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FATEC

Mitsubishi Programmable Controllers
Training Manual
CC-Link (for GX Works2)

● SAFETY PRECAUTION ●

(Always read these instructions before using the products.)

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

[EXERCISE PRECAUTIONS]

⚠ WARNING

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

⚠ CAUTION

- Follow the instructor's directions during the exercise.
- Do not remove the module from the demonstration machine/kit 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 (such as X/Y table) emits abnormal odor/sound, press "Power switch" or "Emergency switch" to turn off the system.
- When a problem occurs, notify the instructor as soon as possible.

REVISIONS

*The textbook number is written at the bottom left of the back cover.

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CONTENTS

INTRODUCTION

This textbook is a user guide to understand easily the CC-Link system with MELSEC-Q series.
For understanding the CC-Link system features, this textbook describes the basic system which connects the remote I/O module or the remote device using GX Works2, and the applied system which connects the RS-232C interface module or the inverter.

The related manuals are show below.

- MELSEC-Q CC-LINK System Master/Local Module type QJ61BT11N
  User's Manual (Details) ····· SH (NA)-080394E

- CC-LINK System Master/Local Module type QJ61BT11N
  User's Manual (Details) ····· SH (NA)-080016

- GX Works2 Version1
  Operating Manual (Common) ····· SH (NA)-080779ENG

- GX Works2 Version1
  Operating Manual (Simple Project) ····· SH (NA)-080780ENG

- Digital-Analog Converter Module type AJ65BT-64DAV/DAI
  User's Manual (Details) ····· SH (NA)-3615

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

- RS-232C Interface Module Type AJ65BT-R2N
  User's Manual (Details) ····· IB (NA)-66781

- INSTRUCTION MANUAL FR-E520-0.1KN to 7.5K-KN ····· IB (NA)-66864

Generic Terms and Abbreviations

This table provides information on the generic terms and abbreviations used in this textbook

Generic Terms and Abbreviations	Description
Intelligent function module	Generic term for 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	• Stations which can perform cyclic transmission and transient transmission of the CC-Link system. The local station is also regarded as the intelligent device station. • Intelligent module device includes the local module installed station such as AJ65BT-R2N, QJ61BT11N, etc.
Intelligent device module	Module that operates as an intelligent device station. (AJ65BT-R2N, etc.)
Error invalid station setting	• Setting for prevention of treatment as data link faulty station if the slave station cannot participate in data link because of power off. (See Section 1.1) • Configure settings in network parameters for CC-Link.
Offline test	• Function to check if the module operates functions normally or not without being connected to the CC-Link. • The test 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 depend on the modules.
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 station	Total number of occupied stations for all the slave stations that configures one CC-Link system.
Station number	• 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 number is 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 (Data link slave station)	• 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 and 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.

Generic Terms and Abbreviations	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 module	• 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 information (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: QJ61BT11N, 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: QJ61BT11N, 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.

Generic Terms and Abbreviations	Description
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	• 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 and 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: QJ61BT11N, AJ61BT11, A1SJ61BT11, AJ61QBT11, A1SJ61QBT11
Word information (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	Generic term of A0J2CPU and A0J2HCPU.
AnACPU	Generic term of A2ACPU (-S1) and A3ACPU. (PLC CPU with data link function is included.)
AnSCPU	Generic term of A1SCPU, A1SJCPU (-S3) and A2SCPU.
AnSHCPU	Generic term of A1SHCPU, A1SJHCPU and A2SHCPU.
AnUCPU	Generic term of A2UCPU (-S1), A3UCPU and A4UCPU.
AnUS(H)CPU	Generic term of A2USCPU (-S1) and A2USHCPU-S1.

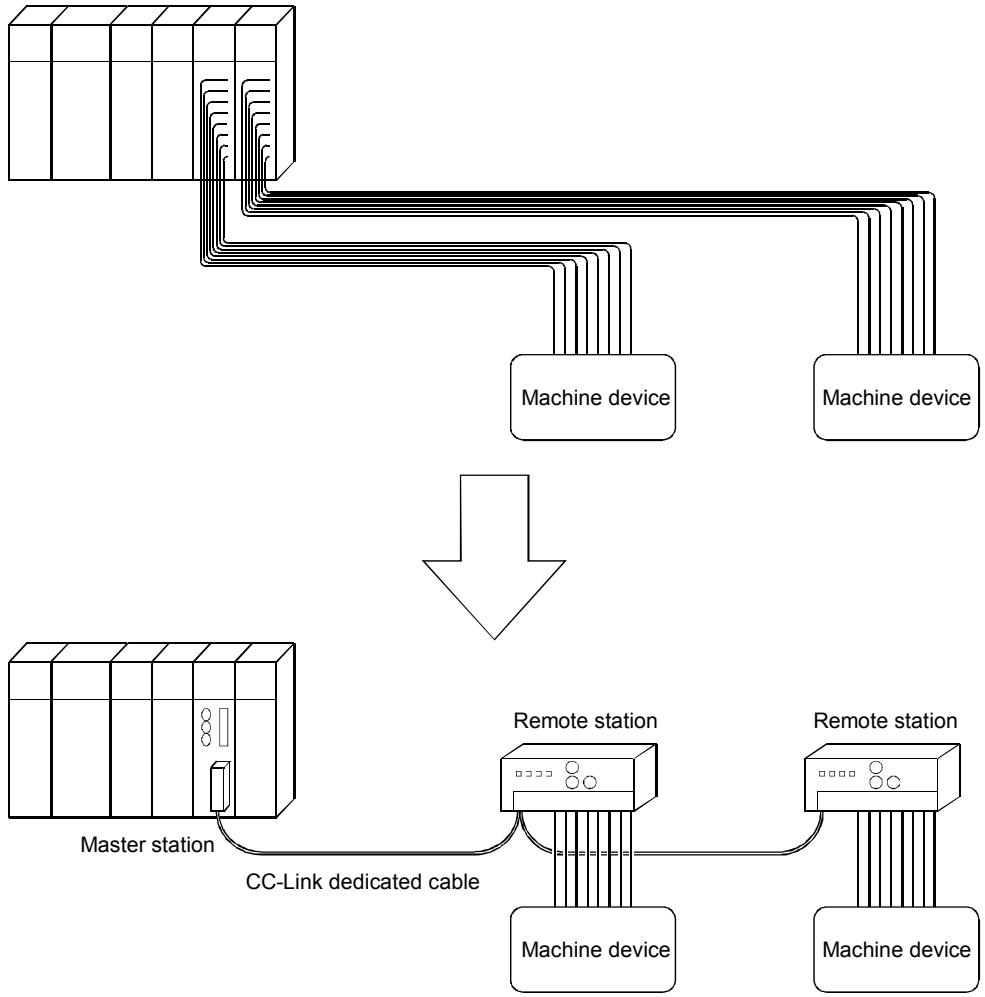
Generic Terms and Abbreviations	Description
ACPU	Generic term of the MELSEC-A series PLC CPUs corresponding to the CC-Link system.
QCPU (Q Mode)	Generic term of the MELSEC-Q series PLC CPUs (Q mode) corresponding to the CC-Link system. (Q00JCPU, Q00CPU, Q01CPU, Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU and Q25HCPU etc)
QCPU (A Mode)	Generic term of Q02CPU-A, Q02HCPU-A and Q06HCPU-A.
QnACPU	Generic term of Q2ASCPU, Q2ASCPU-S1, Q2ASHCPU, Q2ASHCPU-S1, Q2ACPU, Q2ACPU-S1, Q3ACPU, Q4ACPU and Q4ARCPU.
RAS function	Function name that indicates the reliability, the availability and the serviceability of the product. R: Reliability A: Availability S: Serviceability
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	• 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	• 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	• 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	• 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	• 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 to configure a distributed system with reduced wiring and low cost.
CC-Link features and system construction will be explained.

1.1 Features

(1) Reducing wiring and saving space by decentralization.
Each module can be distributed to an equipment device such as a conveyor line and a machine device by using the bus type network. It is possible to reduce the wiring of the entire system, and save space by efficient installation.



(2) Connectable to intelligent device
In addition to the bit/word cyclic transmission, the transient transmission is accomplished. That makes it possible to perform the data communication with intelligent devices such as HMIs, RS-232 interface modules, and personal computers.

(3) Compatible with the safe open field network
Because CC-Link network technology is open many manufacturers in Japan and all around the world have developed a numerous products compatible with CC-link. 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 more details, refer to CC-Link product catalog or the technical information on Mitsubishi Electric (http://www.mitsubishielectric.co.jp/melfansweb/).

(4) The system can be configured to suit to your needs

(a) Transmission distance

The overall distance depends on the transmission speed but the connection is possible from 100m (10Mbps) to 1.2km (156kbps).

(b) Number of connected stations

It is possible to connect a maximum of 64 stations such as remote I/O station, remote device station and local station to one master station.

However, the maximum of connected stations depends also on station type up to 64 remote I/O stations, up to 42 remote device stations, and up to 26 local stations.

(5) Number of link points

Remote Input (RX) 2048 points, remote output (RY) 2048 points and remote register (RW) 512 points can communicate per system.

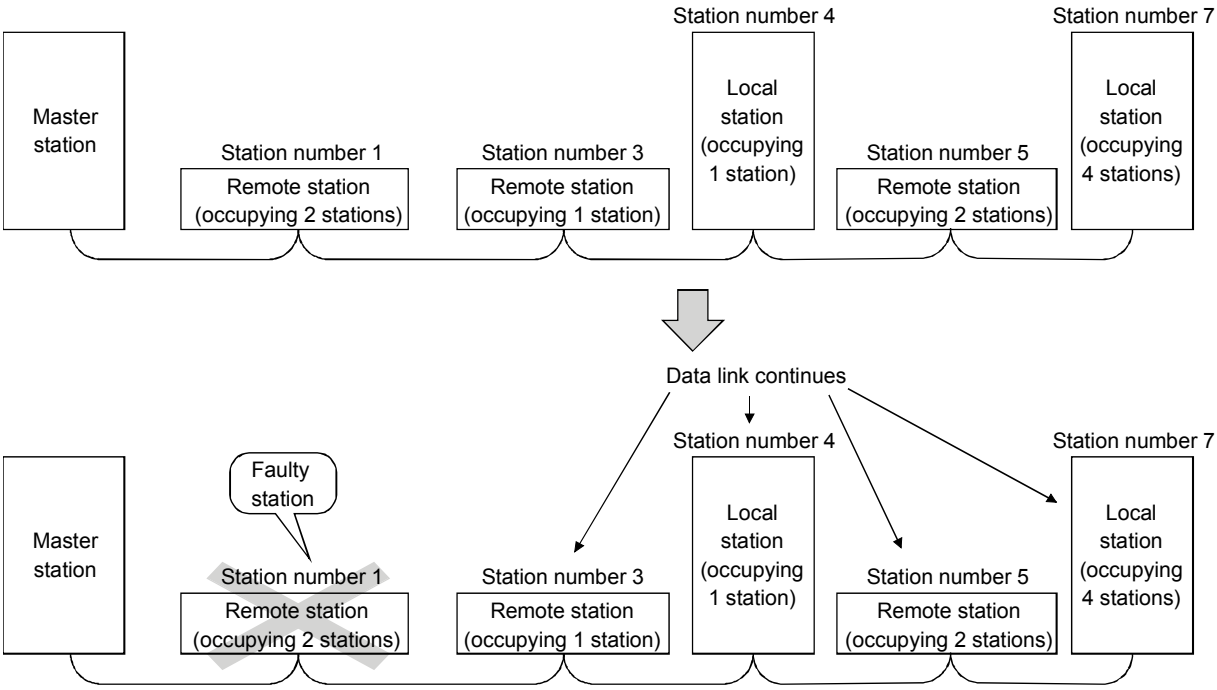
It is possible to deal with remote input (RX) 32 points, remote output (RY) 32 points, remote register (RW) 8 points (RWw: 4 points, RWr: 4 points) per occupied station of the remote station and the local station.

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

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

Also, in case of a module with two-piece terminal block, the module's can be replaced during data link. (Replace the module after turning off the module power.)

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



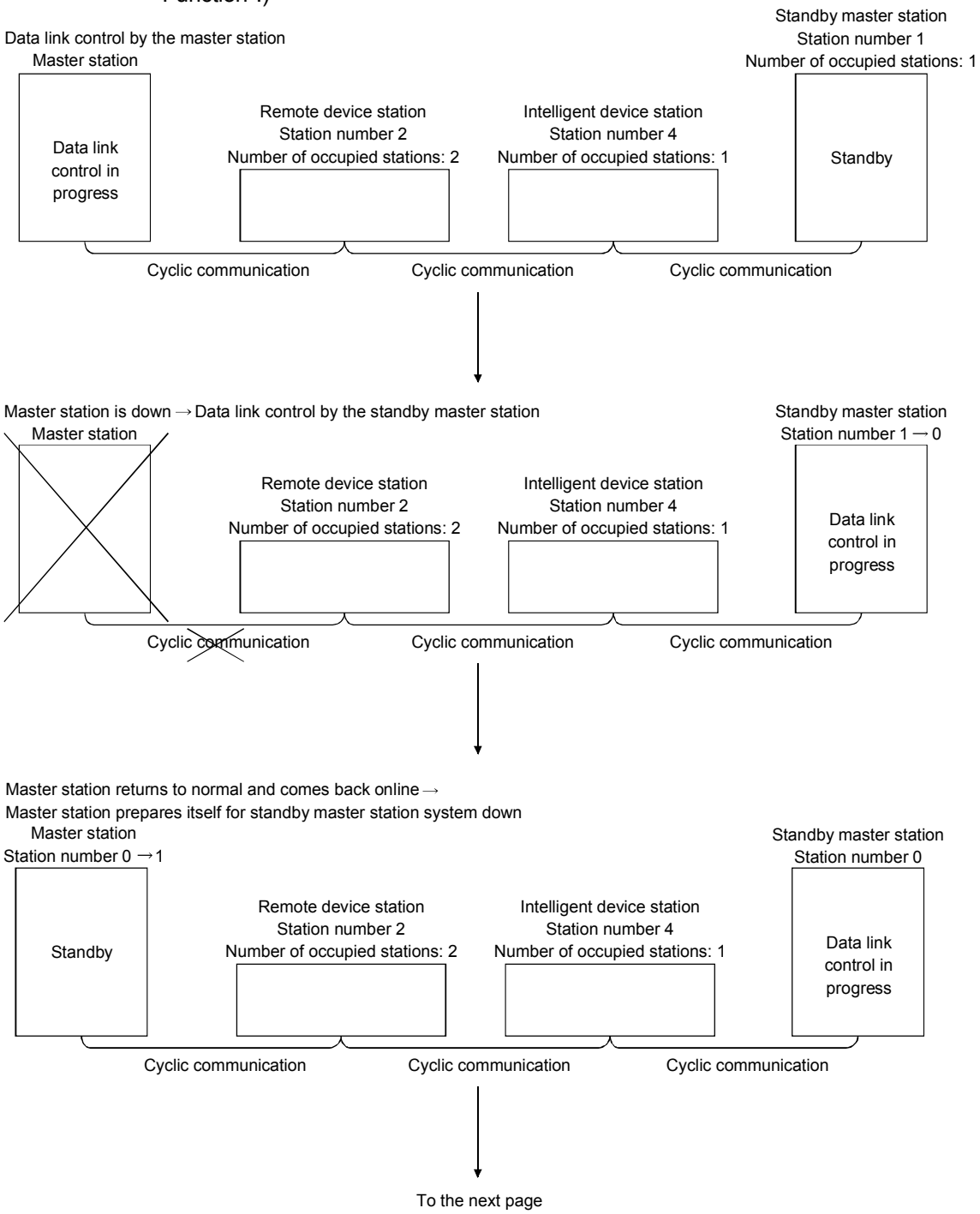
(7) Automatic return function

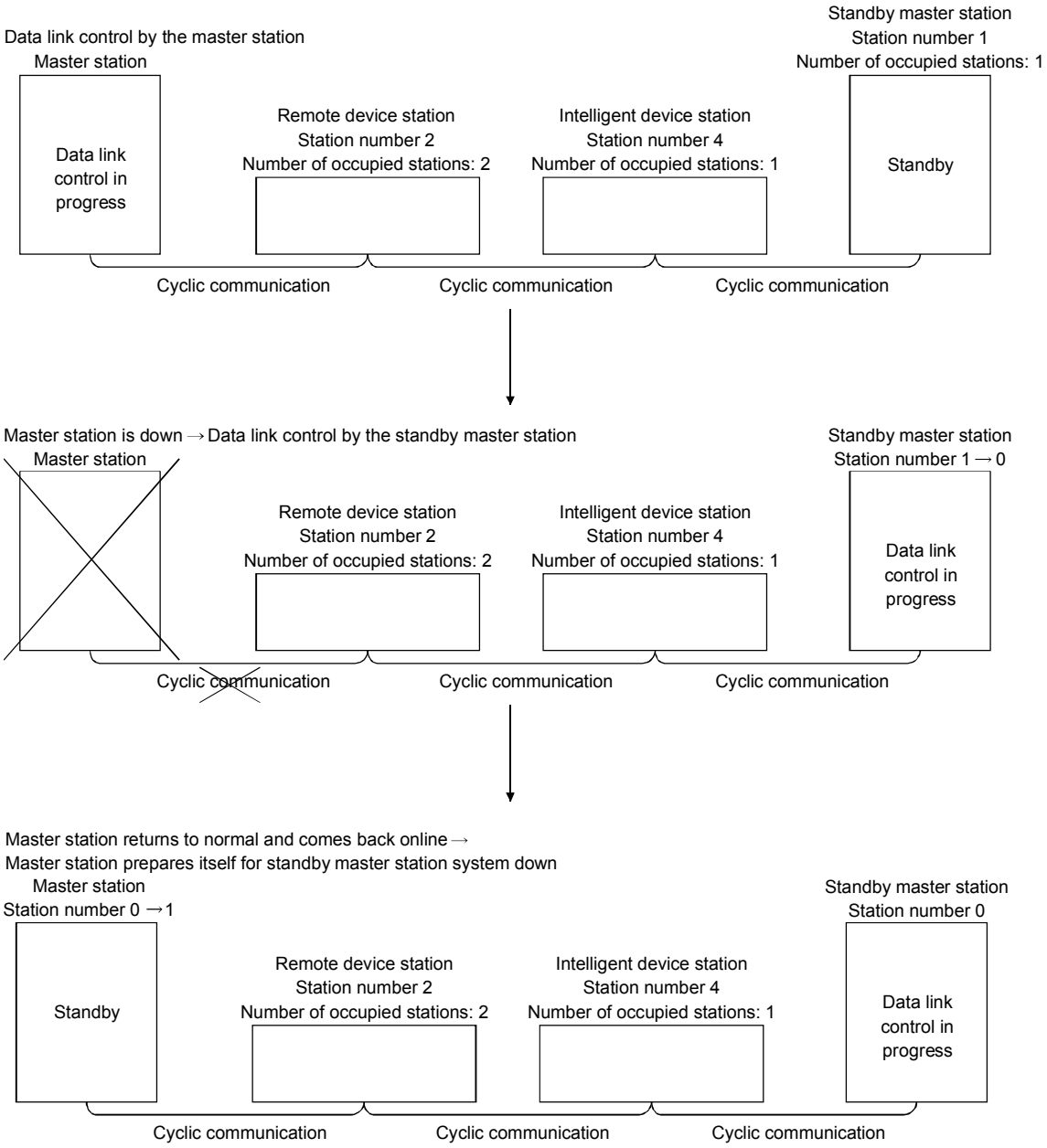
When a station that has been disconnected from the link due to power off recovers the normal status, it will join the data link automatically.

(8) Data link status setting when the master station 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 master station's CPU.
In case of errors which do not stop the PLC operation (such as "Battery ERROR"), the data link will continue regardless of the setting.

(9) Setting the status of input data from a data link faulty station
The data entered (received) from a data-link faulty station can be cleared or the previous status immediately before the error can be maintained.

(10) Standby master function
This function enables the data link to continue working by switching to a standby master station (backup station for the master station) if a malfunction occurs in the master station due to a malfunction of the PLC CPU or power supply.
The master station can return to online operation even when standby master station is controlling the data link. It then waits for standby master station system down. (It is possible by changing the module's settings to "Master Station (Duplex Function".)





(11) Remote device station initialization procedure registration function
This function performs the initial setting for the remote device station using GX Works2, without creating a sequence program.

(12) Event issuance for the interrupt program
This function issues an event when the conditions set by GX Works2 are satisfied in order to make the CPU execute the interrupt program.

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

(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".

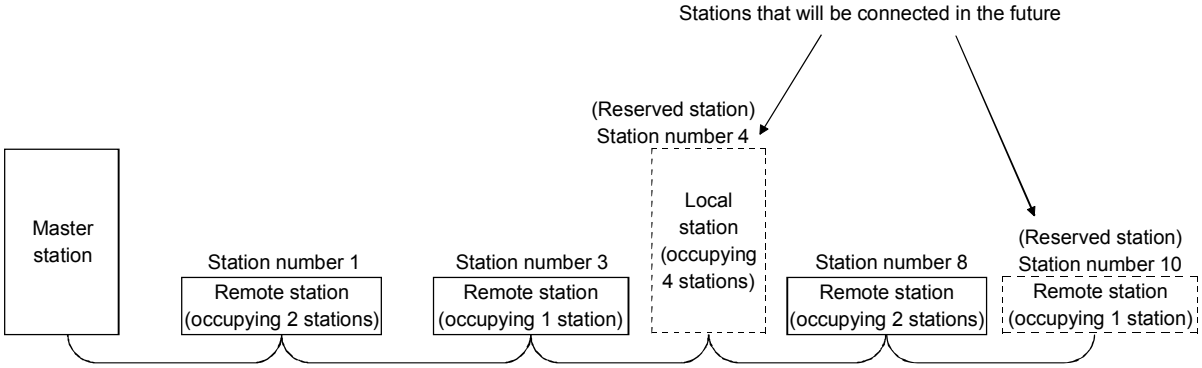
The differences between the two modes are listed in the table below.

	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 (Note)
Transmission rate	Max. 10 Mbps	Max. 10 Mbps
Link scan time	————	Faster than the remote net mode

Note: Only input module and output module.

(15) Reserved station function

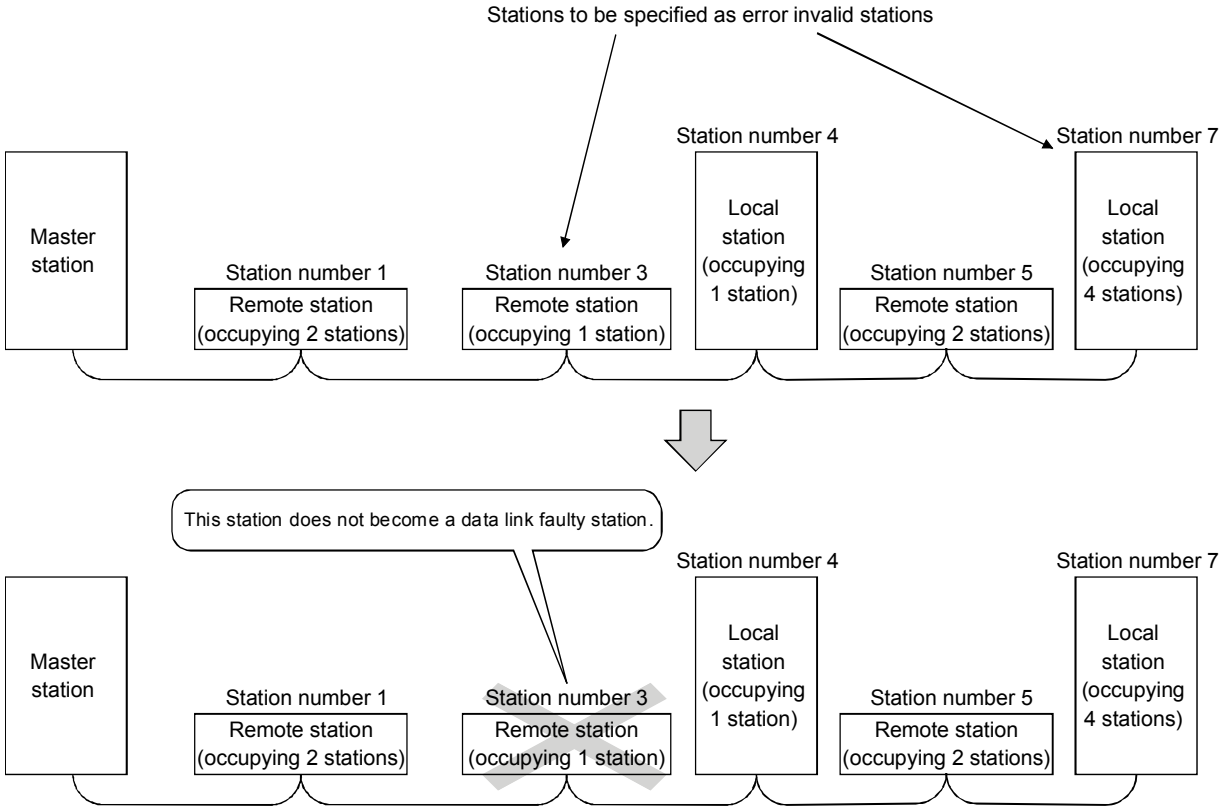
Stations that are not actually connected (stations to be connected in the future) will not be treated as faulty stations if they are specified as reserved stations.



(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 station.

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



(17) Scan synchronization 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 GX Works2 will not be treated as a "data link faulty station" by the master or local station during online operation.

The module can be replaced without detecting an error.

(19) Data link stop/restart

The data link can be stopped and restarted during operation.

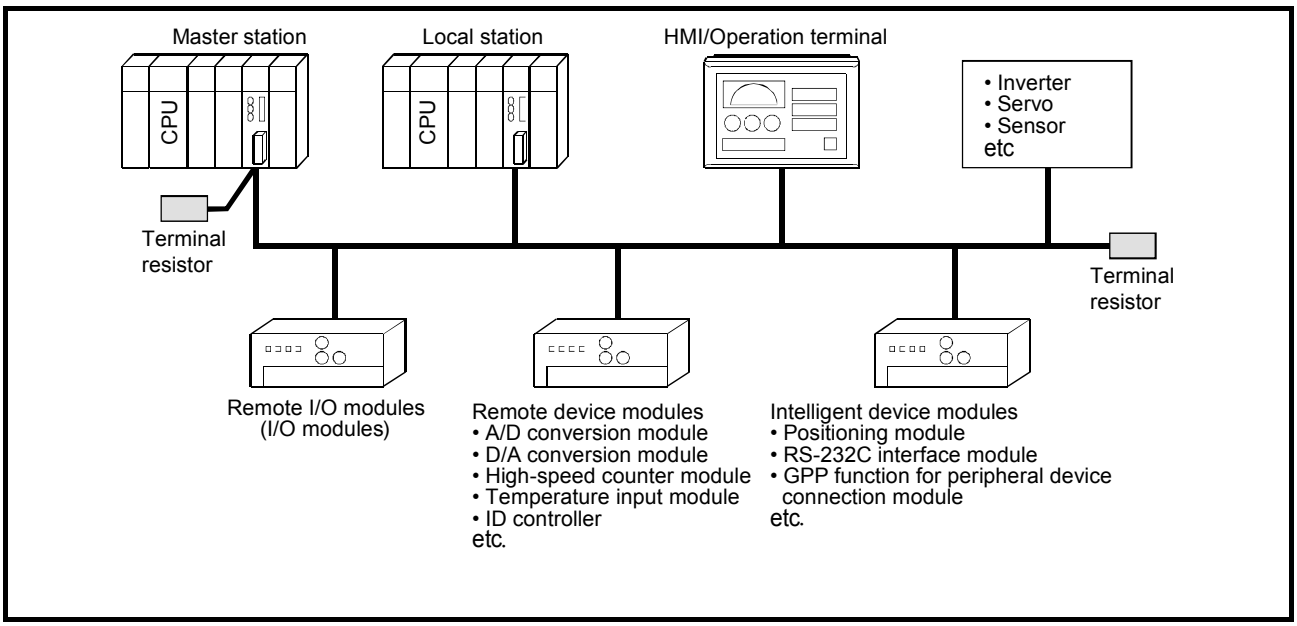
(20) Station number overlap checking function

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

1.2 CC-Link system

CC-Link basic configuration and operation mechanism will be explained.

(1) Example of a basic CC-Link system



(2) Type of equipment

CC-Link system can be divided in 4 main types of stations.

- Master station

  Station which manages/controls the entire CC-Link system with the master/local module mounted on the base unit. Module differs depending on the series: Q Series (QJ61BT11N), L Series (LJ61BT11), QnA Series (AJ61QBT11, A1SJ61QBT11), A Series (AJ61BT11, A1SJ61BT11).

- Local station

  Station which communicates with master station and other local stations with the master/local station mounted on the base unit. Module is the same as master module. (The selection of master or local station depends on the network parameters settings)

- Remote station

  Station which corresponds to the I/O module and special function module and which performs actual input and output processing.

  It includes also other types of devices (inverter, HMI, and sensor). The remote station is divided into the remote I/O station (corresponds to I/O module) and the remote device station (correspond to special function module or equivalent, inverter, HMI, and sensor).

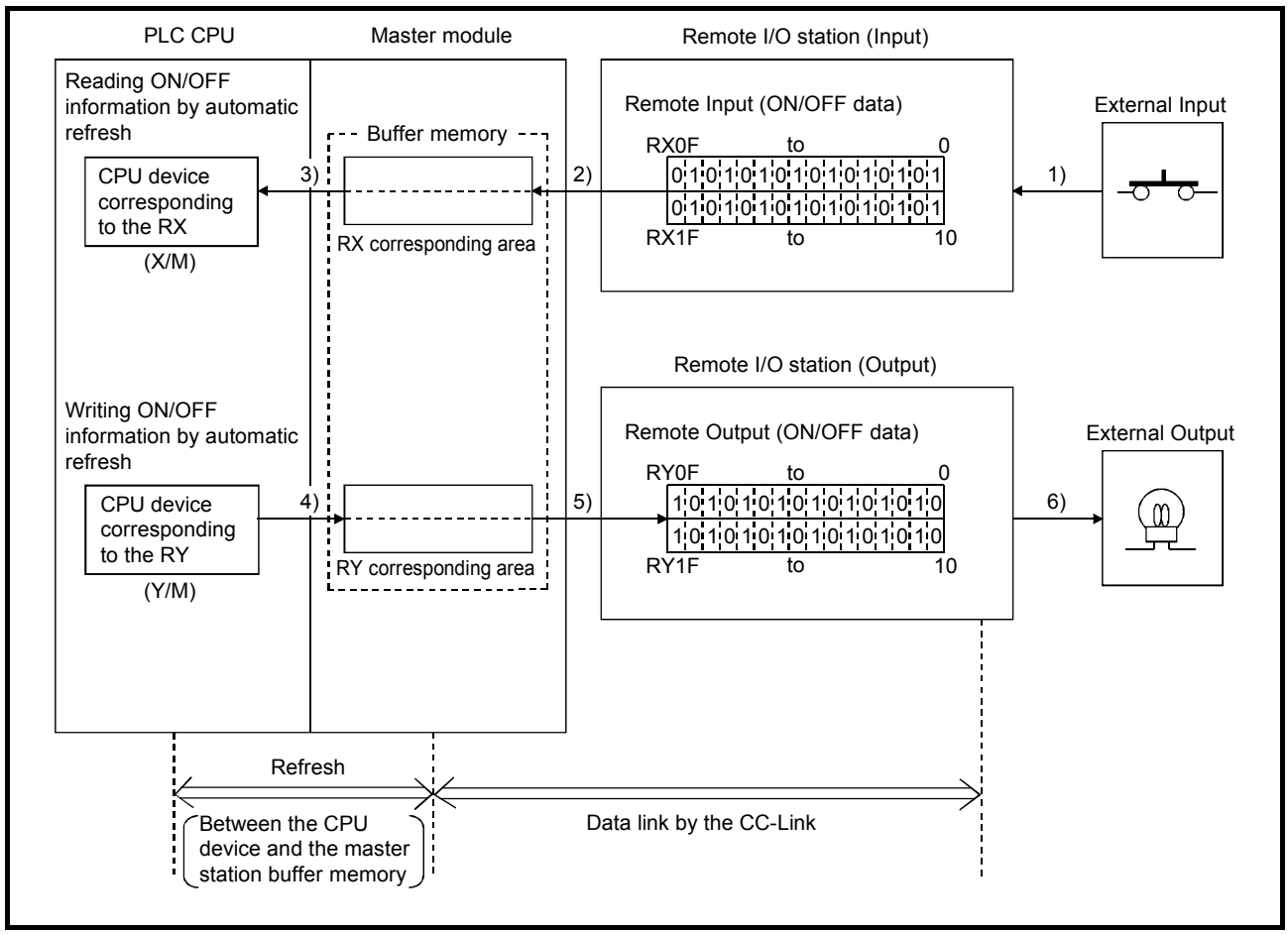
- Intelligent device station

  Station which can perform data communication by the transient transmission (message transmission) (RS-232C Interface module, positioning module, HMI).

For details refer to the Master/Local Module User's Manual (Details), User's Manual (Details) for each module and instructions for each equipment.

(3) CC-Link system basic communication mechanism (master station⟷remote I/O station)

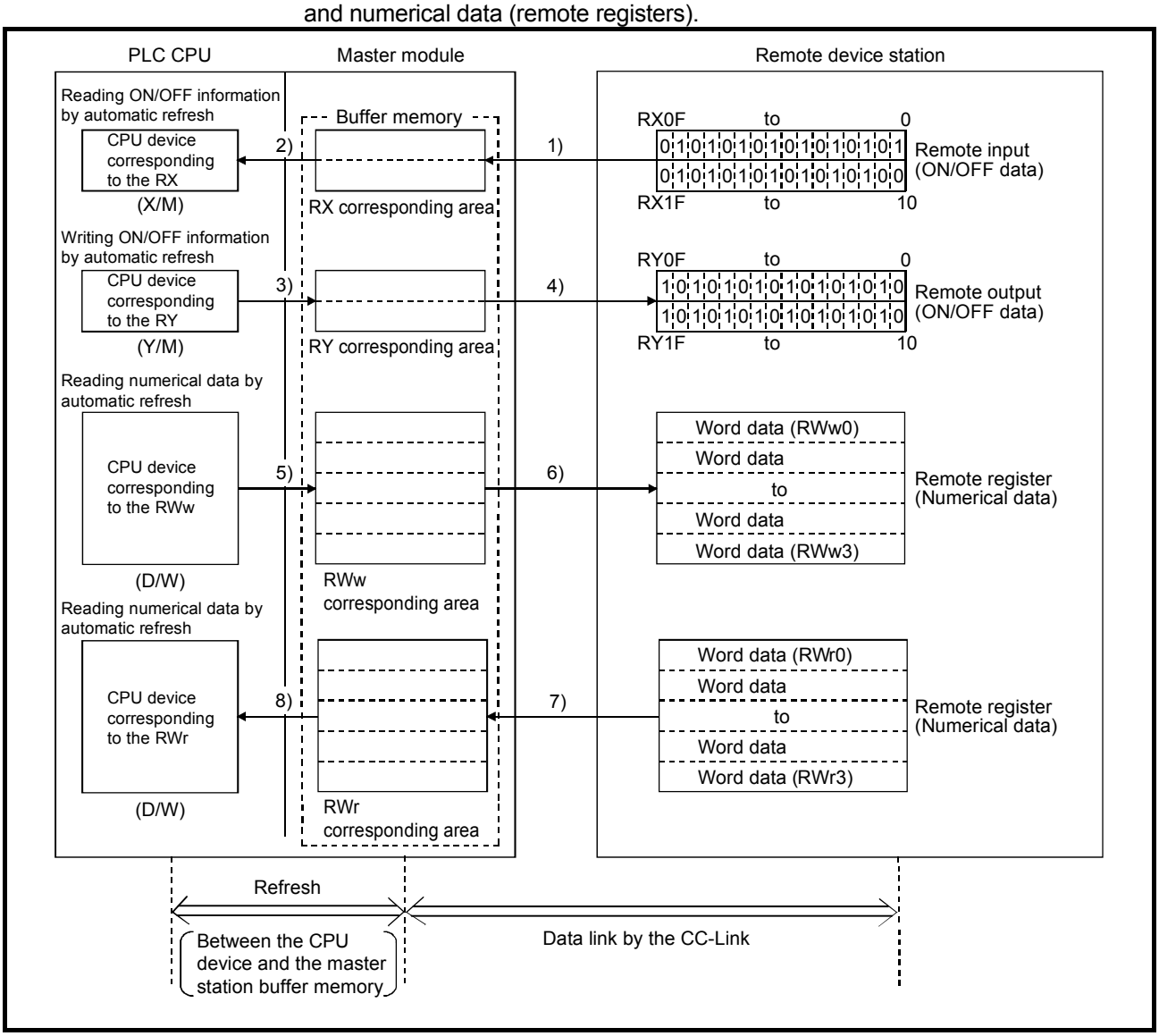
Communicate only with ON/OFF information (remote input RX and remote output RY).



1) The 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 master module buffer memory (remote input signal area) by data link.
3) With the automatic refresh, the remote input signal information of the remote I/O station is read to the CPU from the master module buffer memory (remote input signal area). (It is used as a PLC device in sequence program)
4) The results of the calculation are written to the master module buffer memory (remote output signal area) by automatic refresh.
5) The ON/OFF information stored in the master module buffer memory (remote output signal area) is sent to the remote output signal of the remote I/O station by data link.
6) The signal is output to an external device from the remote I/O station.

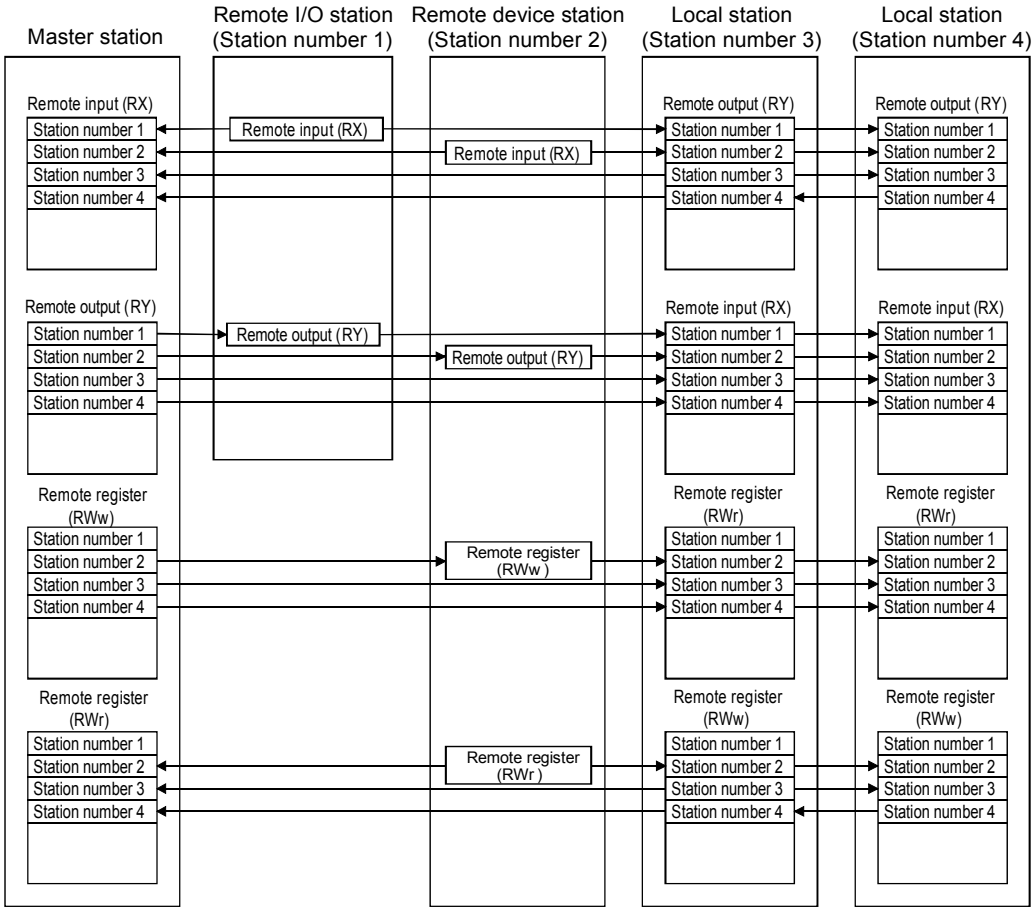
POINT
"Data link by CC-Link" at the bottom of the figure above operates in accordance to the parameter settings of the master station. "Refresh (between the CPU device and the master module buffer memory)", the CPU is operating in accordance with the automatic refresh parameters. It is used as the CPU side device without awareness of the remote side device. Note: The refresh method depends on the type of CPU.

(4) CC-Link system basic communication mechanism (master station⟷remote device station)
Communicate with ON/OFF information (remote input RX and remote output RY) and numerical data (remote registers).

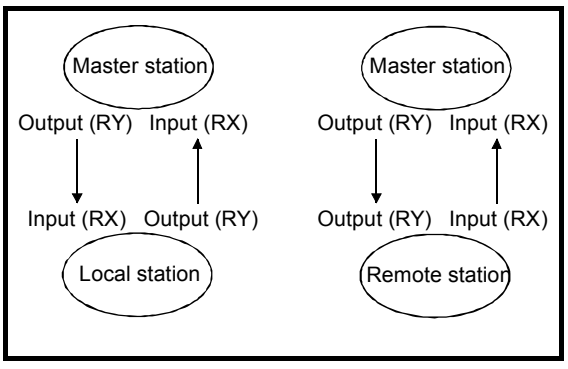


1) The remote input signal (ON/OFF) of the remote device station is stored in the master module buffer memory (remote input signal area) by data link.
2) With the automatic refresh, the remote input signal information of the remote device station is read to the CPU from the master module buffer memory (remote input signal area). (It is used as a PLC device in sequence program)
3) The results of the calculation are written to the master module buffer memory (remote output signal area) by automatic refresh.
4) The ON/OFF information stored in the master module buffer memory (remote output signal area) is sent to the remote output signal of the remote device station by data link.
5) Numerical data are written to the master module buffer memory (remote register transmission area) by automatic refresh.
6) The numerical data stored in the master module buffer memory (remote register transmission area) are written to the remote register of the remote device station by data link.
7) The remote register of the remote device station (numerical data) is stored in the master module buffer memory (remote register reception area) by data link.
8) With the automatic refresh, the numerical data of remote device station are read from the master module buffer memory (remote register reception area).

(5) CC-Link system basic communication mechanism (master station↔local station)
N:N data communication between CPUs is possible with bit information (remote input RX, remote output RY) and word information (remote register).



Because there is an independent CPU in the master station and the local station, with the master station versus the local station, the RY of host station corresponds to the RX of other station as shown below.
In the case of master station versus remote station, the situation is different.



It is the same for remote register RWw and RWr.

1.3 Comparison between QCPU (Q mode)/QnACPU/CC-Link of ACPU

CC-Link system is available with QnACPU and ACPU/QCPU (A mode).
Main differences of functions and control in the case of using QCPU (Q mode), LCPU, QnACPU, ACPU/QCPU the (A mode) are shown below.

Functions	QCPU (Q Mode)	LCPU	QnACPU	ACPU, QCPU (A Mode)
Usable Master/Local module	QJ61BT11N	LJ61BT11	AJ61QBT11, A1SJ61QBT11	AJ61BT11, A1SJ61BT11
Network parameters (master parameters) settings	• GX Works2 *1*5 • Sequence program (Dedicated instruction)		• GX Developer*1 • Sequence program (FROM/TO instruction)	• GX Configurator-CC • Sequence program (FROM/TO instruction, dedicated instruction)
Device Refresh	• Sequence program (FROM/TO instruction) • Automatic refresh parameter*2		• Sequence program (FROM/TO instruction) • Automatic refresh parameter*2	• Sequence program (FROM/TO instruction, dedicated instruction)
Data link startup method	• CC-Link automatic startup*3 (Depends on the default settings) • CC-Link automatic startup (Network parameter settings)		• Sequence program (set ON for Y6/Y8 of master station) • CC-Link automatic startup (Network parameter settings)	• Sequence program (set ON for Y6/Y8 of master station) • Dedicated instruction startup (Network parameter settings)
Initialization procedure registration of remote device station	• GX Works2*4*5 • Sequence program		• Sequence program	• Sequence program
Access to other stations via the CC-Link	Supported		Not supported	Not supported
Standby master function	The master station can automatically return to system		The master station cannot automatically return to system	The master station cannot automatically return to system
Module reset using sequence program	No		Yes	Yes
Event issuance for the interrupt program	Supported		Not supported	Not supported
Parameter verification test	No		Yes	Yes
E^2PROM	No (Not necessary due to the transmission from CPU at the power ON and reset.)		Yes	Yes

*1: Register as PLC CPU network parameter.
*2: Included in PLC CPU network parameter.
*3: In case of one master module, automatic CC-Link startup is possible with default parameter setting.
*4: Register in PLC CPU network parameter (Remote device station initialization procedure registration)
*5: This textbook provides the description of the operation in GX Works2.
In case of QCPU (Q mode) and LCPU, it is possible to operate with GX Developer.

(1) Network parameter settings
In QCPU (Q mode) and QnACPU, parameters which are set in the master station, local station, standby master station with GX Works2 can be set as network parameter.
Because the network parameter is transferred automatically to the master station at the CPU power ON or the reset timing, the parameter setting program for the master station can be omitted.
*: For the ACPU and QCPU (A mode), the sequence program of parameter settings (FROM/TO instructions or dedicated instructions) is necessary.

(2) Device refresh

In case of QCPU (Q mode) and QnACPU, PLC side devices corresponding to remote side devices (RX, RY, RWr, RWw, SB, SW) can be set with automatic refresh parameter.

Sequence program in master station for data read/write is not necessary for the automatic refresh (update) between of specified devices.

*: For the ACPU and QCPU (A mode), the refresh settings with the sequence program (FROM/TO instruction or dedicated instruction) are necessary.

(3) Data link startup method

The master station will start the data link automatically if the network parameters are set in the PLC. For that reason, sequence program for the data link startup request is not necessary.

*: In case of ACPU, the sequence program for the data link startup request is necessary in the master station (ON of Yn6/Yn8 or the dedicated instruction for network parameter settings).

(4) Initial setting of the remote device station

In case of QCPU (Q mode), it is possible to register the initial settings of the remote device station.

By registering the initial setting of the remote device station, it is possible to omit the sequence program.

*: ACPU and QnACPU requires the initial setting for the remote device station to be done in the sequence program.

(5) Access to other stations via the CC-Link

In QCPU (Q mode), access to other station is possible via the CC-Link system from GX Works2 connected to the PLC.

*: It is not possible to access other stations via the CC-Link system from ACPU and QnACPU. (Some access is possible when CC-Link interface board is attached to GX Works2 side)

(6) Automatic return function of standby master station

With Q Series (QJ61BT11N), the master station, after recovery, can automatically return to system when the data link is performed by the standby master station.

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

(7) Event issuance for the interrupt program

With network parameters, the settings of the conditions of issue for event (signal to execute the interrupt program) can be configured and it makes it possible to reduce the number of steps of the program and shorten the san time. The conditions for event issuing may be the ON/OFF state of the specified devices (RX,RY,RWr,SB,SW) or the data match/mismatch.

*: In A Series and QnA Series, it is necessary to judge the conditions of the device ON/OFF and the data match/mismatch with sequence program.

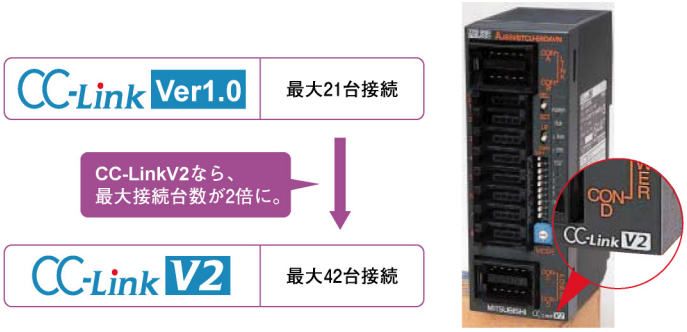
1.4 Introduction of the CC-Link Ver.2 function

(1) The amount of data transmission and reception is about 8 times more than conventional products.
The maximum amount of data transmission and reception for CC-Link Ver2.0 is 8192 points of remote I/Os and 4096 words.
The following table shows the differences of data communication capacity with conventional products (Ver1.0).

CC-Link Ver1.0	CC-Link Ver2.0
Remote I/O (RX, RY): 2048 points each	Remote I/O (RX, RY): 8192 points each
Remote register (RWw): 256 words Remote register (RWr): 256 words	Remote register (RWw): 2048 words Remote register (RWr): 2048 words

(2) Compatible with various extension needs
Analog module for CC-Link Ver2.0 which supports the 8 times higher capacity than conventional products have provided. Also, the support for the instrumentation systems that requires high capacity communication is provided.

■ Analog module supporting CC-Link Ver2.0



(3) Selecting a mode according to the system
CC-Link network provides 4 different modes to support various systems.
Following table provides an overview of those modes.

Mode	Connectable station	Overview
Remote net Ver1. mode	Remote I/O station Remote device station Intelligent device station Local station Standby master station	Full compatibility mode with conventional module (QJ61BT11N). Select this mode in the case of cyclic point extension is not required or the QJ61BT11N is replaced as maintenance part of the conventional module.
Remote net Ver2. mode		Select this mode when you make the cyclic points extension and build a new system.
Remote net additional mode		Select this mode when you add a Ver.2 compatible slave station to an existing system and perform the cyclic points extension.
Remote I/O net mode	Remote I/O station	Select this mode when the system configuration consists of only the master station and remote I/O station. With high speed cyclic transmission, it is possible to reduce the link scan time.

(4) Applicable software package

Following table provides information about the software packages compatible with CC-Link Ver2.0.

Software package name	Model name	Remarks
GX Works2	SWnDNC-GXW2	Required. MELSEC sequence programming software.
GX Developer	SWnD5C-GPPW	Required. MELSEC sequence programming software.

1.4.1 About CC-Link versions

(1) About "Cable version" Ver.1.00 and Ver.1.10

Version 1.10 modules have a uniform station-to-station cable length specification of 20 cm or more on the conventional station-to-station cable length.

In contrast, the conventional modules are defined as Version 1.00.

See APPENDIX 2 and APPENDIX 14 for the maximum overall cable distance of Version 1.10.

In order to make the station-to-station cable length uniformly 20 cm or more, the following conditions are required:

1) All the modules in 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.

POINT

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 modules and cables of both Version 1.00 and Version 1.10.

See APPENDIX 2 for the maximum overall cable distance and station-to-station cable length of Version 1.00.

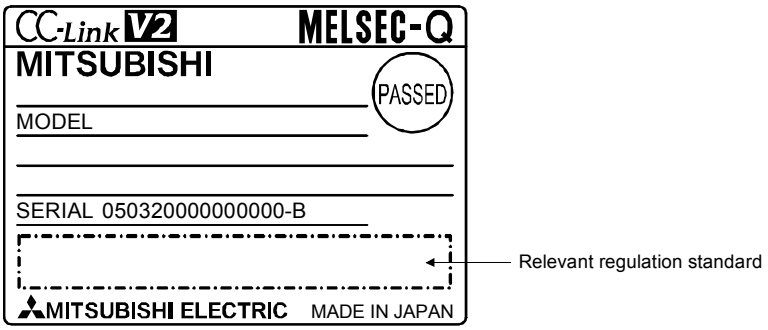
(2) About "function version" Ver.2

Ver.2-compatible module is a module that supports the cyclic points expansion.

(3) How to check the Version

Modules of Version 1.10 have the logo "CC-Link" on the rating plate.

Modules of Version 2 have the logo "Ver.2" on the rating plate.



CHAPTER 2 SPECIFICATIONS AND OPERATION SETTINGS

This section describes the specifications and operation settings of CC-Link for MELSEC-Q Series.
For more details, refer to QJ61BT11N CC-Link System Master/Local Module User's Manual (Details).

2.1 Specifications

2.1.1 Performance Specifications

Table 2.1 Performance specifications

Item	QJ61BT11N
Transmission speed	Can be selected from 156 kbps/ 625 kbps/ 2.5 Mbps/ 5 Mbps/ 10 Mbps
Maximum overall cable distance (Maximum transmission distance)	Varies according to the transmission rate. *1
Maximum number of connected stations (master station)	64 However, the following conditions must be satisfied: {(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 ≤ 64 B: Number of remote device stations ≤ 42 C: Number of local stations, standby master stations, or intelligent device stations ≤ 26
Number of occupied stations (local station)	1 to 4 stations*2 (Switch by parameter settings)
Maximum number of 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 Number of link points per station	Remote I/O (RX, RY) : 32 points (local station is 30 points) Remote register (RWw) : 4 points (master station →remote device station/local station/intelligent device station/standby master station) Remote register (RWr) : 4 points (remote device station/local station/ intelligent device station/standby master station→master station)
Communication method	Polling method
Synchronization method	Frame synchronization method
Encoding method	NRZI method
Network topology	Bus (RS-485)
Transmission format	Conforms to HDLC
Error control system	CRC($X^{16} + X^{12} + X^5 + 1$)
Connection cable	CC-Link dedicated cable/ CC-Link dedicated high performance cable/ Version 1.10 compatible CC-Link dedicated cable *1
RAS function	• Automatic return function • Slave station cut-off function • Error detection by the link special relay/register
Number of I/O occupied points	32 points (I/O assignment: Intelligent 32 points)
5 V DC internal current consumption	0.46A
Weight	0.12kg

*1: For information on the cable, refer to APPENDIX 2.

*2: "1 station" does not indicate the number of stations, but "the number of occupied stations".

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

This section describes the number of occupied stations, station number, number of modules and number of stations.

(a) Number of occupied stations

The number of occupied station is defined for the remote I/O station, remote device station and the local station.

However, it is possible to set the number of occupied stations (1 to 4 stations*) for local station.

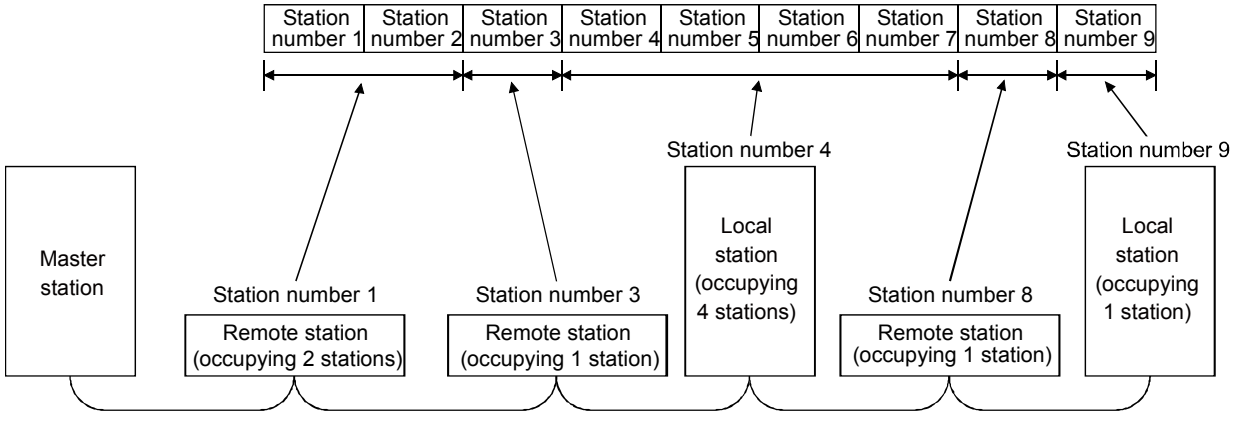
Module		Number of occupied stations
Remote I/O station (8 points, 16 points, 32 points module)		1 station
Remote device station	AJ65BT-64AD	2 stations
	AJ65BT-64DAV	2 stations
	AJ65BT-64DAI	2 stations
	AJ65BT-D62 AJ65BT-D62D(S1)	4 stations
	AJ65BT-68TD	4 stations
	AJ65BT-64RD3 AJ65BT-64RD4	4 stations
Local station	QJ61BT11N	1 to 4 stations* (Switch by parameter settings)
Intelligent device station	AJ65BT-R2N	1 station
	AJ65BT-D75P2-S3	4 stations
	GT15-J61BT13	1 station or 4 stations

*: In case of function version A, the settings are only 1 station or 4 stations.

(b) Station number

If the number of occupied stations of all the connected stations is "1 station", set the station number consecutively from 1 (1, 2, 3,...).

However, if the station which occupies more than 1 station is connected, setting must be done in consideration of the number of occupied stations.



(c) Number of modules and number of stations

Number of modules means the number of physical modules.

Number of stations means the number of occupied stations of each module mentioned in (a).

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

(2) Applicable system

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

(a) Connectable modules, number of connectable modules and mountable base units

1) Connecting a master/local module to a CPU

This section describes the connectable CPU modules of QJ61BT11N, number of connectable modules and mountable base units.

There may be cases where the power capacity is insufficient, depending on the combinations with other connected modules and the number of connected modules.

Be sure to consider the power capacity when connecting the module.

In case of the power capacity is insufficient, consider the combination of the connectable module.

Connectable CPU			Number of connectable modules*1		Mountable base unit*2	
CPU type		CPU Model name	When the parameters are set using the software package	When the parameters are set using dedicated instructions	Main base unit	Extension base unit
PLC CPU	Basic model QCPU	Q00JCPU	Up to 2 modules	Up to 2 modules	○	○
		Q00CPU				
		Q01CPU				
	High performance model QCPU	Q02CPU	Up to 8 modules*3	Up to 64 modules	○	○
		Q02HCPU				
		Q06HCPU				
		Q12HCPU				
		Q25HCPU				
	Process CPU	Q02PHCPU	Up to 8 modules*3	Up to 64 modules	○	○
		Q06PHCPU				
		Q12PHCPU				
		Q25PHCPU				
	Redundant CPU	Q12PRHCPU	Up to 8 modules*4*5*6	Not connectable	○*7	○*7
		Q25PRHCPU				
	Universal model QCPU	Q00UJCPU	Up to 2 modules	Up to 8 modules	○	○
		Q00UCPU	Up to 2 modules	Up to 24 modules		
		Q01UCPU				
		Q02UCPU	Up to 4 modules	Up to 36 modules	○	○
		Q03UDCPU	Up to 8 modules	Up to 64 modules		
		Q04UDHCPU				
		Q06UDHCPU				
		Q10UDHCPU				
		Q13UDHCPU				
		Q20UDHCPU				
		Q26UDHCPU				
		Q03UDECPU				
		Q04UDEHCPU				
		Q06UDEHCPU				
		Q10UDEHCPU				
		Q13UDEHCPU				
		Q20UDEHCPU				
		Q26UDEHCPU				
		Q50UDEHCPU				
		Q100UDEHCPU				

○: Connectable, ×: Not connectable

Connectable CPU		Number of connectable modules*1		Mountable base unit*2	
CPU type	CPU Model name	When the parameters are set using the software package	When the parameters are set using dedicated instructions	Main base unit	Extension base unit
C Controller module	Q06CCPU-V-H01	Up to 8 modules	Not connectable	○*7	○*7
	Q06CCPU-V				
	Q06CCPU-V-B				
	Q12DCCPU-V				

○: Connectable, ×: Not connectable

*1 Must be inside the I/O point number range of 1 CPU module.

*2 Can be mounted on any I/O slot of the usable base unit.

*3 When selecting 8 modules, use a CPU unit with the serial number (first five digits) of 08032 or later.
When an unsupported PLC CPU is used, operations cannot be guaranteed.
If a CPU module with the serial number (first five digits) of 08031 or earlier is used, the number of connectable modules is 4.

*4 When a redundant system is used, use a QJ61BT11N with the serial number (first five digits) of 06052 or later.
When an unsupported QJ61BT11N is used, operations cannot be guaranteed.

*5 Count the number of QJ61BT11N in each system.
Example: When one QJ61BT11N is mounted in each system (A and B), it is counted as one module.

*6 When selecting 8 modules, use a CPU unit with the serial number (first five digits) of 09102 or later on both type.
When an unsupported PLC CPU is used, operations cannot be guaranteed.
If a CPU module with the serial number (first five digits) of 09101 or earlier is used, the number of connectable modules is 4.

*7 If parameter setting has been made using the dedicated instructions, it is not connectable.

REMARK

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

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

This section describes the connectable network modules of QJ61BT11N, number of connectable modules and mountable base units.

There may be cases where the power capacity is insufficient depending on the combinations with other connected modules and the number of connected modules.

Be sure to consider the power capacity when connecting the module.

In case of the power capacity is insufficient, consider the combination of the connectable module.

1) When performing the parameter setting with GX Works2

Connectable network module	Number of connectable modules*1	Mountable base unit*2	
		Remote I/O station main base unit	Remote I/O station extension base unit
QJ72LP25-25	Up to 4 modules	○	○
QJ72LP25G			
QJ72BR15			

○: Connectable, ×: Not connectable

*1 Must be inside the point number range of the network module.

*2 Can be mounted on any I/O slot of the usable base unit.

2) When performing the parameter settings with dedicated instructions

Connectable network module	Number of connectable modules	Mountable base unit	
		Remote I/O station main base unit	Remote I/O station extension base unit
QJ72LP25-25	Not connectable	×	×
QJ72LP25G			
QJ72BR15			

○: Connectable, ×: Not connectable

REMARK

Basic model QCPU and C Controller module cannot compose MELSECNET/H remote I/O.

(b) Availability of CPU module and network module for additional functions.

When QJ61BT11N additional functions are used, use products which support those additional functions, the CPU module and the network module (MELSECNET/H remote I/O station). When the PLC CPU or the network module does not support the functions, operations cannot be guaranteed.

The table below describes the version of CPU module and network module corresponding to the additional functions.

Applicable module		QJ61BT11N additional functions			
		Event issuance for the interrupt program	Remote net additional mode	Data link startup function using a standby master station (QJ61BT11N serial number (first five digits) of 07112 or later)	Block data assurance of cyclic data per station (QJ61BT11N serial number (first five digits) of 08032 or later)
PLC CPU	Q00JCPU Q00CPU Q01CPU	○ (CPU module function Ver.B or later)	○ (CPU module serial number (first five digits) of 06112 or later)	○	×
	Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU	○	○ (CPU module serial number (first five digits) of 05032 or later)	○	○ (CPU module serial number (first five digits) of 08032 or later)
	Q02PHCPU Q06PHCPU	○	○	○	○
	Q12PHCPU Q25PHCPU	○	○ (CPU module serial number (first five digits) of 07032 or later)	○	○ (CPU module serial number (first five digits) of 08032 or later)
	Q12PRHCPU Q25PRHCPU	○	×	○	×
	Q00UJCPU Q00UCPU Q01UCPU Q02UCPU Q03UDCPU Q04UDHCPU Q06UDHCPU Q10UDHCPU Q13UDHCPU Q20UDHCPU Q26UDHCPU Q03UDECPU Q04UDEHCPU Q06UDEHCPU Q10UDEHCPU Q13UDEHCPU Q20UDEHCPU Q26UDEHCPU Q50UDEHCPU Q100UDEHCPU	○	○	○	○

○: Available ×: Not available

Applicable module		QJ61BT11N additional functions			
		Event issuance for the interrupt program	Remote net additional mode	Data link startup function using a standby master station (QJ61BT11N serial number (first five digits) of 07112 or later)	Block data assurance of cyclic data per station (QJ61BT11N serial number (first five digits) of 08032 or later)
C Controller module	Q06CCPU-V-H01 Q06CCPU-V Q06CCPU-V-B Q12DCCPU-V	○	○	○	○
Network module	QJ72LP25-25 QJ72LP25G QJ72BR15	×	×	×	×

○: Available ×: Not available

REMARK

For information on the update of QJ61BT11N functions, refer to QJ61BT11N User's Manual (Details).

(c) Using a multiple CPU system

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

1) Usable QJ61BT11N

QJ61BT11N supports multiple CPU system with function Ver.B from the first products.

2) Network parameters

Set the network parameters in the control CPU of QJ61BT11N.

(d) Applicable software package

The software package available for the QJ61BT11N is listed below:

Manual name	Model name	Remarks
GX Works2	SWnDNC-GXW2	Required MELSEC sequence programming software.

(e) Available slave stations

Ver.1-compatible slave stations and Ver.2-compatible slave stations can also be used.

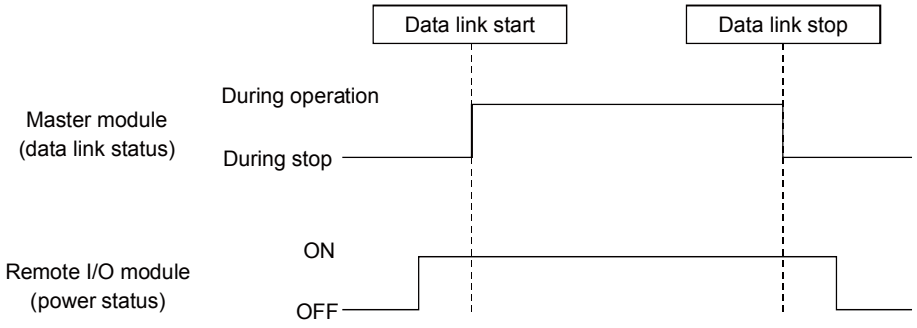
(3) Notes on the system configuration

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

(a) When powering on and off

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

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



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

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

1) Cause for incorrect input due to a momentary power failure

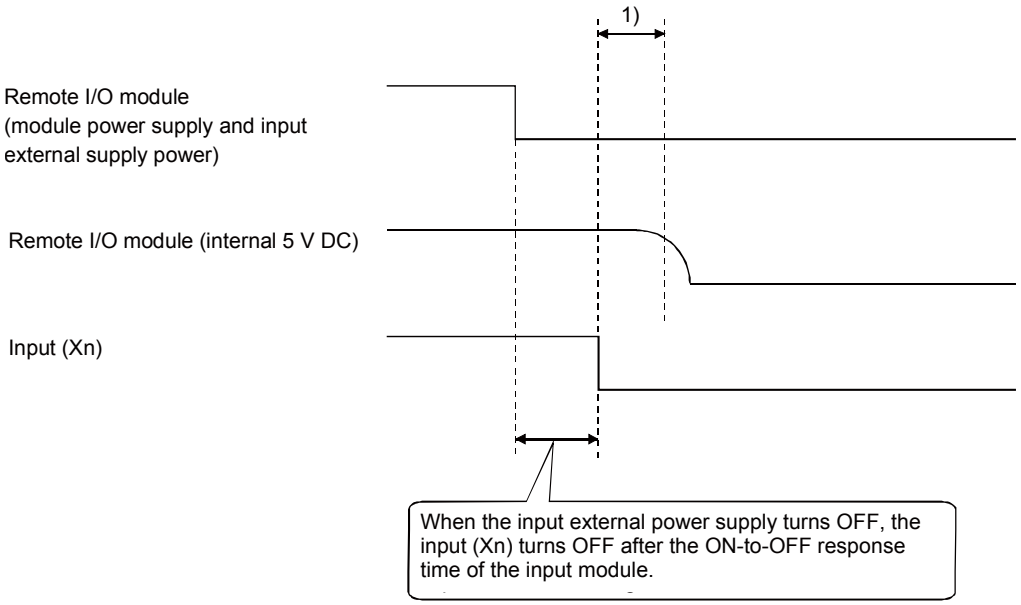
The remote I/O module hardware uses the power by internally converting the module power (24 V DC) to 5 V DC.

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

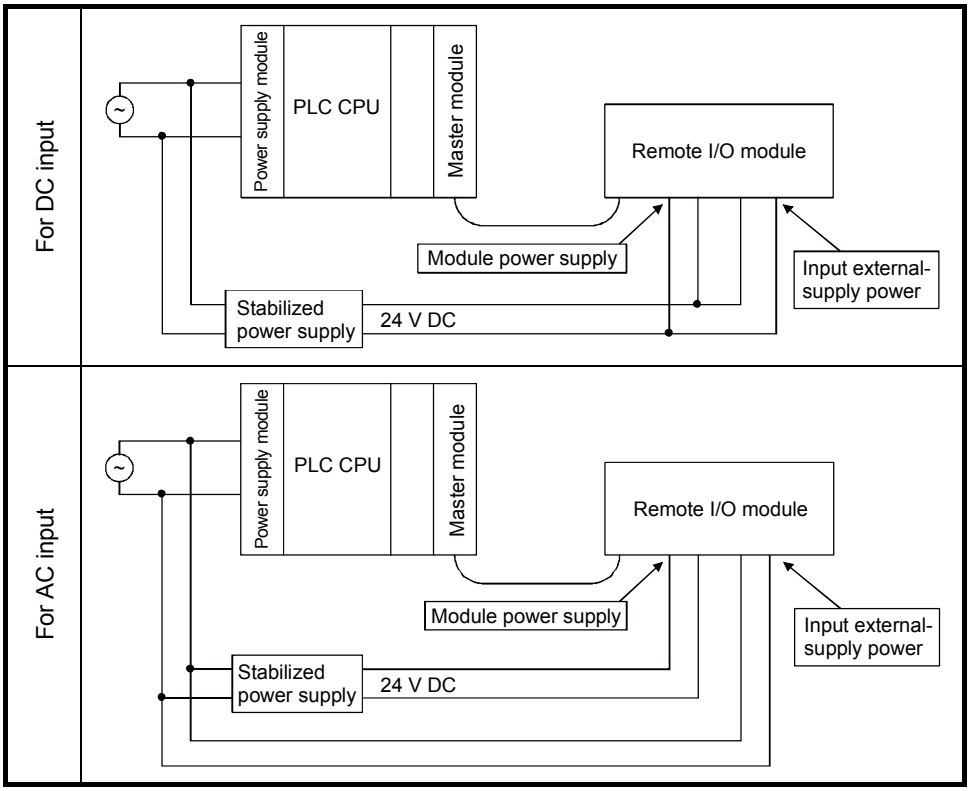
(Time for the 5 V DC power in the remote I/O module to turn off)

> Response time for input module on→off)

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

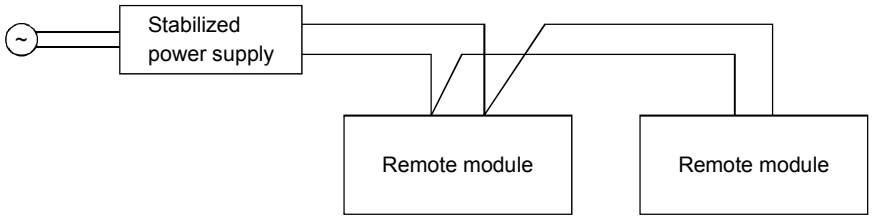


2) Countermeasure for incorrect input
For the power supply module, the stabilized power supply and the input external supply power of AC input, wire the power cables from the same power source.



REMARK

When supplying power from a single power source to multiple remote I/O modules, select the proper type of cable and perform the wiring in consideration of the voltage decline.
Connections can be established if the receiving end voltage at the remote I/O module is within the specified range of the remote I/O module to be used.



(c) Access to a station with the station number 64
1) Access to a local station with the station number 64 cannot be performed from GX Works2 and GOT.
Changing the station number to the one other than 64 allows access from other stations.
2) Access to a local station and intelligent device station with the station number 64 cannot be performed from the CC-Link board.
Changing the station number to the one other than 64 allows access from other stations.

(d) Precautions when using in MELSECNET/H remote I/O station
Consider the following points when using in MELSECNET/H remote I/O station.
• The interrupt settings of the network parameters cannot be performed.
• Dedicated instructions cannot be used.

(e) Precautions when setting dedicated instruction retry count

The serial No. of QJ61BT11N corresponding to the dedicated instruction retry count setting is as follows.

• QJ61BT11N serial number (first five digits) of 08102 or later

Some instructions cannot be used with retry count setting. For more details, refer to Appendix 2.1(3).

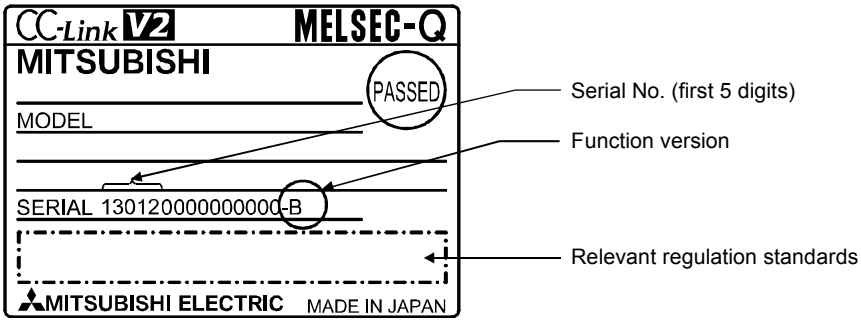
There is no restrictions for CPU module being used.

(4) Checking the function version and serial number

The QJ61BT11N serial number and function version can be checked on the rating plate, on the front of the module and in the system monitor of GX Works2.

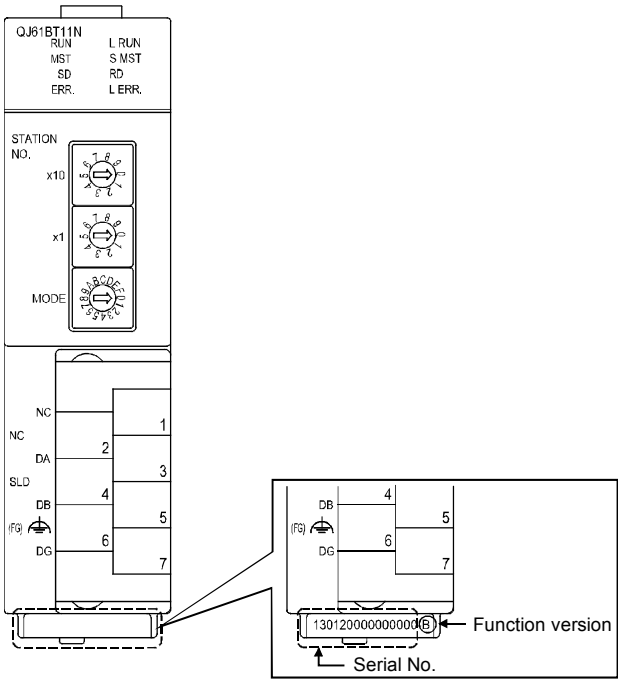
(a) Checking the function version and serial number of QJ61BT11N

1) Checking the SERIAL number on the rating plate on the module side



2) On the front of a module

The serial number is printed on the front (at the bottom) of the module.

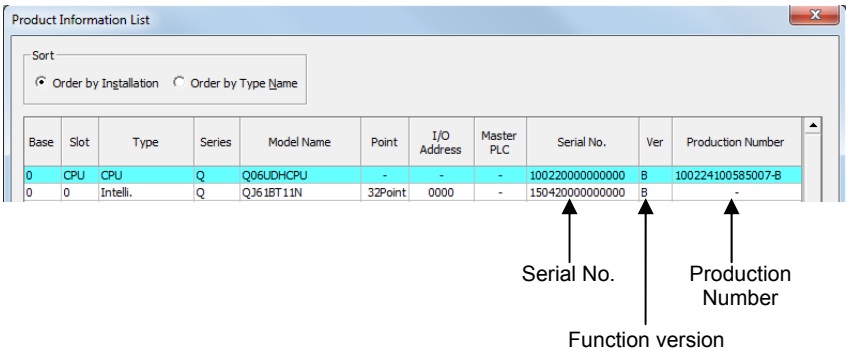


REMARK

The display of the serial No. module is sequentially performed since August 2008. About the product produced in time switching, there are some products which does not print the serial No. on the front of the module.

3) Using the system monitor (Product Information List)

Go to "System monitor" in "Diagnostics" tab of the GX Works2 software, click the "Product information list" button.



1) Display of a production number

Because a QJ61BT11N does not support a production number display, a hyphen (-) is displayed.

POINT

The serial number on the rating plate on the front of the module may differ from that in the production information list window of GX Works2.

- The serial number on the rating plate and the front of the module indicates the management information of the product.
- The serial number on the production information list window of GX Works2 indicates the functional information of the product.
  The functional information of the product is updated when a new function is added.

2.1.2 Master/Local module I/O signals

This section lists the Master/Local module (QJ61BT11N) I/O signals for communication with a PLC CPU.

List of I/O signals

The "n" in the table indicates the master/local module's start I/O number, which is determined by both the installation position and the specification of module installed on a slot before the master/local module.

Example: When the start I/O number of the master/local module is "X/Y30":

Xn0 to X(n + 1)F → X30 to X4F

Yn0 to Y(n + 1)F → Y30 to Y4F

Table 2.4 List of QJ71BT11 I/O signals

Signal direction: PLC CPU ← Master/local module				Signal direction: PLC CPU → Master/local module			
Input No.	Signal name	Availability		Output No.	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

Do not turn on the “Use prohibited” signals in the table 2.4. Doing so may cause a malfunction in the programmable controller system.

2.1.3 Master/Local module buffer memory

The Master/Local module (QJ61BT11N) buffer memory is used to transmit data between the QJ61BT11N and the PLC CPU.
Data can be read from or written to the PLC CPU by using the automatic refresh and the CC-Link dedicated instructions.
The contents of the buffer memory return to the default when the power is turned OFF or the PLC CPU is reset.
For more details, refer to APPENDIX 10 and QJ61BT11N User's Manual (Details).

Buffer memory list

Table 2.5 Buffer memory list (1/3)

Address		Item	Description	Read/write possibility	Availability	
Hexadecimal	Decimal				Master station	Local station
0_H to DF_H	0 to 223	Parameter information area	Stores parameter settings.	Read only	○	—
$E0_H$ to $15F_H$	224 to 351	Remote input (RX)*2	For the master station: Stores the input status from the remote/local /intelligent device/standby master stations.	Read only	○	—
			For the local station: Stores the input status from the master station.		—	○
160_H to $1DF_H$	352 to 479	Remote output (RY)*2	For the master station: Stores the output status to the remote/local /intelligent device/standby master stations.	Write only	○	—
			For the local station: Stores the output status to the master station. Also, stores the received data from the remote/other local/intelligent device/standby master stations.	Read/write enabled	—	○
$1E0_H$ to $2DF_H$	480 to 735	Remote register (RWw)*2 Master station: For sending Local station: For sending/receiving	For the master station: Stores the send data to the remote device/all local/intelligent device/standby master stations.	Write only	○	—
			For the local station: Stores the send data to the master/other local/intelligent device/standby master stations. Also, stores the received data from the remote device/other local/intelligent device/standby master stations.	Read/write enabled	—	○
$2E0_H$ to $3DF_H$	736 to 991	Remote register (RWr)*2 Master station: For data receiving Local station: For data receiving	For the master station: Stores the received 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	Slave station offset, size information	Stores the offset and size of RX/RY/RWw/RWr in the remote device/local/intelligent device/standby master stations.	Read only	○	○

○: Available —: Not available

Table 2.5 Buffer memory list (2/3)

Address		Item	Description	Read/write possibility	Availability	
Hexadecimal	Decimal				Hexadecimal	Decimal
5E0H to 5FFH	1504 to 1535	Link special relays (SB)	Stores the data link status.	Read/write enabled (Read is disable depending on the device)	○	○
600H to 7FFH	1536 to 2047	Link special registers (SW)	Stores the data link status.			
800H to 9FFH	2048 to 2559	Use prohibited*1	——	—	—	—
A00H to FFFH	2560 to 4095	Random access buffer	The specified data is stored and used by transient transmission.	Read/write enabled	○	○
1000H to 1FFFH	4096 to 8191	Communication buffer	Stores the send and receive data and control data when performing transient transmission (communication using this buffer) with the local station, standby master station, and intelligent device station.	Read/write enabled	○	○
2000H to 2FFFH	8192 to 12287	Automatic update buffer	Stores the automatically updated data when performing transient transmission with the AJ65BT-R2N (communication using the automatic update buffer).	Read/write enabled	○	○
3000H to 3FFFH	12288 to 16383	Use prohibited*1	——	—	—	—
4000H to 41FFH	16384 to 16895	Ver.2-compatible remote input (RX)*3	For the master station: Stores the input status from the remote/local /intelligent device/standby master stations.	Read only	○	—
			For the local station: Stores the input status from the master station.		—	○
4200H to 43FFH	16896 to 17407	Ver.2-compatible remote output (RY)*3	For the master station: Stores the output status to the remote/local /intelligent device/standby master stations.	Write only	○	—
			For the local station: Stores the output status to the master station. Also, stores the received data from the remote/other local/intelligent device/standby master stations.	Read/write enabled	—	○
4400H to 4BFFH	17408 to 19455	Ver.2-compatibler emote register (RWw)*3 Master station: For sending Local station: For sending/receiving	For the master station: Stores the send data to the remote device/all local/intelligent device/standby master stations.	Write only	○	—
			For the local station: Stores the send data to the master/other local/intelligent device/standby master stations. Also, stores the received data from the remote device/other local/intelligent device/standby master stations.	Read/write enabled	—	○

○: Available —: Not available

Table 2.5 Buffer memory list (3/3)

Address		Item	Description	Read/write possibility	Availability	
Hexadecimal	Decimal				Hexadecimal	Decimal
4C00H to 53FFH	19456 to 21503	Ver.2-compatible remote register (RWr)*3 Master station: For sending Local station: For sending/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.		—	○
5400H to 7FFFH	21504 to 32767	Use prohibited*1	——	—	—	—

○: Available —: Not available

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

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

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

2.1.4 Network parameter for data link

Following table 2.6 provides information about the required network parameter for data link.
Parameters written to the CPU using GX Works2 are transferred to the master module at the CPU power ON or reset.

Table 2.6 Network 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 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 when a master station PLC CPU error occurs. Default value : Stop Setting range : Stop : Continue
Scan mode specification	Whether to synchronize the link scan with the sequence scan of a CPU module or not can be selected. Default value : Asynchronous Setting range : Asynchronous : Synchronous
Delay time setting	Sets the link scan interval. (Unit: 50 μ s) 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 : From 1 to 4 stations Station number : 1 to 64

Table 2.6 Network parameter setting items (2/2)

Setting item	Description
Assignments of communication buffer and automatic update buffer	Specifies the assignments of buffer memory sizes during transient transmission to a local station, a standby master station and an intelligent device station. Default values Send buffer size : 40H (64) (word) Receive buffer size : 40H (64) (word) Automatic update buffer size : 80H (128) (word) Setting range • Communication buffer size : 0H (0) (word) (Not specified), or 40H (64) (word) to 1000H (4096) (word) However, the total communication buffer size must be 1000H (4096) (word) or less. • Automatic update buffer : 0H (0) (word) (Not specified), or 80H (128) (word) to 1000H (4096) (word) However, the total automatic buffer size must be 1000H (4096) (word) or less.

POINT

Assignments of 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) Required parameter settings to perform data link

The parameter settings that are required to perform data link with the CC-Link are expressed as follow.

- Parameters settings by GX Works2 (See section 2.2.2 and the exercises from the chapter 3)
- Parameters settings by the RLPASET instruction (dedicated instruction) (See Appendix 4.7)

For the procedure from parameter settings to data link startup with the RLPASET instruction, refer to MELSEC-Q CC-LINK System Master/Local Module type QJ61BT11N User's Manual (Details).

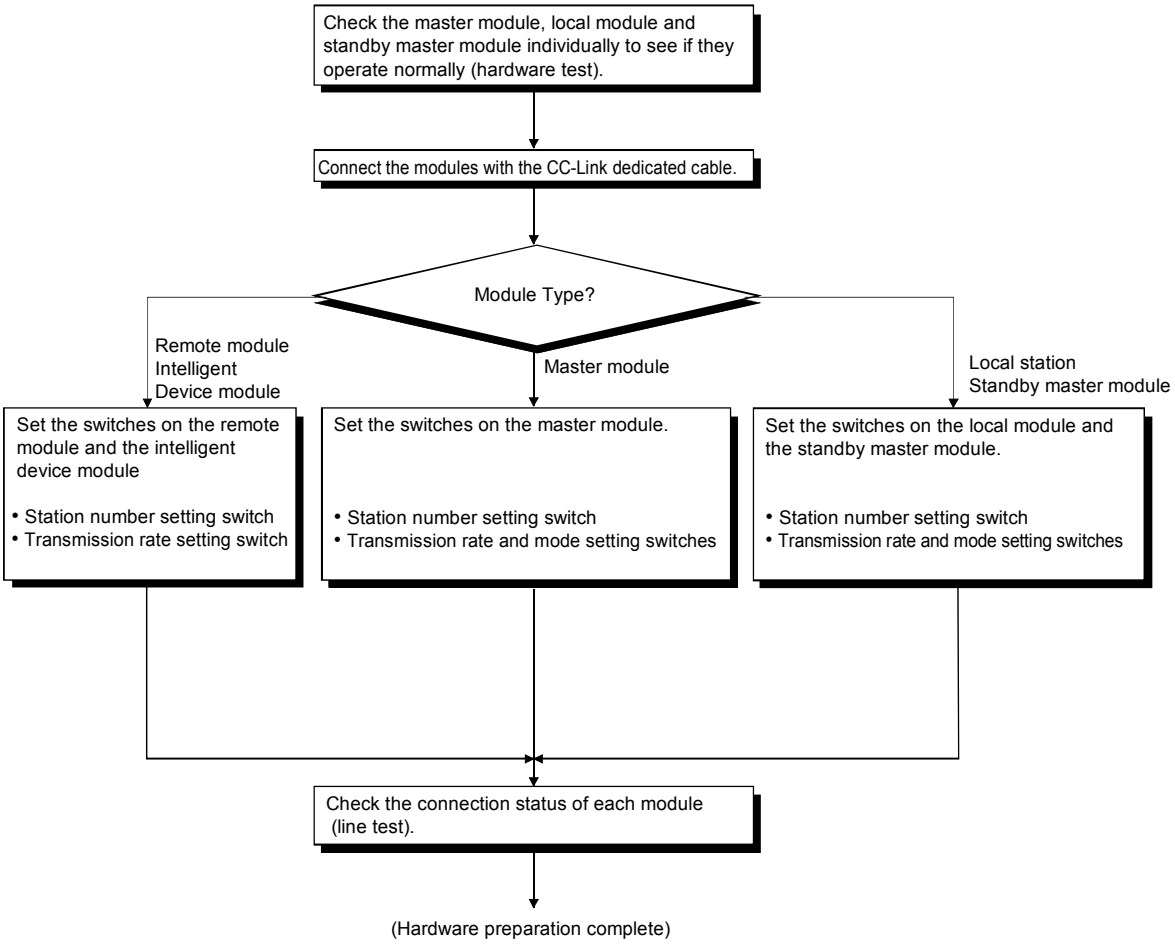
2.2 Operation setting

2.2.1 Required setting

Two kind of settings are required: the hardware settings (switch settings and wiring etc.) and the software settings (parameters and programming).

(1) Hardware settings

Use the step shown below. This section explains procedure related to exercises in chapters from the chapter 3. The detailed description is omitted in this section.



(2) Software settings

The two most basic settings to use CC-Link System are as follows:.

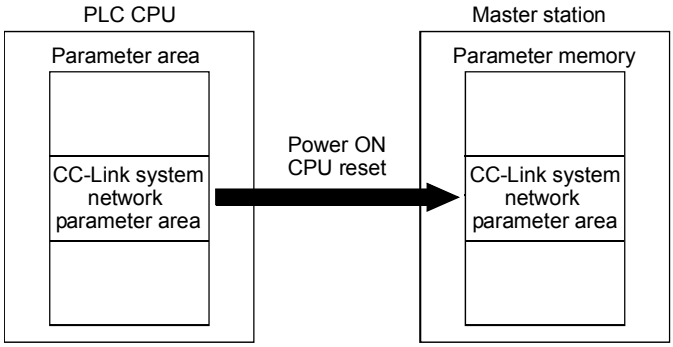
- Network parameters ····· Set number of connected modules, number of retries and number of automatic return modules at the master station module of CC-Link system.
  (→ See section 2.1.5)
- Automatic refresh parameters ····· Update the data between the CC-Link side devices (RX/RY) and the PLC CPU devices (X/Y/M/D).
  In case of Q Series, these parameters can be set in the network parameter screen of GX Works2.
  (→ section 7.1)

In case of connecting inverters and AC servos to CC-Link system, it is necessary to set specific parameters for each device.
Also, in RS-232C interface module (AJ65BT-R2N), it is required to set the specific module buffer memory initialization.
The details of these operations are described in the APPENDIX 12 and 13 of this textbook.

2.2.2 Network parameter/automatic refresh parameter settings

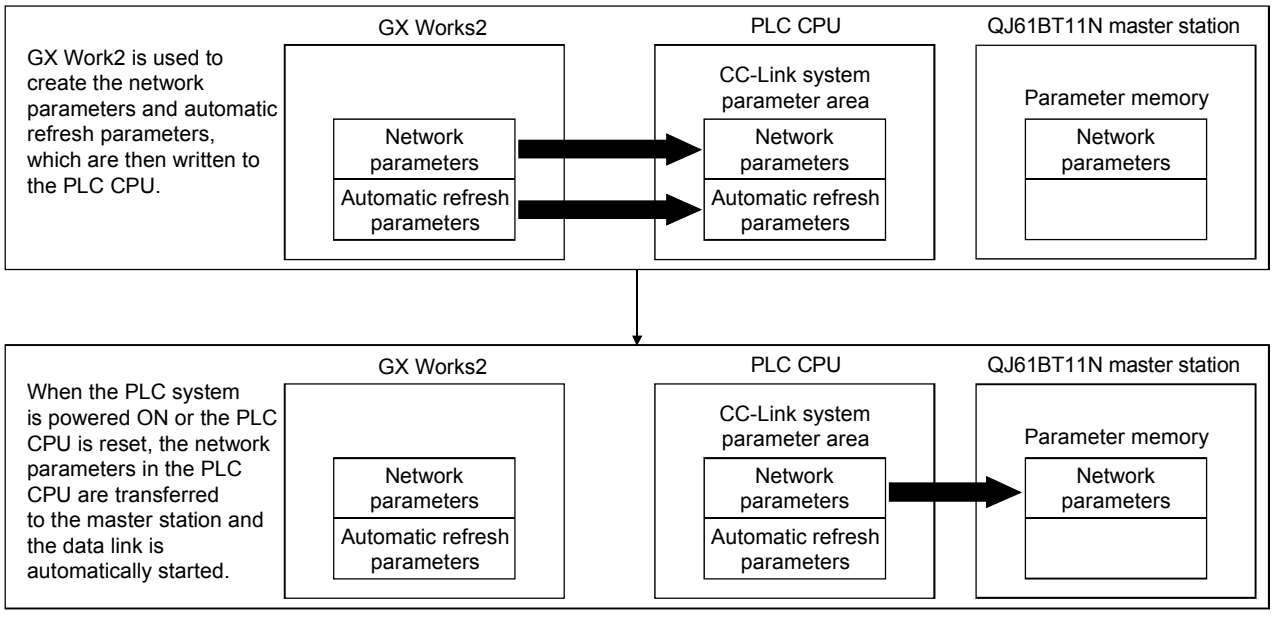
(1) Network parameter settings for MELSEC-Q Series
The network parameters that control CC-Link are set with GX Works2 and then written to the parameter area of the CPU.

(2) Storing area of network parameter
The network parameter written into the PLC CPU are transferred to the master station parameter memory during the POWER ON or the reset of the PLC CPU.
The master station parameter memory is cleared when the power is OFF or the PLC CPU is reset.
(Information will be transferred again from the PLC CPU after the power ON or the reset.)



(3) Automatic refresh parameter settings for MELSEC-Q Series
The automatic parameters that update the devices between each other in the master/local module and the PLC CPU are set with GX Works2 and written in the parameter area of the PLC CPU.
(Automatic refresh parameters are not transferred to the master station.)
It is not possible to set automatic refresh parameters with the sequence program.
Note: In GX Works2, network parameters and automatic refresh parameters are set in the same screen.
Network parameters and automatic refresh parameters are written to the PLC CPU at the same time.

(4) Procedure from parameter settings to data link startup
Follow the process below for the procedure from parameter settings to data link startup.



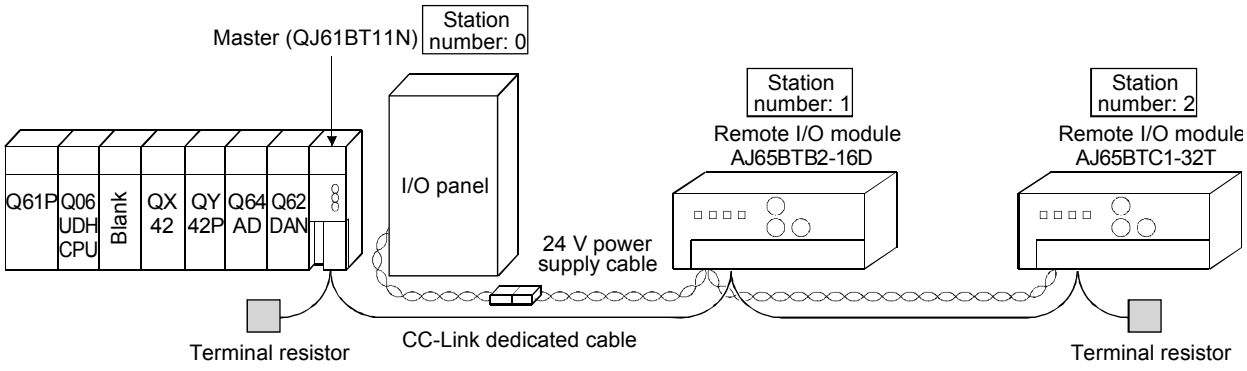
CHAPTER 3 EXERCISE 1 (REMOTE NET MODE: PART 1)

In this chapter, data link will be performed with the CC-Link remote net Ver.1 mode (using remote I/O modules only).

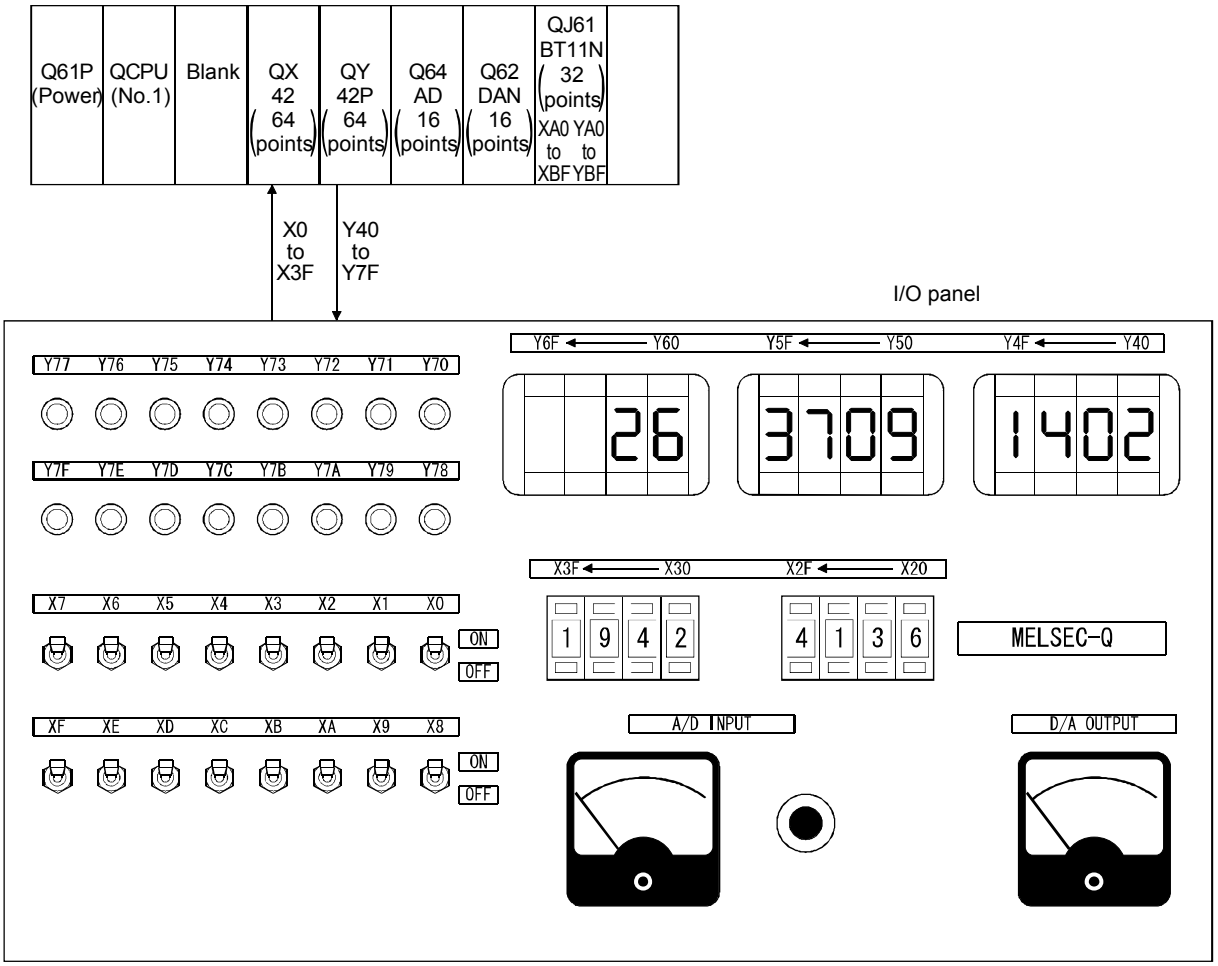
3.1 System configuration

The system configuration used in the practice of the exercise 1 is as follows.

(1) Module configuration



(2) I/O assignment



POINT
In this textbook, the practice will be performed using multiple CPU system with two QCPU modules. When performing operations using system with one QCPU, the multi CPU settings described in this chapter are not required. Refer to the appropriate description.

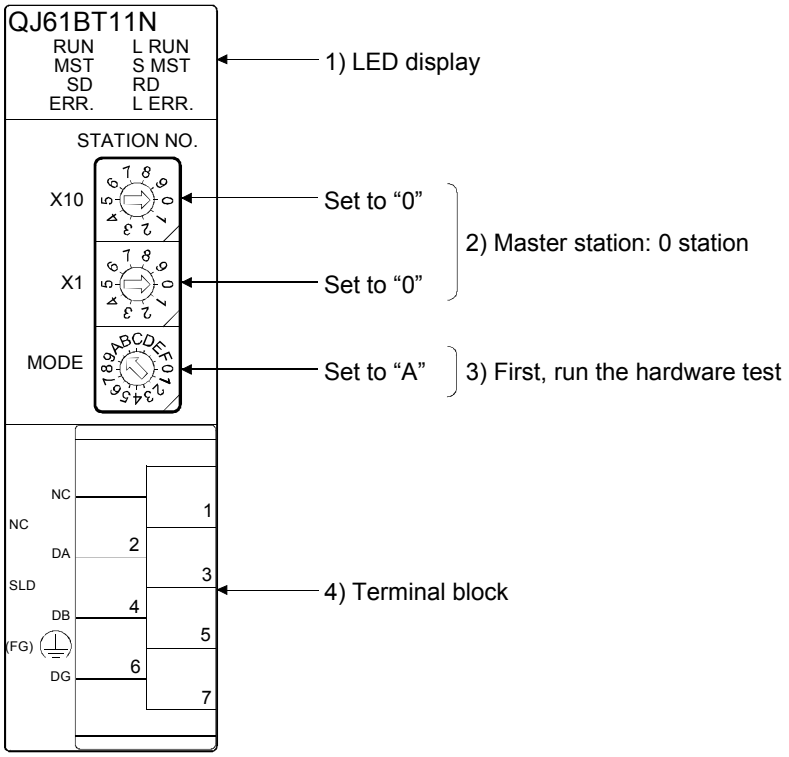
3.2 Module settings

3.2.1 Module's part names and related settings

This paragraph provides information on the QJ61BT11N module's part names and related settings.

(1) QJ61BT11N settings

For the details about the points (1) to (4), refer to the next page and later.



(2) Part names and their descriptions

<table>
<tr><th>Number</th><th>Name</th><th colspan="2">Description</th></tr>
<tr><td rowspan="10">1)</td><td rowspan="10">LED display

QJ61BT11N
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.
For more details about SW0058 (details of LED display status) refer to Appendix 3.
Flashing: There is a communication error in a station</td></tr>
<tr><td>MST</td><td>On: Operating as a master station (during data link control)</td></tr>
<tr><td>S MST</td><td>On: Operating as a standby master station (during standby)</td></tr>
<tr><td>L RUN</td><td>On: 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 data sending</td></tr>
<tr><td>RD</td><td>On: During data receiving</td></tr>
<tr><td>2)</td><td>Station number setting switch

STATION NO.
x10
x1</td><td colspan="2">Set the module station number (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 data link)	Operating as a standby master station (standing by)
Master station	MST ☀ ○ S MST	MST ○ ☀ S MST
Standby master station	MST ☀ ○ S MST	MST ○ ☀ S MST
Local station	———	———

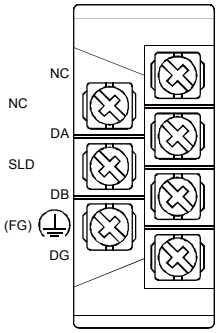
☀ : ON ○ : OFF

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 colspan="3">Description</th></tr>
<tr><td>3)</td><td>Transmission speed/mode setting switch

MODE  </td><td colspan="3">Set the transmission rate and operating conditions for the module (settings at 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 (see 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:
: 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>For AC input</td><td>Transmission rate 156 kbps</td><td rowspan="5">Hardware test
(See 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>For DC input</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 colspan="3">Connect the CC-Link dedicated cable for data linking.
For the connection method, see Section 3.4.1.

Terminals SLD and FG are connected inside the module.
Since a 2-piece type terminal block is used, the module can be replaced without disconnecting the signal line to the terminal block.
(Replace the module after turning its power OFF.)</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 consecutive 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 start station number.
When station numbers are not consecutive, an unoccupied station number will be treated as a "data link faulty station".
When the sequential numbers are not set, specify unoccupied station numbers as reserved stations.
(Set with the number of connected modules and the station information in the network parameter of the master station.)

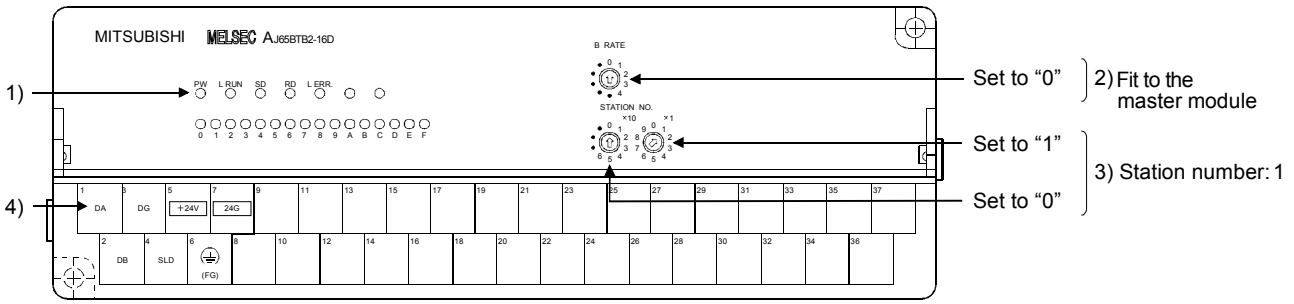
(3) Specify unique station numbers.
If If station numbers are duplicated, an installation status error occurs.

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

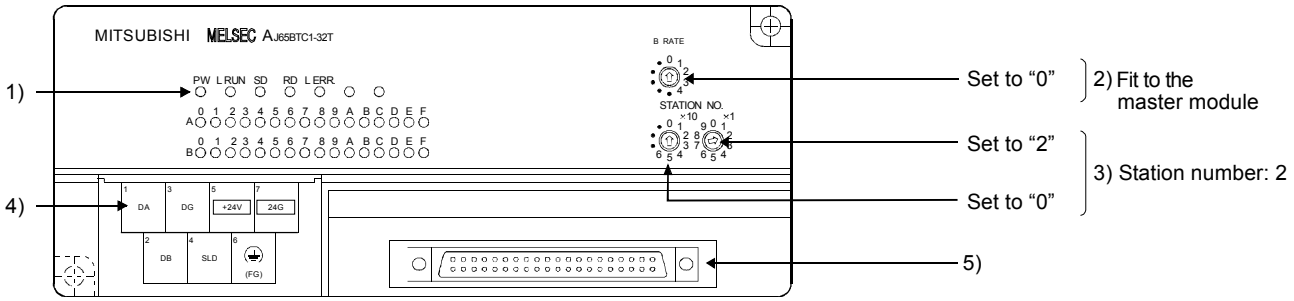
3.2.2 Remote I/O module part names and related settings

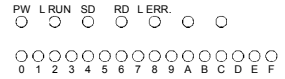
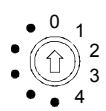
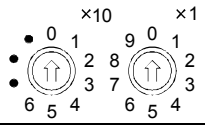
This paragraph provides information on the AJ65BTC1-32T module's part names and related settings.

• AJ65BTB2-16D



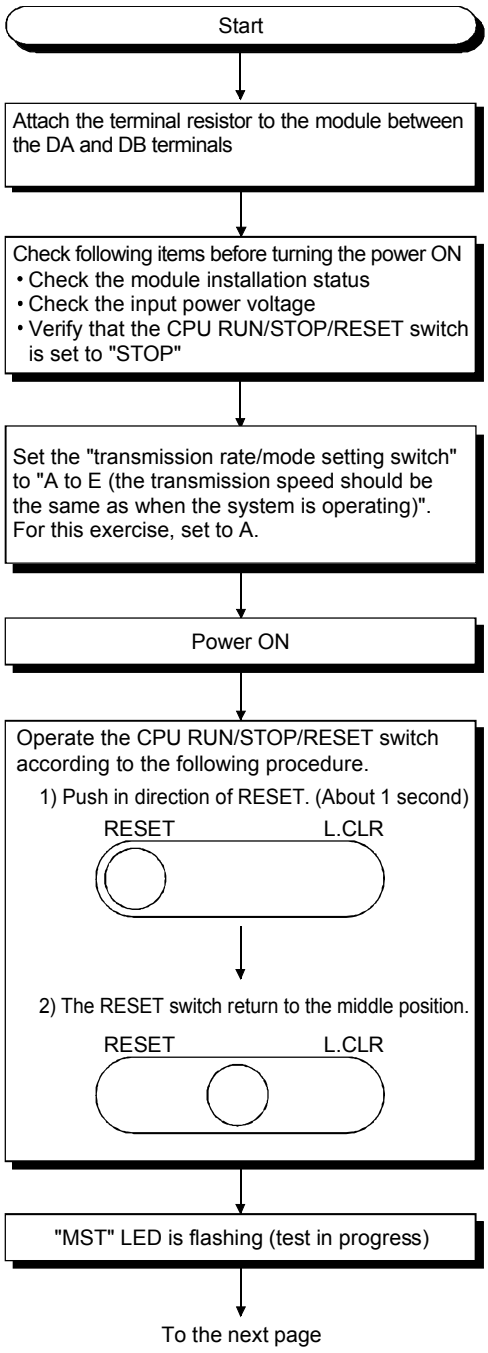
• AJ65BTC1-32T



1)	Operation status indicator LED 	<table><tr><th>LED name</th><th>Details</th></tr><tr><td>PW</td><td>Turn on when the remote I/O module power supply is turned on.</td></tr><tr><td>L RUN</td><td>Used to check if the remote I/O module is communicating with the master station normally. Turns on when normal data is received from the master station, and turns off when time is expired. (Turns on upon receiving normal data.)</td></tr><tr><td>SD</td><td>Turns on when data is sent.</td></tr><tr><td>RD</td><td>Turns on when data is received.</td></tr><tr><td>L ERR.</td><td>Turns on when transmission error (CRC error) occurred, and turns off when time is expired. (The RUN also turns off.) Turns on when station number setting of transmission speed setting is incorrect. (Turns off when the setting is corrected and power is restarted.) Flashes when station number setting or transmission speed setting is changed after startup. (The RUN remains on. The module keeps operating with the same station number and transmission speed settings when the power was turned on.)</td></tr><tr><td>0 to F</td><td>Shows on/off status of I/O. Turns on when on, and turns off when off.</td></tr></table>
2)	Transmission speed setting switch 	<table><tr><th>Setting</th><th>Transmission speed</th></tr><tr><td>0</td><td>156 Kbps</td></tr><tr><td>1</td><td>625 Kbps</td></tr><tr><td>2</td><td>2.5 Mbps</td></tr><tr><td>3</td><td>5 Mbps</td></tr><tr><td>4</td><td>10 Mbps</td></tr></table> Set the transmission speed setting switch within the range of 0 to 4.
3)	Station number setting switch 	Set the station number within the range of 01 to 64. It is not possible to set the station number twice. Use "X10" to set the tens place. Use "X1" to set the ones place.
4)	Terminal block	Terminal block for power supply, transmission, and I/O signals.
5)	Connector	Connector for I/O signals.

3.3 Module test (Hardware test)

Confirm that the master/local module operates normally.
Execute the hardware test using the following procedure.



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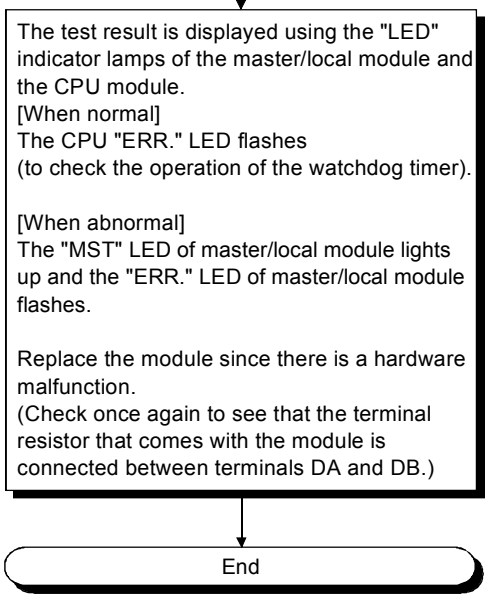


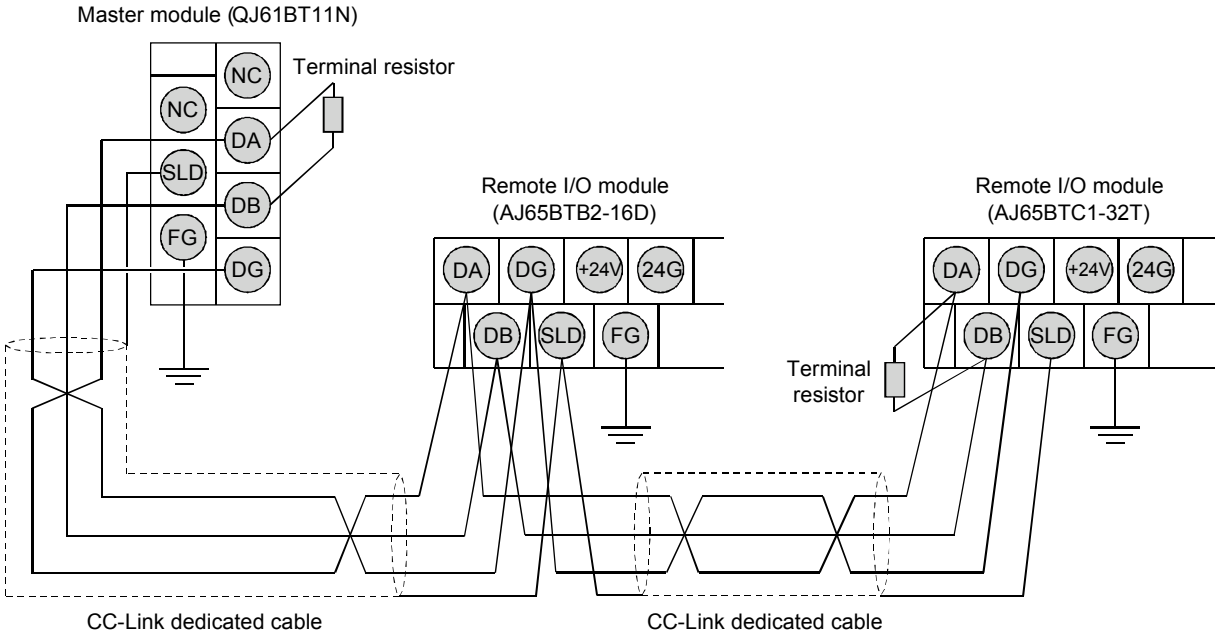
POINT

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

3.4 Wiring

3.4.1 Connection of CC-Link dedicated cable

This paragraph provides information on the connection of a module with the CC-Link dedicated cable.
Shutdown the power supply when wiring the module.

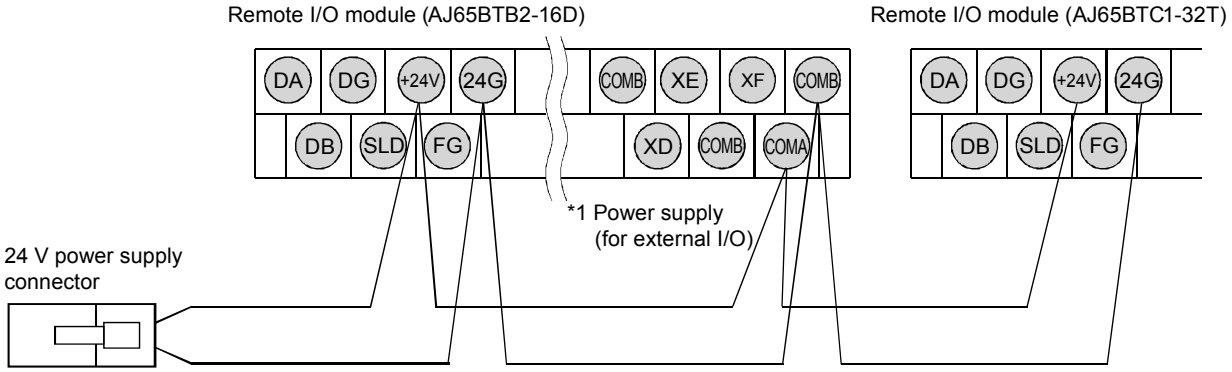


REMARK

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

3.4.2 Connection of the 24 V power supply cable

This paragraph provides information on the connection of a 24 V power supply cable to the remote I/O module (for module's internal use and for external I/Os).
Shutdown the power supply when you connect the cable.

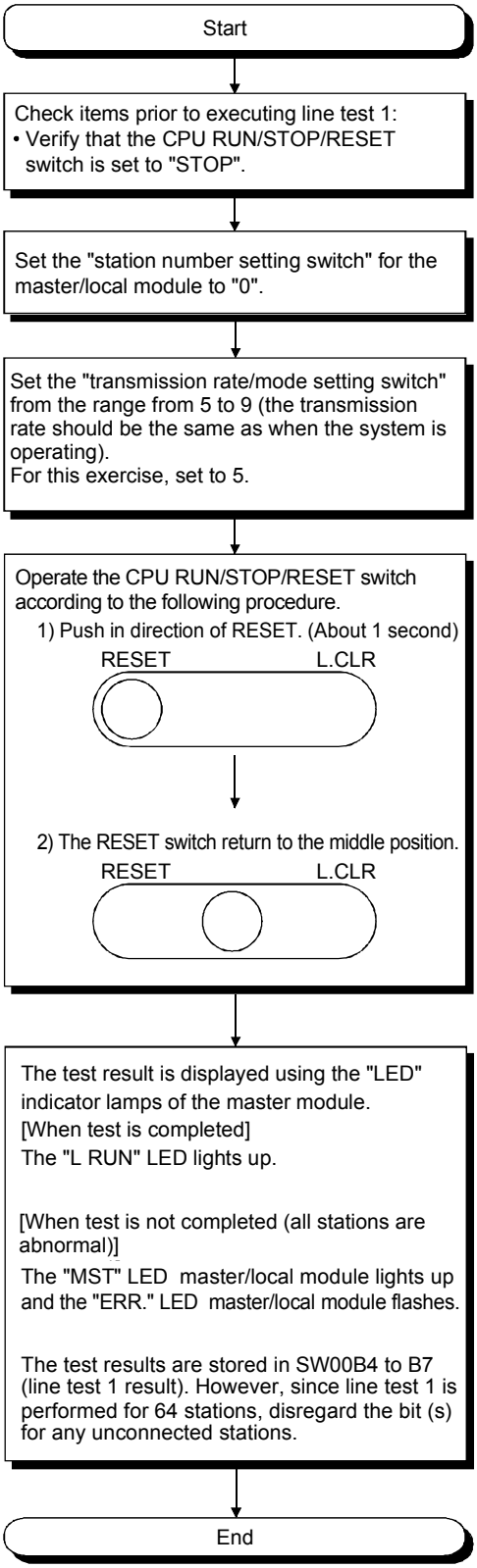


*1 : The external I/O of the AJ65BTB2-16D power polarity is bipolar.
(Available for COMA+, COMB- or COMA-, COMB+)

*2 : On above picture, CC-Link dedicated cable and the terminal resistor connections are omitted.

3.4.3 Line test

Perform "line test 1" to check if the CC-Link dedicated cable and the terminal resistor are correctly connected.
Perform the line test according to the following procedure.

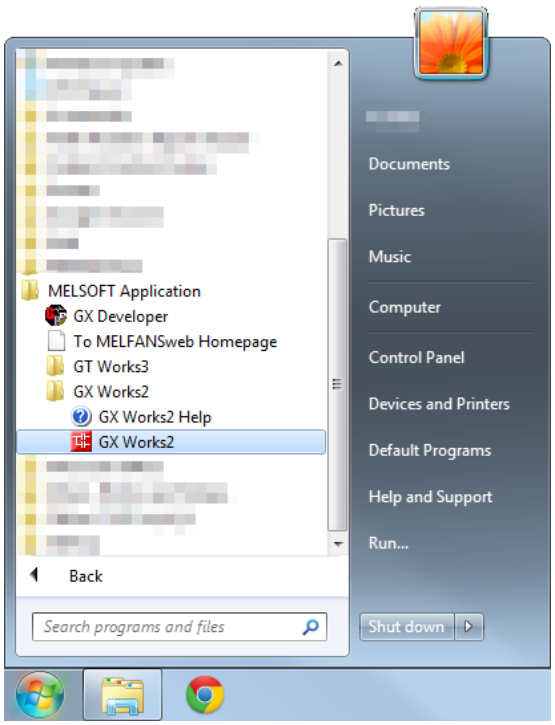


3.5 Parameter settings and writing

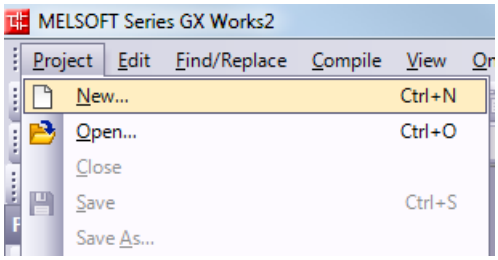
POINT
Set transmission speed ant module setting switch of the master/local module to 0. (Transmission speed 156 kbps/Online mode) When the settings are done, reset the CPU.

3.5.1 Starting GX Works2

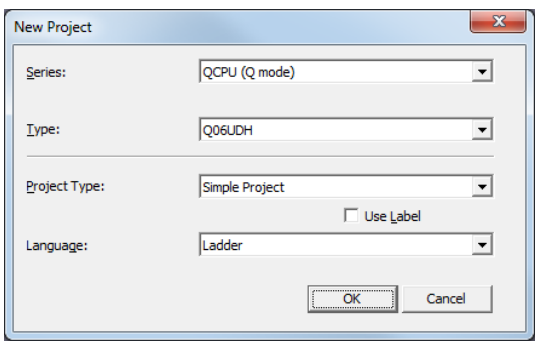
Start GX Works2 to set the CC-Link network parameters and the automatic refresh parameters.



(1) Click on [Start] → [All Programs] → [MELSOFT Application] → [GX Works2] → [GX Works2].



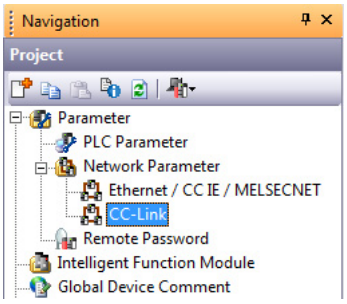
(2) Now GX Works2 is running, click on the menu [Project]→[New].



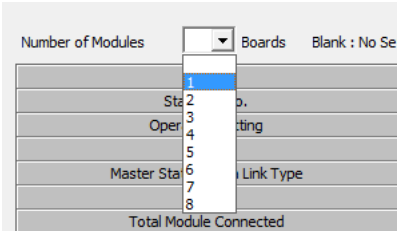
(3) Set "Simple Project" in [Project Type], "QCPU (Q mode) in [Series], "Q06UDH" in [Type] and click on the button [OK].

3.5.2 Setting and saving of network parameters/automatic refresh parameters

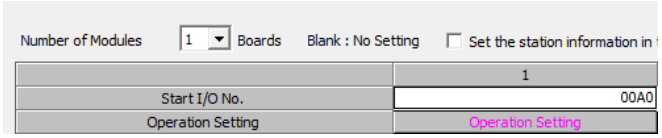
This paragraph provides information on the operations from the network parameter/automatic refresh parameter setting to project saving.



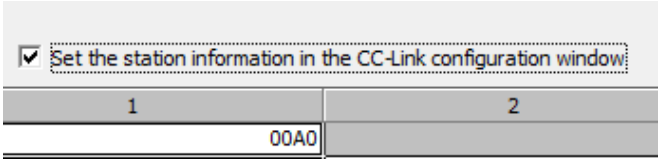
(1) Double click [Network Parameter] → [CC-Link] from the GX Works2 Project view.



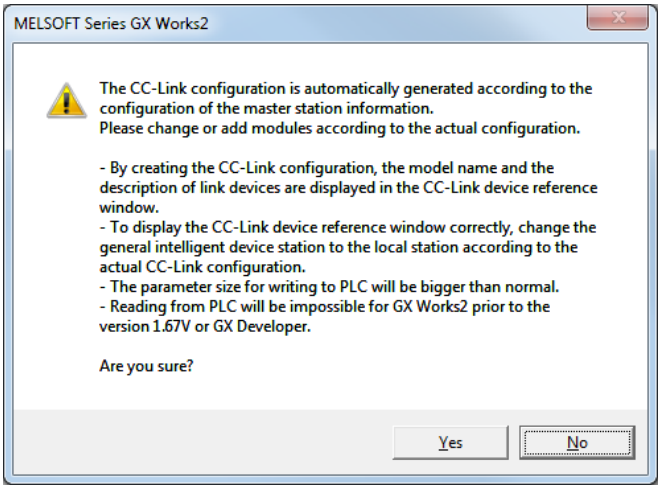
(2) The CC-Link network parameter setting screen appears. Set in "1" in the [Number of Modules].



(3) Set [00A0] in Start I/O No..



(4) Check the option [Set the station information in the CC-Link configuration window].



(5) A message box on the left appears, Click [Yes].

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	1
Start I/O No.	00A0
Operation Setting	Operation Setting
Type	Master Station
Master Station Data Link Type	PLC Parameter Auto Start
Mode	Remote Net(Ver.1 Mode)
Total Module Connected(*1)	0
Remote input(RX)	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
Standby Master Station No.(*1)	
PLC Down Select	Stop
Scan Mode Setting	Asynchronous
Delay Time Setting	0
Station Information Setting	CC-Link Configuration Setting
Remote Device Station Initial Setting	Initial Setting
Interrupt Settings	Interrupt Settings

(6) Set following settings referring to the screen on the left.
The items which are different from the initial settings are shown below.

- [Remote input (RX) Refresh device] ...X100
- [Remote output (RY) Refresh device] ...Y100
- [Special relay (SB) Refresh device] ...SB0
- [Special register (SW) Refresh device] ...SW0

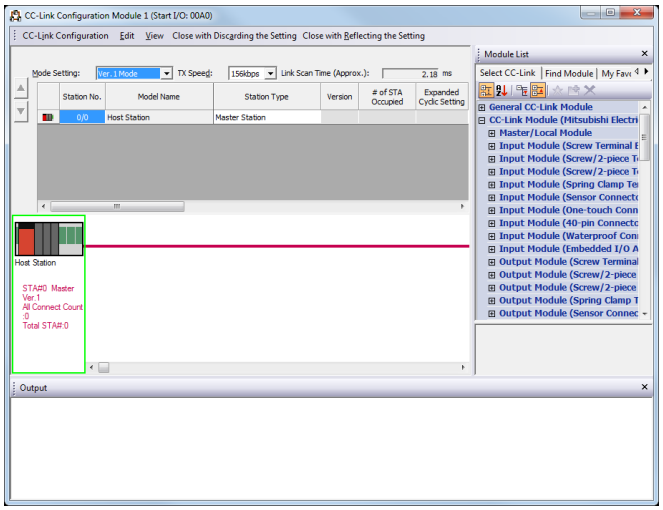
Scan Mode Setting	Asynchronous
Delay Time Setting	0
Station Information Setting	CC-Link Configuration Setting
Remote Device Station Initial Setting	Initial Setting
Interrupt Settings	Interrupt Settings

(7) Click on the button [CC-Link Configuration Setting].

POINT

When multiple network modules are used, be careful to set a unique number for SB/SW.

(Example)	1st module	2nd module	3rd module	4th module
	SB0 to	SB200 to	SB400 to	SB600 to
	SW0 to	SW200 to	SW400 to	SW600 to



(8) CC-Link configuration window appears.

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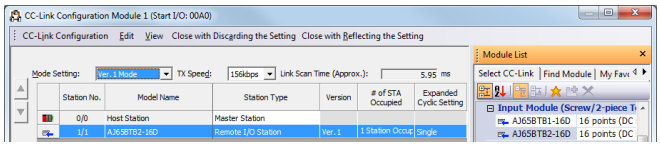
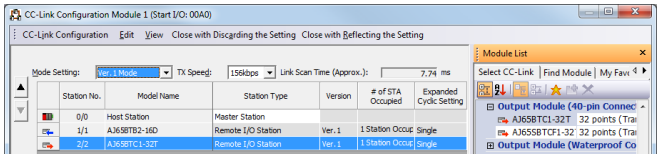
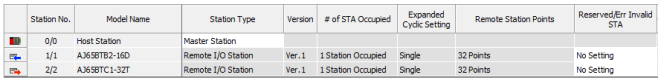


(9) Select the CC-Link module from the module list, and drag and drop it to the "list of stations" or "device map area"

In this example, select "AJ65BTB2-16D".

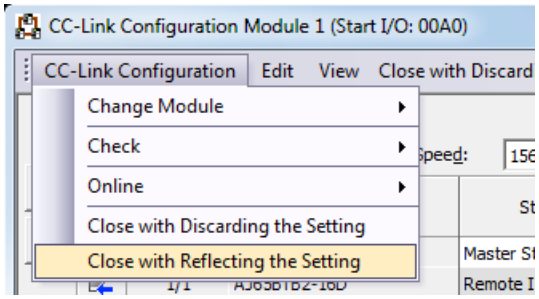


(10) Same as before, select to drag and drop "AJ65BTC1-32T".

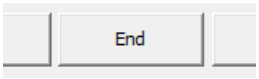


(11) Check the following settings.

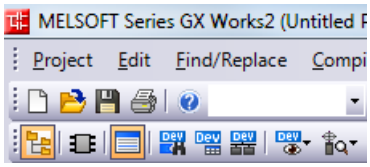
- 1/1 Remote I/O Station,
  1 Station Occupied, No Setting
- 2/2 Remote I/O Station,
  1 Station Occupied, No Setting



(12) Click on the menu [CC-Link Configuration]→[Close with Reflecting the Setting].



(13) Click on the button [End] of network parameter setting screen.



(14) Click  .

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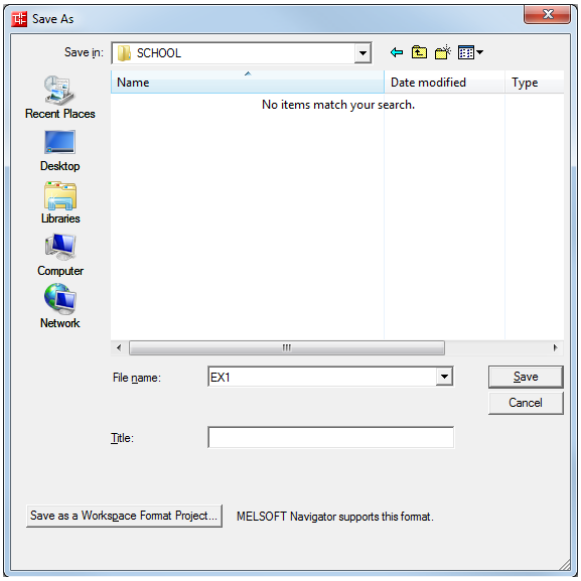
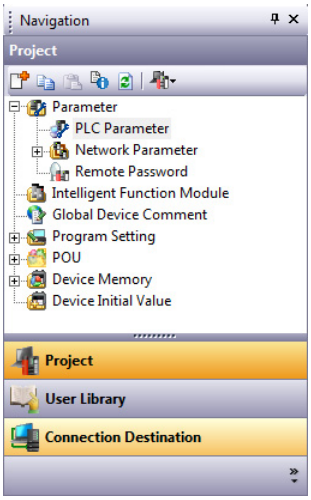


(15) Set a save destination and a file name and click on the button [Save]

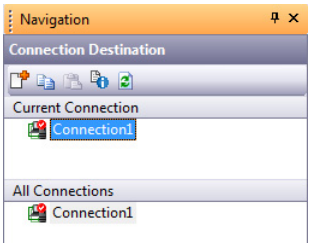
Save destination : Desktop (any)
File name : "EX1"

3.5.3 Connection destination setting

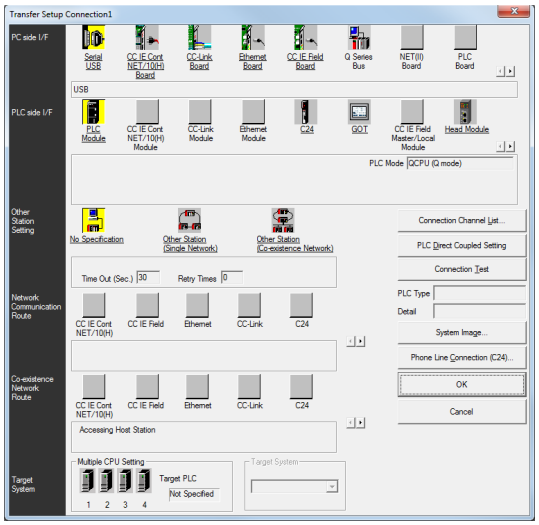
Specify connection destination to write the parameters to the master station PLC CPU.



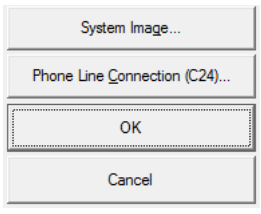
(1) In the Navigation window view, click on Connection Destination view.



(2) The Connection Destination view is displayed. Double click on "Connection1" in "Current Connection".



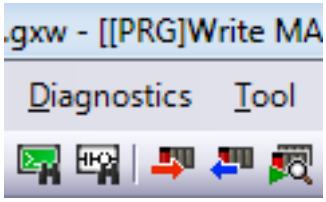
(3) Check the following settings in the Connection Destination Setting screen.
[PC side I/F] : "Serial USB"
[PLC side I/F] : "PLC Module"
[Other Station Setting] : "No Specification"



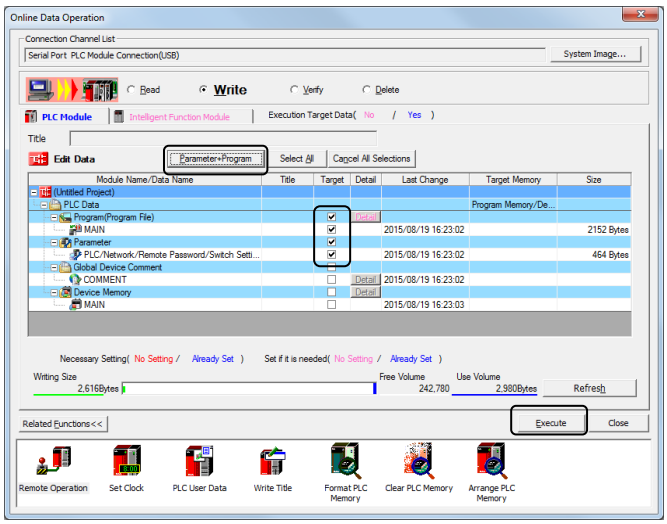
(4) Click OK.
Settings are finished.

3.5.4 Parameter write

The network parameter/automatic refresh parameters, which have been set, are written to the PLC CPU.



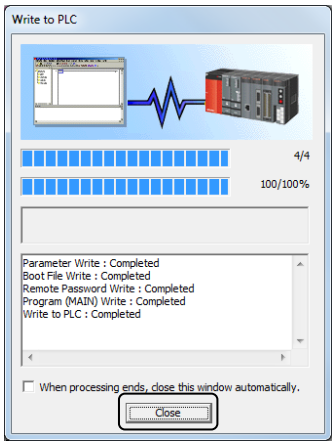
(1) Click .



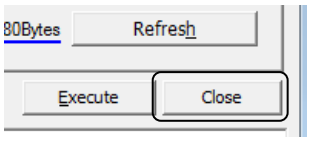
(2) In the Online Data Operation screen, click Parameter+Program , select [MAIN] in the Program setting, and select [PLC/Network] in the Parameter setting.

Note: MAIN program contains only END instruction.

(3) Click Execute .



(4) When the writing is finished, a dialog box will appears on the left. Click Close .



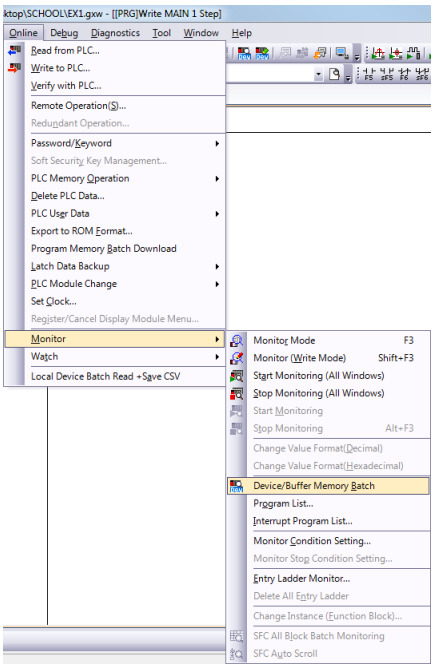
(5) Click on the [Close] button to close the dialog box.
The parameter writing is finished.

(6) To validate the written parameters, reset the PLC CPU.
The parameter writing is finished.

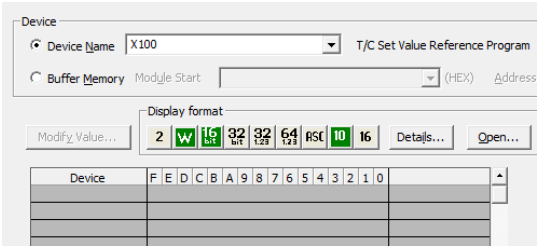
3.6 Remote station device (RX and RY) monitor/test

In order to set correctly the network parameter and the refresh parameter, and perform the data link and the device refresh, perform the remote I/O station I/O signal monitor and test.

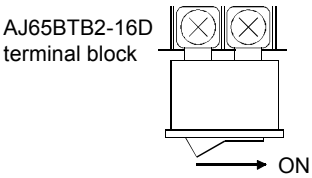
Set the RUN/STOP/RESET switch of the PLC CPU to STOP.



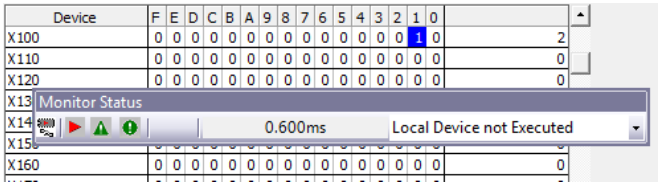
(1) Click on the menu [Online] → [Monitor] → [Device/Buffer Memory Batch].



(2) Write "X100" in [Device] of the Device/Buffer Memory Batch Monitor screen, and hit [Enter].



(3) Set to ON the switch that is connected to the AJ65BTB2-16D Terminal block [X1].



(4) On the Device/Buffer Memory Batch Monitor screen, X101 becomes ON. Check that the data link of input (RX) and the refresh works correctly.

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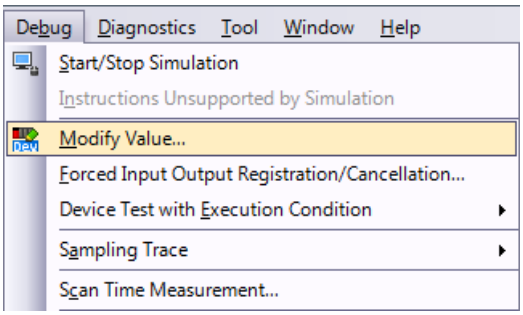
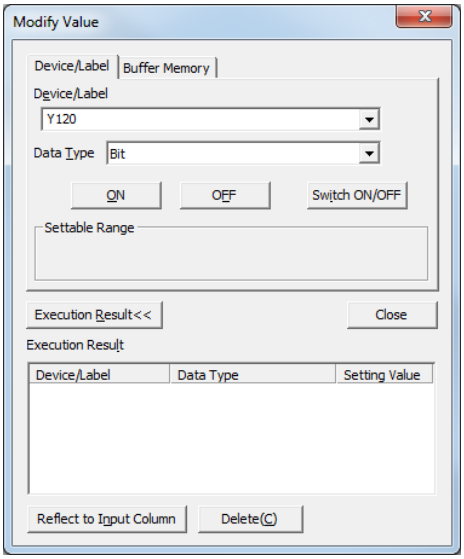
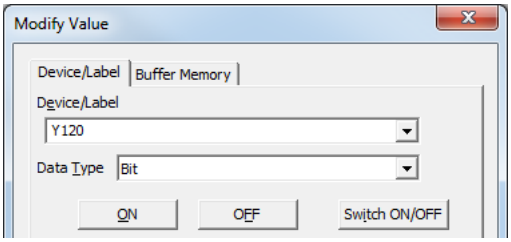


(5) Click on the menu [Debug] → [Modify Value].

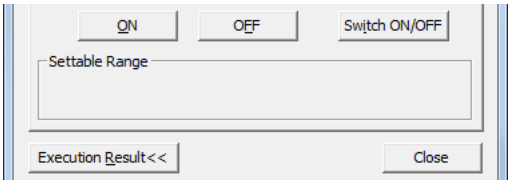


(6) The Modify Value dialog box is displayed, write "Y120" in [Device] and click on the button [ON].

(7) Check that the data link of output (RY9) and the refresh works correctly because Y0 of the AJ65BTC1-32T ("A0" LED) lights up.



(8) Click on the button [OFF], and check that Y0 of the AJ65BTC1-32T ("A0" LED) turns off.



(9) Click on the button [Close] and the Modify Value dialog box disappears.

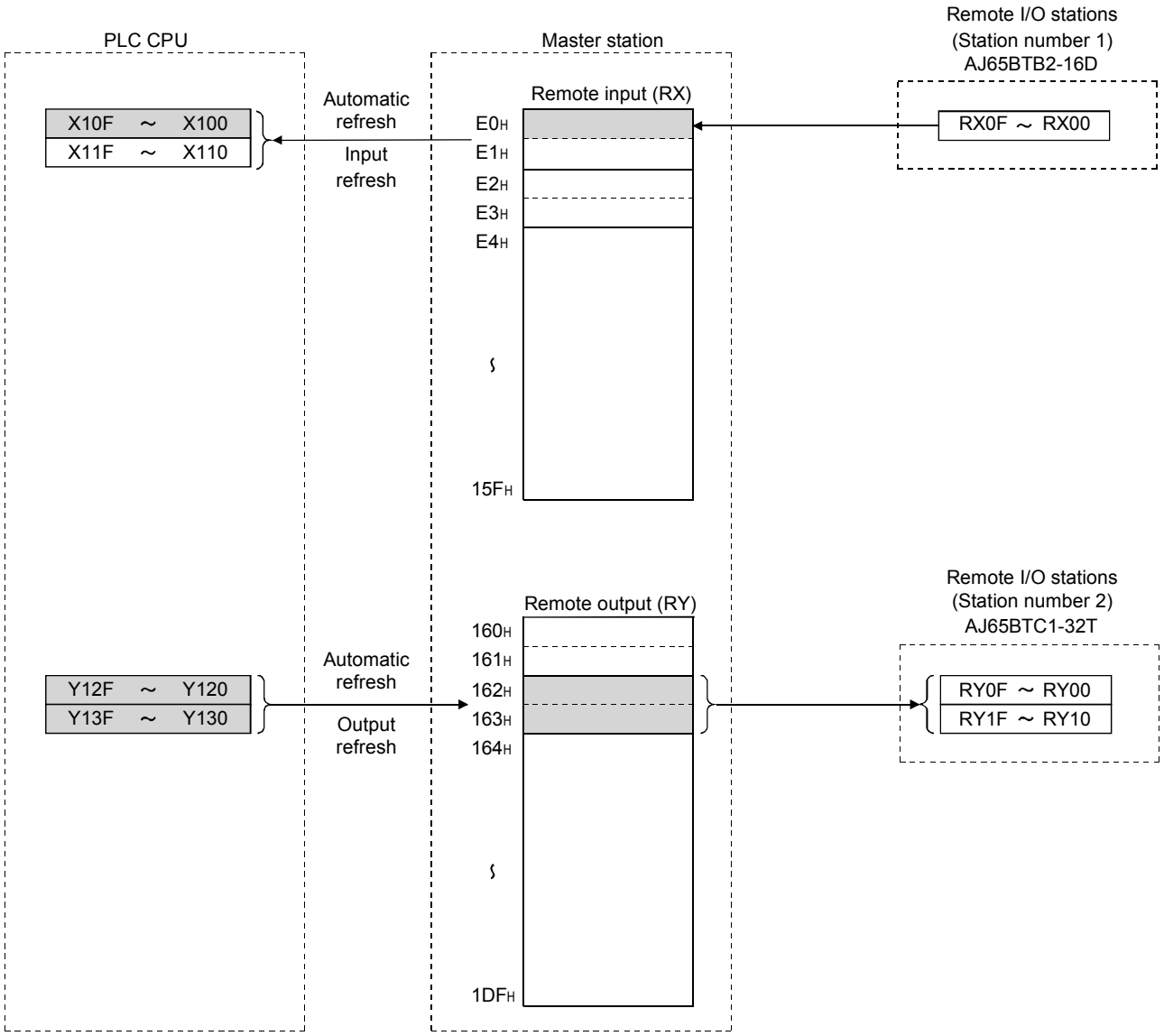
Monitor and test of the remote devices are finished.

3.7 Create a sequence program

Create a sequence program and write it to the PLC CPU.

(1) Refresh support

The relationship between the PLC CPU, master station buffer memory and remote I/O station refresh is shown below.



(2) Setting sheet

(a) Station information setting sheet

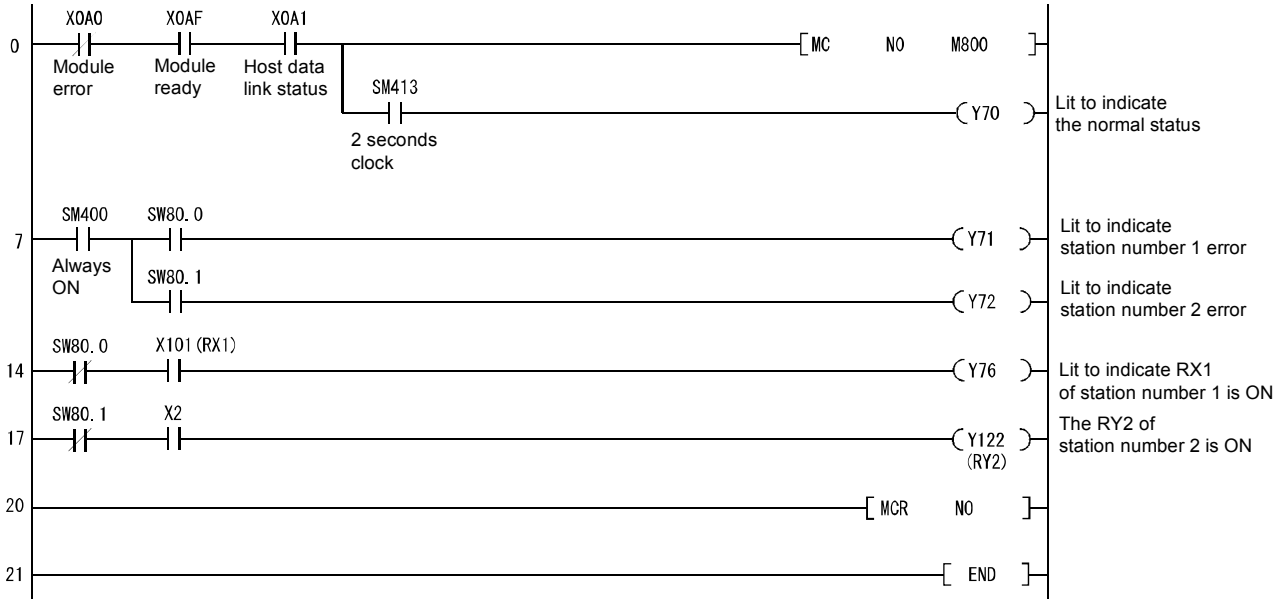
Station No.	Station type	Number of occupied stations	Reserve/Invalid station select	Intelligent buffer select (Word)		
				Send	Receive	Automatic
1	Remote I/O station	1	Not set	—	—	—
2	Remote I/O station	1	Not set	—	—	—
3						
4						
5						
6						
7						
8						
9						
10						

(b) Device assignment table

Device / Station No.	RX → (X)		RY ← (Y)		RWw → ( )		RWr ← ( )	
	Remote device	CPU device	Remote device	CPU device	Remote device	CPU device	Remote device	CPU device
1	RX0 to RXF	X100 to X10F						
	—	X110 to X11F						
2			RY20 to RY2F	Y120 to Y12F				
			RY30 to RY3F	Y130 to Y13F				
3								
4								
5								
6								
7								
8								
9								
10								

(3) Sequence program

Program name	EX1



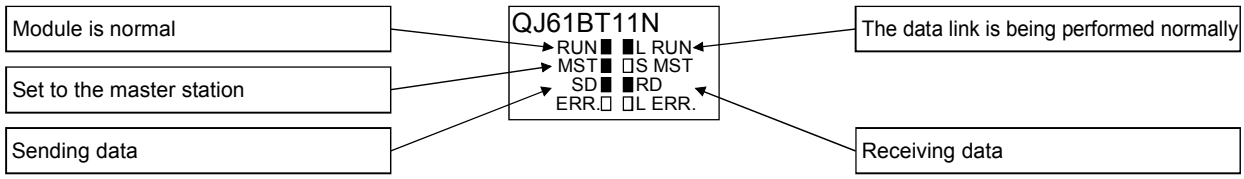
Note: In GX Works2, the master control (M800) ON/OFF status is displayed on the title tag of the monitor screen.

<REFERENCE> Confirming the operation with the LED display

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

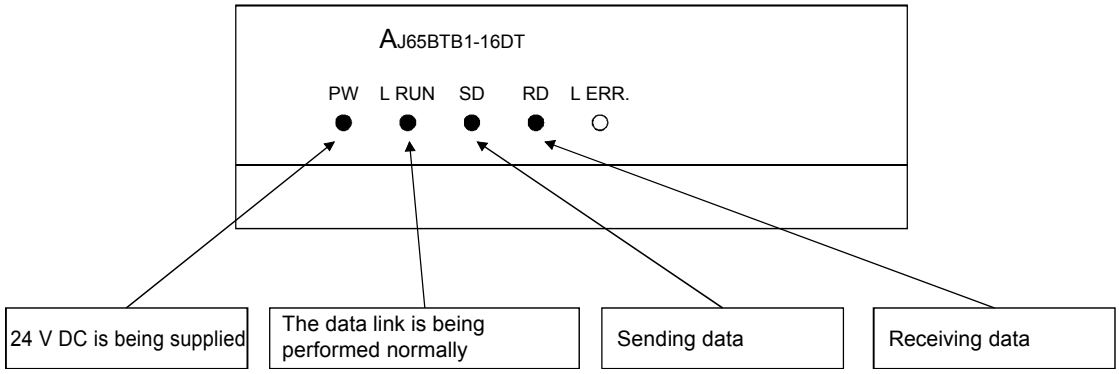
(1) LED display of the master station

Make sure that the LED display shows the following status.



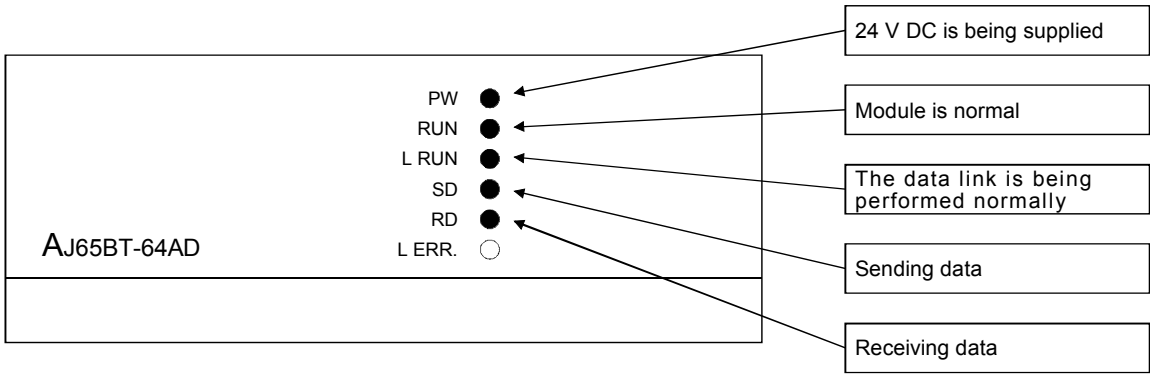
(2) LED display of the remote I/O station

Make sure that the LED display shows the following status.



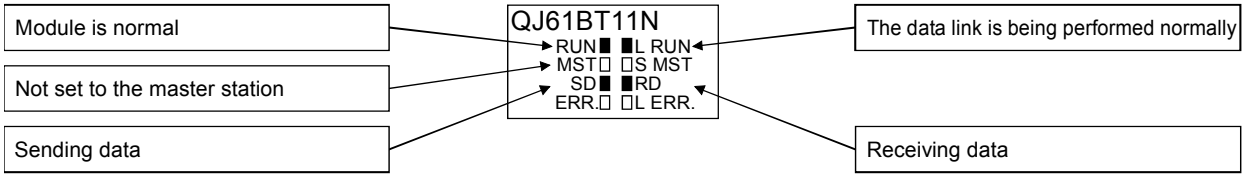
(3) LED display of the remote device station

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

Operation of the training kit

(1) Push the RUN/STOP/RESET switch of the PLC CPU in the "RESET" position one time (1 second) to reset.

(2) Set the RUN/STOP/RESET switch of the PLC CPU to "RUN".
Y70…… Flashing according to the host station data link status (data link is normal)

(3) Set AJ65BTB2-16D terminal block switch to ON.
Y76…… Lights up with RX1 = ON

(4) Set X2 to ON.
AJ65BTC1-32T LED "A2" ……Lights up

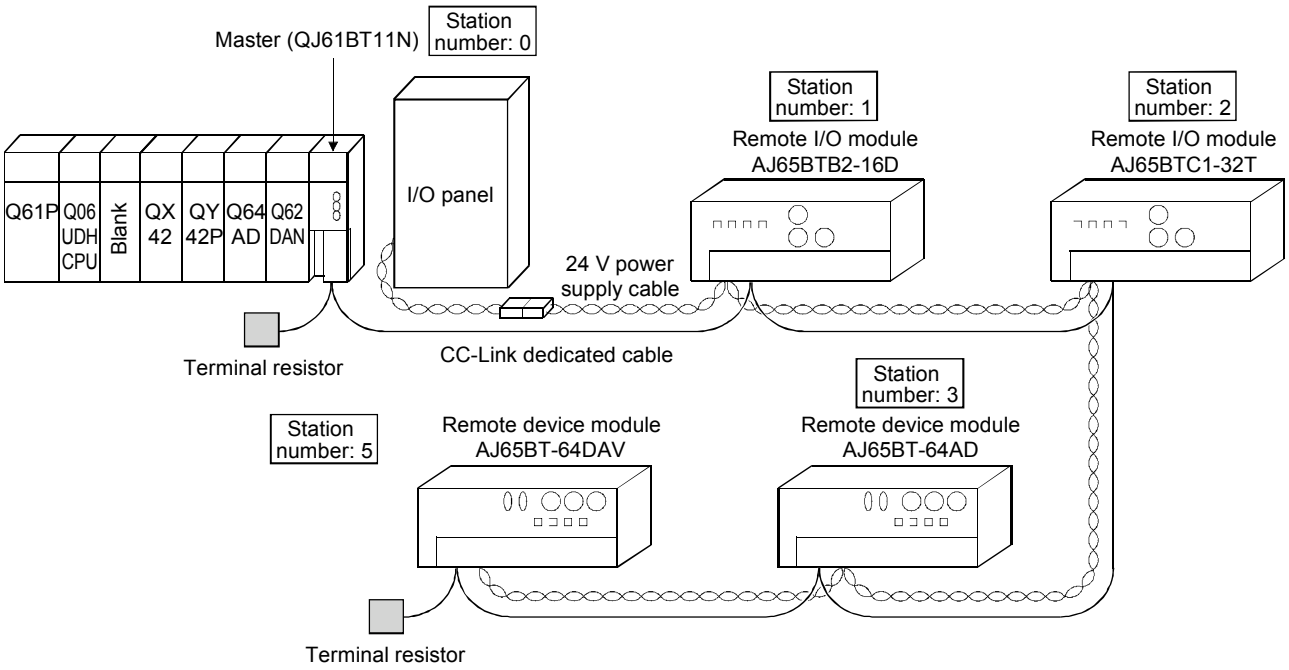
Memo

CHAPTER 4 EXERCISE 2 (REMOTE NET MODE: PART 2)

In this exercise, the remote I/O module and remote device module (AD, DA) are used with the CC-Link remote net Ver.1 mode.

4.1 System configuration

The system configuration used in the practice of the exercise 2 is as follows.



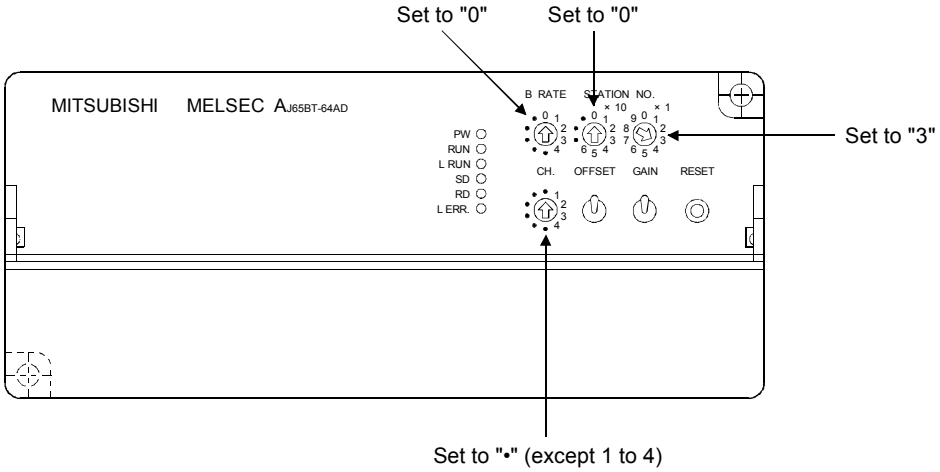
4.2 Remote device station settings and wiring

This section provides information on the settings and wiring of the remote device stations (AJ65BT-64AD type analog-digital converter module and AJ65BT-64D type digital-analog converter module).

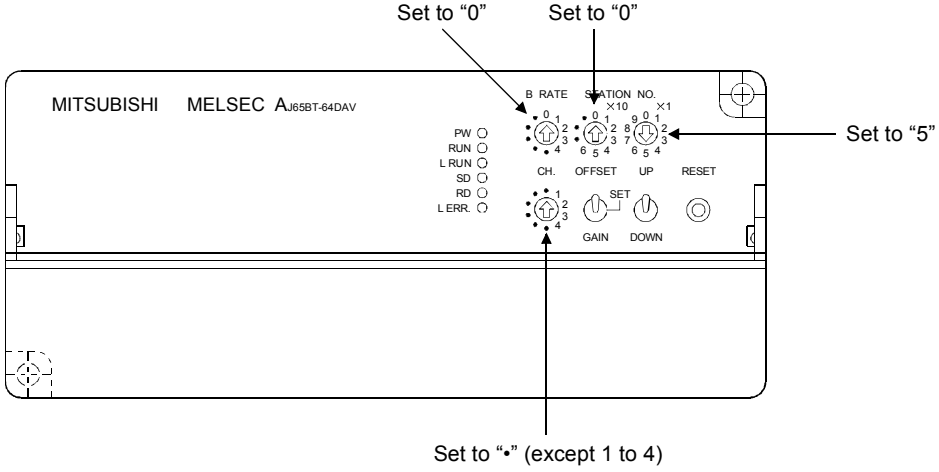
4.2.1 Module settings

The settings of AJ65BT-64AD and AJ65BT-64DAV are described.
For more details about each module functions and specifications, refer to the User's Manual (Details) for each module.

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



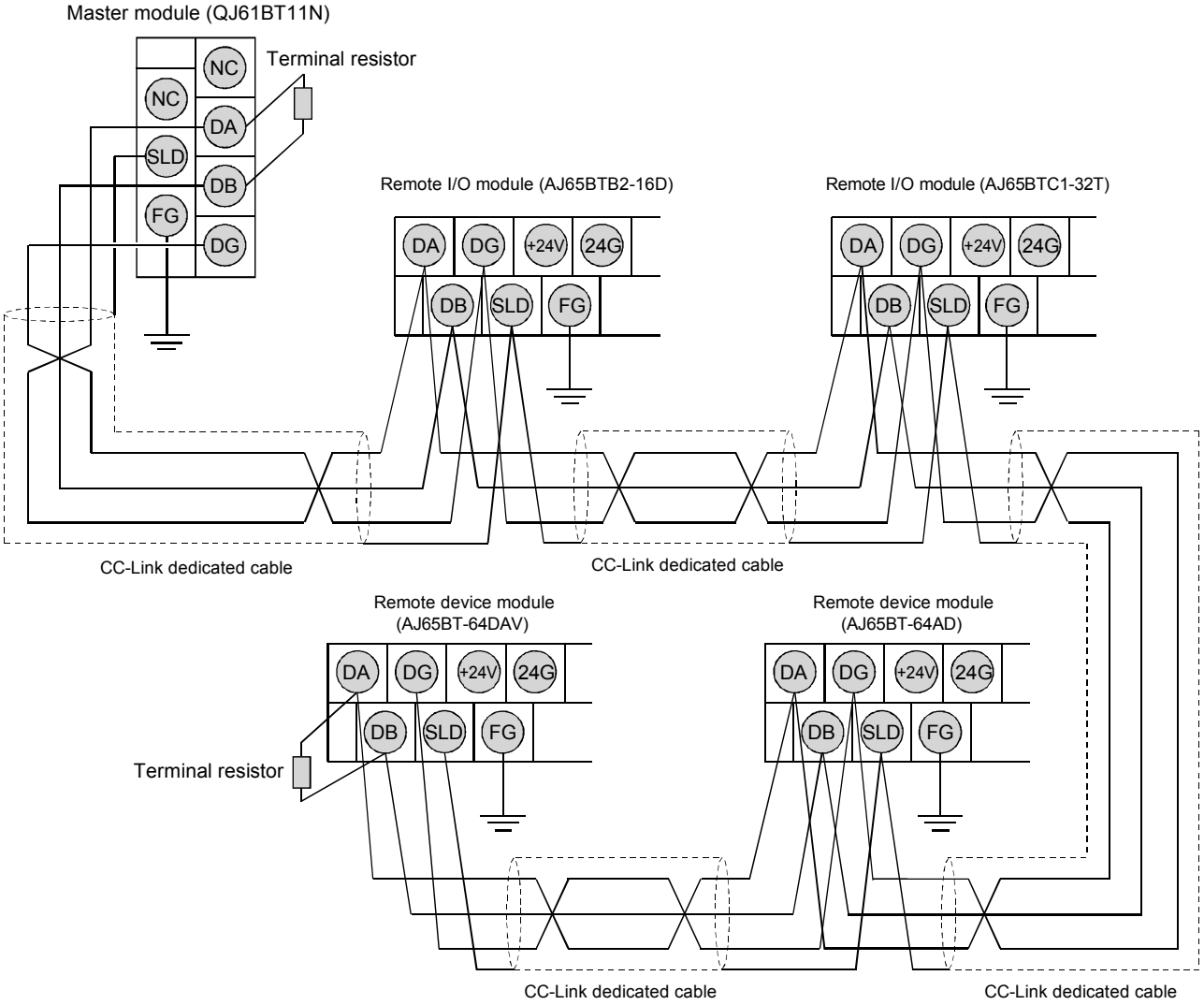
(2) AJ65BT-64DAV settings
(2 stations occupied)



4.2.2 Module wiring

The connection of CC-Link dedicated cable and the terminal resistor needed for exercise 2 is described.
Turn of the power before wiring the CC-Link dedicated cable or the 24 V power supply cable.

(1) Connection of CC-Link dedicated cable



After connecting the CC-Link dedicated cable or the 24 V power supply cable, check that the connection status is normal with the line test. (See Section 3.4.3)

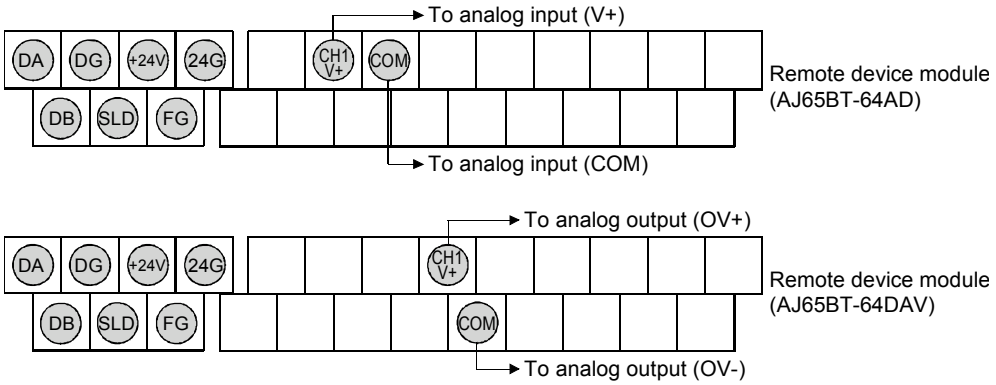
(2) Connection of 24 V power supply cable

The wiring for the Connection of 24 V power supply cable should be the same as remote I/O station.

(See section 3.4.3)

(3) Analog input and output connection

The wiring of the AJ65BT-64AD analog input and the AJ65BT-64DAV analog output use the wiring which is already connected to the I/O panel.



4.3 Master station settings

Perform the network settings of the master station and the remote device station.
After finishing, write the parameters to the PLC CPU.

4.3.1 Network parameter/automatic refresh parameter settings

Network parameters/automatic refresh parameters are set as follows.
For the setting operation refer to section 3.5.2.

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

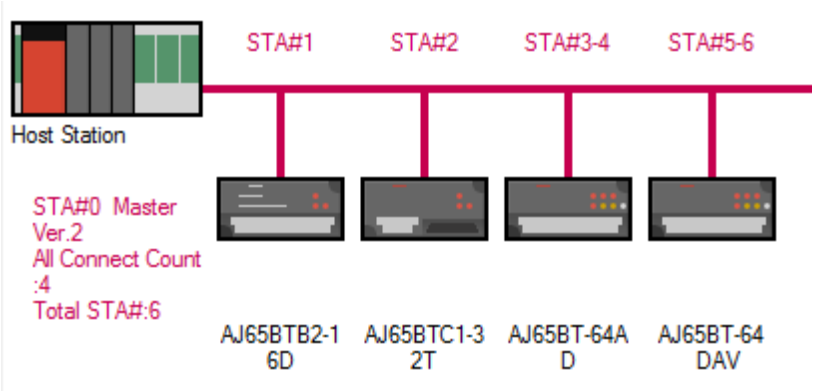
Number of Modules: 1 Boards Blank : No Setting Set the station information in the CC-Link configuration window

	1	2
Start I/O No.	00A0	
Operation Setting	Operation Setting	
Type	Master Station	
Master Station Data Link Type	PLC Parameter Auto Start	
Mode	Remote Net(Ver.2 Mode)	
Total Module Connected(*1)	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	
Standby Master Station No.(*1)		
PLC Down Select	Stop	
Scan Mode Setting	Asynchronous	
Delay Time Setting	0	
Station Information Setting	CC-Link Configuration Setting	
Remote Device Station Initial Setting	Initial Setting	
Interrupt Settings	Interrupt Settings	

- Station information

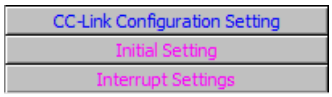
	Station No.	Model Name	Station Type	Version	# of STA Occupied	Expanded Cyclic Setting	Remote Station Points	Reserved/Err Invalid STA	Intelligent Buffer Size(word)		
									Send	Receive	Auto
	0/0	Host Station	Master Station								
	1/1	AJ65BTB2-16D	Remote I/O Station	Ver.1	1 Station Occupied	Single	32 Points	No Setting			
	2/2	AJ65BTC1-32T	Remote I/O Station	Ver.1	1 Station Occupied	Single	32 Points	No Setting			
	3/3	AJ65BT-64AD	Remote Device Station	Ver.1	2 Stations Occupied	Single	64 Points	No Setting			
	4/5	AJ65BT-64DAV	Remote Device Station	Ver.1	2 Stations Occupied	Single	64 Points	No Setting			

<REFERENCE> The station information for the exercise 2 can be shown as below.

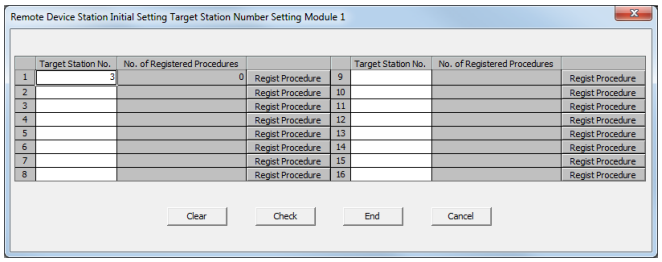


4.3.2 Remote device station initial procedure registration

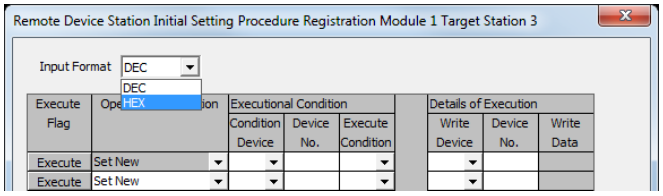
Initial settings are required for AJ65BT-64AD and AJ65BT-64DAV. (For more details, refer to User's Manual (Details) for each module.)
The MESLEC-Q series master station can perform the remote device station initial settings automatically. By registering the procedure to the network parameters, sequence program may be simplified.
The example of initial procedure registration operation is described below.
The sequence programs example corresponding to the registration is described at the end of this section.



(1) Click on [Initial Setting] in the network parameter setting screen.

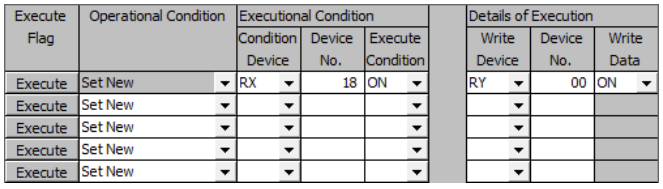


(2) The Remote Device Station Initial Setting dialog box is displayed. Write "3" in [Target Station No.] and click on [Regist Procedure].

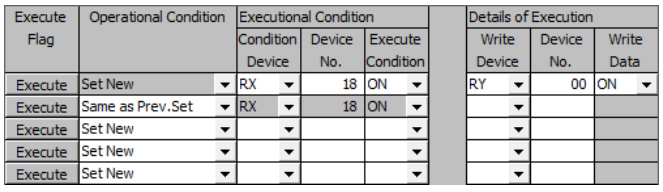


(3) The Remote Device Station Initial Setting Procedure Registration screen is displayed. Set "HEX" in "Input Format".

Note: The Input Format can be changed between decimal and hexadecimal during the settings.



(4) Set the first row as follows.
• [Operation Condition] ··· RX, 18, ON
• [Details of Execution] ··· RY, 00, ON
(The settings above mean that RYO is set to ON by ON of RX18.)



(5) In the second row, set [Operation Condition] on "Same as Prev.Set".
(When "Same as Prev.Set" is selected, the setting becomes the same as above.)

Continue next page

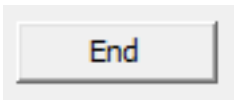
From the previous page

Execute Flag	Operational Condition	Executional Condition			Details of Execution		
		Condition Device	Device No.	Execute Condition	Write Device	Device No.	Write Data
Execute	Set New	RX	18	ON	RY	00	ON
Execute	Same as Prev.Set	RX	18	ON	RWw	00	0101
Execute	Same as Prev.Set	RX	18	ON	RWw	01	01F4
Execute	Same as Prev.Set	RX	18	ON	RWw	06	0001
Execute	Same as Prev.Set	RX	18	ON	RY	18	ON
Execute	Same as Prev.Set	RX	18	ON	RY	19	ON
Execute	Set New	RX	18	OFF	RY	18	OFF
Execute	Set New	RX	19	ON	RY	19	OFF
Execute	Set New						

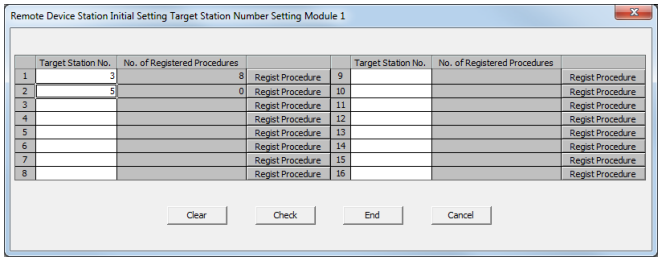
(6) Screen on the left shows the step (4) to (5).

Note1: The number of RX/RY,RWw/RWr is specific to each module, it is not a consecutive number.

Note2: When registering many remote device station initial setting procedures, the scan time becomes longer.



(7) Click on the [End] button of the Remote Device Station Initial Setting Procedure Registration dialog box.

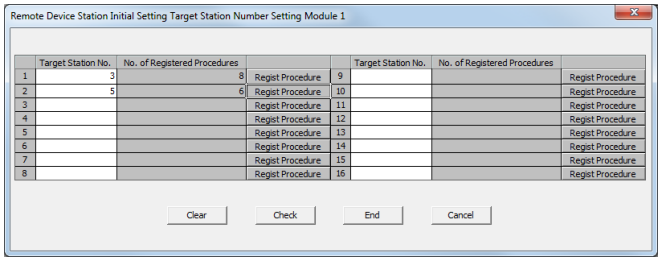


(8) In the Remote Device Station Initial Setting dialog box, write "5" in [Target Station No.] and click on [Regist Procedure].

Execute Flag	Operational Condition	Executional Condition			Details of Execution		
		Condition Device	Device No.	Execute Condition	Write Device	Device No.	Write Data
Execute	Set New	RX	18	ON	RY	04	ON
Execute	Same as Prev.Set	RX	18	ON	RWw	04	000E
Execute	Same as Prev.Set	RX	18	ON	RY	18	ON
Execute	Same as Prev.Set	RX	18	ON	RY	19	ON
Execute	Set New	RX	18	OFF	RY	18	OFF
Execute	Set New	RX	19	ON	RY	19	OFF
Execute	Set New						

(9) Set as shown on the left.

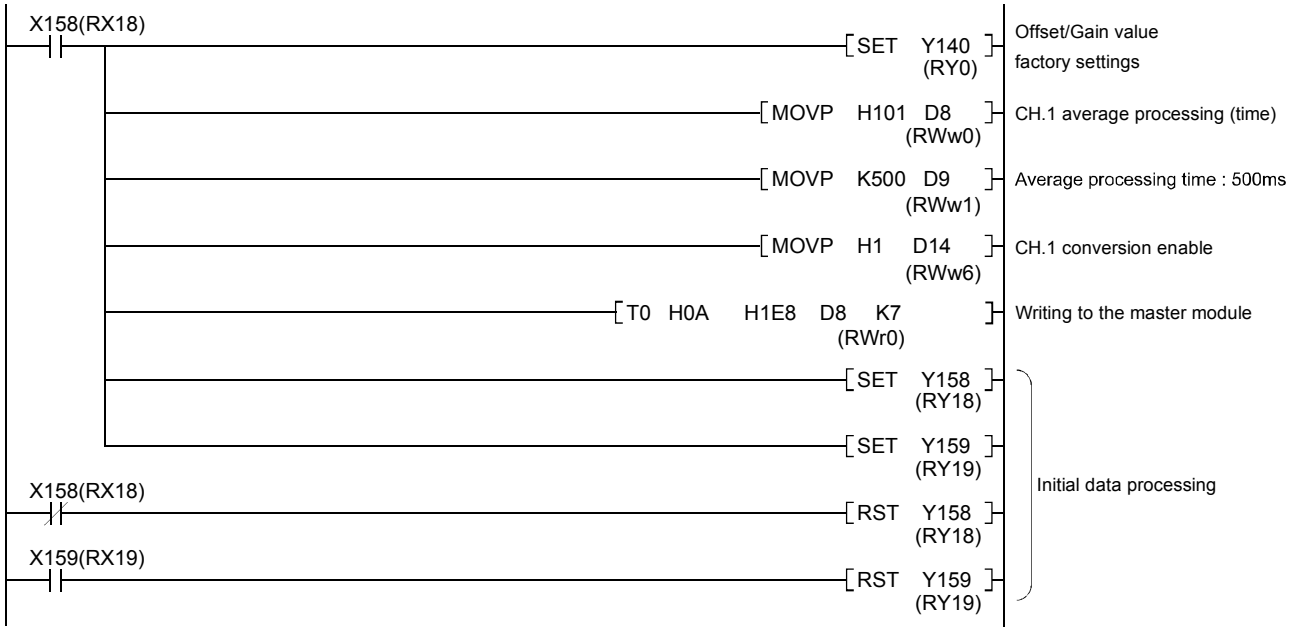
(10) Click on the [End] button of the Remote Device Station Initial Setting Procedure Registration dialog box.



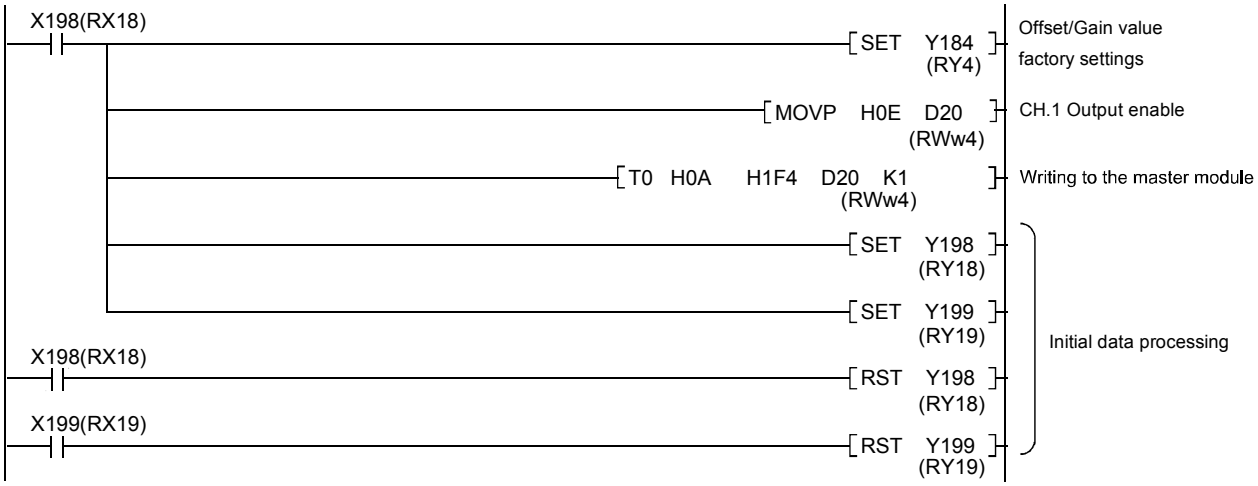
(11) Click on the [End] button of the Remote Device Station Initial Setting dialog box.
The remote device station initial settings are finished.
When the initial settings are done, click on the [End] button of the network parameter setting screen to write the contents to the PLC CPU.

<REFERENCE> When the initial settings in the exercise 2 are executed with MESLEC-A, the sequence program such as following one, will be required.

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



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



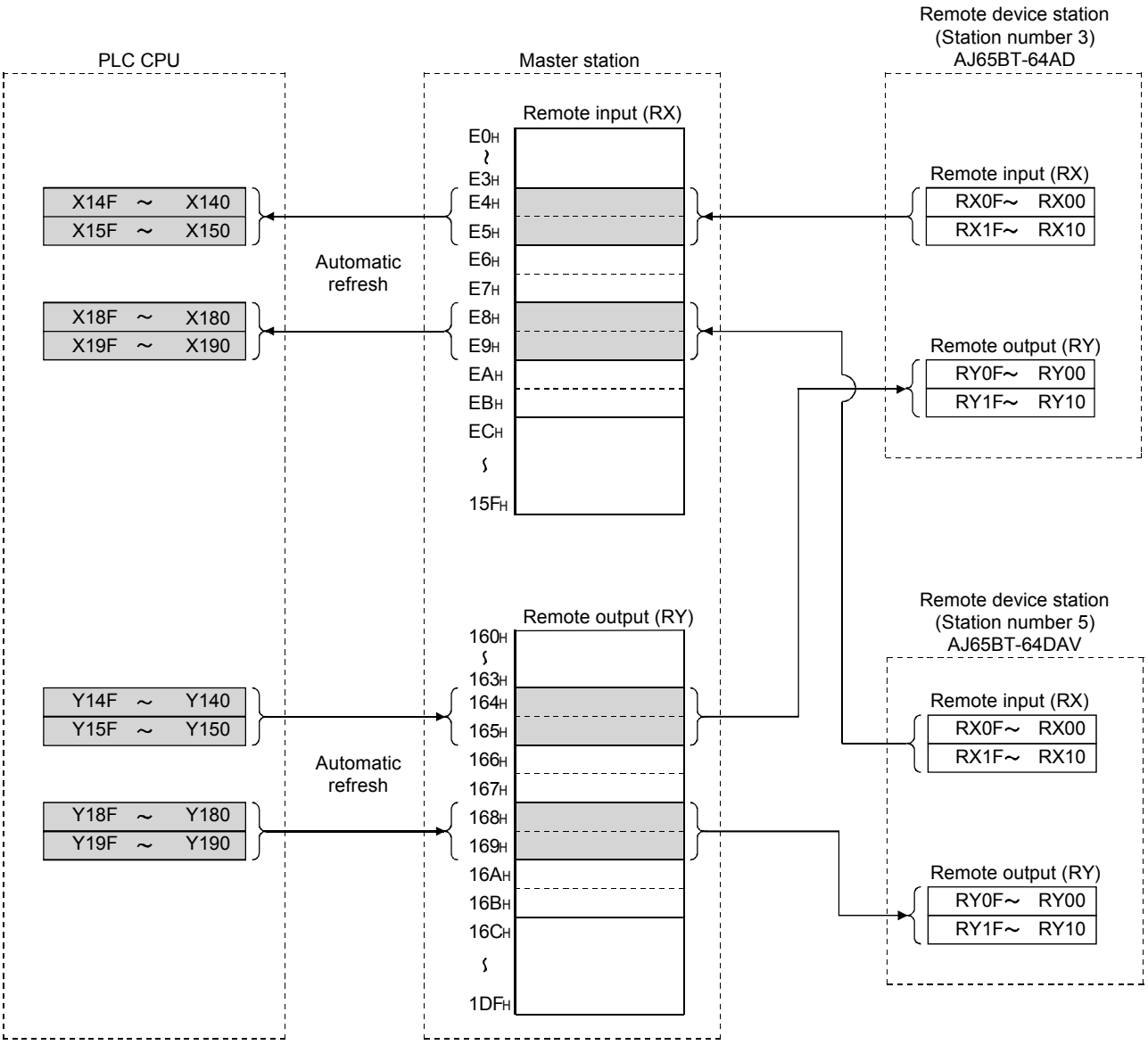
4.4 Sequence programs

(1) Refresh support

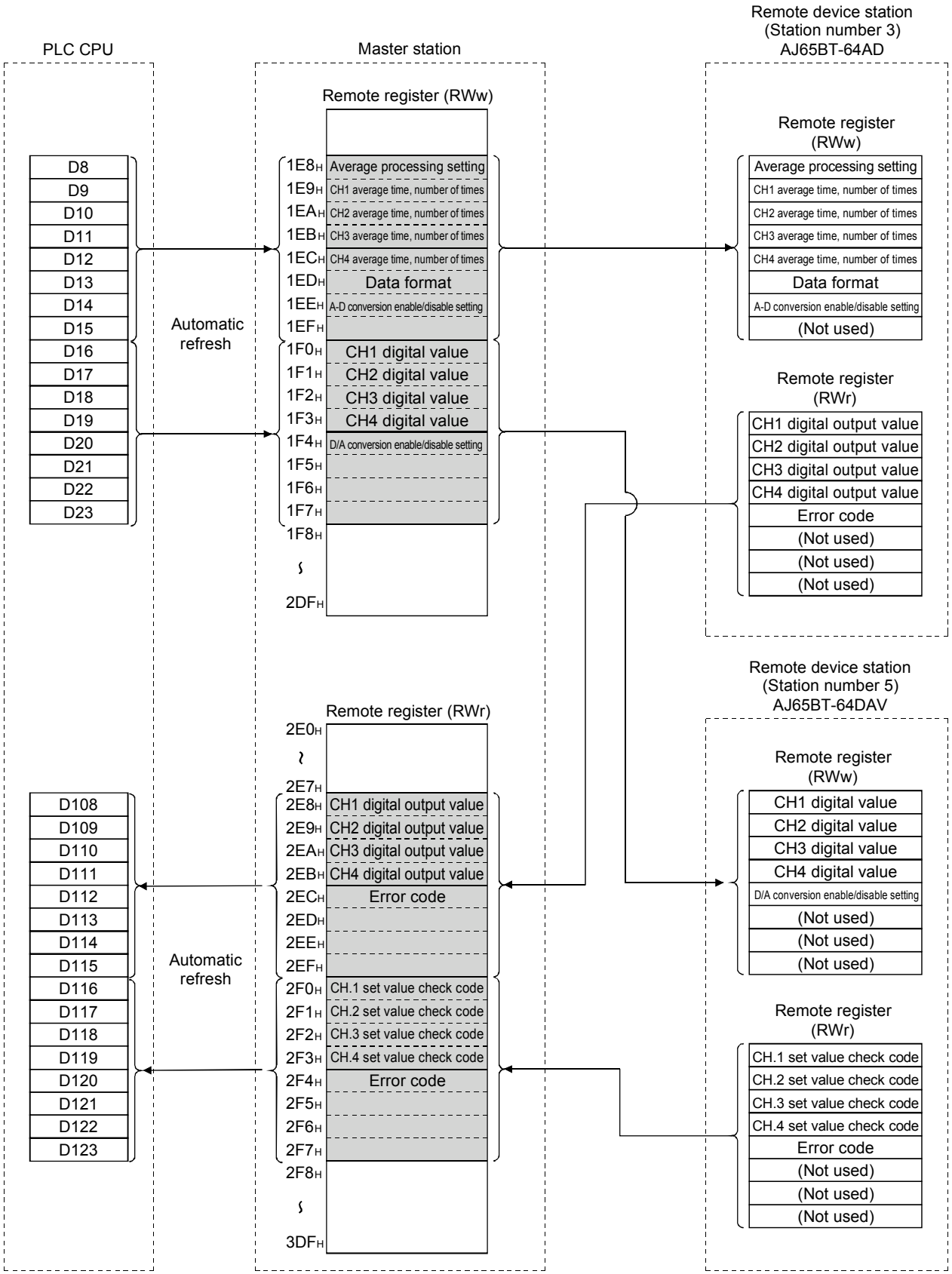
The relationship between the PLC CPU, master station buffer memory and remote I/O station refresh is shown below (same as in the exercise 1).

(For more details regarding each module device station, refer to User's Manual (Details) for each module.)

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



[Remote register (Rww, RWr)]



(2) Setting sheet

(a) Station information setting sheet

Station No.	Station type	Number of occupied stations	Reserve/Invalid station select	Intelligent buffer select (Word)		
				Send	Receive	Automatic
1	Remote I/O station	1	Not set	—	—	—
2	Remote I/O station	1	Not set	—	—	—
3	Remote device station	2	Not set	—	—	—
4						
5	Remote device station	2	Not set	—	—	—
6						
7						
8						
9						
10						

(b) Device assignment table

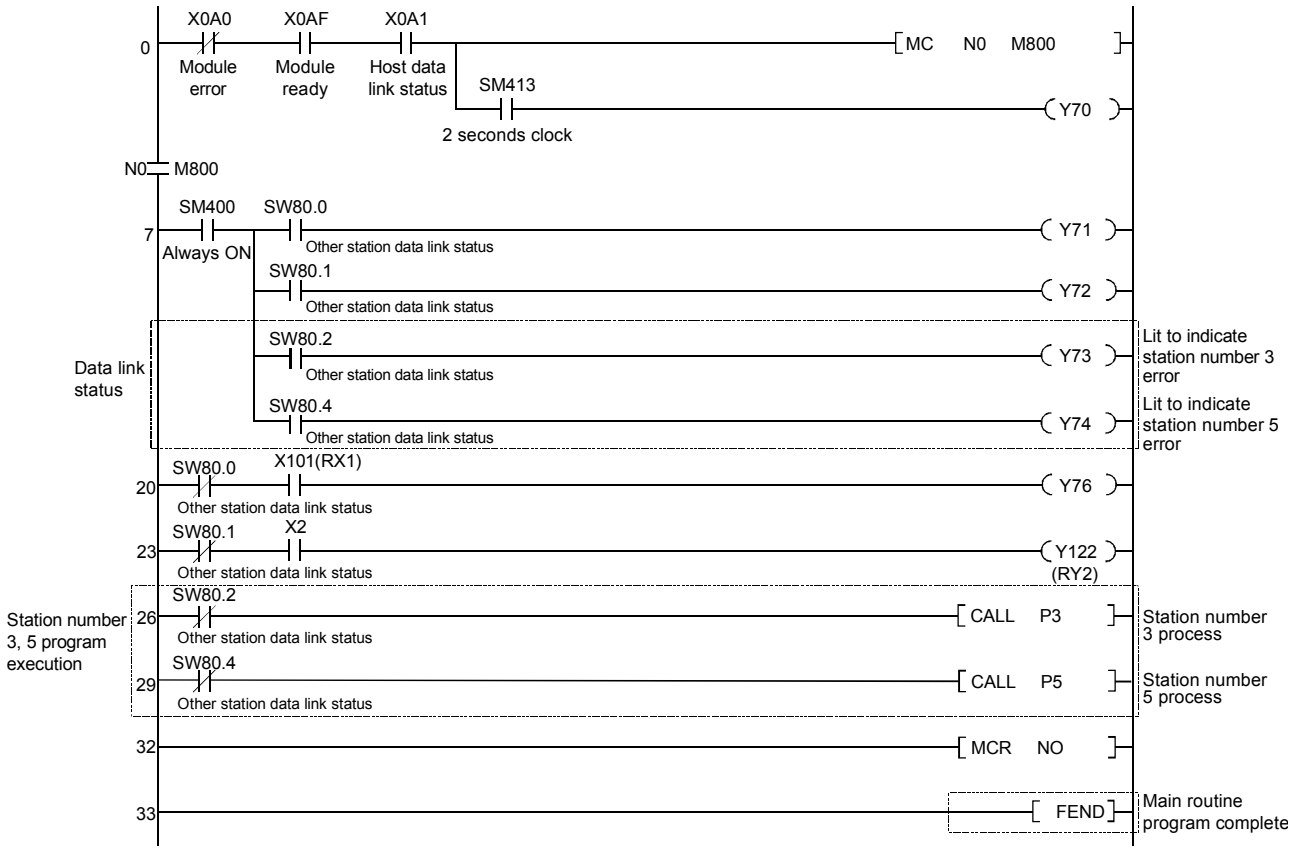
Station No. \ Device	RX → (X)		RY ← (Y)		RWw → (D)		RWr → (D)	
	Remote device	CPU device	Remote device	CPU device	Remote device	CPU device	Remote device	CPU device
1	RX0 to RXF	X100 to X10F						
	—	X110 to X11F						
2			RY20 to RY2F	Y120 to Y12F				
			RY30 to RY3F	Y130 to Y13F				
3	RX40 to RX4F	X140 to X14F	RY40 to RY4F	Y140 to Y14F	RWw8 to RWwB	D8 to D11	RWr8 to RWrB	D108 to D111
	RX50 to RX5F	X150 to X15F	RY50 to RY5F	Y150 to Y15F				
4	—	X160 to X16F	—	Y160 to Y16F	RWwC to RWwF	D12 to D15	RWrC to RWrF	D112 to D115
	—	X170 to X17F	—	Y170 to Y17F				
5	RX80 to RX8F	X180 to X18F	RY80 to RY8F	Y180 to Y18F	RWw10 to RWw13	D16 to D19	RWr10 to RWr13	D116 to D119
	RX90 to RX9F	X190 to X19F	RY90 to RY9F	Y190 to Y19F				
6		X1A0 to X1AF		Y1A0 to Y1AF	RWw14 to RWw17	D20 to D23	RWr14 to RWr17	D120 to D123
		X1B0 to X1BF		Y1B0 to Y1BF				
7								
8								
9								
10								

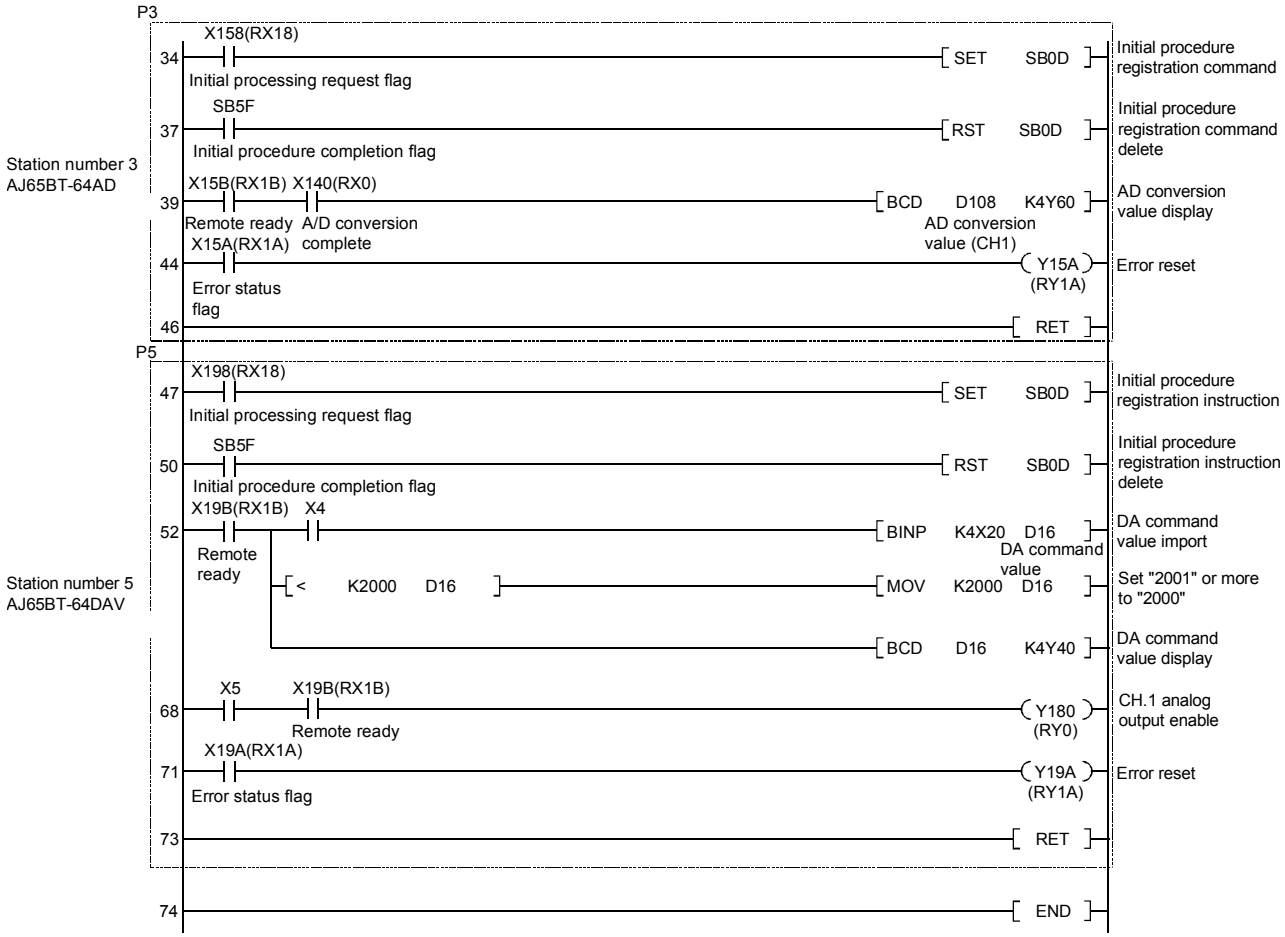
(3) Sequence program

Create a sequence program as below and write it to the PLC CPU.

The parts which are covered by the dashed line have been added or changed comparing to the sequence program in the exercise 1.

Program name	EX2




P3
X158(RX18)
34
SET SB0D
Initial procedure registration command
Initial processing request flag
SB5F
37
RST SB0D
Initial procedure registration command delete
Initial procedure completion flag
Station number 3
AJ65BT-64AD
X15B(RX1B) X140(RX0)
39
BCD D108 K4Y60
AD conversion value display
Remote ready
A/D conversion complete
AD conversion value (CH1)
X15A(RX1A)
44
Y15A (RY1A)
Error reset
Error status flag
46
RET
P5
X198(RX18)
47
SET SB0D
Initial procedure registration instruction
Initial processing request flag
SB5F
50
RST SB0D
Initial procedure registration instruction delete
Initial procedure completion flag
X19B(RX1B) X4
52
BINP K4X20 D16
DA command value import
Remote ready
DA command value
Station number 5
AJ65BT-64DAV
< K2000 D16
MOV K2000 D16
Set "2001" or more to "2000"
BCD D16 K4Y40
DA command value display
X5 X19B(RX1B)
68
Y180 (RY0)
CH.1 analog output enable
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 by sequence programs

Communicate with the remote device station using sequence program which have been written to the PLC CPU.

Operation of the training kit

(1) Push the RUN/STOP/RESET switch of the PLC CPU in the "RESET" position one time (1 second) and it is reset.

(2) Set the RUN/STOP/RESET switch of the PLC CPU to "RUN".
Y70····· Flashing according to the host station data link status (data link is normal)

(3) Y6F-Y60 digital display part ·····Displays the digital output value
Remove the top part of the I/O panel cover and turn the input knob.
The digital output value also changes to correspond with input power voltage change.

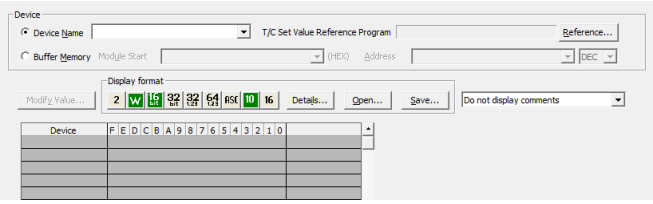
(4) As example, set X2F-X20 digital switch to "1000" and X4 to ON.
Y4F-Y40 digital display part ····· Displays "1000".

(5) Set X5 to ON and output a signal from DA module.
The output power voltage of the top part of I/O panel (D/A OUTPUT) displays around 5 V.

(6) Perform same settings as in steps 1-3 and change the value of X2F-X20 (Range: 0 to 2000). Turn X4 ON again (ON→OFF→ON), the corresponding DA signal is output.

4.5.2 Remote device station monitor/test

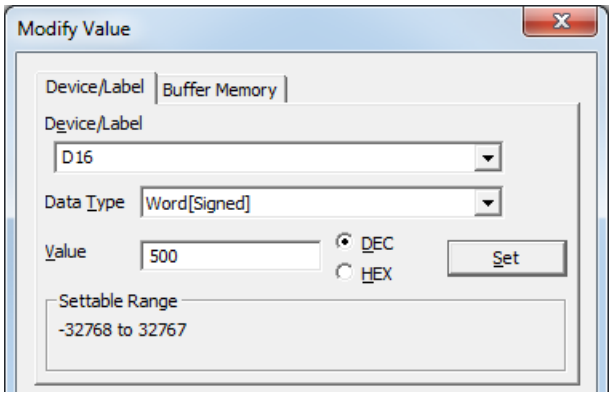
Communication with the remote device stations will be monitored/tested by GX Works2.
About monitor and device test refer to the operation of the section 3.6.



(1) Click on the menu [Online]→[Monitor]→[Device/Buffer Memory Batch]. The Device/Buffer Memory Batch Monitor screen is displayed.

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	1	1	1	0	1	1	1	1	1	1	1983
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) Write "D100" in [Device], and hit [Enter].
Check that the digital output value is stored in D108.



(3) Click on the menu [Debug]→[Modify Value], and the Modify Value dialog box is displayed.

Write "D16" in the list box of the [Device/Label].
Select "Word[Signed]" from the [Data type] list box.
Write "500" in the [Value] list box, and click on the [Set] button.

(4) 500 is stored in the CH.1 digital value setting area of AJ65BT-64DAV. The output power voltage (D/A OUTPUT) shows about 2.5 V.
The remote device station monitor/test is finished.

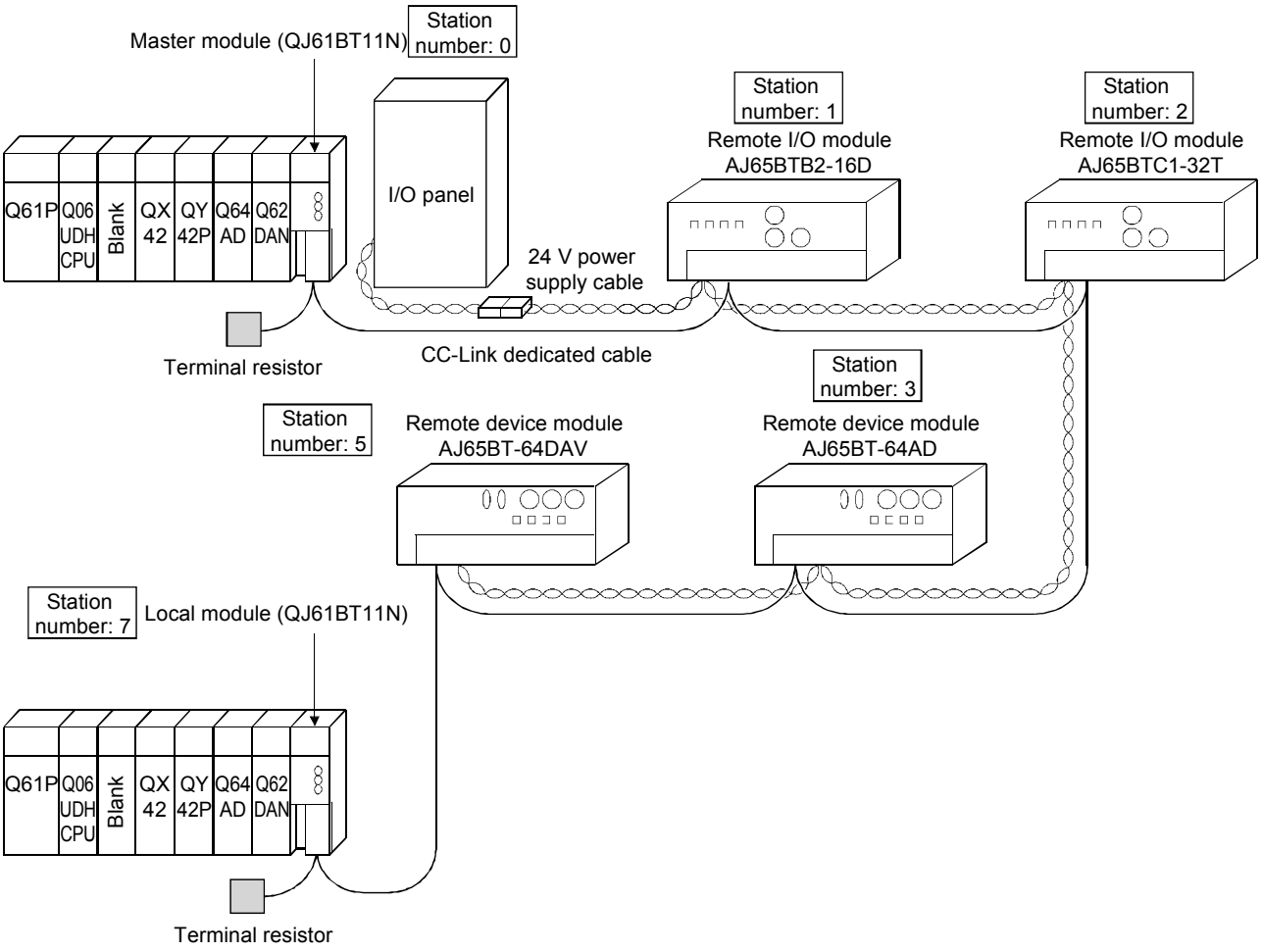
Memo

CHAPTER 5: EXERCISE 3 (COMMUNICATION BETWEEN MASTER STATION AND LOCAL STATION)

In this exercise, local stations has been added to the previously used system configuration

5.1 System configuration

The system configuration used in the practice of the exercise 3 is as follows.

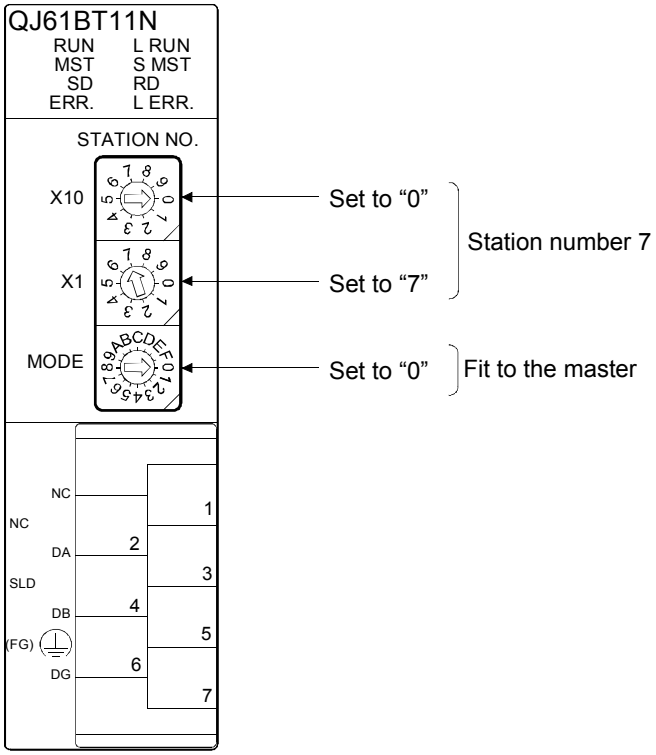


5.2 Local station settings and wiring

This section provides information on the settings and wiring of QJ61BT11N of the local station.

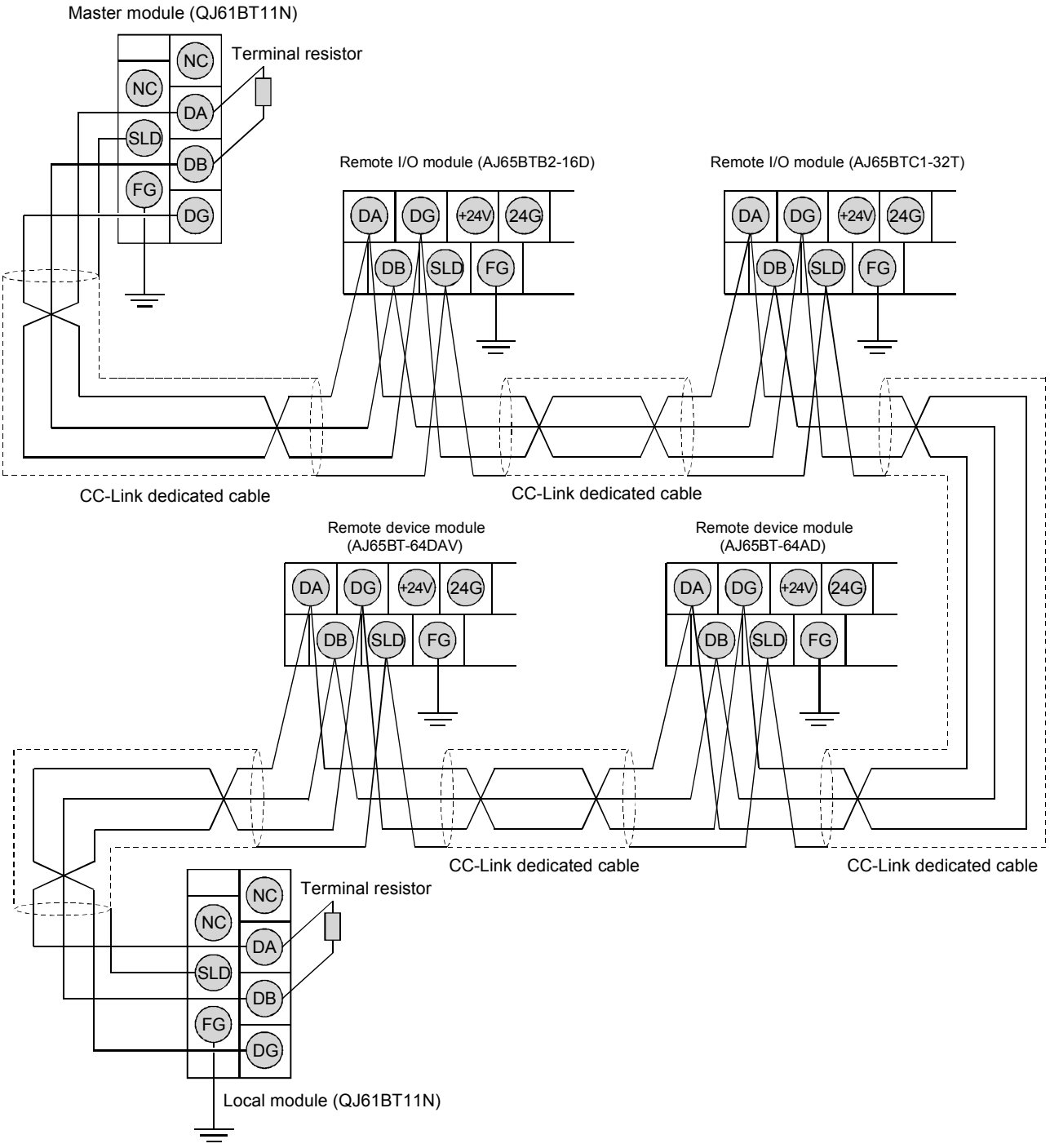
5.2.1 Module settings

The settings of QJ61BT11N of the local station are shown below.



5.2.2 Module wiring

The connection of CC-Link dedicated cable and the terminal resistor needed for exercise 3 is described.
Same as the exercise 2 for the 4 V power supply cable.
Turn of the power before wiring the CC-Link dedicated cable.



5.3 Network parameter/automatic refresh parameter settings

5.3.1 Master station parameters/automatic refresh parameters

In the master station set the network parameters/automatic parameters are set as follows. After finishing, write them to the PLC CPU. (Same as the exercise 2 for the initial setting.)

About the setting and writing operation, refer to the section 3.5.2 to 3.5.4.

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

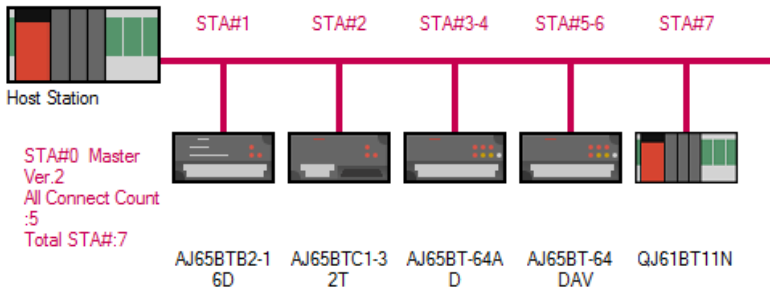
Number of Modules 1 Boards Blank : No Setting ☑ Set the station information in the CC-Link configuration window

	1	2
Start I/O No.	00A0	
Operation Setting	Operation Setting	
Type	Master Station	
Master Station Data Link Type	PLC Parameter Auto Start	
Mode	Remote Net(Ver.2 Mode)	
Total Module Connected(*1)	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	
Standby Master Station No.(*1)		
PLC Down Select	Stop	
Scan Mode Setting	Asynchronous	
Delay Time Setting	0	
Station Information Setting	CC-Link Configuration Setting	
Remote Device Station Initial Setting	Initial Setting	
Interrupt Settings	Interrupt Settings	

- Station information

	Station No.	Model Name	Station Type	Version	# of STA Occupied	Expanded Cyclic Setting	Remote Station Points	Reserved/Err Invalid STA	Intelligent Buffer Size(word)		
									Send	Receive	Auto
	0/0	Host Station	Master Station								
	1/1	AJ65BTB2-16D	Remote I/O Station	Ver.1	1 Station Occupied	Single	32 Points	No Setting			
	2/2	AJ65BTC1-32T	Remote I/O Station	Ver.1	1 Station Occupied	Single	32 Points	No Setting			
	3/3	AJ65BT-64AD	Remote Device Station	Ver.1	2 Stations Occupied	Single	64 Points	No Setting			
	4/5	AJ65BT-64DAV	Remote Device Station	Ver.1	2 Stations Occupied	Single	64 Points	No Setting			
	5/7	QJ61BT11N	Local Station	Ver.1	1 Station Occupied	Single	32 Points	No Setting	64	64	128

<REFERENCE> The station information for the exercise 3 can be shown as below.



5.3.2 Local station network parameters/automatic refresh parameters

Set the network parameters/automatic parameters of the local station as follows. After finishing, write the parameters to the PLC CPU.
About the setting and writing operation, refer to the section 3.5.2 to 3.5.4.

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

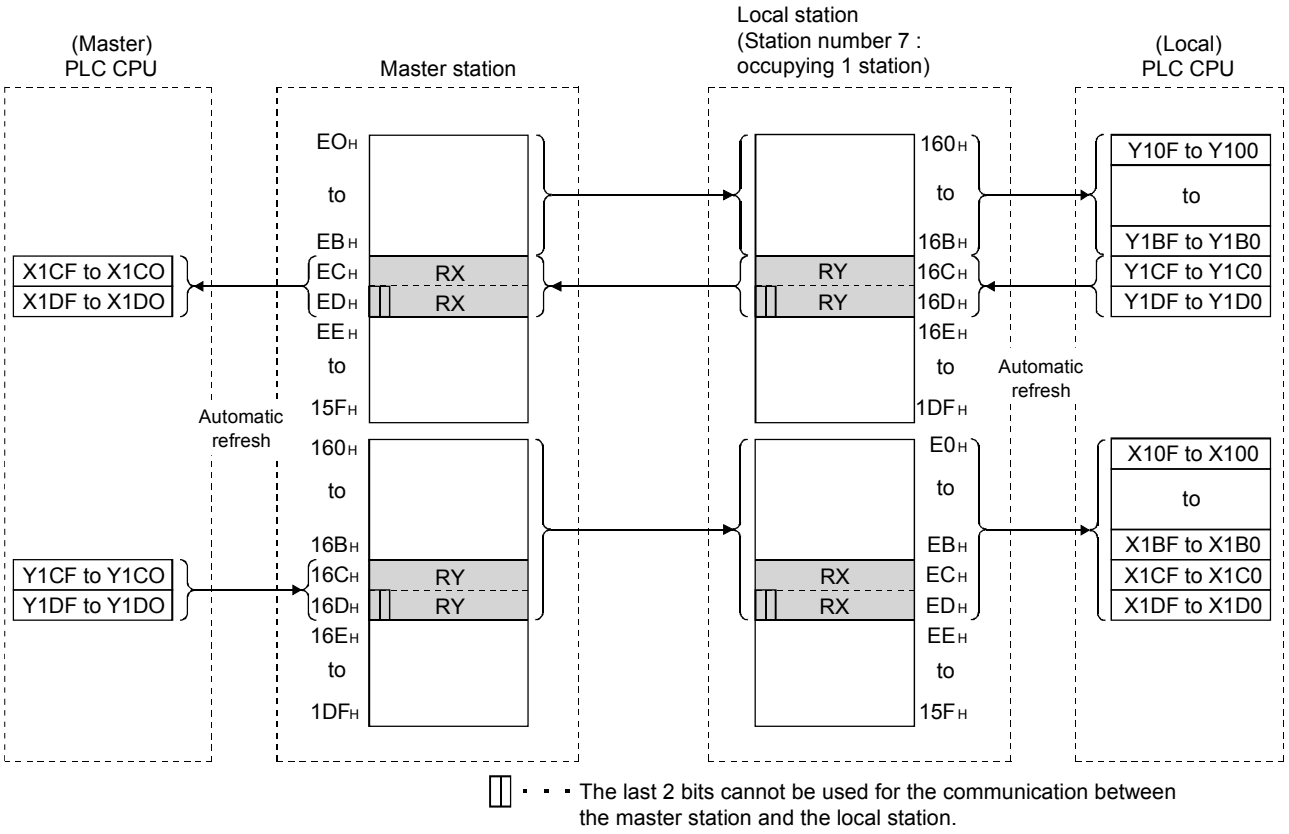
	1
Start I/O No.	00A0
Operation Setting	Operation Setting
Type	Local Station
Master Station Data Link Type	
Mode	Remote Net(Ver.1 Mode)
Total Module Connected(*1)	
Remote input(RX)	X100
Remote output(RY)	Y100
Remote register(RWr)	D0
Remote register(RWw)	D100
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RWr)	
Ver.2 Remote register(RWw)	
Special relay(SB)	SB0
Special register(SW)	SW0
Retry Count	
Automatic Reconnection Station Count	
Standby Master Station No.(*1)	
PLC Down Select	
Scan Mode Setting	
Delay Time Setting	
Station Information Setting	CC-Link Configuration Setting
Remote Device Station Initial Setting	
Interrupt Settings	Interrupt Settings

5.4 Sequence program

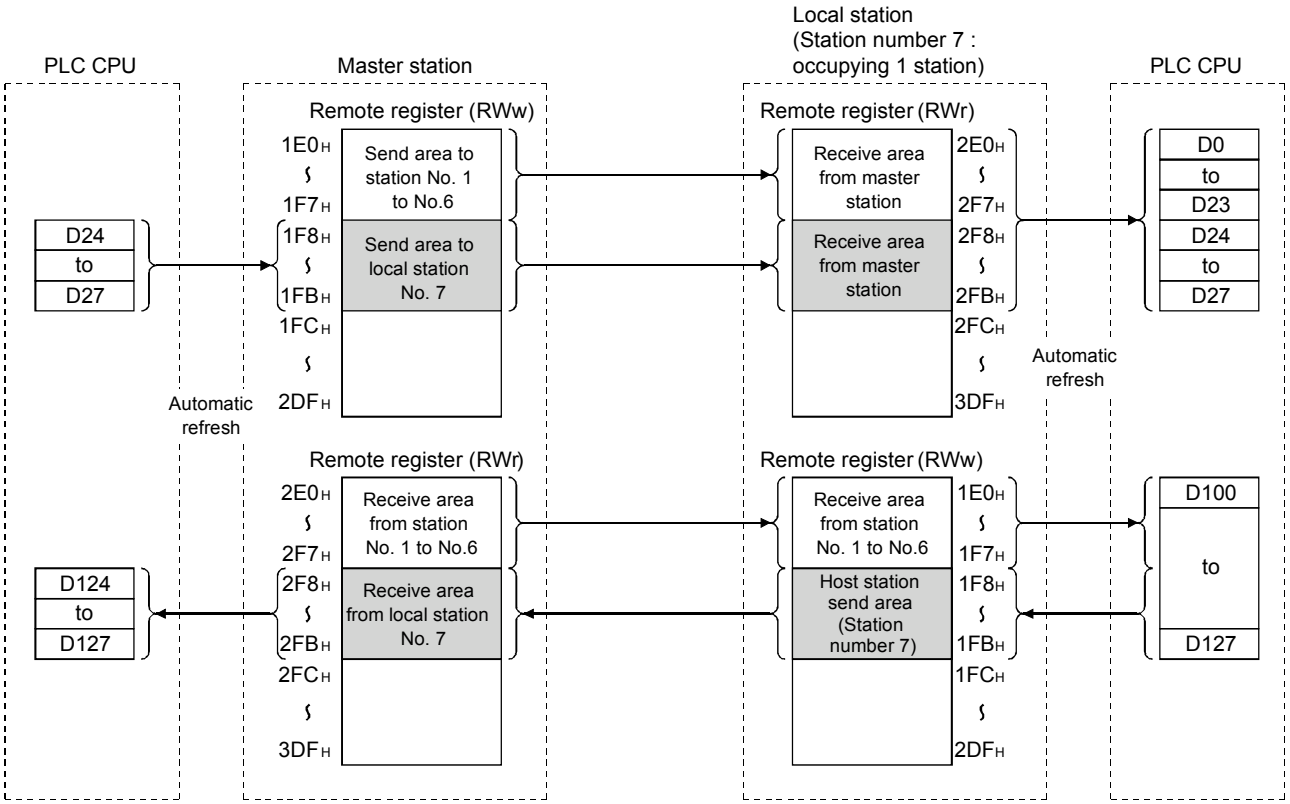
The relationship between the PLC CPU device, master station buffer memory and local station buffer memory refresh is shown below (same as in exercise 2).
Note that in the master station and local station RX and RY are crossed.
(→ Refer to section 1.2 (5))

(1) Refresh support

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



[Remote register (Rww, RWr)]



The data flow between the master station and the local station number 7 (1 occupied station) is shown below.

Master station		Data flow	Local station (Station number 7)	
Device	Buffer memory address		Device	Buffer memory address
RX	ECH to EDH	←	RY	16CH to 16DH
RY	16CH to 16DH	→	RX	ECH to EDH
RWw	1F8H to 1FBH	→	RWr	2F8 to 2FBH
RWr	2F8H to 2FBH	←	RWw	1F8H to 1FBH

(2) Setting sheet

(a) Station information setting sheet

Station No.	Station type	Number of occupied stations	Reserve/Invalid station select	Intelligent buffer select (Word)		
				Send	Receive	Automatic
1	Remote I/O station	1	Not set	—	—	—
2	Remote I/O station	1	Not set	—	—	—
3	Remote device station	2	Not set	—	—	—
4						
5	Remote device station	2	Not set	—	—	—
6						
7	Local station	1	Not set	—	—	—
8						
9						
10						

(b) Device assignment table

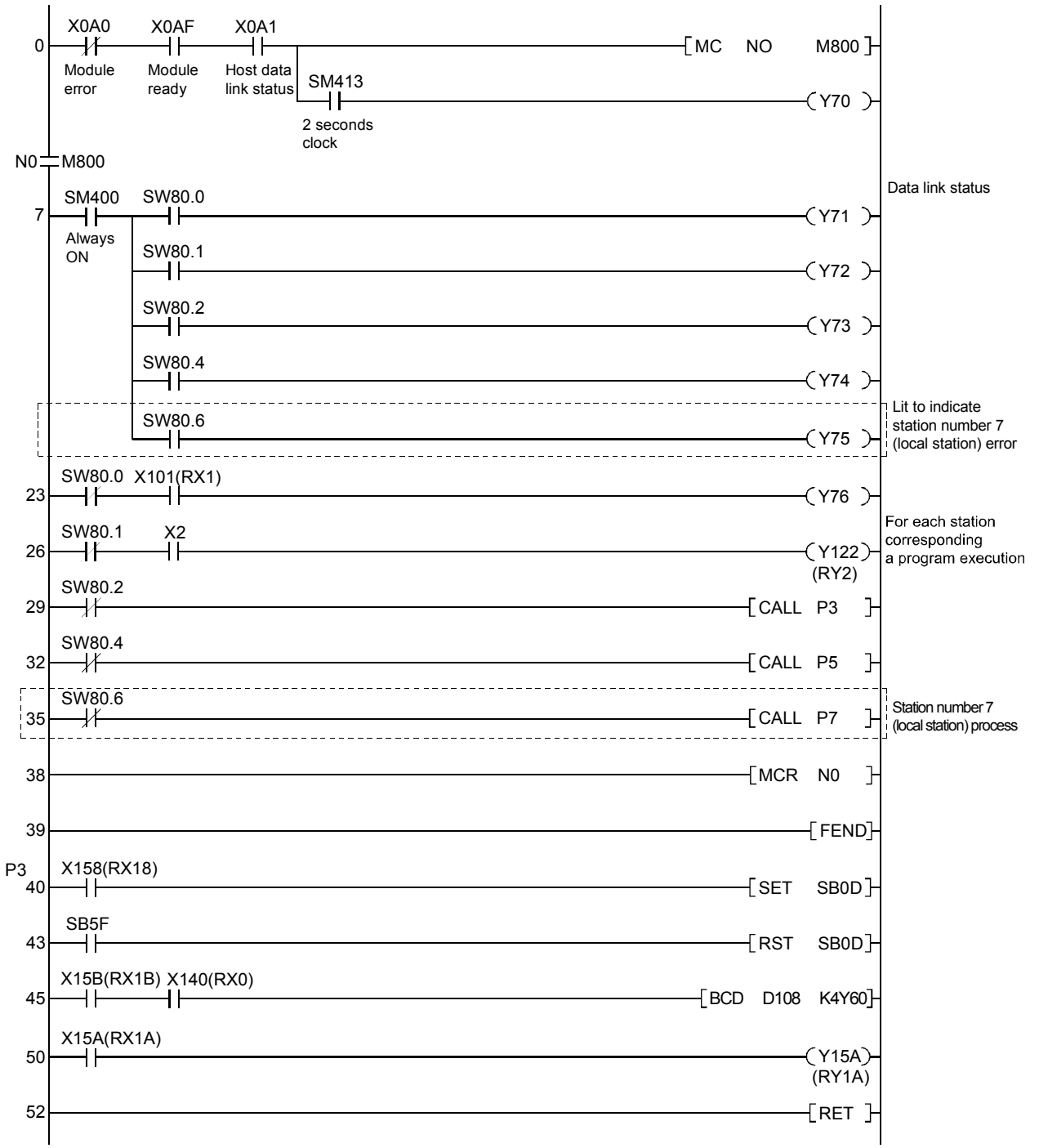
Device / Station No.	RX → (X)		RY ← (Y)		RWw → (D)		RWr → (D)	
	Remote device	CPU device	Remote device	CPU device	Remote device	CPU device	Remote device	CPU device
1	RX0 to RXF	X100 to X10F						
	—	X110 to X11F						
2			RY20 to RY2F	Y120 to Y12F				
			RY30 to RY3F	Y130 to Y13F				
3	RX40 to RX4F	X140 to X14F	RY40 to RY4F	Y140 to Y14F	RWw8 to RWwB	D8 to D11	RWr8 to RWrB	D108 to D111
	RX50 to RX5F	X150 to X15F	RY50 to RY5F	Y150 to Y15F				
4	—	X160 to X16F	—	Y160 to Y16F	RWwC to RWwF	D12 to D15	RWrC to RWrF	D112 to D115
	—	X170 to X17F	—	Y170 to Y17F				
5	RX80 to RX8F	X180 to X18F	RY80 to RY8F	Y180 to Y18F	RWw10 to RWw13	D16 to D19	RWr10 to RWr13	D116 to D119
	RX90 to RX9F	X190 to X19F	RY90 to RY9F	Y190 to Y19F				
6	—	X1A0 to X1AF	—	Y1A0 to Y1AF	RWw14 to RWw17	D20 to D23	RWr14 to RWr17	D120 to D123
	—	X1B0 to X1BF	—	Y1B0 to Y1BF				
7	RXC0 to RXCF	X1C0 to X1CF	RYC0 to RYCF	Y1C0 to Y1CF	RWw18 to RWw1B	D24 to D27	RWr18 to RWr1B	D124 to D127
	RXD0 to RXDF	X1D0 to X1DF	RYD0 to RYDF	Y1D0 to Y1DF				
8								
9								
10								

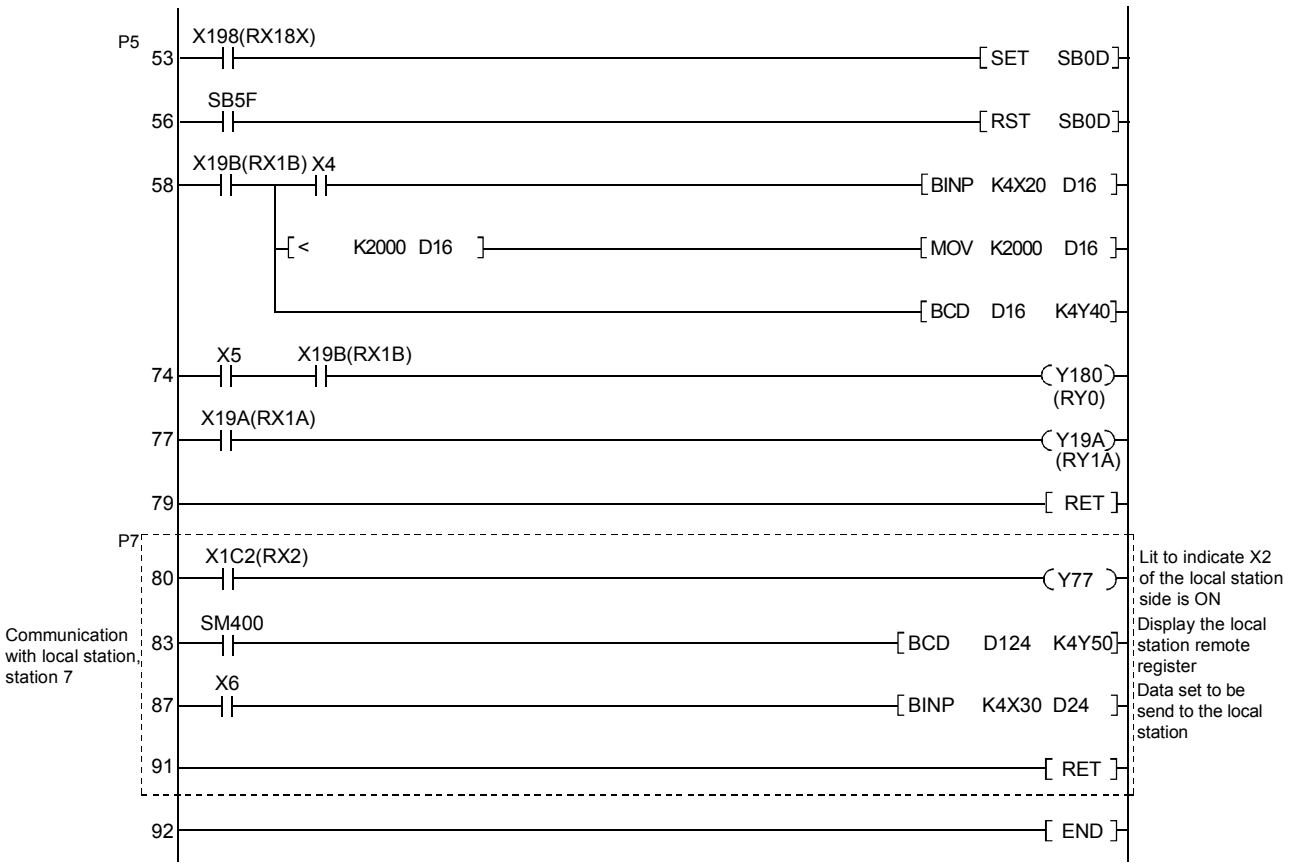
5.4.1 Master station's sequence program

Create the sequence program as below and write it to the master station PLC CPU.

The parts, which are covered by the dashed line, have been added and changed comparing to the sequence program in the exercise 2.

Program name	EX3-M

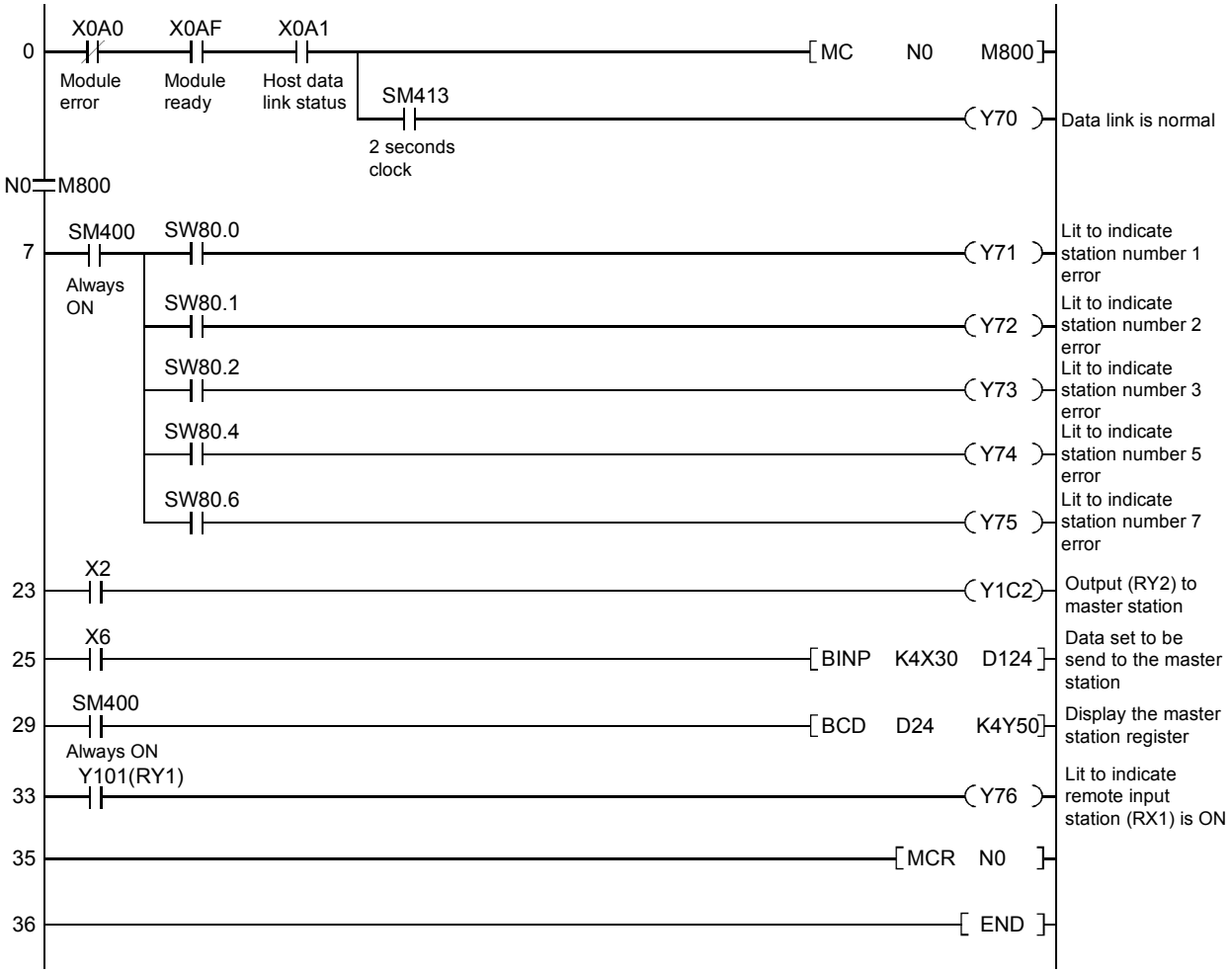



P5
53
X198(RX18X)
SET SB0D
56
SB5F
RST SB0D
58
X19B(RX1B) X4
BINP K4X20 D16
< K2000 D16
MOV K2000 D16
BCD D16 K4Y40
74
X5 X19B(RX1B)
Y180
(RY0)
77
X19A(RX1A)
Y19A
(RY1A)
79
RET
P7
80
X1C2(RX2)
Y77
Lit to indicate X2 of the local station side is ON
Communication with local station, station 7
83
SM400
BCD D124 K4Y50
Display the local station remote register
87
X6
BINP K4X30 D24
Data set to be send to the local station
91
RET
92
END

5.4.2 Local station's sequence program

Create the sequence program as below and write it to the local station PLC CPU.

Program name	EX3-L



5.5 Communication between master station and local station

Operation of the training kit

(1) Push the RUN/STOP/RESET switch of the each PLC CPU of the master station side and local station side in the "RESET" position one time (1 second) and it is reset.

(2) Set the RUN/STOP/RESET switch of the PLC CPU of the master station side and local station side to "RUN".
Y70…… Flashing according to the host station data link status (data link is normal)

(3) Turn ON X2 at the local station side.
X2=ON with the local station program → Y1C2=ON
X1C2 with the master station program → Y77
- (Last station) master station side
  Y77…… ON

(4) Check that the value set by the master station and local station digital switch X3F-X30 is sent to each other.
- Master station→Local station
  (1) Set the value to the master station side digital switch X3F-X30.
  (Example: 1234)
  (2) Turn X6 ON in the master station.
  (3) Check the Y5F-Y50 digital display part of the local station.
- Local station→Master station
  (1) Set the value to the local station side digital switch X3F-X30.
  (Example: 5678)
  (2) Turn X6 ON in the local station.
  (3) Check the Y5F-Y50 digital display switch of the master station.

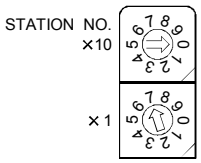
(5) Turn ON the terminal switch of the remote I/O station (AJ65BTB2-16D).
Turning on Y101(RX1) in the local station program lights Y76.
* The X101 (RY1) of the master station corresponds to the X101 (RY1) of the local station.

5.6 Setting of the standby master station

The standby master station function operates as local station when the master station is normal and takes over control when the master station becomes abnormal.
This section describes the setting when the standby master station function is used.

(1) Module setting

Set the module which is defined as standby master station as follows.

Setting range	Description
Station number setting switch 	Set to 1 to 64

(2) Network parameter setting

The settings are required for the modules which are defined as master station and standby master station.

(a) Master station network parameter

In the master station network parameter, set the station number (1 to 64) of module which is defined as the standby master at the "standby master station number".

Retry Count	3
Automatic Reconnection Station Count	1
Standby Master Station No.(*1)	7
PLC Down Select	Stop
Scan Mode Setting	Asynchronous

(B) Standby master station network parameter

In the standby master station network parameter, set "Standby Master Station" in [Type].

	1
Start I/O No.	00A0
Operation Setting	Operation Setting
Type	Standby Master Station
Master Station Data Link Type	
Mode	Remote Net(Ver.1 Mode)
Total Module Connected(*1)	
Remote input(RX)	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	
Automatic Reconnection Station Count	
Standby Master Station No.(*1)	
PLC Down Select	
Scan Mode Setting	
Delay Time Setting	
Station Information Setting	CC-Link Configuration Setting
Remote Device Station Initial Setting	
Interrupt Settings	Interrupt Settings

For more details about standby master station, refer to the Master/Local Module User's Manual (Details).

5.7 Regarding master station (Duplex function support)

Execute setting by using GX Work2.

(1) Master station setting

First, set [Type] in the network parameters.

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

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

Next, set the "Standby master station No.".

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

Default: blank (no specification for standby master station)

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

(2) Setting the standby master station

Set "Type" in the network parameters to "Standby Master Station".

Match the mode setting to the mode setting of the master station.

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

For more details, refer to the Master/Local Module User's Manual (Details).

CHAPTER 6: EXERCISE 4 (REMOTE I/O NET MODE)

6.1 Remote I/O net mode features

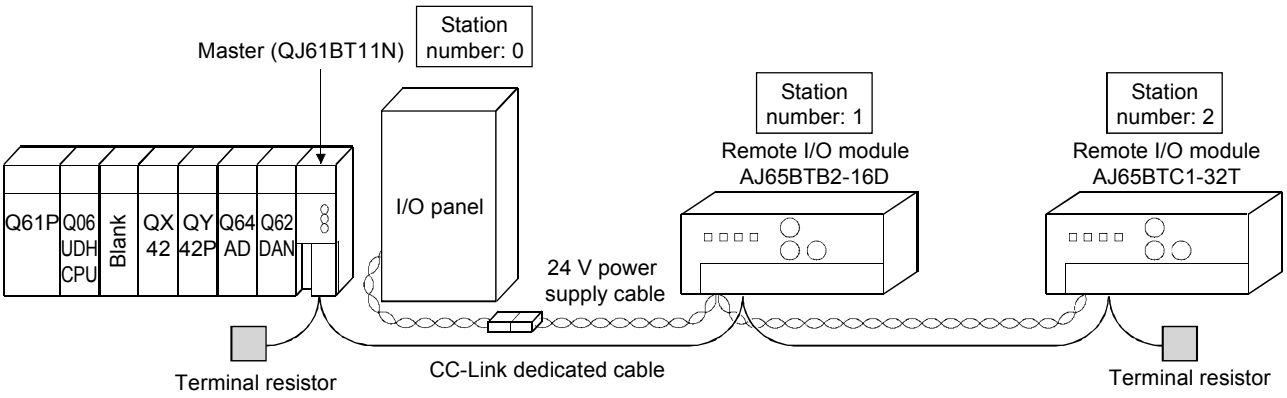
It is possible to use the remote I/O net mode in a system consisting only of the master station and remote I/O stations.
When the remote I/O net mode is used, it is possible to reduce the link scan time because the cyclic transmission is performed at high speed.
The differences of link scan time depending on the modes and listed in the table below.

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

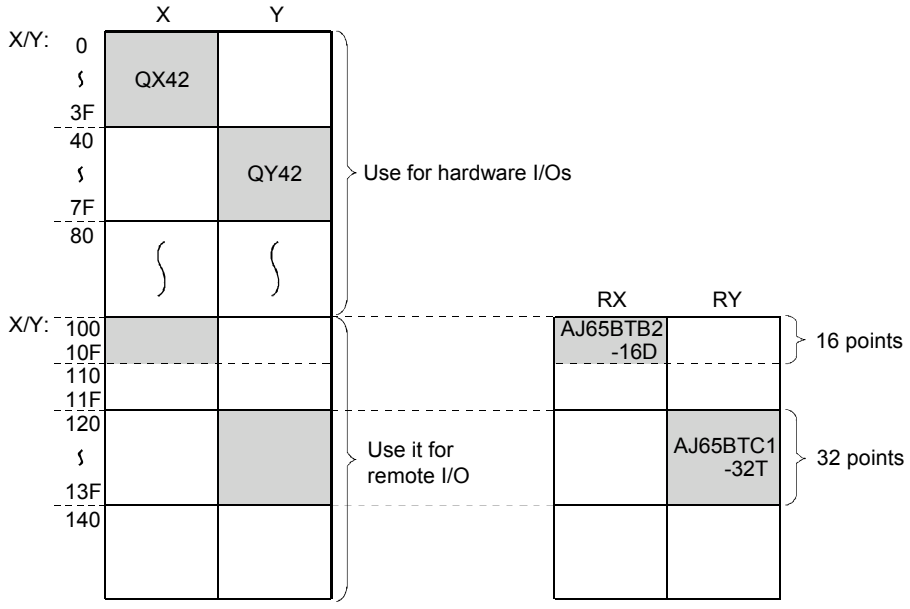
(Transmission rate: 10 Mbps)

6.2 System configuration

The system configuration used in the practice of the exercise 4 is as follows.



* The settings for the master station and for the remote I/O station and system wiring are the same as the training kit of the exercise 1. (section 3.2 and 3.4).



6.3 Network parameter/automatic refresh parameter settings

Set the network parameters/automatic refresh parameters as follows and write them to the PLC CPU.
About the setting and writing operation, refer to the section 3.5.2 to 3.5.4.

[Number of Modules "1"]

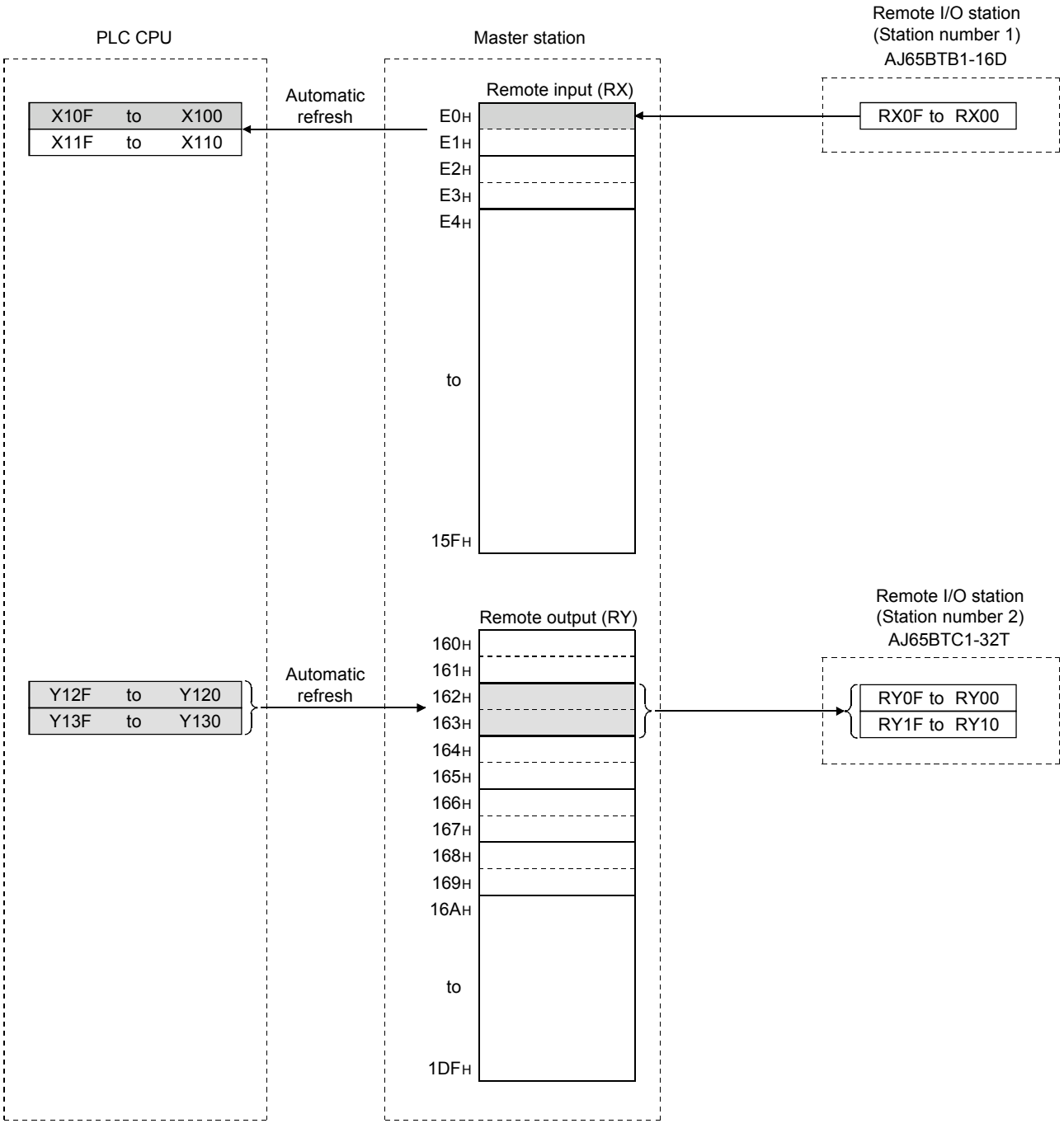
	1
Start I/O No.	00A0
Operation Setting	Operation Setting
Type	Master Station
Master Station Data Link Type	PLC Parameter Auto Start
Mode	Remote I/O Net Mode
Total Module Connected(*1)	64
Remote input(RX)	X100
Remote output(RY)	Y100
Remote register(RWr)	
Remote register(RWw)	
Ver.2 Remote input(RX)	
Ver.2 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	
Standby Master Station No.(*1)	
PLC Down Select	Stop
Scan Mode Setting	Asynchronous
Delay Time Setting	
Station Information Setting	CC-Link Configuration Setting
Remote Device Station Initial Setting	
Interrupt Settings	Interrupt Settings

- The station information is not required in remote I/O net mode.

6.4 Sequence program

(1) Refresh support

The relationship between the PLC CPU, master station buffer memory and remote I/O station refresh is shown below.



(2) Setting sheet

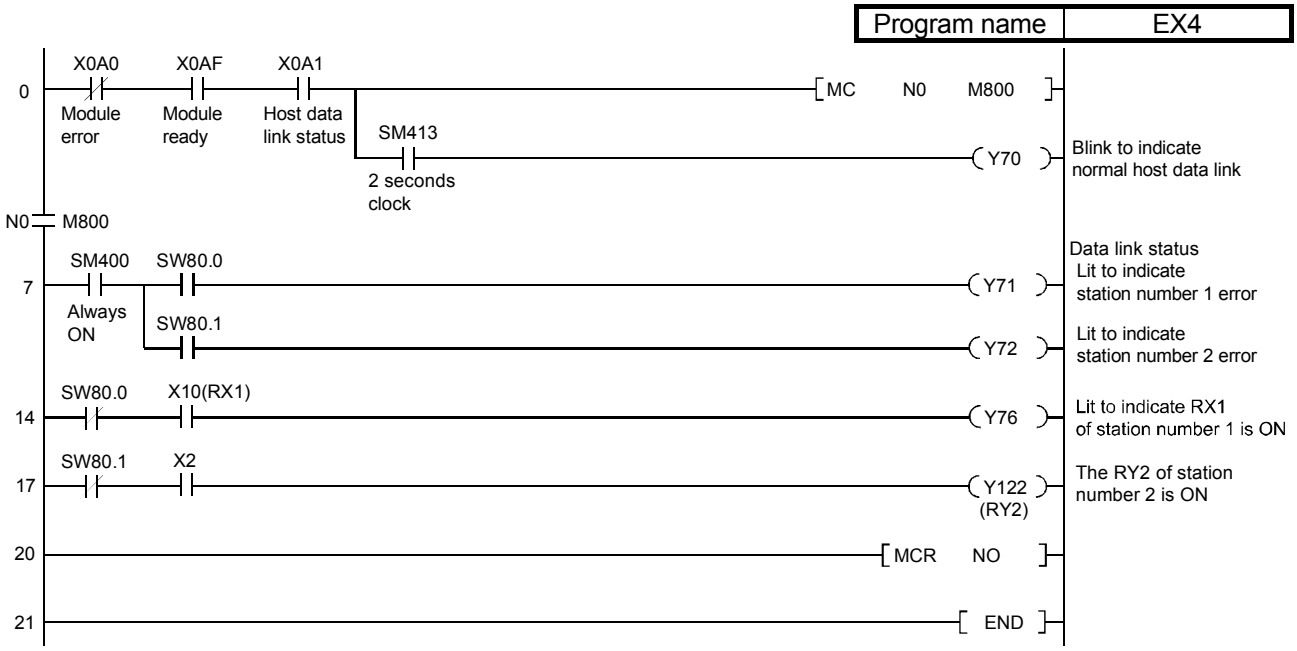
(a) Station information setting sheet

Station No.	Station Type	Number of Occupied Stations	Reserve/Invalid Station Select	Intelligent Buffer Select (Word)		
				Send	Receive	Automatic
1	Remote I/O station	1	Not set	—	—	—
2	Remote I/O station	1	Not set	—	—	—
3						
4						
5						
6						
7						
8						
9						
10						

(b) Device assignment table

Device / Station No.	RX → (X)		RY ← (Y)		RWw → ( )		RWr ← ( )	
	Remote device	CPU device	Remote device	CPU device	Remote device	CPU device	Remote device	CPU device
1	RX0 to RXF	X100 to X10F						
	—	X110 to X11F						
2			RY20 to RY2F	Y120 to Y12F				
			RY30 to RY3F	Y130 to Y13F				
3								
4								
5								
6								
7								
8								
9								
10								

(3) Sequence program
The sequence program shown below is the same as the exercise 1.
Write in to the PLC CPU.



6.5 Communication with the remote I/O net mode

Operation of the training kit

(1) Push the RUN/STOP/RESET switch of the PLC CPU in the "RESET" position one time (1 second) and it is reset.

(2) Set the RUN/STOP/RESET switch of the PLC CPU to "RUN".
Y70 ····· Flashing according to the host station data link status (data link is normal)

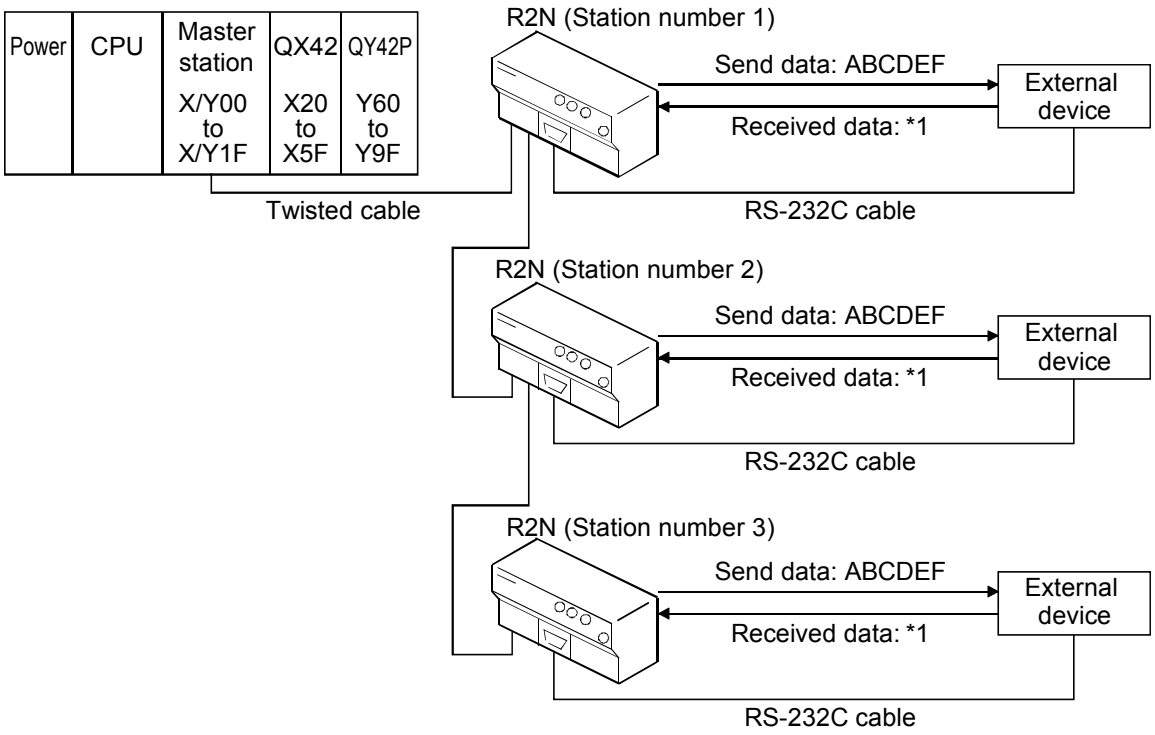
(3) Set the terminal block switch of the remote I/O station (AJ65BTB2-16D) to ON.
Y76 ····· Lights up when RX1 = ON

(4) Set X2 to ON.
The LED (A2) of the remote I/O station (AJ65BTC1-32T) ····· Lights up

APPENDIX 1 Configuration Example for Connecting Multiple AJ65BT-R2N Modules

Configuration example when connecting three AJ65BT-R2N modules is shown below.

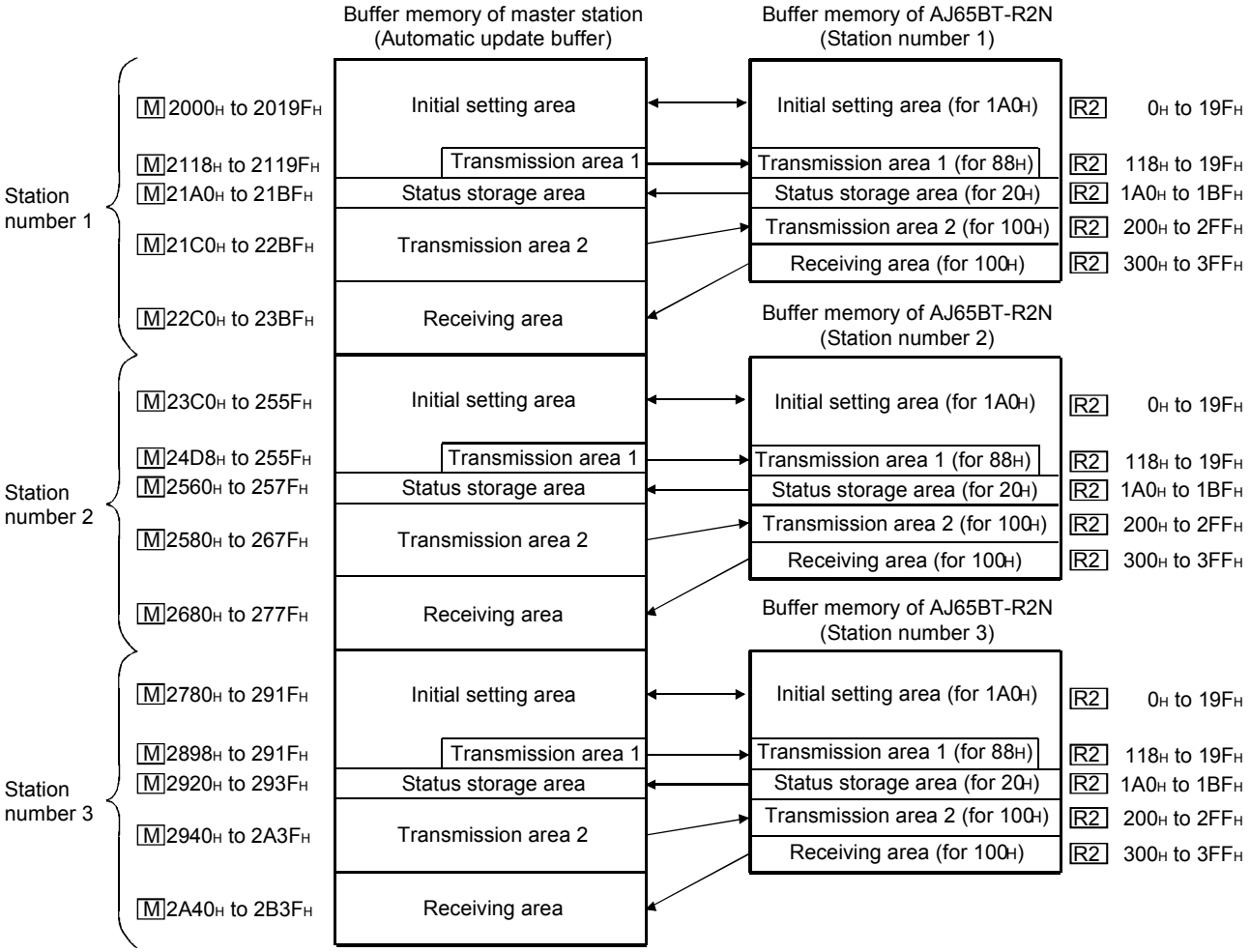
(1) System configuration example



*1 "Random data +CR(0DH)" or "Random data +LF(0AH)"

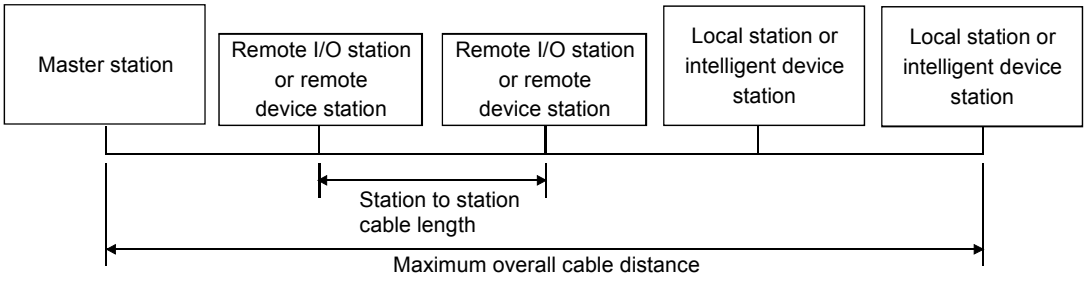
(2) Buffer memory configuration

Buffer memory allocation example when connecting three AJ65BT-R2N modules is shown below, as indicated in the system configuration example.



APPENDIX 2 CC-Link Cable Specifications

(1) Maximum overall cable distance (for Ver.1.10)
The relationship between the transmission speed and the maximum overall cable distance when configuring the entire system with Version 1.10 modules and cables 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
156 kbps	20 cm or more	1200 m	2.5 Mbps	20 cm or more	400 m
625 kbps		900 m	5 Mbps		160 m
-		-	10 Mbps		100 m

POINT

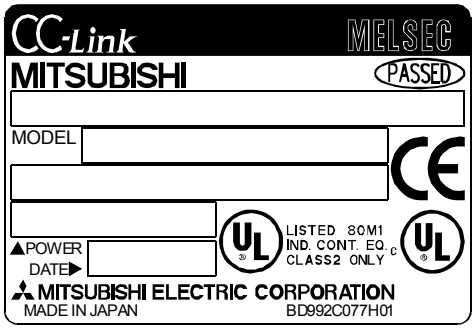
(1) Version 1.10 modules have a uniform station-to-station cable length of 20 cm or more by improving the restrictions on the conventional station-to-station cable length.
In contrast, the conventional modules are defined as Version 1.00.

(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 modules and cables of both Version 1.00 and Version 1.10.

REMARK

How to identify Ver1.10
1) The rating plate has a CC-Link logo.
2) The package label has a CC-Link logo.

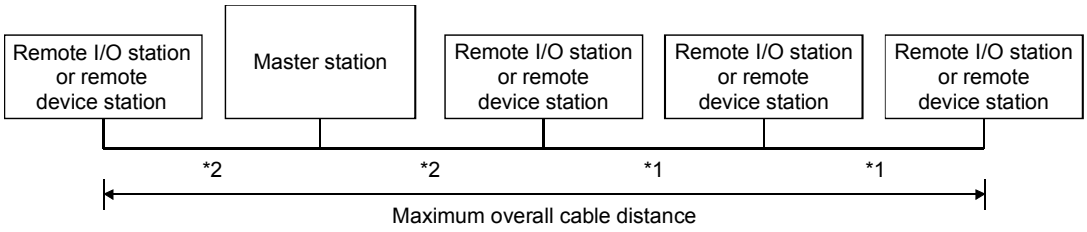


Sample of rating plate

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 shown below:

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



*1 Cable length between remote I/O stations or remote device stations
*2 Cable length between the master station and the adjacent stations

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

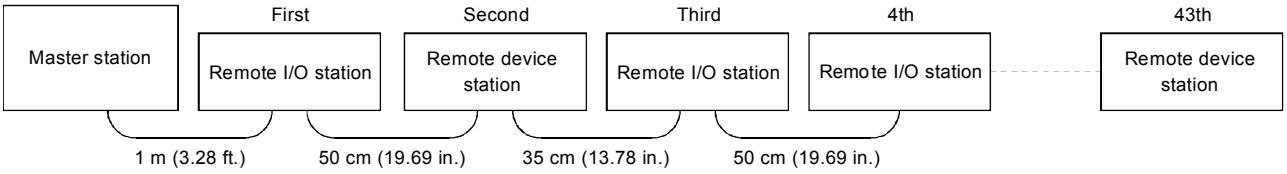
Transmission speed	Station to station cable length		Maximum overall cable distance
	*1	*2	
156 kbps	30 cm (11.81 in.) or more	1 m (3.28 ft.) or more	1200 m (3937.2 ft.)
625 kbps			600 m (1968.6 ft.)
2.5 Mbps			200 m (656.2 ft.)
5 Mbps	30 cm (11.81 in.) to 59 cm (23.23 in.)*		110 m (360.9 ft.)
	60 cm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

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

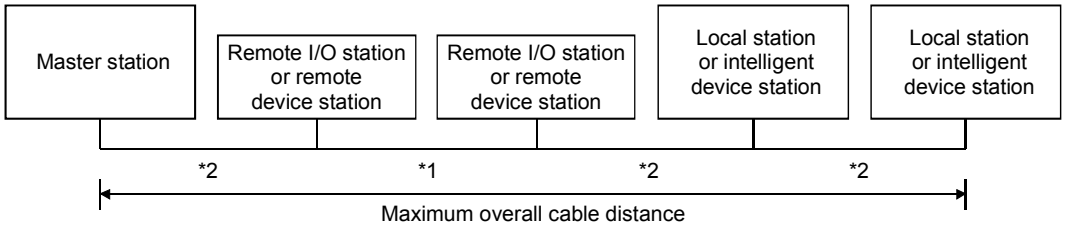
Transmission speed		Station to station cable length		Maximum overall cable distance
		*1	*2	
156 kbps		30 cm (11.81 in.) or more	1 m (3.28 ft.) or more	1200 m (3937.2 ft.)
625 kbps				900 m (2952.9 ft.)
2.5 Mbps				400 m (1312.4 ft.)
5 Mbps				160 m (524.96 ft.)
10 Mbps	Number of connected stations: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

* If any cable length between each station is within the range indicated with * mark, adjust the overall cable distance so that it becomes shorter than the maximum overall cable distance shown in the table. (Refer to the example in the next page.)

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



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



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

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

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

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

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

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

* If any cable length between each station is within the range indicated with * mark, adjust the overall cable distance so that it becomes shorter than the maximum overall cable distance shown in the table.

APPENDIX 3 Link Special Relays/Registers (SB/SW)/Error code

Data link status is indicated by bit data (link special relays (SBs)) and word data (link special registers (SWs)).
The SB and SW represent information stored in the buffer memory areas of a master/local module for smooth operation. They are read to devices configured in the automatic refresh parameter.

- Link special relays (SBs)·····Buffer memory addresses: 5E0H to 5FFH
- Link special registers (SWs) ···Buffer memory addresses: 600H to 7FFH

(1) Link special relays (SBs)

SB0000 to SB001F may be turned on/off using a sequence program, whereas SB0020 to SB01FF are turned on/off by the system.
When the standby master station is controlling the data link, the availability of the link's special relays is basically identical to that of the master station.
When the standby master station is operating as a local station, the availability of the link's special relays is identical to that of a local station.
For the correspondence with the buffer memory, refer to 2.1.4.
The figures in the [Number] column indicate the buffer memory address and bit locations.

Link special relay list (1/6)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB0000 (5E0H, b0)	Data link restart	Restart the data link that had been stopped by SB0002. OFF: Not instructed ON: Instructed	○	○	×
SB0001 (5E0H, b1)	Refresh instruction at standby master switching	Instructs to perform cyclic data refresh after the data link control is transferred to the standby master station. OFF: Not instructed ON : Instructed	○	×	×
SB0002 (5E0H, b2)	Data link stop	Stops the host data link. However, when the master station executes this, the entire system will stop. OFF: Not instructed ON: Instructed	○	○	×
SB0003 (5E0H, b3)	Refresh instruction when changing parameters by the dedicated instruction	Instructs to refresh cyclic data after changing parameters by the G(P).RLPASET instruction. OFF: Not instructed (stop refreshing) ON: Instructed (start/continue refreshing)	○	○	×
SB0004 (5E0H, b4)	Temporary error invalid request	Establishes the stations specified by SW0003 to SW0007 as temporary error invalid stations. OFF: Not requested ON: Requested	○	×	×
SB0005 (5E0H, b5)	Temporary error invalid canceling request	Cancels the temporary error invalid status of stations specified by SW0003 to SW0007. OFF: Not requested ON: Requested	○	×	×
SB0007 (5E0H, b7)	Master station duplication error canceling request	Instructs to cancel master station duplication error. OFF: Not instructed ON: Instructed	○	×	×
SB0008 (5E0H, b8)	Loop test request	Execute loop tests for the stations specified by SW0008. OFF: Not requested ON: Requested	○	×	×
SB0009 (5E0H, b9)	Parameter information read request	Reads the parameter setting information of the actual system configuration. (Ver.1-compatible remote station only) OFF: Normal ON: Abnormal	○	×	×

Link special relay list (2/6)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB000B (5E0H, b11)	Transmission speed test request	Use this to perform the transmission speed test. OFF: Not requested ON: Requested	○	×	×
SB000C (5E0H, b12)	Forced master switching	Forcefully transfers the data link control from the standby master station that is controlling the data link to the standby master station in case the standby master station becomes faulty. OFF: Not requested ON: Requested	○*1	×	×
SB000D (5E0H, b13)	Remote device station initialization procedure registration instruction	Starts the initial processing using the information registered during the initialization procedure registration. While SB000D is on, the refresh of the remote input/output and remote registers stops. OFF: Not instructed ON: Instructed	○	×	×
SB0020 (5E2H, b0)	Module status	Indicates the module access (module operation) status. OFF: Normal (Module is operating normally) ON: Abnormal (Module error has occurred)	○	○	○
SB0040 (5E4H, b0)	Data link restart acceptance	Indicates the data link restart instruction acknowledgment status. OFF: Not acknowledged ON: Startup instruction acknowledged	○	○	×
SB0041 (5E4H, b1)	Data link restart complete	Indicates the data link restart instruction acknowledgment completion status. OFF: Not complete ON: Startup complete	○	○	×
SB0042 (5E4H, b2)	Refresh instruction acknowledgment status at standby master switching	Indicates whether or not the refresh instruction at standby master switching have been acknowledged. OFF: Not executed ON: Instruction acknowledged	○	×	×
SB0043 (5E4H, b3)	Refresh instruction complete status at standby master switching	Indicates whether or not the refresh instruction at standby master switching is complete. OFF: Not executed ON: Switching complete	○	×	×
SB0044 (5E4H, b4)	Data link stop acceptance	Indicates the data link stop instruction acknowledgment status. OFF: Not acknowledged ON: Stop instruction acknowledged	○	○	×
SB0045 (5E4H, b5)	Data link stop complete	Indicates the data link stop instruction acknowledgment completion status. OFF: Not complete ON: Stop complete	○	○	×
SB0046 (5E4H, b5)	Forced master switching executable status	Indicates whether the forced master switching (SB000C) signal can be executed or not. OFF: Cannot be executed. ON: Can be executed.	○*1	×	×
SB0048 (5E4H, b8)	Temporary error invalid acceptance status	Indicates the acknowledgment status of remote station temporary error invalid instruction. OFF: Not executed ON: Instruction acknowledged	○	×	×
SB0049 (5E4H, 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 (5E4H, 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 standby master station only.

Link special relay list (3/6)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB004B (5E4H, 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 (5E4H, b12)	Loop test acceptance status	Indicates the loop test request acknowledgment status. OFF: Not executed ON: Instruction acknowledged	○	×	×
SB004D (5E4H, b13)	Loop test complete status	Indicates the loop test completion status. OFF: Not executed ON: Test complete	○	×	×
SB004E (5E4H, b14)	Parameter information read acknowledgment status	Indicates the parameter information read request acknowledgment status. OFF: Not executed ON: Instruction acknowledged	○	×	×
SB004F (5E4H, b15)	Parameter information read completion status	Indicates the completion status of the parameter information read request. OFF: Not executed ON: Complete	○	×	×
SB0050 (5E5H, b0)	Offline test status	Indicates the offline test execution status. OFF: Not executed ON: In progress	×	×	○
SB0057 (5E5H, b7)	Master station duplication error canceling acknowledgement	Whether a master station duplication error canceling request has been accepted is stored. OFF: Not acknowledged ON: Acknowledged	○	×	×
SB0058 (5E5H, b8)	Master station duplication error canceling complete	Whether a master station duplication error canceling request has been completed is stored. OFF: Not complete ON: Complete	○	×	×
SB005A (5E5H, b10)	Master switching request acknowledgement	Whether the standby master station has detected the system down of the master station and has accepted a request of switching from standby master operation to master operation is stored. OFF: Not acknowledged ON: Request acknowledged	×	○*1	×
SB005B (5E5H, b11)	Master switching request complete	Indicates whether or not the switching from the standby master station to master station is complete. OFF: Not complete ON: Complete	×	○*1	×
SB005C (5E5H, b12)	Forced master switching request acknowledgment	Indicates whether or not a forced master switching request has been acknowledged. OFF: Not acknowledged ON: Instruction acknowledged	○*1	×	×
SB005D (5E5H, b13)	Forced master switching request complete	Indicates whether or not a forced master switching request is complete. OFF: Not complete ON: Complete	○*1	○*1	×
SB005E (5E5H, b14)	Execution status of remote device station initialization procedure	Indicates the execution status of the initialization procedure. OFF: Not executed ON: Being executed	○	×	×
SB005F (5E5H, b15)	Completion status of remote device station initialization procedure	Indicates the completion status of the initialization procedure execution. OFF: Not complete ON: Complete	○	×	×
SB0060 (5E6H, b0)	Host mode	Indicates the mode setting status of the transmission rate/mode setting switch for the host. OFF: Online OFF: Mode other than online	○	○	○

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

Link special relay list (4/6)

<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>SB0061
(5E6H, b1)</td><td>Host type</td><td>Indicates the station type of the host.
OFF: Master station (station number 0)
ON: Local station (station numbers 1 to 64)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0062
(5E6H, b2)</td><td>Host standby master station setting status</td><td>Indicates whether or not the standby master station setting exists for the host.
OFF: No setting
ON: Setting exists</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>SB0065
(5E6H, b5)</td><td>Input data status of 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
(5E6H, b6)

SB0067
(5E6H, 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</td><td>OFF</td><td>OFF</td></tr><tr><td>2</td><td>OFF</td><td>ON</td></tr><tr><td>3</td><td>ON</td><td>ON</td></tr><tr><td>4</td><td>ON</td><td>OFF</td></tr></table></td><td>×</td><td>○</td><td>×</td></tr>
<tr><td>SB006A
(5E6H, 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
(5E6H, 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>○
(For the station number 0 only)</td><td>○</td><td>×</td></tr>
<tr><td>SB006E
(5E6H, b14)</td><td>Host station operation status</td><td>Whether data link with other stations is being performed is stored.
OFF: Being executed
ON: Not executed</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB006F
(5E6H, b15)</td><td>Setting status of block guarantee of cyclic data per station</td><td>Whether the block guarantee of cyclic data per station has been set to the host station is stored.
OFF: No setting
ON: Setting exists</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0070
(5E7H, 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
(5E7H, b1)</td><td>Standby master station information</td><td>Indicates whether or not a standby master station exists.
OFF: Not present
ON: Present</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0072
(5E7H, b2)</td><td>Scan mode setting information</td><td>Indicates the setting information of the scan mode.
OFF: Asynchronous mode
OFF: Synchronous mode</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SB0073
(5E7H, b3)</td><td>Operation specification when CPU is down status</td><td>Indicates the parameter setting status of the operation specification when CPU is down.
OFF: Stop
ON: Continue</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0074
(5E7H, b4)</td><td>Reserved station specified status</td><td>Indicates the reserved station specification status using a parameter.
OFF: No specification
ON : Specification exists (information is stored in SW0074 to SW0077)
Depending on the link refresh timing, SB0074 may be updated with the time difference of one sequence scan from the update of Reserved station specified status (SW0074 to SW0077).</td><td>○</td><td>○</td><td>×</td></tr>
</table>

Link special relay list (5/6)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB0075 (5E7H, b5)	Error invalid station specified status	Indicates the error invalid station specification status using a parameter. OFF: No specification ON : Specification exists (information is stored in SW0078 to SW007B) Depending on the link refresh timing, SB0075 may be updated with the time difference of one sequence scan from the update of Error invalid station specified status (SW0078 to SW007B).	○	○	×
SB0076 (5E7H, b6)	Temporary error invalid station setting information	Indicates whether there is a temporary error invalid station setting. OFF: No setting ON : Setting exists (information is stored in SW007C to SW007F) Depending on the link refresh timing, SB0076 may be updated with the time difference of one sequence scan from the update of Temporary error invalid status (SW007C to SW007F).	○	○	×
SB0077 (5E7H, b7)	Parameter receive status	Indicates the parameter receive status from the master station. OFF: Reception complete ON: Reception not complete	×	○	×
SB0078 (5E7H, b8)	Host station switch change detection	Detects changes to the host setting switch during data linking. OFF: No changes detected ON: Changes detected	○	○	×
SB0079 (5E7H, 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 (5E7H, b11)	Host master/standby master operation status	Indicates whether the host operates as the master or standby master station. OFF: Operates as the master station (controlling data link) ON: Operates as the standby master station (standby)	○	○	×
SB007C (5E7H, b12)	Slave station refresh/compulsory clear setting status in case of programmable controller CPU STOP	The parameter setting status of the slave station refresh/compulsory clear setting in case of programmable controller CPU STOP is stored. OFF: Refresh ON: Clears compulsorily	○	○	×
SB0080 (5E8H, b0)	Other station data link status	Indicates the communication status between remote/local/intelligent device/standby master stations. OFF: All stations normal ON : Faulty station exists (information is stored in SW0080 to SW0083) It takes maximum of six seconds for Other station data link status (SB0080) to turn on after a slave station connected to the master station or local station becomes faulty.	○	○	×
SB0081 (5E8H, b1)	Other station watchdog timer error status	Indicates the occurrence of a watchdog timer error in other stations. OFF: No error ON: Error occurrence Depending on the link refresh timing, SB0081 may be updated with the time difference of one sequence scan from the update of Other station watchdog timer error occurrence status (SW0084 to SW0087).	○	○	×

Link special relay list (6/6)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB0082 (5E8H, b2)	Other station fuse blown status	Indicates the fuse blown occurrence status at other stations.(SW0088 to SW008B) OFF: No error ON: Error occurrence Depending on the link refresh timing, SB0082 may be updated with the time difference of one sequence scan from the update of Other station fuse blown status (SW0088 to SW008B).	○	○	×
SB0083 (5E8H, b3)	Other station switch change status	Detects changes in setting switches of other stations during data linking. OFF: No changes detected ON: Changes detected Depending on the link refresh timing, SB0083 may be updated with the time difference of one sequence scan from the update of Other station switch change status (SW008C to SW008F).	○	○	×
SB0090 (5E9H, b0)	Host line status	Indicates the line status of the host. OFF: Normal ON: Abnormal (line disconnection)	×	○	×
SB0094 (5E9H, b4)	Other stations transient transmission status	Indicates whether there is other stations transient transmission error. OFF: No error ON: Error (SW0094 to SW0097) Even when the transient transmission is retried using a dedicated instruction, the error will be detected. Depending on the link refresh timing, SB0094 may be updated with the time difference of one sequence scan from the update of Other stations transient transmission status (SW0094 to SW0097).	○	○	×
SB0095 (5E9H, b5)	Master station transient transmission status	Indicates the transient transmission status of the master station. OFF: Normal ON: Abnormal	×	○	×
SB00B4 (5EBH, b4)	Standby master station test result	Stores the test result of loop test 1 or loop test 2. OFF: Normal ON: Abnormal	○	×	○
SB0184 (5F8H, b4)	Transmission speed test result for standby master station	Stores a result of the transmission speed test for the standby master station. OFF: Normal (same transmission speed as the master station) or no response from the module ON: Error (different transmission speed from the master station)	○	×	×
SB0185 (5F8H, b5)	Transmission speed test accept status	Indicates the accept status of Transmission speed test request (SB000B). OFF: Not accepted ON: Accepted	○	×	×
SB0186 (5F8H, b6)	Transmission speed test completion status	Whether a transmission speed test has been completed is stored. OFF: Not complete ON: Test complete	○	×	×

(2) Link special registers (SWs)

Data may be stored in SW0000 to SW001F using a sequence program, whereas data are stored in SW0020 to SW01FF by the system.

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

The values in the [Number] column indicate the buffer memory address.

Link special register list (1/12)

<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>SW0003
(603H)</td><td>Multiple temporary error invalid station specification</td><td>Select whether multiple temporary error invalid stations are specified.
00: Specifies multiple stations indicated by SW0004 to SW0007.
01 to 64: Specifies a single station from 1 to 64.
(The specified number indicates the station number of a temporary error invalid station.)</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0004
(604H)

SW0005
(605H)

SW0006
(606H)

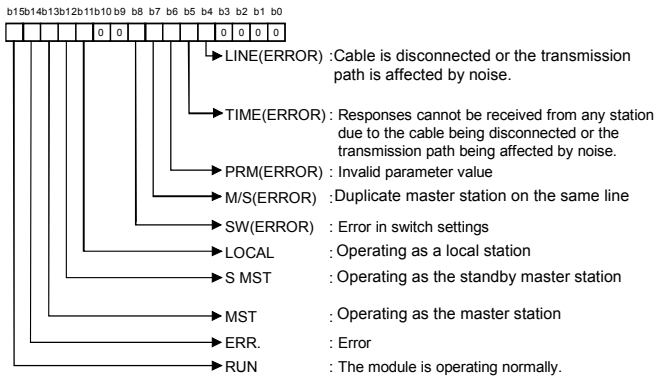
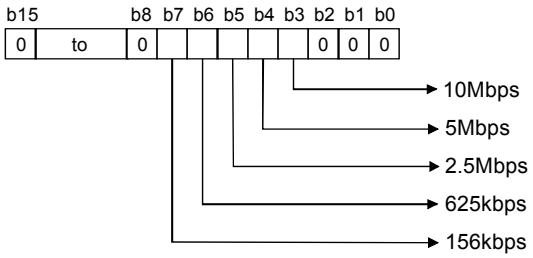
SW0007
(607H)</td><td>Temporary error invalid station specification</td><td>Specifies a temporary error invalid station
0: Not specified as a temporary error invalid station
1: Specified as a temporary error invalid station
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0004</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0005</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0006</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0007</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.
The stations need not be set by the number of occupied stations.
Error invalid stations, reserved stations and any station of the number higher than the max. are not specified.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0008
(608H)</td><td>Loop test station setting</td><td>Set a station number where the loop test is executed.
0 : Entire system (executed for all stations)
01 to 64 : Specified station only
Default : 0</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0009
(609H)</td><td>Monitoring time setting</td><td>Sets the monitoring time when a dedicated instruction is used.
Default value: 10 (seconds)
Setting range: 0 to 360 (seconds)
The monitoring time of 360 seconds will be used if a value outside of the above setting range is specified.

If a value is set in SW000B, time elapsed until error completion of a dedicated instruction is as follows:
(Number of retries + 1) x Monitoring time</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW000A
(60AH)</td><td>CPU monitoring time setting</td><td>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.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW000B
(60BH)</td><td>Dedicated instruction retry count setting</td><td>Set the number of retries for use of dedicated instructions.
Default value: 0 (No retry)
Setting range: 0 to 7 (times)
When the set value is out of the range, 7 is applied.</td><td>○</td><td>○</td><td>×</td></tr>
</table>

Link special register list (2/12)

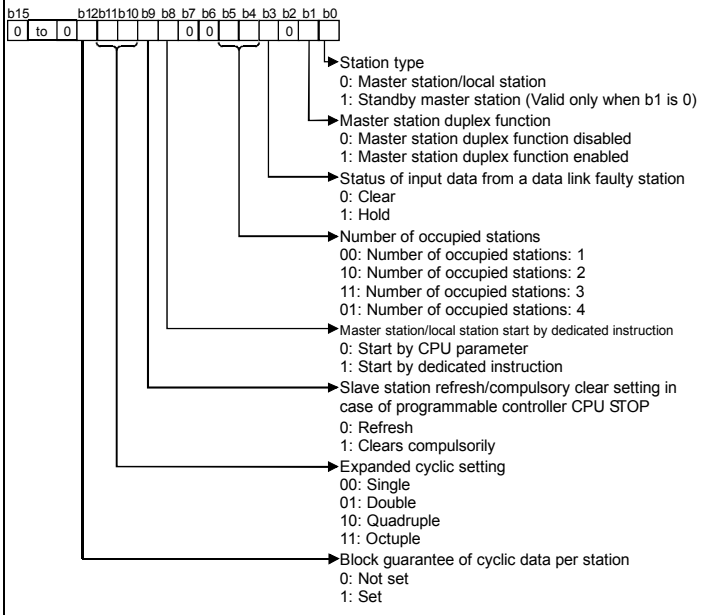
<table>
<tr><th rowspan="2">Number</th><th rowspan="2">Name</th><th rowspan="2">Description</th><th colspan="3">Availability
(○: Available, ×: Not available)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW0014 (614H)
SW0015 (615H)
SW0016 (616H)
SW0017 (617H)</td><td>Specification of remote device station to be initialized</td><td>Specifies the station to be initialized using the information saved in initialization procedure registration using a programming tool.
0: Initial process not performed
1: Initial process performed
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0014</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0015</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0016</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0017</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.
The stations need not be set by the number of occupied stations.
Error invalid stations, reserved stations and any station of the number higher than the max. are not specified.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0020 (620H)</td><td>Module status</td><td>Whether communications are being normally performed with a CPU module is stored.
0 : Normal
Other than 0 : Stores the error code</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>SW0041 (641H)</td><td>Data link restart result</td><td>Stores the execution result of the data link restart instruction with SB0000.
0 : Normal
Other than 0 : Stores the error code</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0043 (643H)</td><td>Refresh instruction at standby master switching result</td><td>Indicates the execution result of refresh instruction at standby master switching.
0 : Normal
Other than 0 : Stores the error code</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0045 (645H)</td><td>Data link stop result</td><td>Stores the execution result of the data-link stop instruction with SB0002.
0 : Normal
Other than 0 : Stores the error code</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0049 (649H)</td><td>Temporary error invalid station specification result</td><td>Indicates the execution result of temporary error invalid station specification
0 : Normal
Other than 0 : Stores the error code</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW004B (64BH)</td><td>Temporary error invalid station specification cancel result</td><td>Indicates the execution result of the temporary error invalid station specification cancellation.
0 : Normal
Other than 0 : Stores the error code</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW004D (64DH)</td><td>Loop test result</td><td>Indicates the execution result of the loop test.
0 : Normal
Other than 0 : Stores the error code</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW004F (64FH)</td><td>Parameter setting test result</td><td>Indicates the execution result of the parameter setting test.
0 : Normal
Other than 0 : Stores the error code</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0052 (652H)</td><td>Automatic CC-Link startup execution result</td><td>Stores the system configuration check result when a new station is added to a system using an automatic CC-Link startup.
0 : Normal
Other than 0 : Stores the error code</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0057 (657H)</td><td>Master station duplication error canceling result</td><td>Stores the execution result of the master station duplication error canceling request.
0 : Normal completion
Other than 0 : Stores the error code</td><td>○</td><td>×</td><td>×</td></tr>
</table>

Link special register list (3/12)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW0058 (658H)	Detailed LED display status	Stores the details of the LED display status. 0: OFF 1: ON 	○	○	○
SW0059 (659H)	Transmission speed setting	Stores the transmission speed setting status. 0: Cancel 1: Set 	○	○	○
SW005D (65DH)	Forced master switching instruction result	Stores the execution result of the forced master switching instruction with SB000C. 0 : Normal Other than 0 : Stores an error code	○*1	×	×
SW005F (65FH)	Remote device station initialization procedure registration instruction result	Stores the execution result of the initialization procedure registration instruction with SB000D. 0 : Normal Other than 0 : Stores an error code	○	×	×
SW0060 (660H)	Mode setting status	Stores the mode setting status. 0: Online (remote net mode) 1: Online (remote I/O net mode) 2: Offline 3: Loop test 1 4: Loop test 2 6: Hardware test	○	○	○
SW0061 (661H)	Host station number	Stores the station number of the host that is currently in operation. 0 : Master station 1 to 64 : Local station	○	○	○

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

Link special register list (4/12)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW0062 (662H)	Module operating status	Stores the operation setting status of the module.  	○	○	○
SW0064 (664H)	No. of retries information	Indicates the retry count setting information when there is an error response. 1 to 7 (time)	○	×	×
SW0065 (665H)	No. of automatic return stations	Indicates the setting information for the number of automatic return stations during one link scan. 1 to 10 (station)	○	×	×
SW0066 (666H)	Delay timer information	Indicates the delay time setting information.	○	×	×
SW0067 (667H)	Parameter information	Stores the parameter information area to be used. 0H: CPU built-in parameters 3H: Dedicated instruction (parameter setting with the G(P).RLPASET instruction and data link startup.) DH: Default parameters (automatically starts CC-Link)	○	×	○
SW0068 (668H)	Host parameter status	Stores the parameter setting status. 0: Normal Other than 0: Stores the error code	○	×	×
SW0069 (669H)	Loading status	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 SW009B and SW009C to SW009F. This item is checked, and the result is stored only upon link start.	○	×	×
SW006A (66AH)	Switch setting status	Stores the switch setting status. 0 : Normal Other than 0 : Stores the error code	○	○	○
SW006D (66DH)	Max. link scan time	Stores the maximum value of the link scan time (in 1 ms units).	○	○	×
SW006E (66EH)	Current link scan time	Stores the current value of the link scan time (in 1 ms units).	○	○	×
SW006F (66FH)	Min. link scan time	Stores the minimum value of the link scan time (in 1 ms units).	○	○	×

Link special register list (5/12)

<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>SW0070
(670H)</td><td>Total number of stations</td><td>Stores the final station number set in the parameter.
1 to 64 (station)</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0071
(671H)</td><td>Max. communication station number</td><td>Stores the maximum station number (set number of the station number setting) that is performing data link.
1 to 64 (station)
Reserved stations are excepted.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0072
(672H)</td><td>Number of connected modules</td><td>Stores the number of modules that are performing data link.
Reserved stations are excepted.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0073
(673H)</td><td>Standby master station number</td><td>Stores the station number of the standby master station.
1 to 64 (station)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0074
(674H)

SW0075
(675H)

SW0076
(676H)

SW0077
(677H)</td><td>Reserved station specified status</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.

Only the bit corresponding to the start station number turns on.
Any station of the number higher than the max. are excepted.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0078
(678H)

SW0079
(679H)

SW007A
(67AH)

SW007B
(67BH)</td><td>Error invalid station specified status</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.

Reserved stations and any station of the number higher than the max. are excepted.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW007C
(67CH)

SW007D
(67DH)

SW007E
(67EH)

SW007F
(67FH)</td><td>Temporary error invalid status</td><td>Indicates the temporary error invalid status.
0: Normal
1: Temporary error invalid status

<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW007C</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW007D</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW007E</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW007F</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.

The bits turn on by the number of occupied stations.
Error invalid stations, reserved stations, station with the last station number, and stations later than that are excepted.</td><td>○</td><td>○</td><td>×</td></tr>
</table>

Table 8.4 Link special register list (6/12)

<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>SW0080
(680H)

SW0081
(681H)

SW0082
(682H)

SW0083
(683H)</td><td>Other station data link status</td><td>Stores the data link status of each station.
0: Normal
1: Data link error

<table>
<tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>SW0080</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>SW0081</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr>
<tr><td>SW0082</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr>
<tr><td>SW0083</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr>
</table>
Numbers 1 to 64 in the above table indicate the station numbers.

• The bits turn on by the number of occupied stations.
• It takes maximum of six seconds for this register to turn on after a slave station connected to the master station or local station becomes faulty. The time until this register turns on differs depending on the system configuration and error status.
• Temporary error invalid stations, error invalid stations, reserved stations, station with the last station number, and stations later than that are excepted.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0084
(684H)

SW0085
(685H)

SW0086
(686H)

SW0087
(687H)</td><td>Other station watchdog timer error occurrence status</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.

Only the bit for the first station number is turned on.
Reserved stations and any station of the number higher than the max. are excepted.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0088
(688H)

SW0089
(689H)

SW008A
(68AH)

SW008B
(68BH)</td><td>Other station fuse blown status</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.

Only the bit for the first station number is turned on.
Reserved stations and any station of the number higher than the max. are excepted.</td><td>○</td><td>×</td><td>×</td></tr>
</table>

Link special register list (7/12)

<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>Offline</th></tr>
<tr><th></th><th></th><th></th><th>Master station</th><th>Local station</th><th></th></tr>
<tr><td>SW008C
(68CH)

SW008D
(68DH)

SW008E
(68EH)

SW008F
(68FH)</td><td>Other station switch change status</td><td>Indicates the switch change status of other stations performing 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.
Only the bit for the first station number is turned on.
Reserved stations and any station of the number higher than the max. are excepted.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0090
(690H)</td><td>Line status</td><td>Stores the line status.
0: Normal
1: Data link cannot be performed (disconnected)</td><td>×</td><td>○</td><td>×</td></tr>
<tr><td>SW0094
(694H)

SW0095
(695H)

SW0096
(696H)

SW0097
(697H)</td><td>Other stations transient transmission status</td><td>Indicates the transient transmission error status of each station.
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.
Only the bit for the first station number is turned on.
Reserved stations and any station of the number higher than the max. are excluded.
Even when a dedicated instruction was retried, an error is detected.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0098
(698H)

SW0099
(699H)

SW009A
(69AH)

SW009B
(69BH)</td><td>Station number overlap status</td><td>Stores the overlap status when the first station number of each module is not overlapped.
0: Normal
1: Overlap station number (first station number only)
<table><tr><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.
• Reserved stations and any station of the number higher than the max. are excluded.
• Only the bit for the first station number is turned on. The status is checked and stored only at link startup and at parameter update.
• For the slave stations with "Auto Following" set for transmission speed, station numbers may not be detected even when any of them are overlapping.
• Unable to detect station number overlapping of standby master stations.</td><td>○</td><td>×</td><td>×</td></tr>
</table>

Link special register list (8/12)

<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>SW009C
(69C_H)

SW009D
(69D_H)

SW009E
(69E_H)

SW009F
(69F_H)</td><td>Loading/ parameter consistency status</td><td>Stores the consistency status between the loaded station and the parameter settings.
A matching error occurs in any of the following cases.
1) Station type mismatch*1
2) Number of occupied stations mismatch
3) Expanded cyclic setting mismatch
4) CC-Link compatible version mismatch
*1 A matching error will not occur when installation parameter. (For example, a matching error will not occur when a remote device station is installed and the parameter setting is an intelligent device station.)
0: Normal
1: Matching error
<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.
• Reserved stations and any station of the number higher than the max. are excluded.
• Only the bit for the first station number is turned on. The status is checked and stored only at link startup and at parameter update.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW00B4
(6B4_H)

SW00B5
(6B5_H)

SW00B6
(6B6_H)

SW00B7
(6B7_H)</td><td>Loop test 1 result</td><td>Stores the loop 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.
The bits turn on by the number of occupied stations.</td><td>○</td><td>×</td><td>○</td></tr>
<tr><td>SW00B8
(6B8_H)</td><td>Loop test result</td><td>Stores the loop test 1/loop test 2 result.
0 : Normal
Other than 0 : Stores an error code</td><td>×</td><td>×</td><td>○</td></tr>
</table>

Link special register list (9/12)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW0110 (710_H)	Remote device station initialization procedure registration execution individual information (target 1)	The execution phase of initialization procedure registration is stored. Upper bit: Next execution procedure number (FF_H at completion) Lower bit: Targeted station number	○	×	×
SW0111 (711_H)	Remote device station initialization procedure registration execution individual information (target 2)				
SW0112 (712_H)	Remote device station initialization procedure registration execution individual information (target 3)				
SW0113 (713_H)	Remote device station initialization procedure registration execution individual information (target 4)				
SW0114 (714_H)	Remote device station initialization procedure registration execution individual information (target 5)				
SW0115 (715_H)	Remote device station initialization procedure registration execution individual information (target 6)				
SW0116 (716_H)	Remote device station initialization procedure registration execution individual information (target 7)				
SW0117 (717_H)	Remote device station initialization procedure registration execution individual information (target 8)				

Link special register list (10/12)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW0118 (718_H)	Remote device station initialization procedure registration execution individual information (target 9)	The execution phase of initialization procedure registration is stored. Upper bit: Next execution procedure number (FF_H at completion) Lower bit: Targeted station number	○	×	×
SW0119 (719_H)	Remote device station initialization procedure registration execution individual information (target 10)				
SW011A ($71A_H$)	Remote device station initialization procedure registration execution individual information (target 11)				
SW011B ($71B_H$)	Remote device station initialization procedure registration execution individual information (target 12)				
SW011C ($71C_H$)	Remote device station initialization procedure registration execution individual information (target 13)				
SW011D (71DH)	Remote device station initialization procedure registration execution individual information (target 14)				
SW011E ($71E_H$)	Remote device station initialization procedure registration execution individual information (target 15)				
SW011F ($71F_H$)	Remote device station initialization procedure registration execution individual information (target 16)				

Link special register list (11/12)

<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>SW0140
(740H)

SW0141
(741H)

SW0142
(742H)

SW0143
(743H)</td><td>Compatible CCLink ver. information</td><td>Indicates the slave stations compatible with CC-Link Ver.2.
0: Ver.1-compatible slave station
1: Ver.2-compatible slave station

<table>
<tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>SW0140</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>SW0141</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr>
<tr><td>SW0142</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr>
<tr><td>SW0143</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr>
</table>
Numbers 1 to 64 in the above table indicate the station numbers.

The bits turn on by the number of occupied stations.
Reserved stations and any station of the number higher than the max. are excepted.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0144
(744H)

SW0145
(745H)

SW0146
(746H)

SW0147
(747H)</td><td>CC-Link ver. installation/ parameter matching status</td><td>Stores the CC-Link version matching status of the parameters and slave stations.
0: Normal
1: Matching error
Example of matching error

<table>
<tr><th>Installation</th><th>Parameter</th></tr>
<tr><td>Ver.2-compatible remote device station</td><td>Ver.1-compatible remote device station</td></tr>
<tr><td>Ver.1-compatible remote device station</td><td>Ver.2-compatible remote device station</td></tr>
</table>

<table>
<tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>SW0144</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>SW0145</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr>
<tr><td>SW0146</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr>
<tr><td>SW0147</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr>
</table>
Numbers 1 to 64 in the above table indicate the station numbers.

The bits turn on by the number of occupied stations.
Reserved stations and any station of the number higher than the max. are excepted.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0148
(748H)</td><td>Parameter mode</td><td>Indicates in which mode the system is operating.
0: Remote net Ver.1 mode
1: Remote net additional mode
2: Remote net Ver.2 mode</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0149
(749H)</td><td>Host parameter mode</td><td>Indicates in which mode the host is operating.
0: Remote net Ver.1 mode
1: Remote net additional mode
2: Remote net Ver.2 mode</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>SW0183
(783H)</td><td>Transmission speed test result</td><td>Indicates the execution result of the transmission speed test.
0 : Normal
Other than 0 : Stores an error code</td><td>○</td><td>○</td><td>×</td></tr>
</table>

Link special register list (12/12)

<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>SW0184
(784H)

SW0185
(785H)

SW0186
(786H)

SW0187
(787H)</td><td>Transmission speed test result for each station</td><td>Indicates transmission speed test results by station numbers.
0: Normal (Same transmission speed as that of master station), or no response from the module
1: Abnormal (Different transmission speed from that of master station)
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0184</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0185</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0186</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0187</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.

Only the bit corresponding to the start station number turns on.</td><td>○</td><td>×</td><td>×</td></tr>
</table>

The timing of link special registers (SWs) update differs depending on the link special register number.
The following table lists the update timing.

Update timing for link special register

<table>
<tr><th>Link special register</th><th>Data update timing</th><th>Link special register</th><th>Data update timing</th></tr>
<tr><td>SW0041</td><td rowspan="2">Updated independently regardless of SB</td><td>SW0071</td><td rowspan="2">Updated independently regardless of SB
(Updated after each station becomes stable.)</td></tr>
<tr><td>SW0045</td><td>SW0072</td></tr>
<tr><td>SW0060</td><td>When SB0060 changes</td><td>SW0074 to SW0077</td><td>When SB0074 changes</td></tr>
<tr><td>SW0061</td><td>When SB0061 changes</td><td>SW0078 to SW007B</td><td>When SB0075 changes</td></tr>
<tr><td>SW0062</td><td rowspan="10">Updated independently regardless of SB</td><td>SW0080 to SW0083</td><td>When SB0080 changes</td></tr>
<tr><td>SW0067</td><td>SW0088 to SW008B</td><td>Updated independently regardless of SB</td></tr>
<tr><td>SW0068</td><td>SW0090</td><td>When SB0090 changes</td></tr>
<tr><td>SW0069</td><td>SW0098 to SW009B</td><td rowspan="4">Updated independently regardless of SB</td></tr>
<tr><td>SW006A</td><td>SW009C to SW009F</td></tr>
<tr><td>SW006D</td><td>SW00B4 to SW00B7</td></tr>
<tr><td>SW006E</td><td>SW00B8</td></tr>
<tr><td>SW006F</td><td rowspan="2">—</td><td rowspan="2">—</td></tr>
<tr><td>SW0070</td></tr>
</table>

(3) Error codes

The following table lists the error codes that are stored in the link special registers (SWs).

When the standby master station is operating as the master station, the detectability is identical to that of the master station.

When the standby master is operating as a local station, the detectability is identical to that of the local station.

Error code list (1/8)

Error code (hex.)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
B110	Transient data receiving disabled	A line error has occurred.	Check the line.	○	○
B111	Transient data receiving order error	A line error has occurred.	Check the line.	○	○
B112	Transient data length error	A line error has occurred.	Check the line.	○	○
B113	Transient data ID error	A line error has occurred or an instantaneous power failure has occurred at the send station.	Check the line, or check the supply power and power supply module of the send station.	○	○
B115	Link error	A line error has occurred.	Check the line.	○	○
B116	Packet error	A line error has occurred.	Check the line.	○	○
B120	Forced termination of the remote device station initialize procedure registration function	In the remote device station initialize procedure registration function, the specification of the remote device station initialize procedure registration was turned off before all procedures were completed.	Do not turn the specification of the remote device station initialize procedure registration off until all procedures are completed.	○	×
B124	Error at a station on which the remote device station initialize procedure registration function was executed	The specification of the remote device station initialize procedure registration function was turned on at a station other than the master station.	Turn on the remote device station initialization procedure registration instruction on the master station.	×	○
B125	Parameter not set error of the remote device station initialize procedure registration function	The specification of the remote device station initialize procedure registration function was turned on without setting the remote device station initialize procedure registration.	Turn on the specification of the remote device station initialize procedure registration function after setting the remote device station initialize procedure registration.	○	×
		Bits corresponding to other than the head station number were turned ON in the Specification of remote device station to be initialized (SW0014 to SW0017) to instruct remote device station initialization procedure registration.	Turn ON only the bit corresponding to the head station number in the Specification of remote device station to be initialized (SW0014 to SW0017).		
B201	Corresponding station error during sending	A data link error occurred at the corresponding station during transient transmission.	Check the communication status of other stations, whether or not a temporary error invalid station is specified, or if the corresponding station is stopped.	○	○
B204	Transient request overload error	Too many transient requests were sent to the corresponding station.	Wait for a while and send the request again.	○	○
B205	Transient target station error	A transient request was issued to a station other than an intelligent device station.	Check the target station.	○	○
B301	Processing request error during link stop	Loop test request was issued while the link was stopped.	Perform a loop test while the link is being established.	○	○
B302	Specified station number setting error	The specified station number exceeded the highest communication station number during temporary error invalid request/temporary error invalid cancel request.	Specify a station number that is no greater than the highest communication station number	○	×
B303	Specified station number not set error	The station number was not specified during temporary error invalid request/temporary error invalid cancel request.	Set a specified station number. (SW0003, SW0004 to SW0007)	○	×
B304	Loop test error station detected	An error was detected in a remote station, intelligent device station or standby master station when a loop test was performed.	Check that the remote station, intelligent device station or standby master station is operational and that the cable is not disconnected.	○	×
B306	Specified station number setting error	A station number other than the head station number was specified during temporary error invalid request/temporary error invalid cancel request.	Specify the head station number.	○	○

Error code list (2/8)

<table>
<tr><th rowspan="2">Error code (hex.)</th><th rowspan="2">Description</th><th rowspan="2">Error cause (details)</th><th rowspan="2">Corrective action</th><th colspan="2">Delectability</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>B307</td><td>All stations data link error</td><td>All stations were in data link error status when one of the following requests was made:
• Data link restart (SB0000)
• Data link stop (SB0002)</td><td>Request again after the data link becomes normal.</td><td>○</td><td>○</td></tr>
<tr><td>B308</td><td>Station number setting error (installation status)</td><td>The station number of the slave station is not within 1 to 64.</td><td>Set the station number of the slave station within the range between "1 and 64".</td><td>○</td><td>×</td></tr>
<tr><td>B309</td><td>Station number overlap error</td><td>The station number of the connected module was duplicated (including number of occupied stations). However, this excludes the duplicate head station number.</td><td>Check the module station number.</td><td>○</td><td>×</td></tr>
<tr><td rowspan="2">B30A</td><td rowspan="2">Loading/parameter consistency error</td><td>The station types of the module are different from parameter settings.
Example)
<table>
<tr><th>Connected module</th><th>Parameter setting</th></tr>
<tr><td>Remote device</td><td>Remote I/O</td></tr>
<tr><td rowspan="2">Intelligent device</td><td>Remote I/O</td></tr>
<tr><td>Remote device</td></tr>
</table></td><td>Set the correct parameters.</td><td rowspan="2">○</td><td rowspan="2">×</td></tr>
<tr><td>The mode is inconsistent between the master station and a local or standby master station.
• The modes of the master station and standby master station are different.</td><td>After correcting the parameters of the master station, the local station, or standby master station, reset the CPU module.</td></tr>
<tr><td>B30B</td><td>Loading/parameter consistency error</td><td>The contents of the installation status and network parameters do not match.</td><td>Set the contents of the installation status and network parameters to match.</td><td>○</td><td>×</td></tr>
<tr><td>B30C</td><td>Standby master station specification error</td><td>Master station switching was instructed to a station other than the standby master station.</td><td>Specify the station number that corresponds to the standby master station.</td><td>○</td><td>○</td></tr>
<tr><td>B30D</td><td>Initial status</td><td>Temporary error invalid station specification, loop test request, or data link stop/restart request, etc. was issued before starting the link.</td><td>Issue the request after the data link is started.</td><td>○</td><td>○</td></tr>
<tr><td>B30E</td><td>Unsupported service by module</td><td>The function that is started with SB/SW and that only the master station supports was executed in a local station.</td><td>Execute the corresponding function from the master station.</td><td>×</td><td>○</td></tr>
<tr><td>B30F</td><td>Temporary error invalid station specification error</td><td>A temporary error invalid station was specified while data link was being performed upon automatic CC-Link startup.</td><td>Specify a temporary error invalid station while data link is being performed with parameters set using a programming tool or dedicated instruction.</td><td>○</td><td>×</td></tr>
<tr><td>B310</td><td>Data link restart error</td><td>Data link restart (SB0000) was executed for the station that was performing data link.</td><td>Execute Data link restart (SB0000) for the station that has stopped a data link with Data link stop (SB0002).</td><td>○</td><td>○</td></tr>
<tr><td>B311</td><td>Data link stop error</td><td>Data link stop (SB0002) was executed for the station that had stopped a data link.</td><td>Execute Data link stop (SB0002) for the station that is performing a data link.</td><td>○</td><td>○</td></tr>
<tr><td>B312</td><td>Standby master station absence error</td><td>Forced master switching (SB000C) was executed in the system where no standby master station exists or in the system where the standby master station is faulty.</td><td>After starting the data link in the standby master station, execute Forced master switching (SB000C).</td><td>○</td><td>×</td></tr>
<tr><td>B313</td><td>All station fault error</td><td>Forced master switching (SB000C) was executed in the system where all stations were faulty.</td><td>After starting the data link in the standby master station, execute Forced master switching (SB000C).</td><td>○</td><td>×</td></tr>
<tr><td>B314</td><td>Switching target error</td><td>Forced master switching (SB000C) was executed to a station other than the master station.</td><td>Execute Forced master switching (SB000C) to the master station.</td><td>×</td><td>○</td></tr>
<tr><td>B315</td><td>Forced master station switching error</td><td>Forced master switching (SB000C) was instructed again while the master station was being switched to the standby master station.</td><td>Check ON/OFF of Forced master switching (SB000C).</td><td>○</td><td>×</td></tr>
</table>

Error code list (3/8)

Error code (hex.)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
B317	Network startup setting mode error	The G(P).RLPASET instruction was executed to a module whose parameters have been set with a programming tool. The parameter setting was changed without powering off and on the programmable controller system or resetting the CPU module.	Clear the settings of the network parameters using a programming tool and set the network parameters using the G(P).RLPASET instruction.	○	×
B31A	Data linking	Data link has already been started when the master station duplication error cancelling is instructed.	Do not instruct the master station duplication error cancelling during data linking.	○	×
B31B	Transmission speed test execution error	The transmission speed test was executed during data link.	Turn on Data link stop (SB0002) then Transmission speed test request (SB000B).	○	×
B31E	Status logging start error	Logging started while the log was being cleared.	Execute logging after clearing the logs.	○	○
B31F	Status logging clear error	Log was cleared while logging.	Execute logging after clearing the logs.	○	○
B320	Status logging mode invalid	The logging or log clear was executed in the remote I/O net mode.	Set the module to the remote net mode, then start the logging or log clear.	○	○
B322	Status logging flash ROM deletion invalid	During data link, the logs were cleared with "RAM + FlashROM" checked.	Stop the data link and then clear the logs.	○	○
B323	Status logging flash ROM clear incomplete	Clear of the logs was attempted with "RAM + FlashROM" checked, but logging started even though the clear was incomplete.	Clear the logs again with "RAM + FlashROM" checked.	○	○
B324	Status logging flash ROM storage error	The logs were attempted to be stored in the flash ROM even though the logs could not be stored in flash ROM.	After clearing the logs with "RAM + FlashROM" checked, start logging. Or, start the logging with “RAM” checked.	○	○
B325	Status logging flash ROM error	The total number of storing the logs in the flash ROM exceeded 100,000 times.	Start logging with "RAM" checked. For “RAM + FlashROM”, replace the module.	○	○
B384	Station number setting error (parameter)	The station number (including the number of occupied stations) of the station information parameters was set to "other than 1 H to 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	Delay time setting error (parameter)	The delay time setting in the master station network parameters is out of the setting range.	Set 0 in the delay time setting.	○	×
B388	Station type setting error (parameter)	When the remote net ver.1 mode is used, a value set to the station type in the station information parameter is out of the setting range.	When the remote net ver.1 mode is used, set a value within the range from 0 to 2.	○	×
B38B	Remote device station setting error (parameter)	The number of remote device stations was set to "43 stations or more" with the station information parameter.	Set the remote device station to "42 stations or less" with the station information parameter.	○	×
B38C	Intelligent device station setting error (parameter)	The number of intelligent device stations (including local stations) was set to "27 stations or more" with the station information parameter.	Set the intelligent device station to "26 stations or less" with the station information parameter.	○	×
B38D	Invalid station specified error (parameter)	"Other than module head station number" or "station number not specified in the parameter" was set with the invalid station specification parameter. <Example of other than head station number> A bit other than that for station number 5 was ON for a module occupies 4 stations (station numbers 5 to 8).	Set the "Head station number of the module". Do not specify any of the stations not specified with the parameter.	○	×
B38E	Communication buffer assignment error (parameter)	The total size of the communication buffers in the station information parameter exceeded 4 K words.	Set the total size of the communication buffers to 4 K words or less.	○	×

Error code list (4/8)

Error code (hex.)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
B38F	Automatic update buffer assignment error (parameter)	The total size of the automatic update buffer in the station information parameter exceeded 4 K words.	Set the total size of the automatic update buffer to 4 K words or less.	○	×
B390	Standby master station specification error (parameter)	The standby master station parameter was set to a value other than "1 to 64".	Specify the standby master station to a value within the range from "1 to 64".	○	×
B391	Retry count setting error (parameter)	The retry count parameter was set to a value other than "1 to 7".	Set a value within the range from "1 to 7".	○	×
B392	Operation when CPU is down specified error (parameter)	The operation when the CPU is down specification parameter was set to a value other than "0 or 1".	Set "0 or 1".	○	×
B393	Scan mode specification error (parameter)	The scan mode parameter was set to a value other than "0 or 1".	Set "0 or 1".	○	×
B394	Number of automatic return stations setting error (parameter)	The number of automatic return stations parameter was set to a value other than "1 to 10".	Set a value within the range from "1 to 10".	○	×
B396	Station number overlap error (parameter)	A duplicate station number was specified with the station information parameter.	Set so that station numbers are not duplicated.	○	×
B397	Station information setting error (parameter)	The station information parameter setting does not meet the following condition: (16 × A) + (54 × B) + (88 × C) ≤ 2304 A: Number of remote I/O stations B: Number of remote device stations C: Number of intelligent device stations (including local stations)	Set the parameter so that it meets the condition shown on left.	○	×
B398	Number of occupied stations setting error (parameter)	The number of occupied stations in the station information parameter was set to a value other than "1 to 4".	Set a value within the range from "1 to 4".	○	×
B399	Number of connected modules setting error (parameter)	The number of connected modules parameter was set to a value other than "1 to 64".	Set a value within the range from "1 to 64".	○	×
B39A	Standby master station specification error (loading status)	The station number of the standby master station differs from that set in the "Standby Master Station No." network parameter of the master station, or the station set in the "Standby Master Station No." network parameter of the master station is a local station.	Change the parameter setting of the master station, or change the station number setting of the local/standby master station, and then reset the CPU module of the local/standby master station.	×	○
B39B	Reserved station specification error	All stations were set as reserved stations.	Check the reserved station specification.	○	×
B39C	Standby master station setting error	Any other than Intelligent device station has been set to the station type for the "Standby Master Station No." specified in the master station network parameter. The mode setting is different between the master and standby master stations.	Specify the standby master station as an intelligent device station. Make the same setting to the master and standby master stations.	○	×
B39D	Reserved station 0 points setting error	Reserved station 0 points setting has been made in the remote net additional mode.	Change the mode to the remote net Ver.2 mode.	○	×
		Reserved station 0 points setting has been made for the station that is not a reserved station.	Set the station of reserved 0 points setting as a reserved station.		
B39E	8/16-point remote I/O station setting error	Remote I/O station points setting is 8/16 points in the remote net additional mode.	Change the mode to the remote net Ver.2 mode.	○	×
		8/16 points setting has been made for the station other than the remote I/O station.	8 points setting and 16 points setting have been made for the same remote I/O station.		
		Make 8/16 points setting for the same remote I/O station.	Make either 8 points setting or 16 points setting for the remote I/O station.		
B39F	Remote net additional mode station number invalid	In the remote net additional mode, the "maximum station number of Ver.1-compatible slave stations" is greater than the "minimum station number of Ver.2-compatible slave stations" in the network parameter setting.	In the remote net additional mode, make network parameter setting so that the "maximum station number of Ver.1-compatible slave stations" is less than the "minimum station number of Ver.2-compatible slave stations".	○	×

Error code list (5/8)

Error code (hex.)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
B3A0	Mode invalid (between master and local/standby master stations)	Model invalid has occurred between the master and local/standby master stations. • The mode differs between the master and standby master stations. • The local station is set to the remote net additional mode, and the master station is set to other than the remote net additional mode. • The local station is in the remote net Ver.2 mode or remote net additional mode, and the master station is in the remote net Ver.1 mode.	After correcting the mismatch of modes between the master and local/standby master stations, reset the CPU module.	×	○
B3A1	Standby master setting invalid	At the time of parameter setting with dedicated instruction, an invalid value has been set to switch 5 of the intelligent function module switch setting.	Set a correct value to switch 5 of the intelligent function module switch setting.	○	×
B3A2	Remote I/O net mode station type invalid	At the time of parameter setting with dedicated instruction, the station type of other than the remote I/O station has been set in the remote I/O net mode.	Set all station types to the remote I/O station.	○	×
B3A3	Assignment error	In the remote net Ver.2 mode or remote net additional mode, total points for remote stations set in the station information have exceeded the maximum of 8192.	Check the points for remote stations in the station information setting.	○	×
B3A4	Parameter mismatch	When the standby master station was operating as the master station with the master station duplex function, the network parameter setting of the faulty master station was changed.	Return the network parameter setting of the master station to the original value.	○	×
B3A5	Mode invalid (parameter)	The mode set in the control data of the G(P).RLPASET instruction differs from the mode set with the switch 3 of the intelligent function module switch setting.	Check the control data of the G(P).RLPASET instruction and the switch 3 setting of the intelligent function module switch setting.	○	×
B401	Parameter change error	Parameter change was executed during transient request.	Change the parameter after all transient requests are completed or before any are requested.	○	○
B404	Response error	A response from the requested station was not returned within the watchdog time period.	Set a longer watchdog time. If an error persists, check the requested module and cables.	○	○
B405	Transient request error	A transient request was made to a remote I/O station or a remote device station. Or too many transient requests were sent to the corresponding station.	Set the corresponding station to a local station or an intelligent device station. Or wait for a while and send the request again (overload due to many transient requests).	○	○
B410	Receive buffer size error	The receive buffer size of the dedicated instruction is less than the response data size.	Check the receive buffer size.	○	○
B411	Data length outside of range	The number of read/write points in the control data of the dedicated instruction is outside the setting range.	Change the read/write points to within the setting range.	○	○
B412	Station number outside of range	The station number in the control data of the dedicated instruction is outside the setting range.	Change the station number to within the setting range.	○	○
B413	Request error	Multiple dedicated instructions were executed for the same station.	Check the program.	○	○
B414	Interlock signal data outside of range	The setting of the interlock signal storage device of the G(P).RIRCV or G(P).RISEND instruction is outside the setting range.	Set the interlock signal storage device within the range.	○	×
B415	Execution station type error	The RLPASET instruction was tried to be executed on a station other than the master station.	Change the setting of the interlock signal storage device to within the setting range.	×	○
B601	Request type error	An unsupported request was received.	Check the contents of the request, as well as the target station number.	○	○
B602 to B603	Transient request overload error	There are too many transient requests to the corresponding station.	Wait for a while and send the requests again.	○	○

Error code list (6/8)

Error code (hex.)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
B604	Line test in processing	Transient transmission was sent when a loop test was in progress.	Wait a while and then retransmit.	○	×
B605	Transient storage buffer data could not be obtained	Transient storage buffer could not be obtained.	Wait a while and then retransmit.	○	○
B607	Target station CPU error	There is an error in the target station's CPU.	Check the target CPU.	○	○
B608	Transient transmission target station mode setting error	Transient transmission was performed to the AJ61BT11 or A1SJ61BT11 in the I/O mode.	Set the target station to the intelligent mode.	○	○
B701 to B704	Transient transmission failure	Transient transmission failed.	• Reduce the load placed on the transient transmission and perform the transmission again. • If the same error persists after taking the above action, please consult your local Mitsubishi representative.	○	○
B771	Transient request overload error	There are too many transient requests to the corresponding station.	Wait a while and then retransmit	○	○
B774	Transient request error	The target station was not an intelligent device station.	Check if the target station is an intelligent device station.	○	○
B775 to B777	Transient type error	Unsupported transient data was received.	Check the application of the request source.	○	○
B778	Response 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 the intelligent mode for the target station.	○	○
B782	Station number specification error	The transmission destination and source stations were the same when other station connection was specified.	Check the transmission destination station number, or change to host connection.	○	○
B783	Transient storage buffer error	An error occurred in the transient storage buffer when a transient transmission of greater than 1 k was being performed.	Wait a while and then retransmit.	○	○
B801	Access code setting error	A non-existing access code/attribute was set.	Set a correct access code/attribute.	○	○
B802	Access code error	An access code that does not exist was used.	Use the correct access code.	○	○
B803	Data points error	The number of data points were out of range.	Set the number of data points to within 1 to 960 bytes.	○	○
B804	Attribute definition error Transient transmission unsupported station specification error	The attribute definition is invalid. Alternatively, transient transmission was performed even though the target station does not support transient transmission.	Review the attribute definition. Check the designation of the target station number, as well as the function version and software version of the target local station	○	○
B805	Data points error	The number of data was out of range.	Set the range to within 1 to 100 when writing, and 1 to 160 when reading.	○	○
B807	Device No. error	The start device No. is out of range. Or, the address was not a multiple of 16 when the bit device was access	Correct the start device No. Or, set the address to a multiple of 16 when accessing the bit device.	○	○
B80D	Setting range error	The specified combination (addresses and points) exceeded the valid processing range.	Set so that the number of processing points does not exceed the device range.	○	○
B814	File register capacity setting error	The file register capacity was not specified.	Specify the file register capacity.	○	○
B815	Module mode setting error	A transient transmission was executed when the target station was set to the I/O mode.	Set the target station to the intelligent mode.	○	○
B823	Remote control mode error	The mode setting of the remote control was incorrect.	Check the mode specification.	○	○
B903	Transient request error	A transient request was issued to a station that had not secured a communication buffer.	Secure a communication buffer area with a parameter.	○	○
B904	Communication buffer size setting error	The communication buffer size of the corresponding station was out of range when a dedicated instruction was executed.	Set the communication buffer size of the corresponding station within the range.	○	○
B905	Transient data length error	When the dedicated instruction is executed, the transient data length is greater than the communication buffer size of the corresponding station.	Make the communication buffer size of the corresponding station greater than the transient data length.	○	○

Error code list (7/8)

Error code (hex.)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
BA01	Error (hardware test)	A hardware error has been detected.	Please consult your local Mitsubishi representative.	○	○
BA06 to BA13	Error (hardware test)	A hardware error has been detected.	Please consult your local Mitsubishi representative.	○	○
BA14	Error (hardware test)	A hardware (communication circuit) error has been detected.	• Check if the terminating resistor provided with the master/local module is connected between the DA and DB terminals, and execute the hardware test again. • If the same error persists after taking the above action, please consult your local Mitsubishi representative.	○	○
BA15	Error (hardware test)	A hardware error has been detected.	Please consult your local Mitsubishi representative.	○	○
BA16 to BA17	Error (hardware test)	A hardware (communication circuit) error has been detected.	• Check if the terminating resistor provided with the master/local module is connected between the DA and DB terminals, and execute the hardware test again. • If the same error persists after taking the above action, please consult your local Mitsubishi representative.	○	○
BA19	Corresponding station error	The corresponding station that is being tested stopped communication during loop test 1.	Check the cable and the corresponding station.	○	×
BA1B	All stations error	All stations stopped communications during loop test 1.	Check the cables.	○	×
BB01	Concurrent execution error	Any of the following were attempted to be executed to the same station. (Including the same requests) • Remote device station initialization procedure registration function • G(P).RISEND or G(P).RIRCV instruction • Remote device station access from a peripheral.	Execute a request after completion of another processing.	○	○
BBC1	Mode setting error	A station other than the station number 0 is set to the remote I/O net mode.	When setting the remote I/O net mode, set the station number setting switches to 0.	○	○
BBC2	Station No. setting error	A station No. is set to a number other than 0 to 64 using the station number setting switches on the module, or the last station number has exceeded 64.	Check the station No. and the number of occupied stations of the module.	○	○
BBC5	Master station duplication error	Multiple master stations exist on the same line. Alternatively, line noise was detected at power on.	Reduce the number of master stations on the same line to one. Alternatively, if data link starts when turning on the SB0007 (Master station duplication error canceling request), check the line status.*1	○	×
BBCA	Standby master station duplication error	Multiple standby master stations exist on the same line.	Reduce the number of standby master stations on the same line to one. Alternatively, check the line status.	×	○
BC57	Multiple requests error	Execution of multiple requests for message transmission or remote device station access from a peripheral was attempted to the same station.	Execute a request after completion of another processing.	○	×
BC70	No. of concurrent execution error (Remote device station access)	Too many remote device station accesses were requested from peripherals.	Execute four requests or less at the same time.	○	×
BC71	Unsupported function error (Remote device station access)	Execution of the remote device station access function was attempted from a station other than the master station.	Execute the function from the master station.	×	○

*1 The master/local module with the serial number (first five digits) of 09112 or later supports this function.
When using the master/local module with the serial number (first five digits) of 09111 or earlier, reset the CPU module.

Error code list (8/8)

Error code (hex.)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
BC72	Target station error (Remote device station access)	The target of remote device station access from the peripheral is any of the following. • Does not exist among network parameters. • Does not have the start station No. • Has been set as a reserved station. • Has a data link error (including errors on all stations).	Check the parameters or operations of the target station.	○	×
BC73	Target station specification error (Remote device station access)	The target of the remote device station access from the peripheral is a remote I/O station.	The target of the remote device station access from the peripheral is a remote I/O station.	○	×
BC74	Device No. error (Remote device station access)	Device No. for "RX", "RY", "RWw", or "RWr" is outside the valid range for the target station.	Check the parameters and valid device No. of the target station.	○	×
BC75	All-stations data link error (Remote device station access)	An all-stations data link error occurred during execution of the remote device station access from the peripheral.	Issue the request after starting data link.	○	×
BC76	Timeout (Remote device station access)	Timeout occurred during the remote device station access from the peripheral.	Timeout occurred during the remote device station access from the peripheral.	○	×
BD85	Hardware error detection	A hardware error was detected.	Please consult your local Mitsubishi representative.	○	○
BF38	Execution result read error (Remote device station access)	An error is detected in the process of reading the execution result of the remote device station access from the peripheral.	• Check the application of the request source. • Check for remote device station access from another peripheral.	○	○
BF39	Request procedure error (Remote device station access)	An error in the request procedure is detected during the remote device station access from the peripheral.	• Check the application of the request source. • Check for remote device station accesses from multiple peripherals. • Check if any value is written in the system area.	○	○
BFFB	Transient request overload error	There are too many transient requests from a programming tool or GOT.	Wait for a while and send the request again.	○	○
BFFE	CPU monitoring timer timeout	The CPU monitoring timer timed out.	Check the operation of the target station.	○	○

Transient transmission can be performed with 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 station types:

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 page
		M	L	M	L	Id	Rd	Rio	
RIRD	Reads data from the buffer memory or the PLC CPU device of the specified station.	○		×	○	○	×	×	Appendix - 4.1
			○	○	○	×	×	×	
RIWT	Writes data into the buffer memory or the PLC CPU device of the specified station.	○		×	○	○	×	×	Appendix - 4.2
			○	○	○	×	×	×	
RIRCV	Automatically performs handshaking with the specified station and reads data from the buffer memory of that station.	○	×	×	×	○	×	×	Appendix - 4.3
RISEND	Automatically performs 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 of the specified station.	○	×	The access is only available from the master station to the master module of the host station					Appendix - 4.5
RITO	Writes data into the automatic update buffer or random access buffer of 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

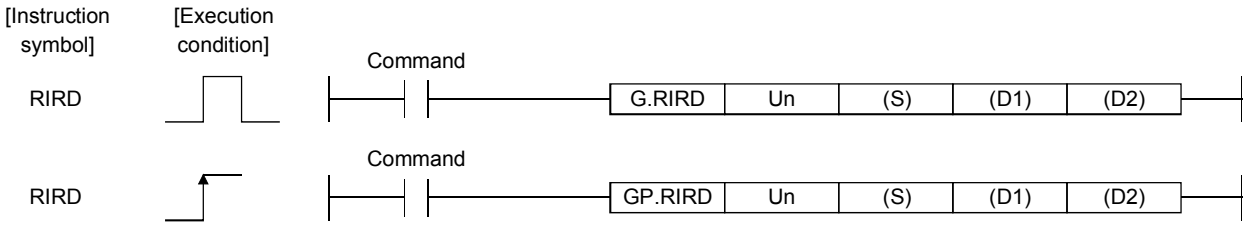
(1) Execute the dedicated instructions while the data link is being performed.
If any of the dedicated instructions is executed offline, no error will occur, but the execution of the dedicated instruction will not be completed.

(2) Because the last two bits of the corresponding remote station input (RX) and output (RY) are used by the system in the communication between stations shown below, they cannot be used in a sequence program.
- Master station – Local station
- Master station – Intelligent device station

Appendix 4.1 RIRD instruction

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

Set 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	
(S)	—	○		—				—	—	—
(D1)	—	○		—				—	—	—
(D2)	○			—				—	—	—

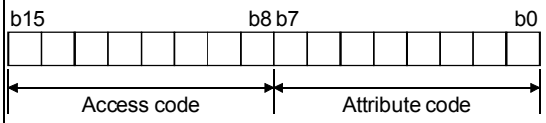


Set data

Device	Description	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 device	Device name
(D1)	Start number of the device to which read data is to be stored.	Within the range of the specified device	
(D2)	Device that is turned ON for one scan upon completion of reading. (D2) + 1 also turns ON at an abnormal completion.	Within the range of the specified device	Bit

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

Control data

Device	Item	Set data	Setting range	Set by
(S)+0	Completion status	Stores the status when the instruction is complete. 0 : No error (normal completion) Other than 0 : Error code	—	System
(S)+1	Station number	Specify the station numbers of the local station and intelligent device station.	0 to 64	User
(S)+2	Access code Attribute code		See (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 read data count (in word units).	1 to 480*2 1 to 32*3	User

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

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

*3 When reading device data from the PLC CPU other than the QCPU (Q mode), QCPU (A mode), QnACPU or AnUCPU, the setting range shall be 1 to 32 words.

(1) Buffer memory in the CC-Link

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

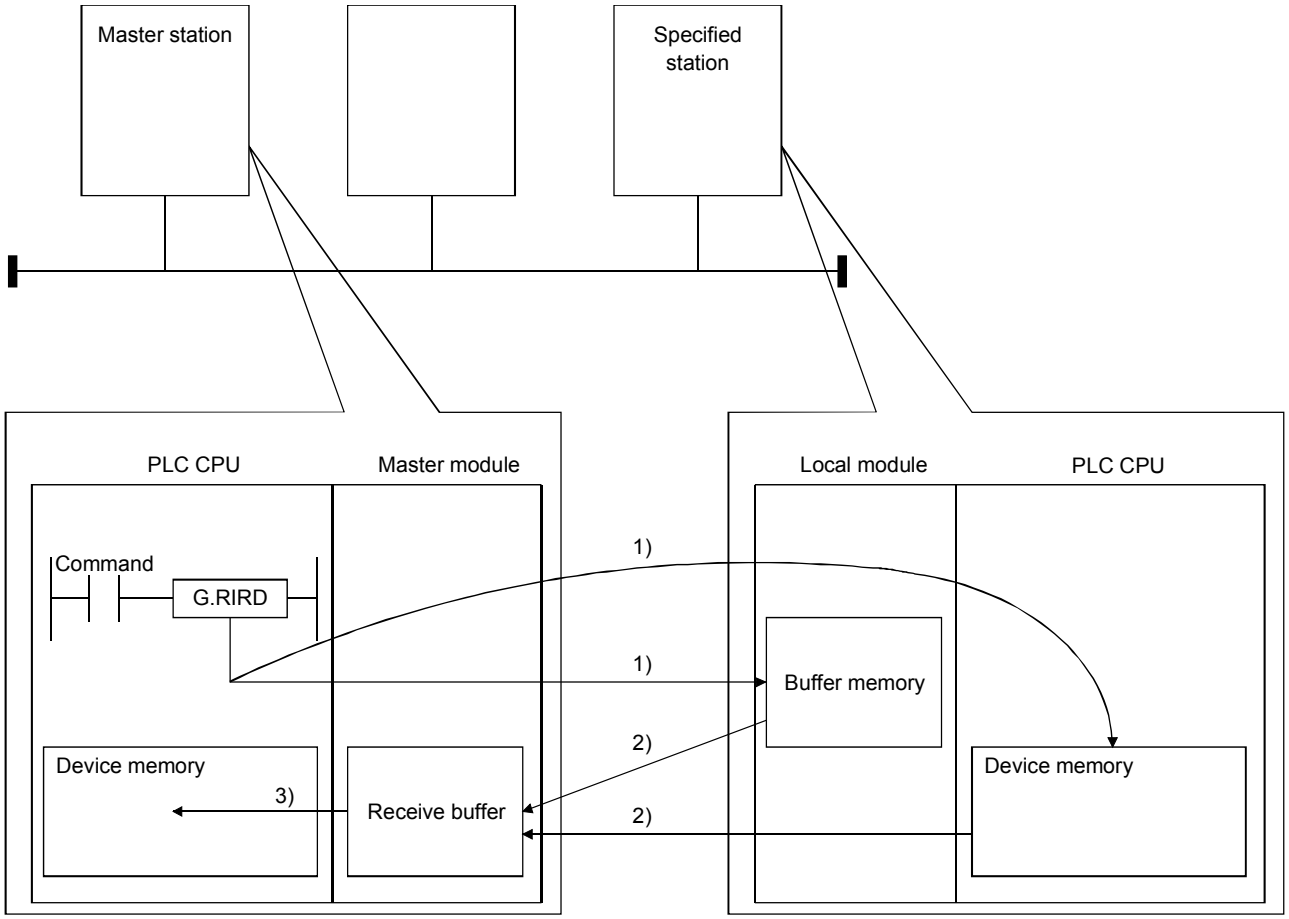
(2) Device memory in the PLC CPU

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 it with 0 or a multiple of 16.

(3) Functions

(a) Operation chart for the RIRD instruction



1) Accesses the buffer memory specified by (S)+2 and (S)+3 of the station specified by (S)+1, or the 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 status display device at completion (D2) + 1.

1) Completion device

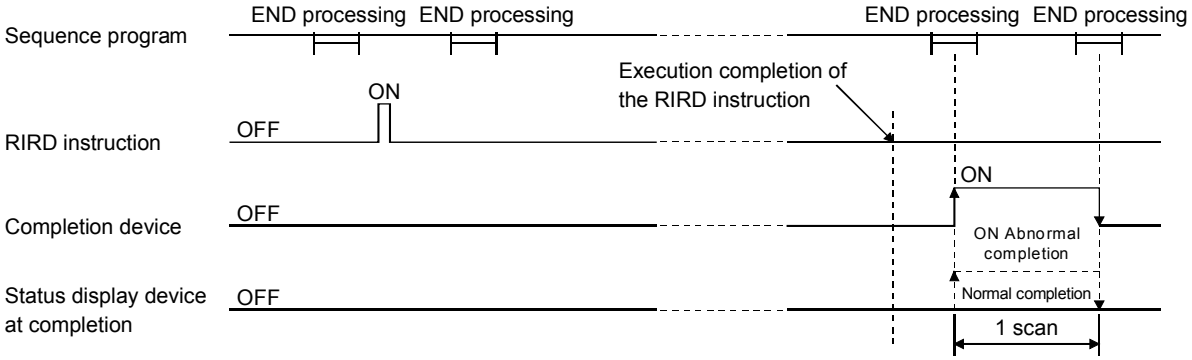
Turns ON in the END processing of the scan where the RIRD instruction is completed, and turns OFF in the next END processing.

2) Status display device at completion

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.

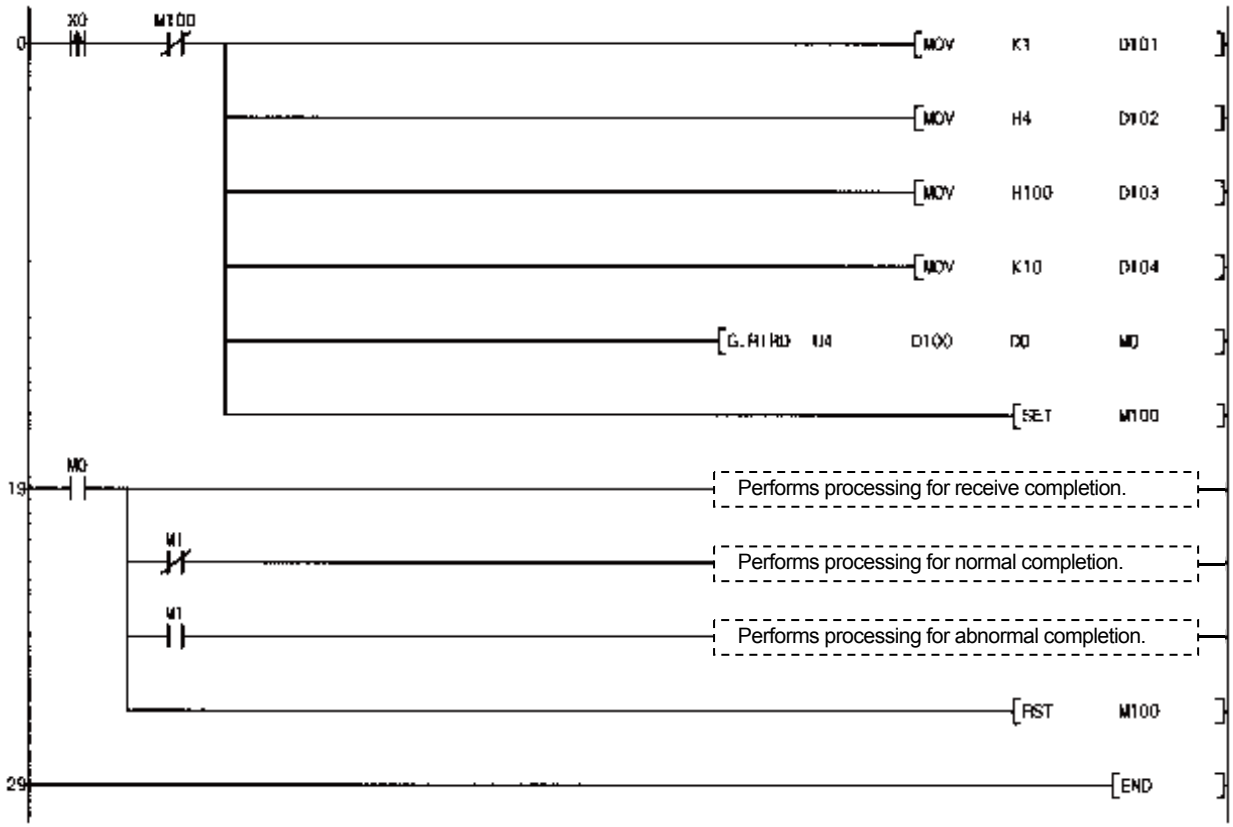
(4) Operation error

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 an unsupported instruction.
4003	When the number of devices in the instruction is incorrect.
4004	When the instruction specifies a device that cannot be used.
4100	When the instruction contains the data that cannot be used.
4101	When the number of data set to be used exceeds the allowable range. Or, when the storage data or constants of the device specified with the instruction exceeds the allowable range.

(5) Program example

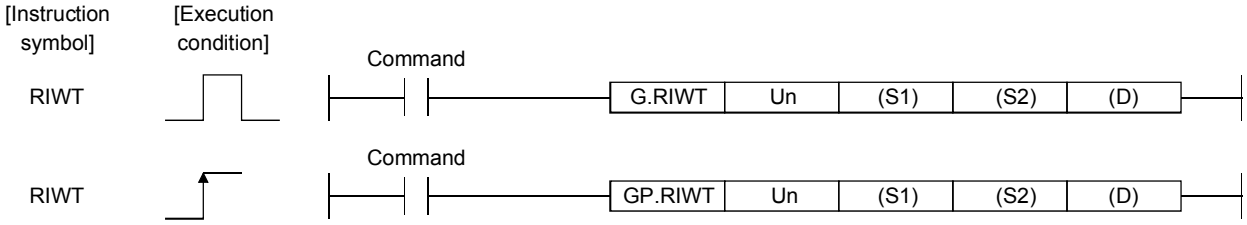
When X0 is turned ON, this program stores 10-word data to D0 and succeeding addresses from buffer memory address 100H of the station (station number 1), which is connected to the master module installed at I/O numbers from X/Y40 to X/Y5F.



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.

Set 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	
(S)	—	○		—				—	—	—
(D1)	—	○		—				—	—	—
(D2)	○			—				—	—	—

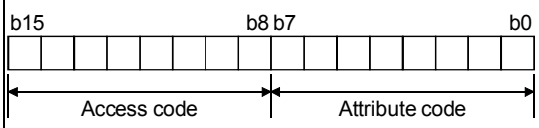


Set data

Device	Description	Setting range	Data type
Un	Start I/O number of the module	0 to FEH	Binary 16 bits
(S)	Start number of the device in which control data is stored.	Within the range of the specified device	Device name
(D1)	Start number of the device to which write data is to be stored.	Within the range of the specified device	
(D2)	Device that is turned ON for one scan upon completion of writing. (D) + 1 also turns ON at an abnormal completion.	Within the range of the specified device	Bit

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

Control data

Device	Item	Set data	Setting range	Set by
(S)+0	Completion status	Stores the status when the instruction is complete. 0 : No error (normal completion) Other than 0 : Error code	—	System
(S)+1	Station number	Specify the station numbers of the local station and intelligent device station.	0 to 64	User
(S)+2	Access code Attribute code		See (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 write data count (in word units).	1 to 480*2 1 to 10*3	User

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

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

*3 When writing device data to the PLC CPU other than the QCPU (Q mode), QCPU (A mode), QnACPU or AnUCPU, the setting range shall be 1 to 10 words.

(1) Buffer memory in the CC-Link

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

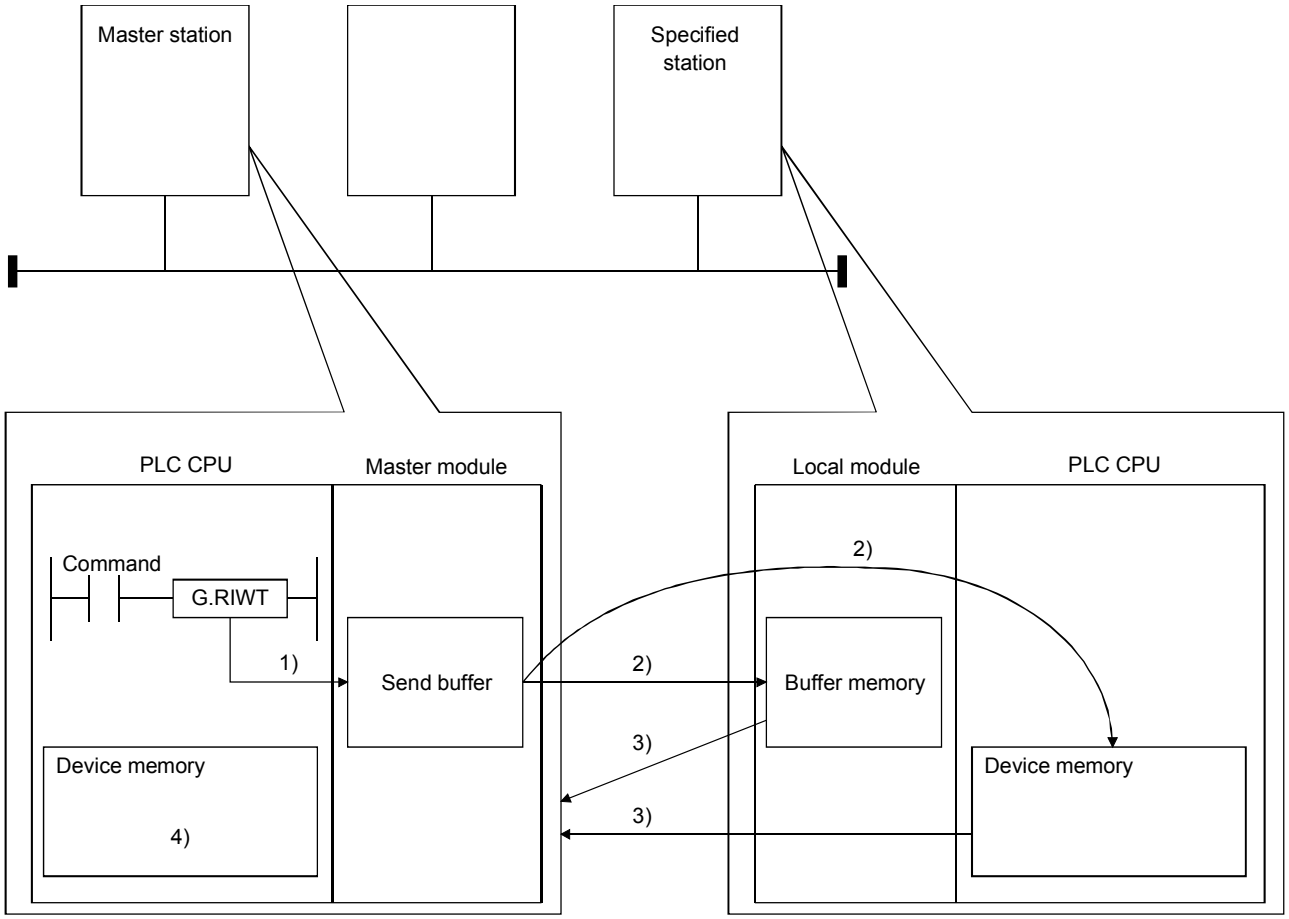
(2) Device memory in the PLC CPU

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 it 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 (D2) 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

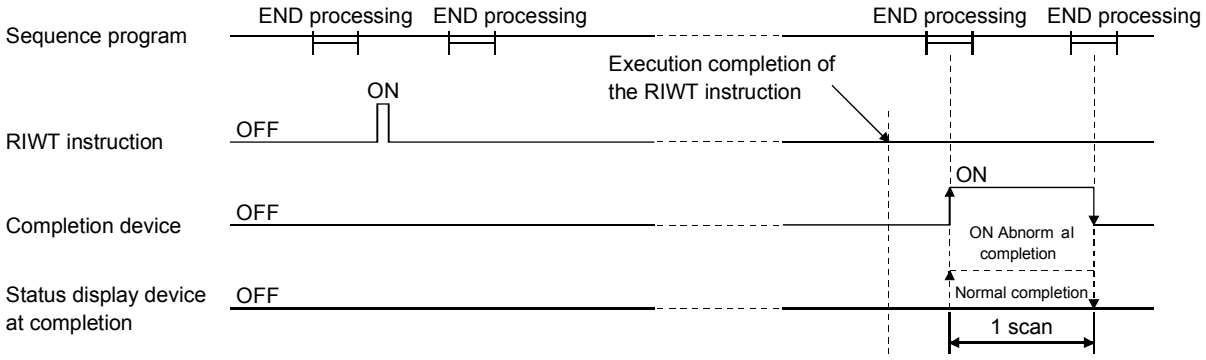
Turns ON in the END processing of the scan where the RIWT instruction is completed, and turns OFF in the next END processing.

2) Status display device at completion

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.

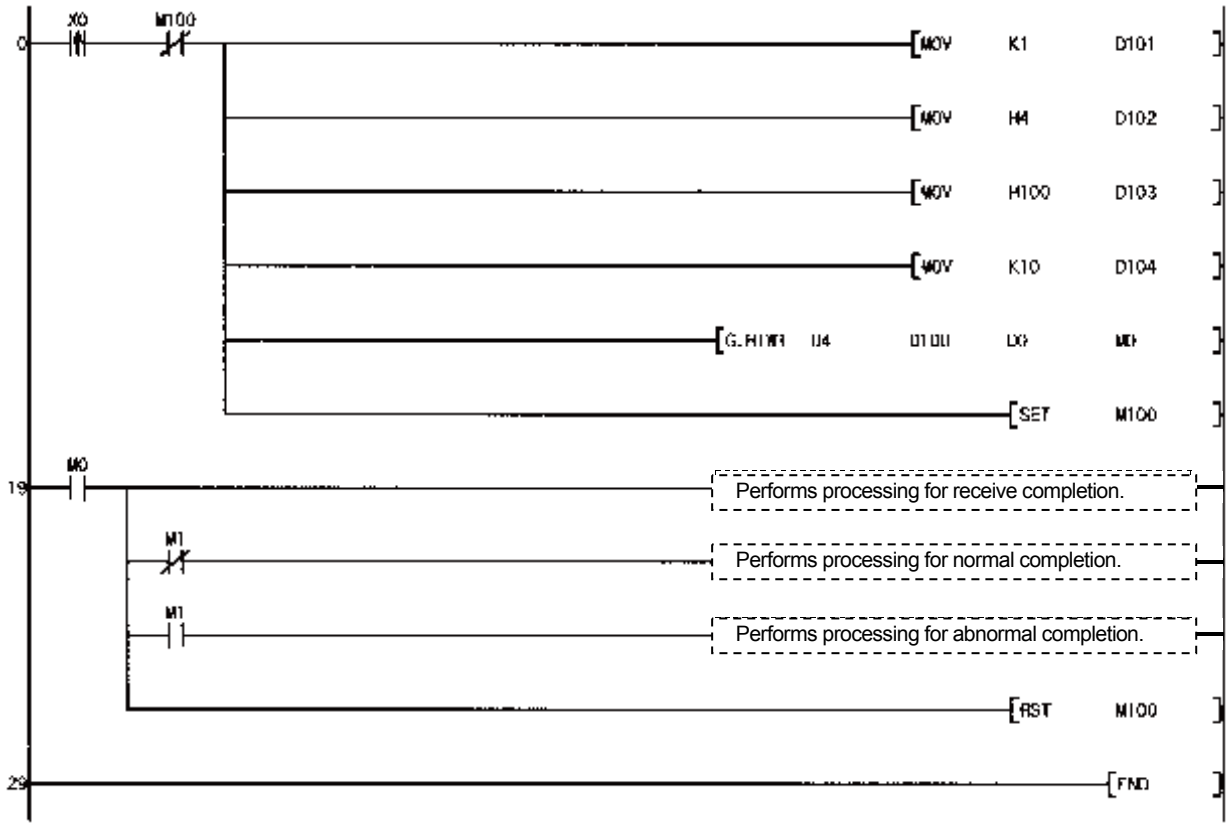
(4) Operation error

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 an unsupported instruction.
4003	When the number of devices in the instruction is incorrect.
4004	When the instruction specifies a device that cannot be used.
4100	When the instruction contains the data that cannot be used.
4101	When the number of data set to be used exceeds the allowable range. Or, when the storage data or constants of the device specified with the instruction exceeds the allowable range.

(5) Program example

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

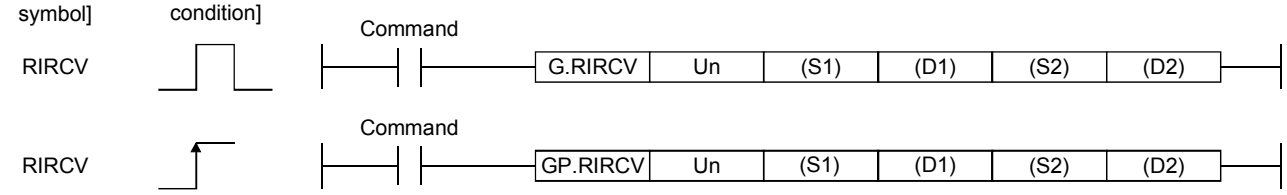


Appendix 4.3 RIRCV instruction

When the remote input (RX) which is used as a handshaking signal of the specified intelligent device station is turned ON, reads the data from the buffer memory.
Also, when the data reading is completed, the remote output (RY) which is used as a handshaking signal is turned ON.
The data reading and remote output ON/OFF switching are performed automatically.

Set 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]



Set data

Device	Description	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 device	Device name
(D1)	Start number of the device to which read data is to be stored.	Within the range of the specified device	
(S2)	Start number of the device in which the handshaking signals are stored. This device specifies the number of the remote input and remote output that are used as the handshaking signals.	Within the range of the specified device	Bit
(D2)	Device that is turned ON for one scan upon completion of reading. (D2) + 1 also turns ON at an abnormal completion.	Within the range of the specified device	

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

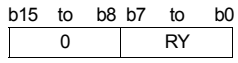
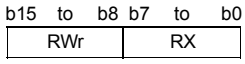
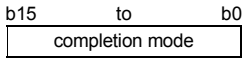
Control data

Device	Item	Set data	Setting range	Set by
(S1)+0	Completion status	Stores the status when the instruction is complete. 0 : No error (normal completion) Other than 0 : Error code	—	System
(S1)+1	Station number	Specify the station number of the intelligent device station.	0 to 64	User
(S1)+2	Access code Attribute code	Set "0004$_H$".	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 read data count (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.

Handshaking signal storage devices

Device	Item	Set data	Setting range	Set by
(S2)+0		RY: Request device (*2)	0 to 127	User
		Set the upper 8 bits to 0.	0	User
(S2)+1		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		0: Complete with ON→OFF of 1 device (RXn specified by (S2)+1) 1: Complete with ON→OFF of 2 devices (RXn, RXn+1 specified by (S2)+1) (RXn+1 turns ON at an abnormal completion.)	0/1	User

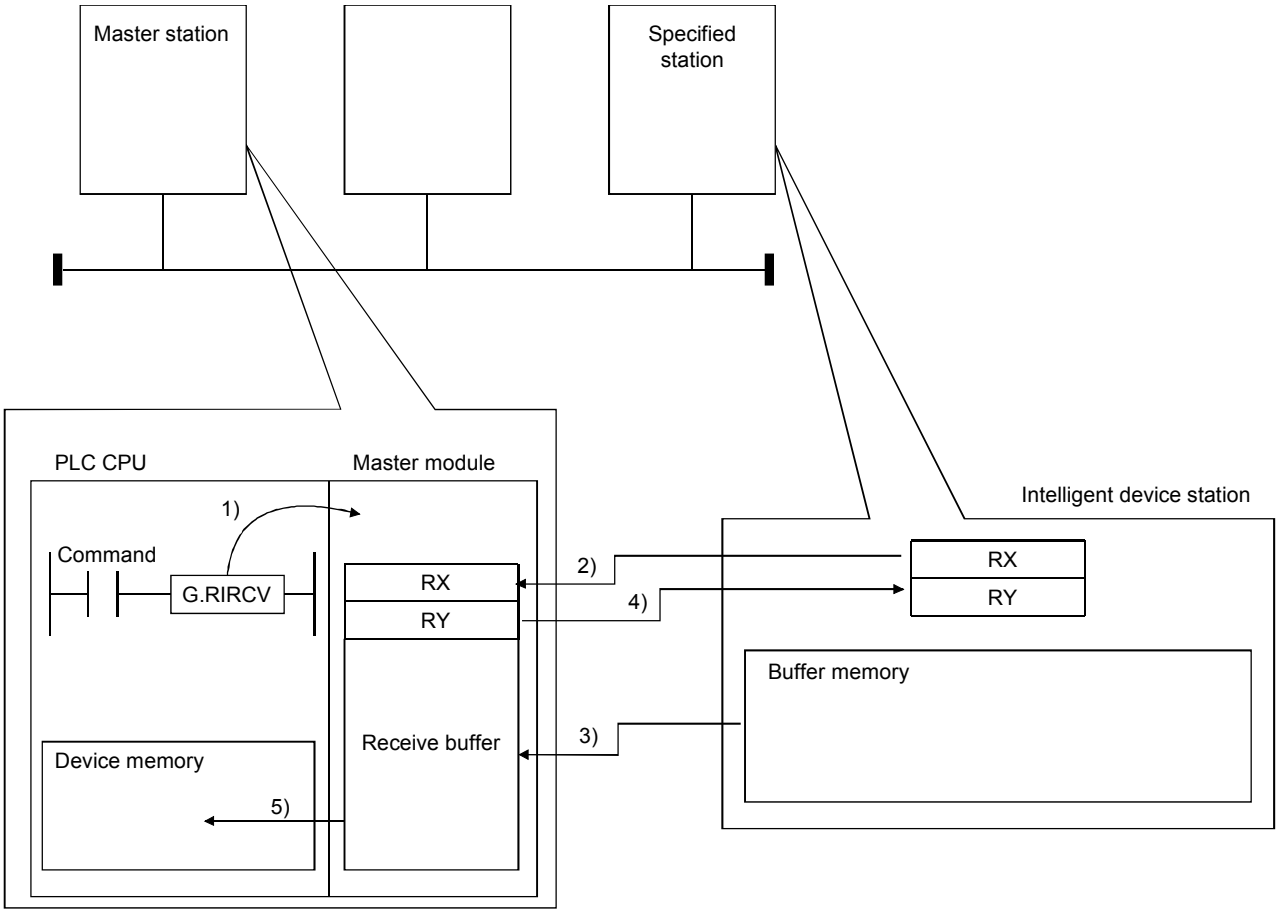
*1 For the error code storage device, specify the remote register number where the error code at reception with the start of the target intelligent device station remote register "RWr0".
When a reception error occurs, the contents of the error code storage device are also stored in the control data completion status.

*2 For the request device, specify the remote output (RY) number which is turned on for notifying the data read completion to the intelligent device station with the start of the remote output for the target intelligent device station "RY0".
(Specify the handshaking signals for output)

*3 For the completion device, specify the remote input (RX) number which is used as the data reading timing with the start "RX0" for the remote input for t he target intelligent device station.
(Specify the handshaking signals for input)

(1) Functions

(a) Operation chart for the RIRCV instruction



1) Instructs the master module to read data from the buffer memory specified in (S1) + 2 and (S1) + 3 of the station specified in (S1) + 1.
2) The master module monitors the remote input (RX) specified by (S2) + 1. (Monitoring handshaking signals for input)
3) When the remote input specified by (S2) + 1 turns on, the master module reads data from the buffer memory of the target station.
   The read data is stored in the receive buffer of the master module.
4) The master module turns on the remote output (RY) specified by (S2) + 0. (Outputting handshaking signals for output)
   When the remote input shown above turns off, remote output is turned off.
5) The data read from the specified station are stored in the device specified by (D1) and subsequent devices, and 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 completion (D2)+1.

1) Completion device

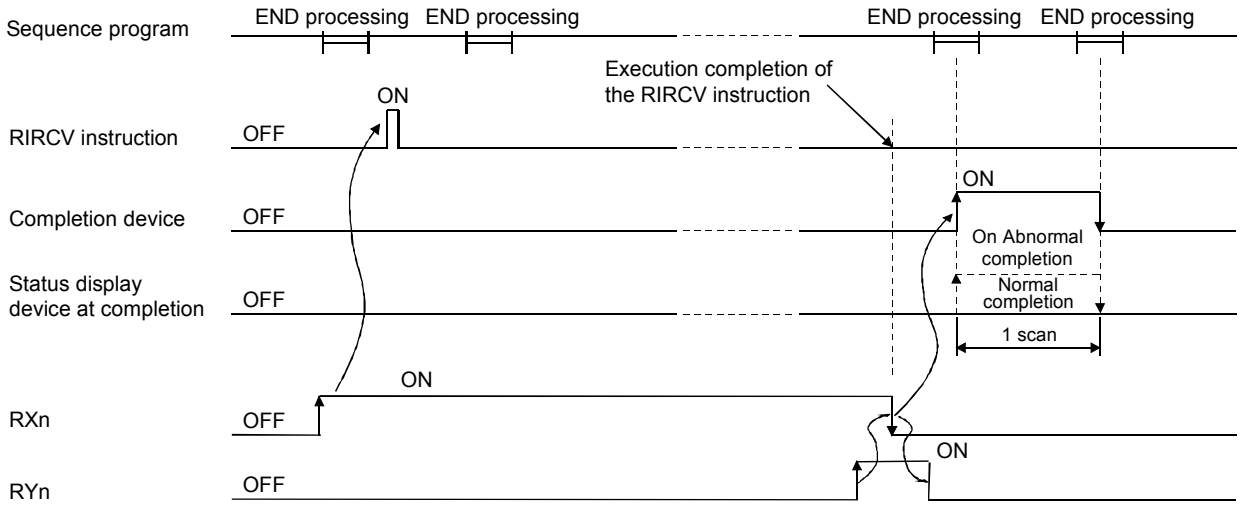
Turns ON in the END processing of the scan where the RIRCV instruction is completed, and turns OFF in the next END processing.

2) Status display device at completion

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

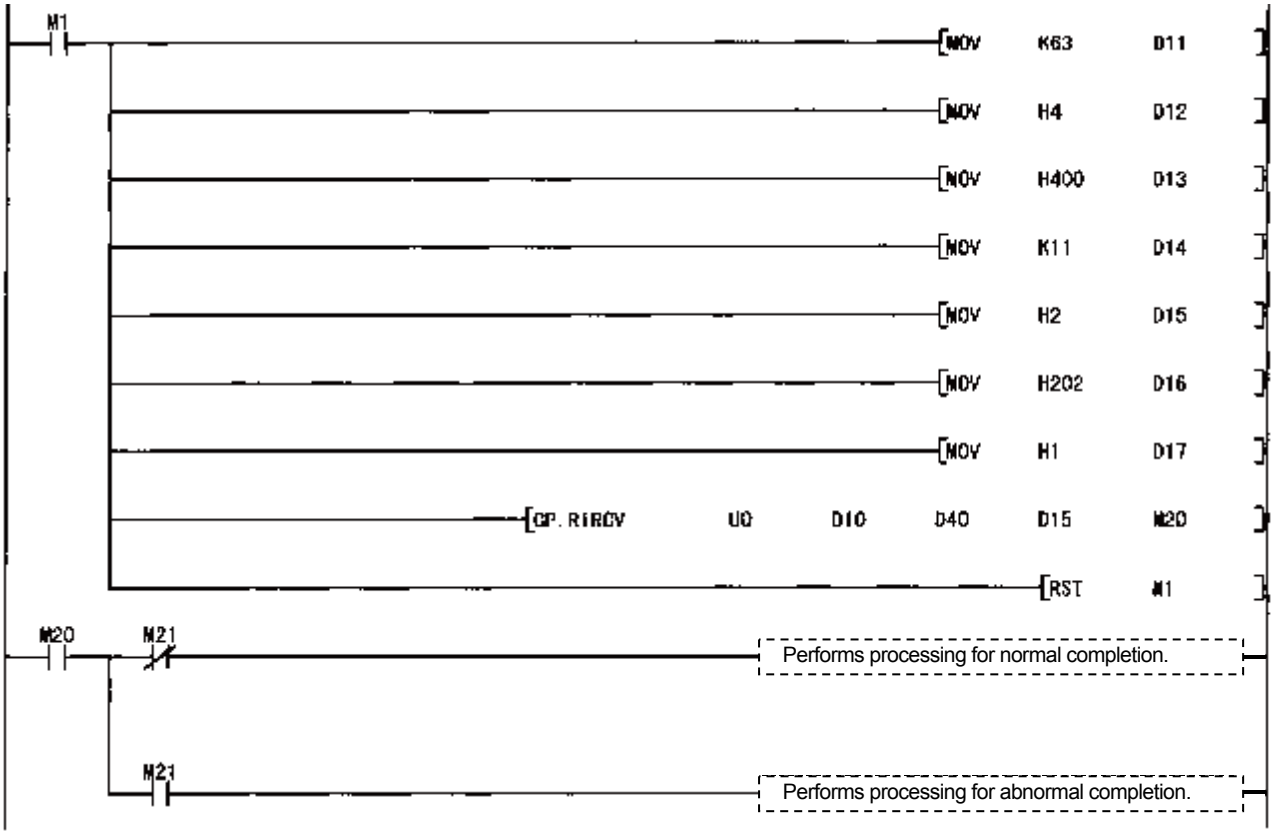
In the following cases, an operation error occurs; the error flag (SM0) turns ON and the error code is stored in SD0.

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 an unsupported instruction.
4003	When the number of devices in the instruction is incorrect.
4004	When the instruction specifies a device that cannot be used.
4100	When the instruction contains the data that cannot be used.
4101	When the number of data set to be used exceeds the allowable range. Or, when the storage data or constants of the device specified with the instruction exceeds the allowable range.

(3) Program example

When M1 turns ON, 11-word data in the buffer memory address 400H and later of the intelligent device station No.63 (AJ65BT-R2N), which is connected to the master module installed in the position of I/O No. X/Y00 to X/Y1F, are read out to the area starting from D40.

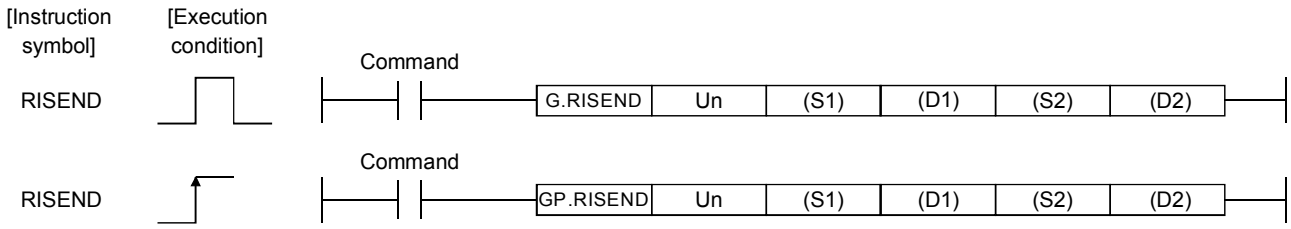
The settings of the handshaking signal storage device (S2) are as follows: request device RY2, completion device RX2, error code storage device RWr2, and completion mode 1.



Appendix 4.4 RISEND instruction

The RISEND instruction writes data to the buffer memory of the specified intelligent device station, and turn on the remote output (RY) which is used as the handshaking signal.
Also, when the remote input (RX) which is used as the handshaking signal turned on, remote output is turned off.
The data writing and remote output ON/OFF switching are performed automatically.

Set 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)	○			—				—	—	—



Set data

Device	Description	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 device	Device name
(D1)	Start number of the device to which write data is to be stored.	Within the range of the specified device	
(S2)	Start number of the device in which the handshaking signals are stored. This device specifies the number of the remote input and remote output that are used as the handshaking signals.	Within the range of the specified device	
(D2)	Device that is turned ON for one scan upon completion of writing. (D) + 1 also turns ON at an abnormal completion.	Within the range of the specified device	Bit

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

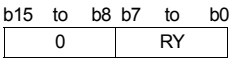
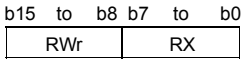
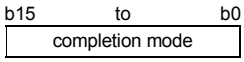
Control data

Device	Item	Set data	Setting range	Set by
(S1)+0	Completion status	Stores the status when the instruction is complete. 0 :No error (normal completion) Other than 0: Error code	—	System
(S1)+1	Station number	Specify the station number of the intelligent device station.	0 to 64	User
(S1)+2	Access code Attribute code	Set "0004$_H$".	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 write data count (in word units).	1 to 480*2	User

*1 Refer to the manual for the intelligent device station to which data will be written.

*2 Indicates the maximum number of data items that can be written.
Specify the buffer memory capacities of the intelligent device station and the receive buffer area setting range to be set with a parameter.

Handshaking signal storage devices

Device	Item	Set data	Setting range	Set by
(S2)+0		RY: Request device	0 to 127	User
		Set the upper 8 bits to 0.	0	User
(S2)+1		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		0: Complete with ON→OFF of 1 device (RXn specified by (S2)+1) 1: Complete with ON→OFF of 2 devices (RXn, RXn+1 specified by (S2)+1) (RXn+1 turns ON at an abnormal completion.)	0/1	User

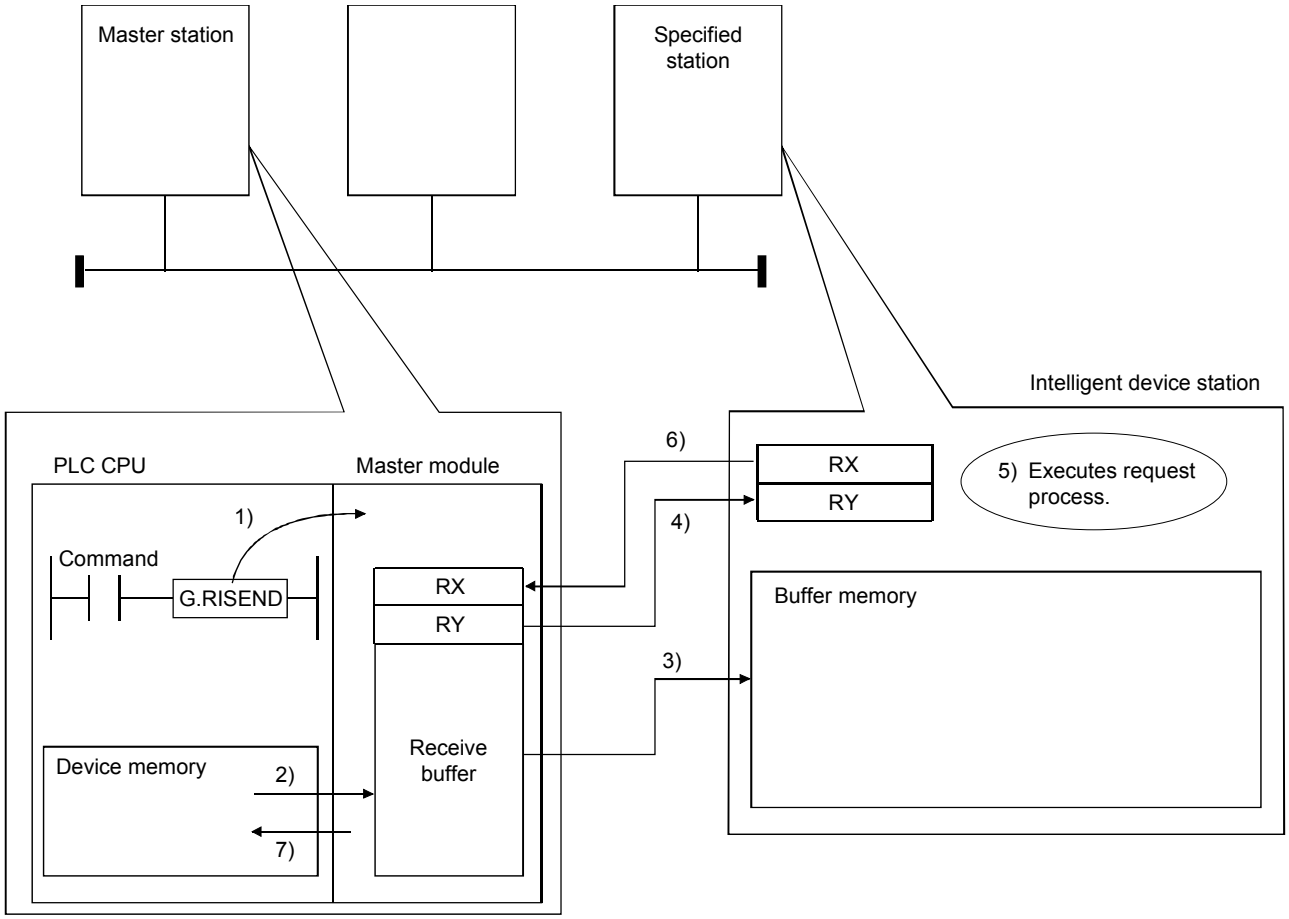
*1 For the error code storage device, specify the remote register number where the error code at reception with the start of the target intelligent device station remote register "RWr0".
When a transmission error occurs, the contents of the error code storage device are also stored in the control data completion status.

*2 For the request device, specify the remote output (RY) number which is turned on for notifying the data read completion to the intelligent device station with the start of the remote output for the target intelligent device station "RY0".
(Specify the handshaking signals for output)

*3 For the completion device, specify the remote input (RX) number which is referred as a processing completion timing (OFF → ON) to a processing request after data writing to the intelligent device station with the start "RX0".
(Specify the handshaking signals for input)

(1) Functions

(a) Operation chart for the RISEND instruction



1) Instructs the master module to write data to the buffer memory specified in (S1) + 2 and (S1) + 3 of the station specified in (S1) + 1 and to execute the specified handshaking signal process.
2) Stores the data to be written to the specified station in the send buffer of the master module.
3) Data are written to the buffer memory specified in (S1) + 2 and (S1) + 3 of the station specified in (S1) + 1.
4) The master module turns on the handshaking signal RYn specified by (S2) + 0.
5) The station specified in (S1) + 1 performs the process for the handshaking signal RYn.
6) Upon completion of the process for the handshaking signal RYn, the station specified in (S1) + 1 turns on the handshaking signal RYn specified in (S2) + 1.
   Also, the response indicating write completion to the master module is returned.
7) The device specified in (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 completion (D2)+1.

1) Completion device

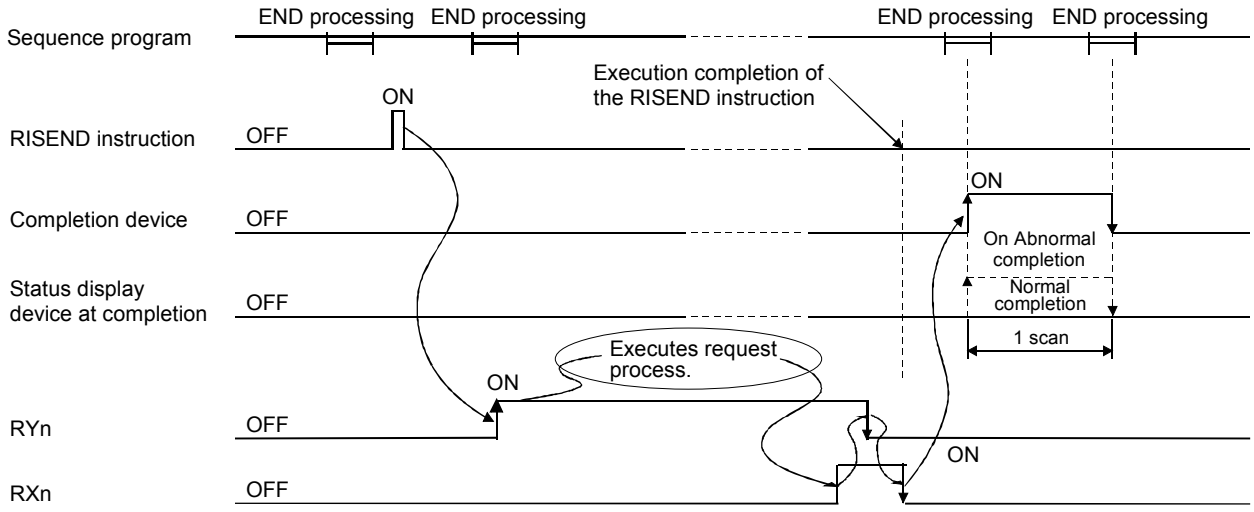
Turns ON in the END processing of the scan where the RISEND instruction is completed, and turns OFF in the next END processing.

2) Status display device at completion

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

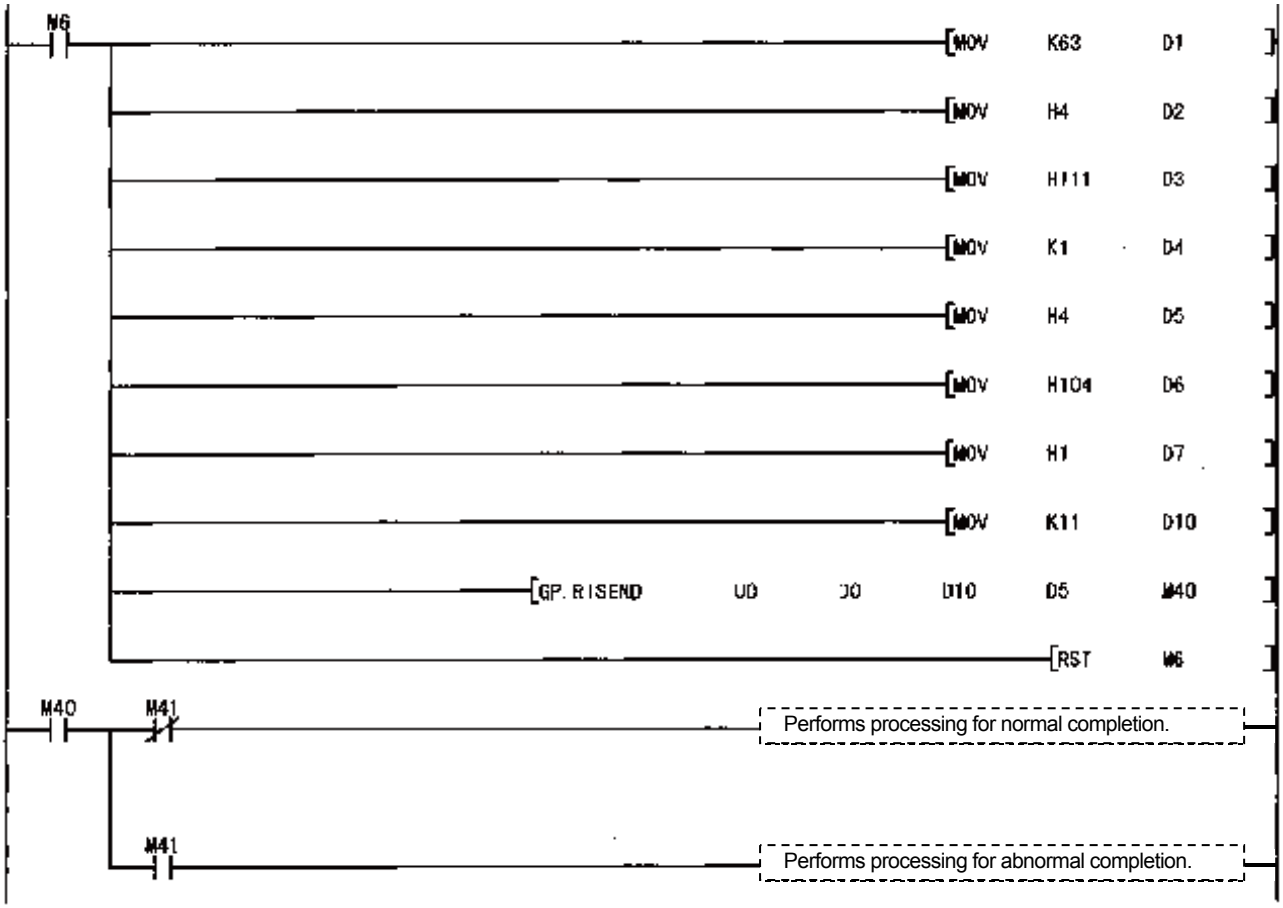
In the following cases, an operation error occurs; the error flag (SM0) turns ON and the error code is stored in SD0.

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 an unsupported instruction.
4003	When the number of devices in the instruction is incorrect.
4004	When the instruction specifies a device that cannot be used.
4100	When the instruction contains the data that cannot be used.
4101	When the number of data set to be used exceeds the allowable range. Or, when the storage data or constants of the device specified with the instruction exceeds the allowable range.

(3) Program example

When M6 is turned ON, 1-word data are written from the area starting D0 into the buffer memory address 111H of the intelligent device station No.63, which is connected to the master module installed in the position of I/O No. X/Y00 to X/Y1F.

The settings of the handshaking signal storage device (S2) are as follows: request device RY4, completion device RX4, error code storage device RWr1, and completion mode 1.

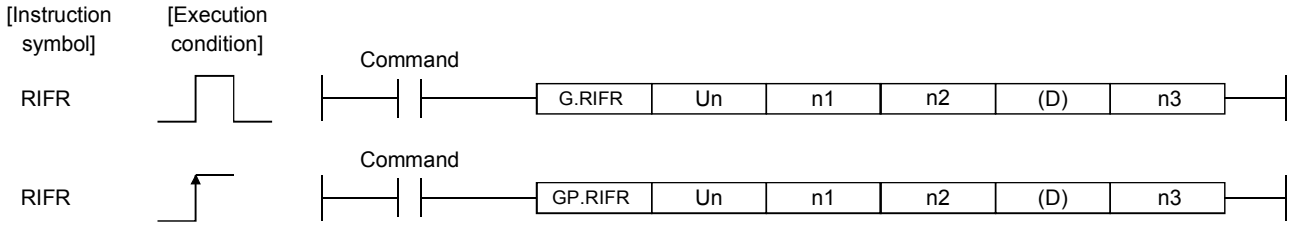


Appendix 4.5 RIFR instruction

Targeting the buffer memory on master module of host station, reads data from the automatic update buffer or random access buffer for the specified station.

* The RIFR instruction can be executed in the master station only.

Set 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	○	○		—				○	—	—



Set data

Device	Description	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 address of master module • The automatic update buffer of the specified intelligent device station • Random access buffer	Between 0 and parameter setting value*1	
(D)	Start number of the device to which read data is to be stored.	Within the range of the specified device	Device
n3	Number of points to read	0 to 4096*2	Binary 16 bits

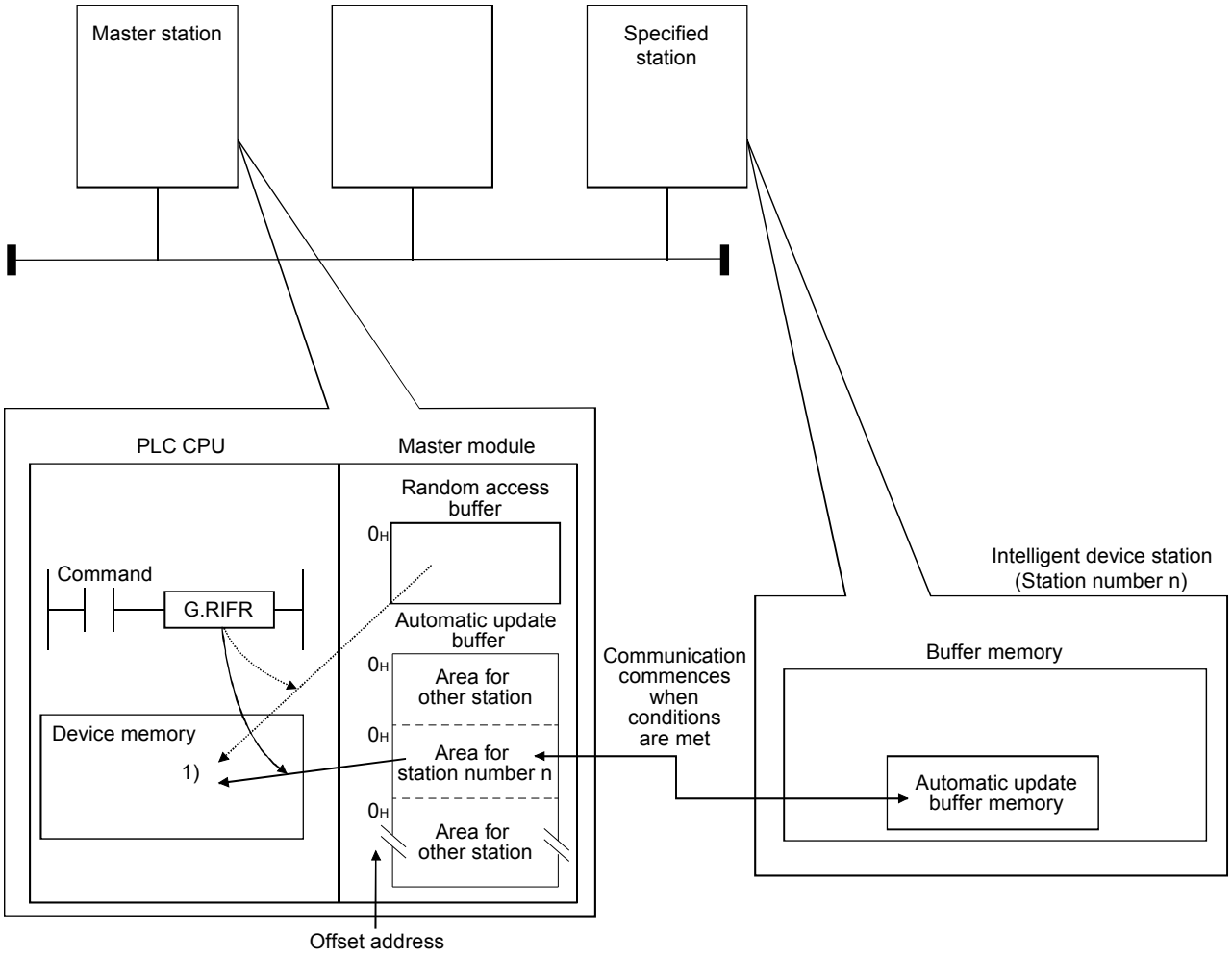
*1: The value set in the "Station Information Setting" of the network parameters of GX Works2.

- When reading the data from the automatic update buffer of the intelligent device station, specify the start area of the automatic update buffer for the specified station with the offset address of address 0.
- When reading the data from the random access buffer, specify the start area of the random access buffer with the offset address of address 0.

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

(1) Functions

(a) Operation chart for the RIFR instruction



1) Read the data from either of the following specified by n1 and n2 of the master module specified by Un.
   - The automatic update buffer of the intelligent device stationspecified by n1 and n2
   - The random access buffer specified by n1 and n2

   Stores the data read 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 Setting" in the "Network Parameter" window of GX Works2.

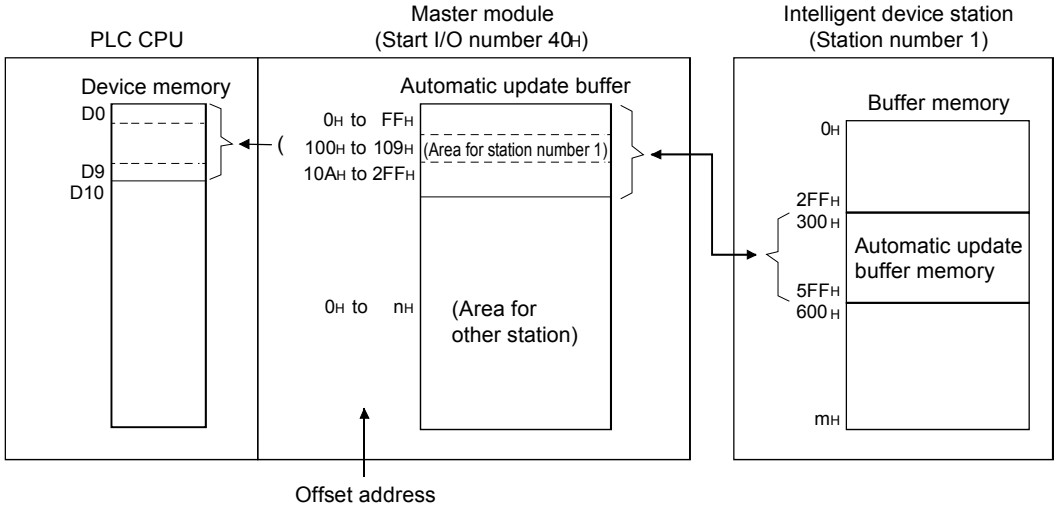
(2) Operation error

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

Error code	Description of operation error
2112	When the module specified by Un is not an intelligent function module.
	When the module specified by Un is not a special function module.
4002	When an attempt was made to execute an unsupported instruction.
4003	When the number of devices in the instruction is incorrect.
4004	When the instruction specifies a device that cannot be used.
4100	When the setting for number of points to read (n3) is outside of the setting range.
	When the station number specified with n1 does not exist.

(3) Program example

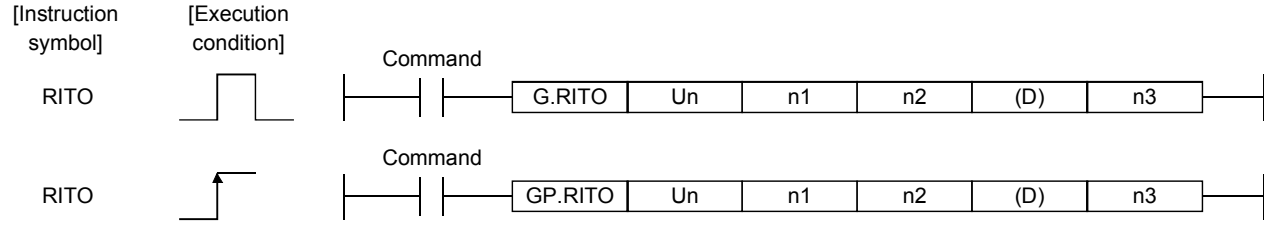
When X0 is turned ON, this program reads 10-word data to D0 or succeeding addresses from the automatic update buffer offset value of 100H (400H of the intelligent device station) in the area for station No. 1 of the master module.



Appendix 4.6 RITO instruction

Targeting the buffer memory on master module of host station, writes data to the automatic update buffer or random access buffer for the specified station.
The RITO instruction can be executed in the master station only.

Set 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	○	○		—				○	—	—



Set data

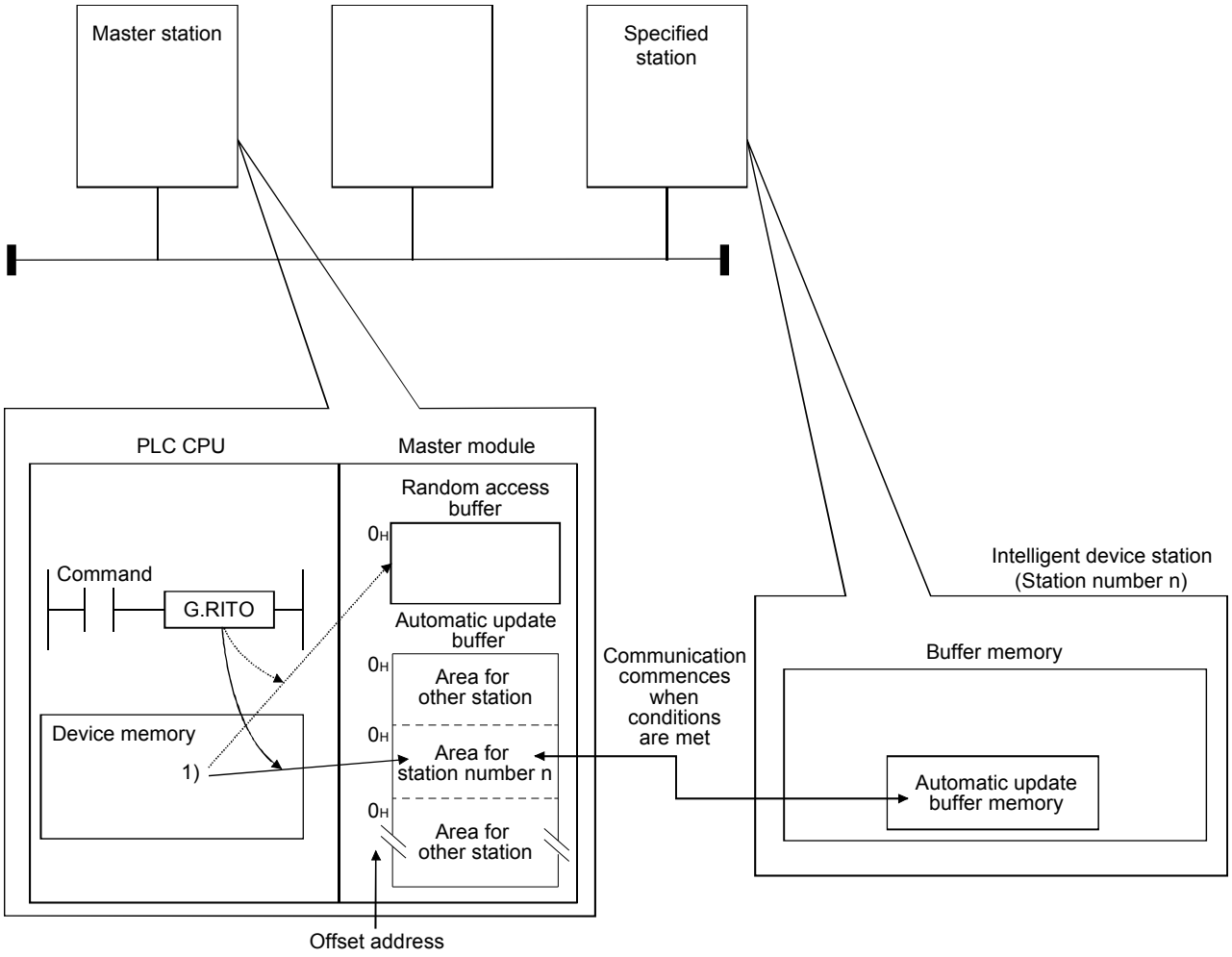
Device	Description	Setting range	Data type
Un	Start I/O number of the module	0 to FE_H	Binary 16 bits
n1	Intelligent device station number	1 to 64	
	Random access buffer specification	FF_H	
n2	Any of the following offset address of master module • The automatic update buffer of the specified intelligent device station • Random access buffer	Between 0 and parameter setting value*1	
(D)	Start number of the device to which write data is to be stored.	Within the range of the specified device	Device
n3	Number of points to write	0 to 4096*2	Binary 16 bits

*1: The value set in the "Station Information Setting" of the network parameters of GX Works2.
- When writing the data to the automatic update buffer of the intelligent device station, specify the start area of the automatic update buffer for the specified station with the offset address of address 0.
- When writing the data to the random access buffer, specify the start area of the random access buffer with the offset address of address 0.

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

(1) Functions

(a) Operation chart for the RITO instruction



1) Write the data to either of the following specified by n1 and n2 of the master module specified by Un.
   - The automatic update buffer of the intelligent device stationspecified by n1 and n2
   - The 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 Setting" in the "Network Parameter" window of GX Works2.

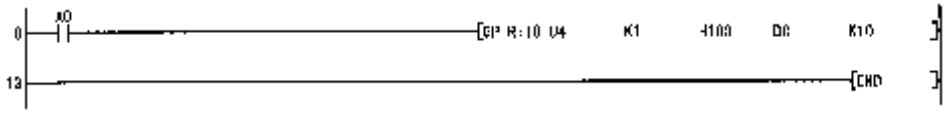
(2) Operation error

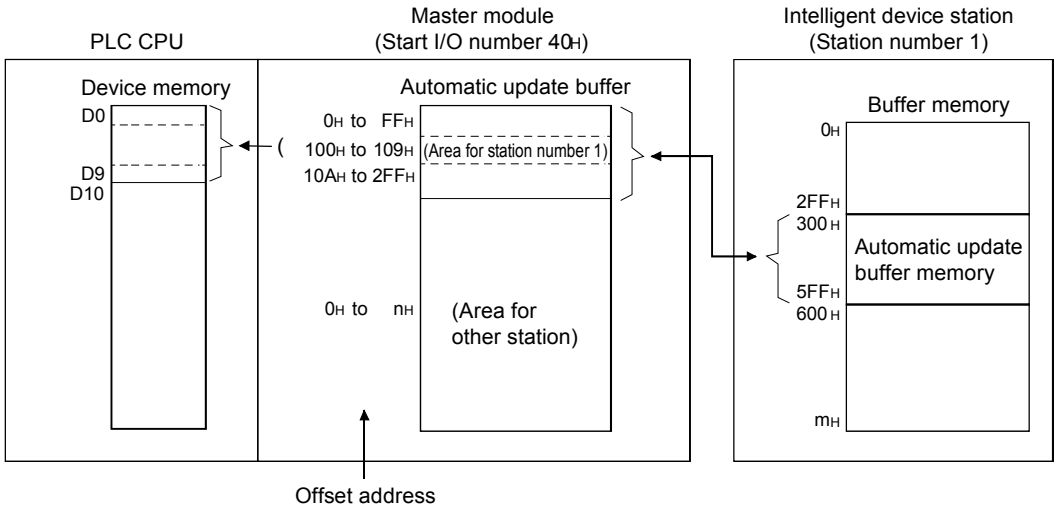
In the following cases, an operation error occurs; the error flag (SM0) turns ON and the error code is stored in SD0.

Error code	Description of operation error
2112	When the module specified by Un is not an intelligent function module.
	When the module specified by Un is not a special function module.
4002	When an attempt was made to execute an unsupported instruction.
4003	When the number of devices in the instruction is incorrect.
4004	When the instruction specifies a device that cannot be used.
4100	When the setting for number of points to write (n3) is outside of the setting range.
	When the station number specified with n1 does not exist.

(3) Program example

When X0 is turned ON, this program writes 10-word data from D0 to the automatic update buffer offset value starting from 100H (corresponding to 400H of the intelligent device station) in the area for station No. 1 of the master module.



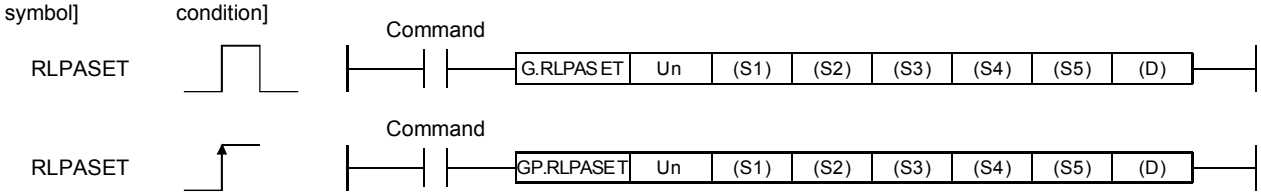


Appendix 4.7 RLPASET instruction

Sets the network parameters to the master module and starts the data link.

Set 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]



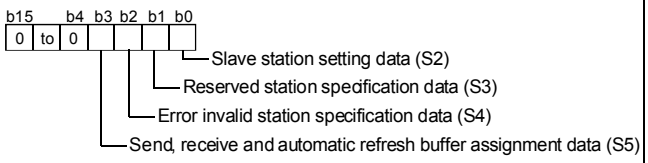
Set data

Device	Description	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 device	Device name
(S2)*	Start number of the device in which slave station setting data is stored.	Within the range of the specified device	
(S3)*	Start number of the device in which reserved station specification data is stored.	Within the range of the specified device	
(S4)*	Start number of the device in which error invalid station specification data is stored.	Within the range of the specified device	
(S5)*	Start number of the device in which send, receive and automatic refresh buffer assignment data is stored.	Within the range of the specified device	
(D)	Device that is turned ON for one scan upon completion of settings. (D) + 1 also turns ON at an abnormal completion.	Within the range of the specified device	Bit

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

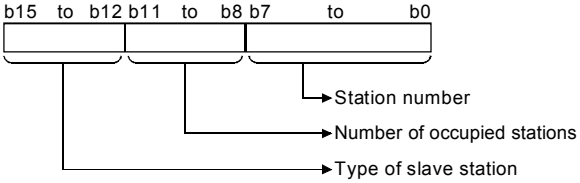
* When the setting data for (S2) to (S5) are not to be set, specify a dummy device.

Control data

Device	Item	Set data	Setting range	Set by
(S1)+0	Completion status	Stores the status when the instruction is complete. 0 : No error (normal completion) Other than 0: Error code	—	System
(S1)+1	Setting flag	Specify whether the individual setting data from (S2) to (S5) is valid or invalid. 0: Invalid*1 1: Valid 	—	User
(S1)+2	Number of connected modules involved in communication	Set the total number of the modules connected to the CC-Link system.	1 to 64	
(S1)+3	Number of retries	Set the number of retries to a communication faulty station.	1 to 7	
(S1)+4	Number of automatic return modules	Set the number of slave stations that can be returned per one link scan.	1 to 10	
(S1)+5	Operation specification when CPU is down	Specify the data link status when a master station PLC CPU error occurs. 0: Stop 1: Continue	0, 1	
(S1)+6	Scan mode specification	Specify either the synchronous or asynchronous mode for sequence scan. 0: Asynchronous 1: Synchronous	0, 1	
(S1)+7	Delay time setting	Set the link scan interval. (Unit: 50μs)	0 to 100	

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

Slave station setting data

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

Reserved station specification data

<table>
<tr><th>Device</th><th>Item</th><th>Set data</th><th>Setting range</th><th>Set by</th></tr>
<tr><td>(S3)+0
to
(S3)+3</td><td>Setting for 1 to 64 modules
*3</td><td>Specify reserved stations.*4
0: Not specified 1: Specified
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>(S3)+0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>(S3)+1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>(S3)+2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>(S3)+3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>1 to 64 in the table indicate station numbers.

The default parameter setting is "No reserved station specification for all stations."</td><td>—</td><td>User</td></tr>
</table>

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

*4 Specify only the start 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

<table>
<tr><th>Device</th><th>Item</th><th>Set data</th><th>Setting range</th><th>Set by</th></tr>
<tr><td>(S4)+0
to
(S4)+3</td><td>Setting for 1 to 64 modules
*5</td><td>Specify the error invalid station.*6
0: Not specified 1: Specified
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>(S4)+0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>(S4)+1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>(S4)+2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>(S4)+3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>1 to 64 in the table indicate station numbers.

The default parameter setting is "No error invalid station specification for all stations."</td><td>—</td><td>User</td></tr>
</table>

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

*6 Specify only the start station number of a module in the case of a remote station, local station or intelligent device station that occupies 2 or more stations.
The reserved station specification is given the higher priority if both error invalid station and reserved station specifications are made for the same station.

Send, receive and automatic refresh buffer assignment data

Device	Item	Set data	Setting range	Set by
(S5)+0 to (S5)+77	Setting for 1 to 26 modules *7	Specify assignments of buffer memory size at transient transmission to local stations and intelligent device stations. (S5)+0 Send buffer size (S5)+1 Receive buffer size (S5)+2 Automatic refresh buffer size } Settings for the first module to (S5)+75 Send buffer size (S5)+76 Receive buffer size (S5)+77 Automatic refresh buffer size } Settings for the 26th module The default parameter settings are "send buffer size: 40H, receive buffer size: 40H, automatic refresh buffer size: 80H."	Send/receive buffer*8 : 0H (no setting), 4040H to 1000H (word) 64 to 4096 (words) Automatic update buffer*9 : (no setting), 8040H to 1000H (word) 128 to 4096 (words)	User

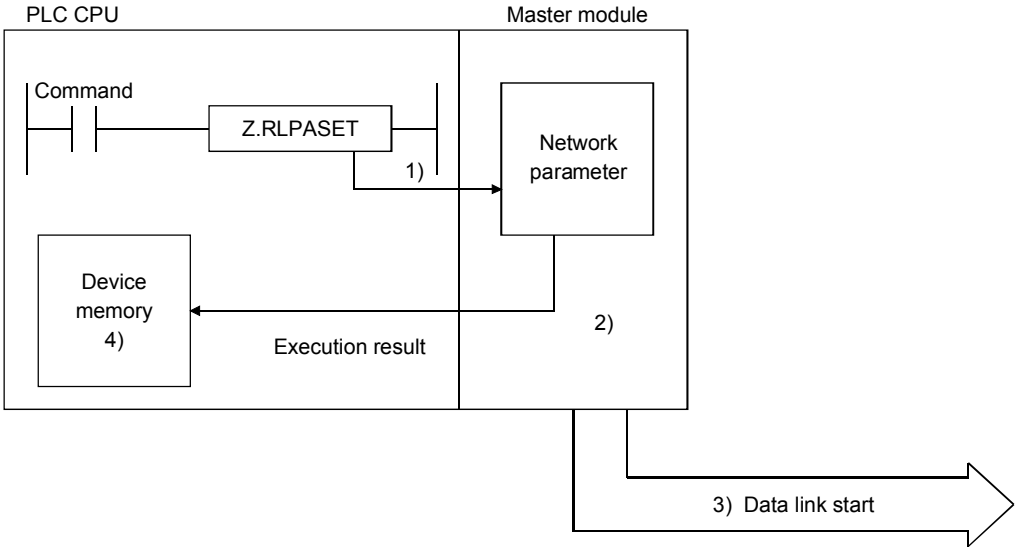
*7 Perform the settings for stations specified as local stations or intelligent device stations in the slave station setting data, starting from the smallest station number.

*8 Keep the total size of the send and receive buffer sizes at 1000H (4096 (words)) or less.
Specify the size of data to be sent and received plus 7 words for the send and receive buffer sizes, respectively.

*9 Keep the total size of the automatic refresh 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 only possible to execute one RLPASET instruction at a time.

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

1) Completion device

Turns ON in the END Processing of the scan where the RLPASET instruction is completed, and turns OFF in the next END processing.

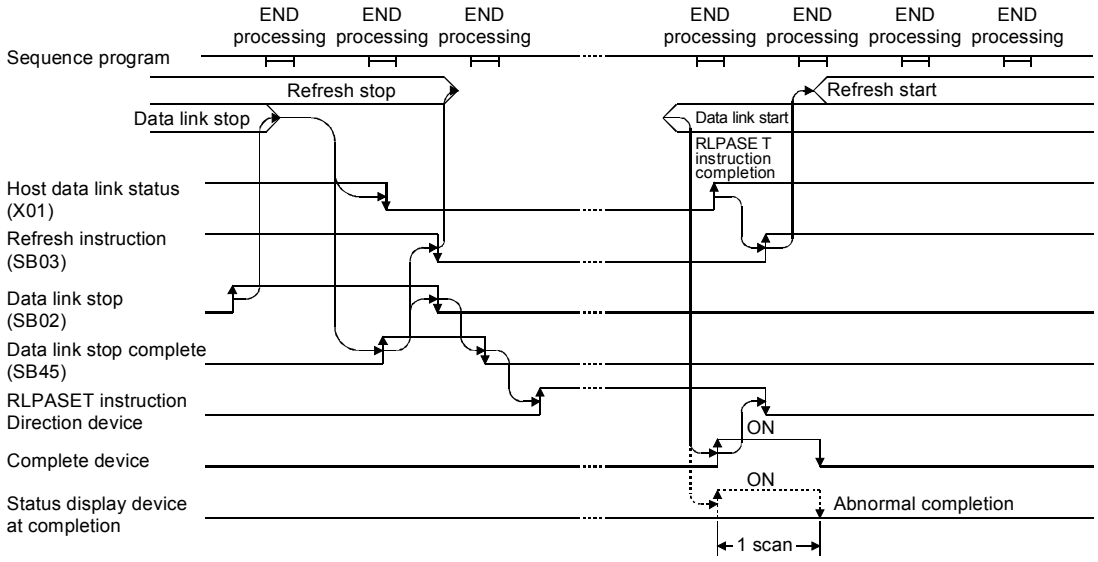
2) Status display device at completion

Turns ON and OFF depending on the completion status of the RLPASET instruction.

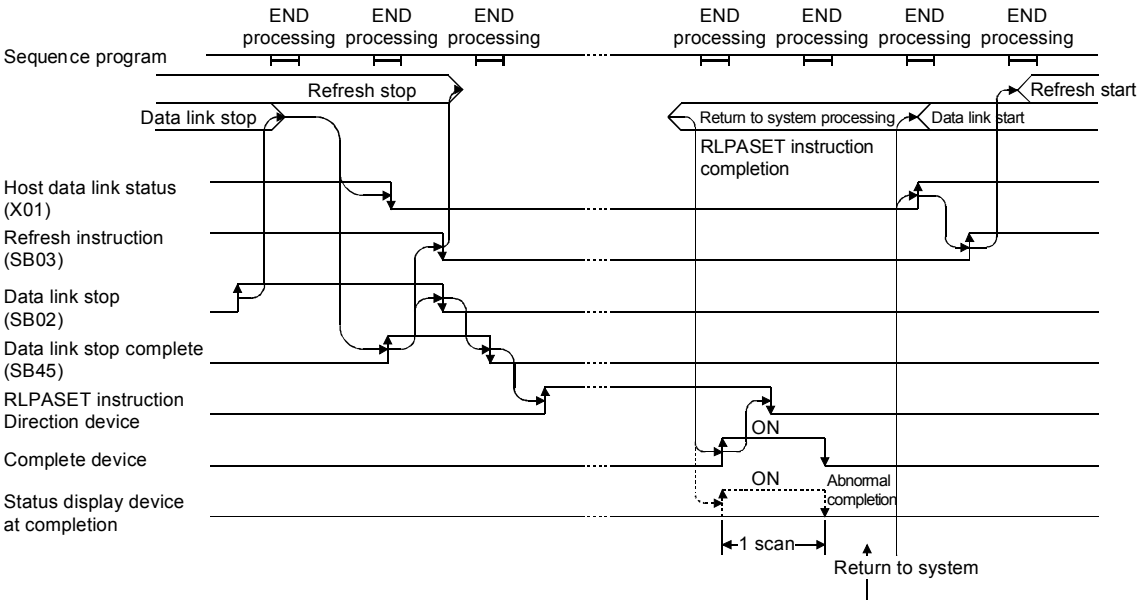
Normal completion: Stays OFF and does not change.

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]



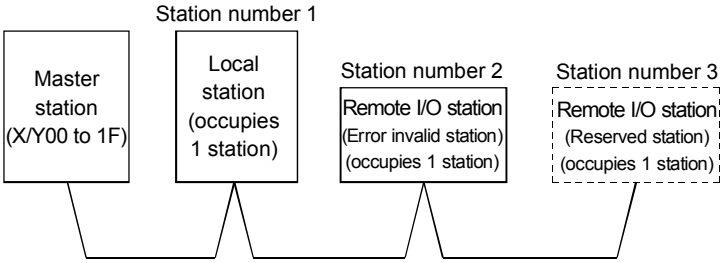
(2) Operation error

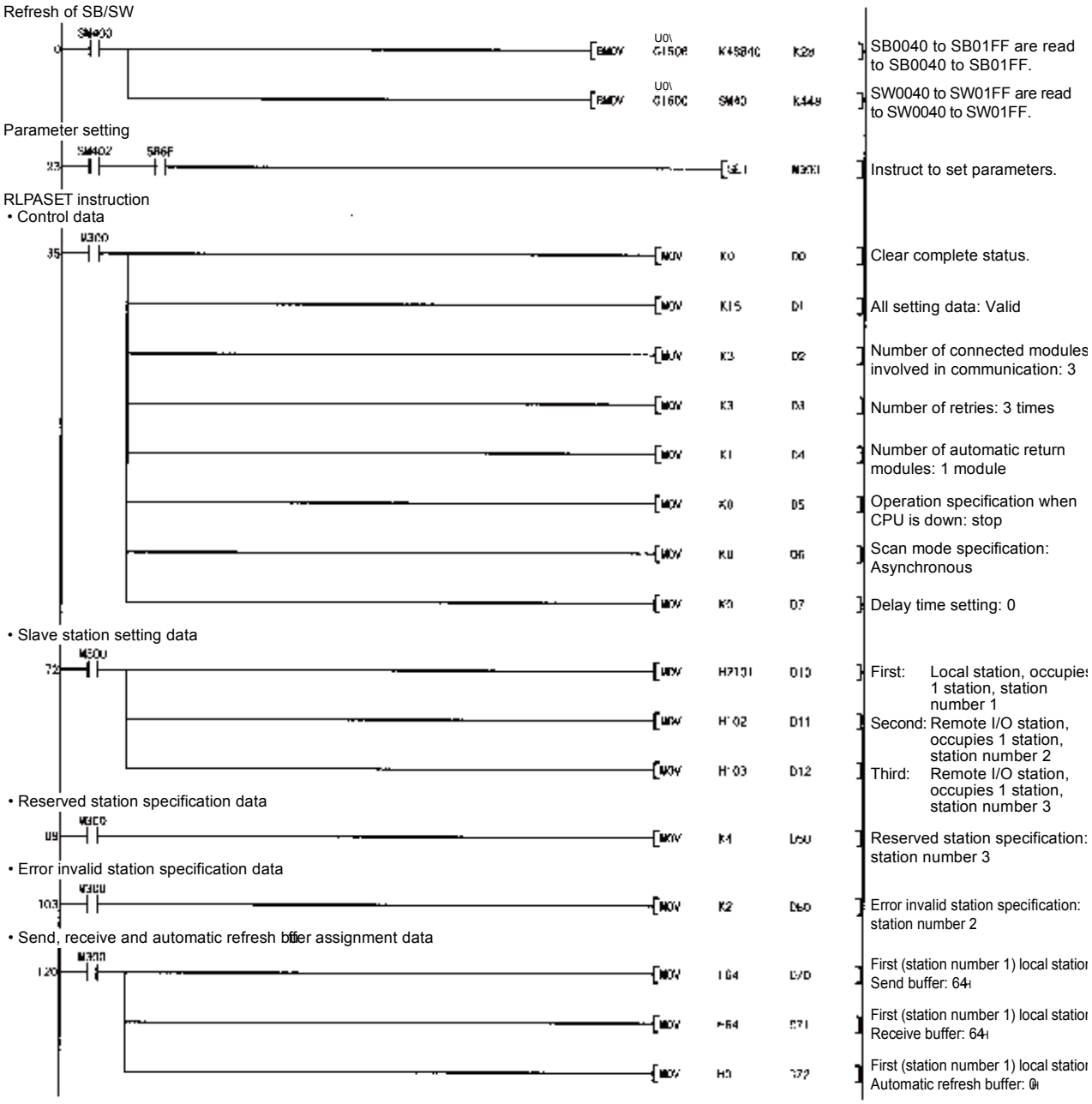
In the following cases, an operation error occurs; the error flag (SM0) turns ON and the error code is stored in SD0.

Error code	Description of operation error
2112	When the module specified by Un is not an intelligent function module.
4002	When an attempt was made to execute an unsupported instruction.
4003	When the number of devices in the instruction is incorrect.
4004	When the instruction specifies a device that cannot be used.
4100	When the instruction contains the data that cannot be used.
4101	1) When the number of points for data used in the instruction exceeds the available range Or, when the storage data or constants of the device specified with the instruction exceeds the allowable range. (including dummy devices) 2) The number of points required for each data is shown below. • Control data : 8 points • Slave station setting data : 64 points • Reserved station specification data : 4 points • Error invalid station specification data : 4 points • Send, receive and automatic refresh buffer assignment data : 78 points Example: Assume that data link registers D0 to D12287 are available for the Q02CPU. If the device head number of the slave station setting data is set to D12284 because there are only 4 slave stations, the PLC CPU nonetheless checks the range from D12284 to D122347 (for 64 stations) and an error indicating that the available range is exceeded occurs.

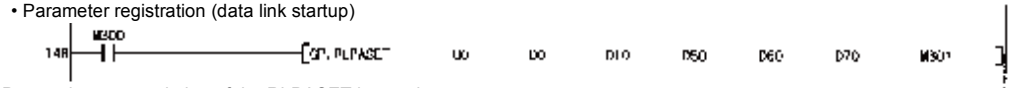
(3) Program example

This program sets the network parameters for the master module with I/O numbers X/Y00 to X/Y1F and starts the data link.

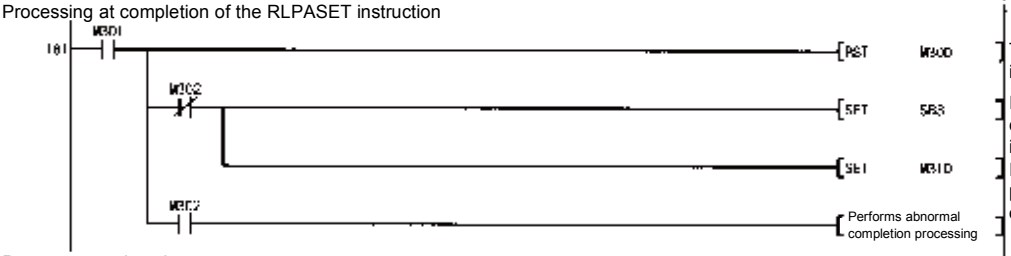




• Parameter registration (data link startup)



Processing at completion of the RLPASET instruction

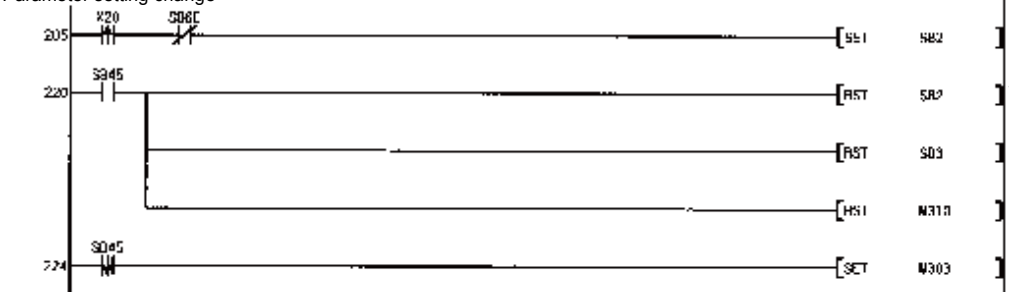


Turn the parameter setting instruction off.

Instruct to refresh at normal completion of the RLPASET instruction.

Instruct to start the control program at normal completion of the RLPASET instruction.

Parameter setting change



Instruct to stop data link.

Turn the data link stop instruction off.

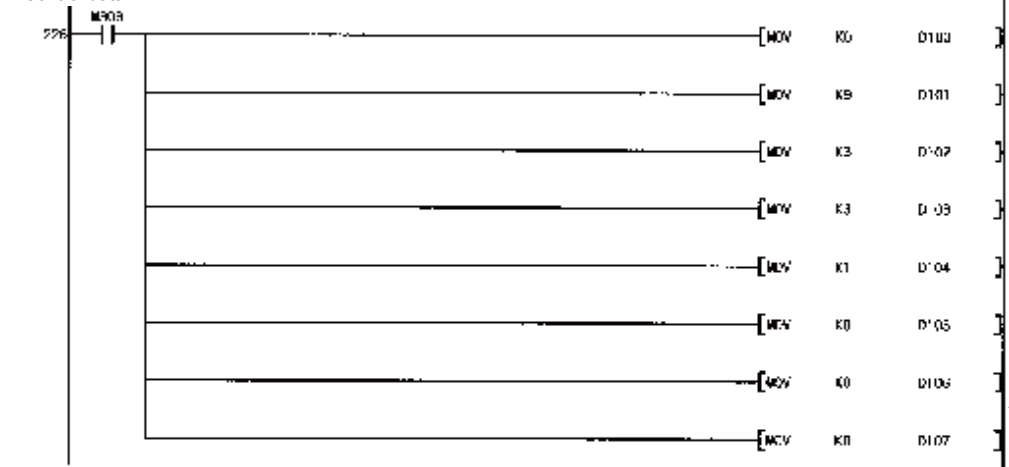
Instruct to stop refreshing.

Instruct to stop control program.

Instruct to change parameters.

RLPASET instruction

• Control data



Clear complete status.

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

Number of connected modules involved in communication: 3

Number of retries: 3 times

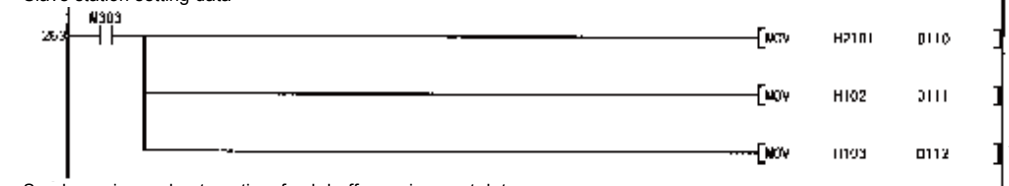
Number of automatic return modules: 1 module

Operation specification when CPU is down: Stop

Scan mode specification: Asynchronous

Delay time setting: 0

• Slave station setting data

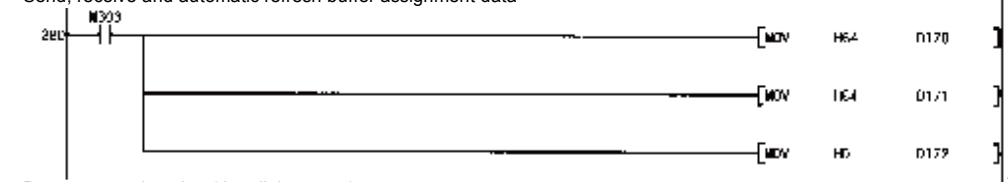


First: Local station, occupies 1 station, station number 1

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

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

• Send, receive and automatic refresh buffer assignment data



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

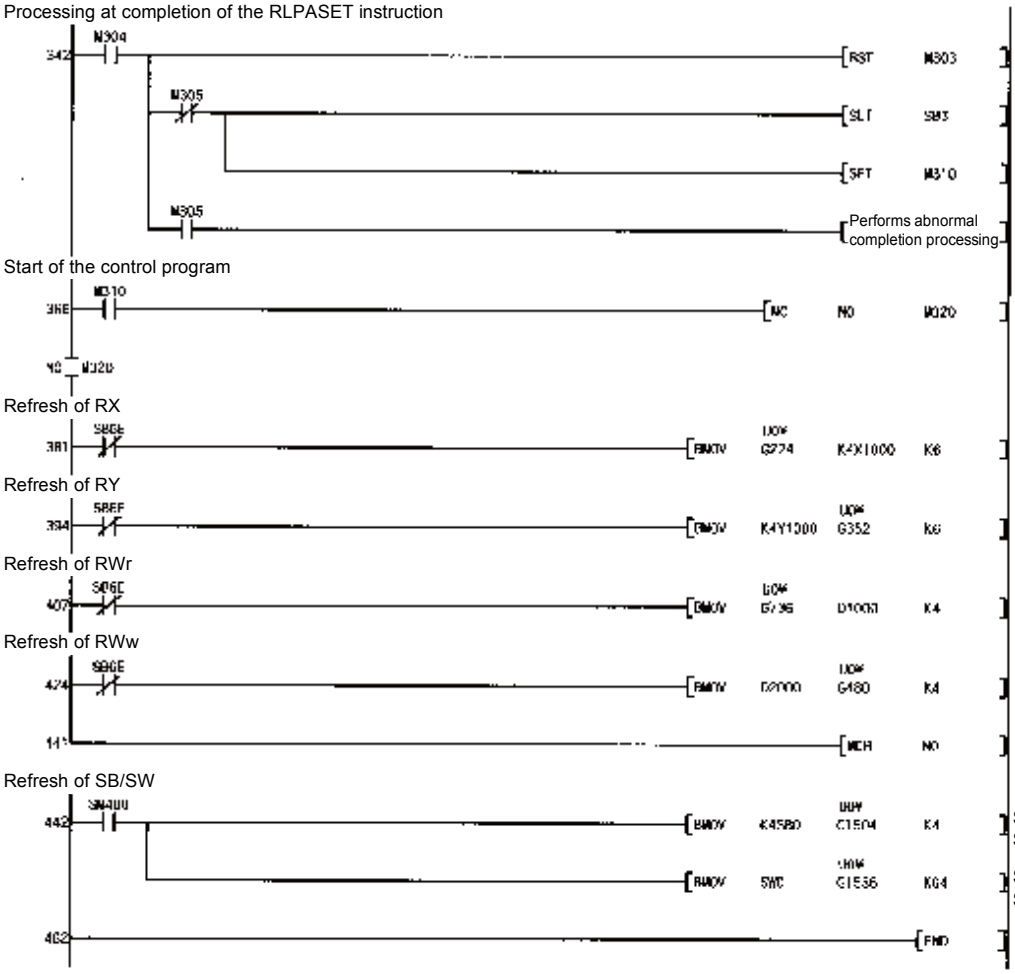
First (station number 1) local station Receive buffer: 64H

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

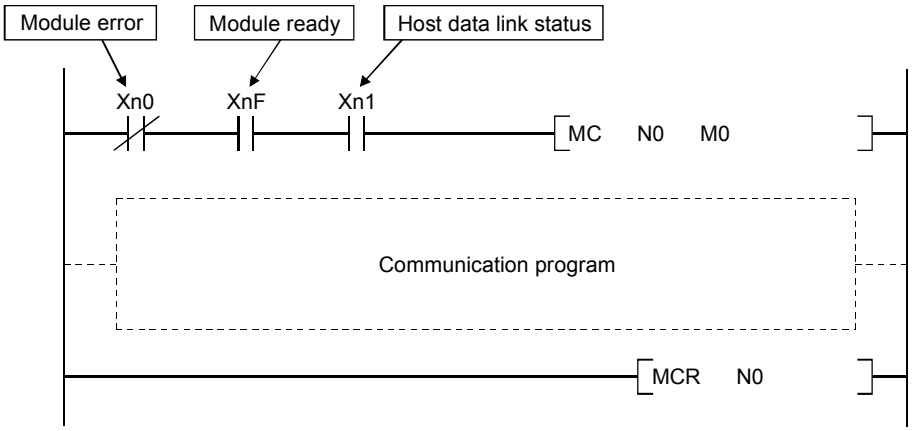
• Parameter registration (data link startup)

Dedicated instruction (RLPASET)

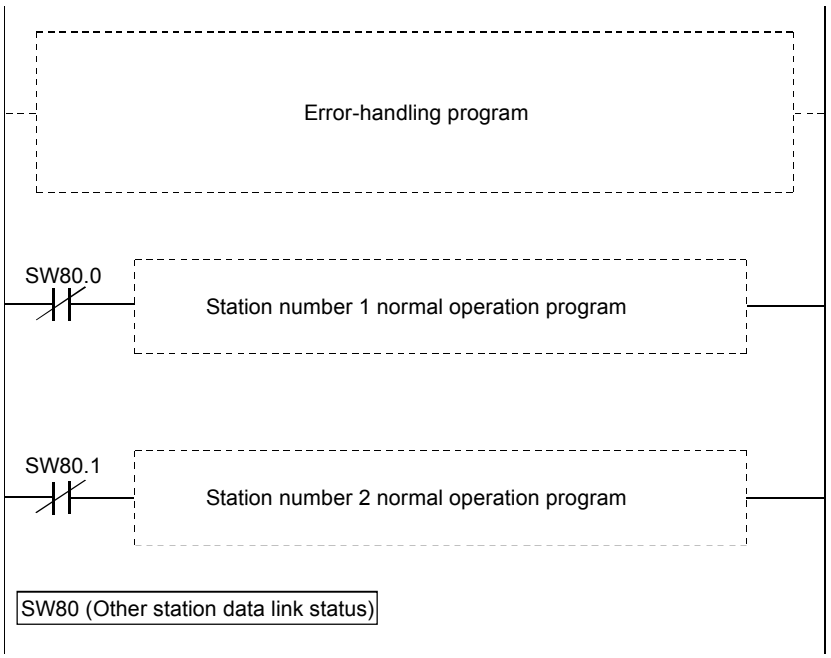
Processing at completion of the RLPASET instruction



(1) Create a program so that receive data reading and send data writing are performed after the host station started the data link (Xn1 is ON).



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



APPENDIX 6 I/O Signal/Remote register allocation list for the AJ65BT-64AD

(1) I/O signal list

The AJ65BT-64AD uses 32 input points and 32 output points for 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	Offset/gain value selection
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	Unusable
RXn3	CH.4 A/D conversion completion flag		
RXn4 to RX(n+1)7	Unusable		
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	Unusable
RX(n+1)C to RX(n+1)F	Unusable		

n: Address allocated to the master module by the station number setting.

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

(2) Remote register allocation

Signal direction	Address	Description	Default value
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	Unusable	―
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	Unusable	―
	RWrn+6		
	RWrn+7		

m, n: Address allocated to the master module by the station number setting.

POINT

Do not read/write to unusable remote registers. If read/write is performed, the functions of the AJ65BT-64AD cannot be guaranteed.

APPENDIX 7 I/O Signal/Remote register allocation list for the AJ65BT-64DAV

(1) I/O signal list

The AJ65BT-64DAV uses 32 input points and 32 output points for 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	Unusable	RYn0	CH.1 analog output enable signal
		RYn1	CH.2 analog output enable signal
		RYn2	CH.3 analog output enable signal
		RYn3	CH.4 analog output enable signal
		RYn4	Offset/gain value selection
		RYn5 to RYnF	Unusable
RX(n+1)0 to RX(n+1)7	Unusable	RY(n+1)0 to RY(n+1)7	Unusable
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	Unusable
RX(n+1)C	Unusable	RY(n+1)C	
RX(n+1)D		RY(n+1)D	
RX(n+1)E	(Unusable: QnA)	RY(n+1)E	(Unusable: QnA)
RX(n+1)F		RY(n+1)F	

n: Address allocated to the master station by the station number setting.

POINT

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

(2) Allocation of the remote register

Signal direction	Address	Description	Default value
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	Unusable	
	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	Unusable	
	RWrn+6		
	RWrn+7		

m, n: Address allocated to the master station by the station number setting.

POINT

Do not read/write to unusable remote registers. If read/write is performed, the functions of the AJ65BT-64DAV cannot be guaranteed.

APPENDIX 8 I/O Signal/Buffer memory list for the AJ65BT-R2N

(1) I/O signal list

Signal direction: Master module←R2N			Signal direction: Master module→R2N		
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	Unusable	
RXn6	OS reception area clear complete		RYn6	OS reception area clear request	
RXn7	E^2PROM function normal complete		RYn7	E^2PROM function request	
RXn8	E^2PROM function error complete		RYn8	Unusable	
RXn9	Signal status	CS (CTS) signal	RYn9	Signal setting	RS (RST) signal*1
RXnA		DR (DSR) signal	RYnA		ER (DTR) signal*2
RXnB		CD signal	RYnB	Unusable	
RXnC to RXnD	General-purpose external input signal		RYnC to RYnD	General-purpose external output signal	
RXnE to RX(n+1)8	Unusable		RYnE to RY(n+1)8	Unusable	
RX(n+1)9	Initial data read complete		RY(n+1)9	Initial data read request	
RX(n+1)A	Error state		RY(n+1)A	Error reset request	
RX(n+1)B	Remote station ready		RY(n+1)B to RY(n+1)D	Unusable	
RX(n+1)C to RX(n+1)D	Unusable				
RX(n+1)E	Intelligent device station access complete		RY(n+1)E	Intelligent device station access request	
RX(n+1)F	Unusable		RY(n+1)F	Unusable	

n: Address allocated to the master module by the station number setting.

*1 The RS signal setting is valid when the "RS signal status designation (R2N 101H)" is set to "Follow RYn9 ON/OFF (0)".

*2 The ER signal setting is invalid when the "Flow control designation (R2N 100H)" is set to "Carry out 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 RYn9, RYnB, or RYnE to RY (N+1)F signals to the following functions.
- Monitor target RX/RY for monitor transmission function
- Reference RX/RY for registration frame RX/RY/RW reference special character.

(2) Do not output (turn ON) the unusable RY signals.
If an output is carried out to a unusable signal, the PLC system could malfunction.

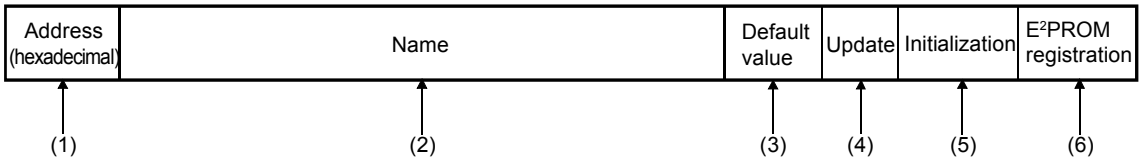
(2) Buffer memory list

The entire configuration of the AJ65BT-R2N (it will be referred to as R2N below) buffer memory is explained in this section.

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

However, if the user has registered the default values in the R2N E^2PROM, the E^2PROM default values will be written in when the power is turned ON.

Refer to the buffer memory list in the following manner.



No.	Name	Description
(1)	Address	Indicates R2 buffer memory address as a hexadecimal.
(2)	Name	Indicates the name of the R2 buffer memory.
(3)	Default value	Indicates the default value at 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 • RN2 : Updated by R2 • Both : Updated by both master station and R2
(5)	Initialization	Indicates whether initialization is required when the R2 buffer memory values have been changed. Refer to R2N User's Manual (Details) for details on initialization. • Required : Initialization is required. • Not required : Initialization is not required.
(6)	E^2PROM registration	Indicates whether the contents of the R2 buffer memory can be registered in the R2 E^2PROM. Refer to R2N User's Manual (Details) for details on registering to the E^2. • Possible : Registration to the E^2PROM is possible. • Not possible : Registration to the E^2PROM is not possible.

(a) Area for designating various assignments

Address (hexadecimal)	Name			Default value	Update	Initialization	E^2PROM registration
R2N 0H	Head address designation area		Transmission area head address designation	200H	Both	Required	Possible
R2N 1H			Transmission area size designation	200H			
R2N 2H			Reception area head address designation	400H			
R2N 3H			Reception area size designation	200H			
R2N 4H to FH	System area (Unusable)			———	——	——	——
R2N 10H	Automatic update area designation (*1)	Status storage area	Transmission size	20H	Both	Required	Possible
R2N 11H			R2 side head address	1A0H			
R2N 12H			(Fixed value: 4004H)	4004H			
R2N 13H			Master station side offset address	1A0H			
R2N 14H		Transmission area 1	Transmission size	88H			
R2N 15H			R2 side head address	118H			
R2N 16H			(Fixed value: 4004H)	4004H			
R2N 17H			Master station side offset address	118H			
R2N 18H		Transmission area 2	Transmission size	200H			
R2N 19H			R2 side head address	200H			
R2N 1AH			(Fixed value: 4004H)	4004H			
R2N 1BH			Master station side offset address	200H			
R2N 1CH		Reception area	Transmission size	200H			
R2N 1DH			R2 side head address	400H			
R2N 1EH			(Fixed value: 4004H)	4004H			
R2N 1FH			Master station side offset address	400H			
R2N 20H		Initial setting area	Transmission size	1A0H			
R2N 21H			R2 side head address	0H			
R2N 22H			(Fixed value: 4004H)	4004H			
R2N 23H			Master station side offset address	0H			
R2N 24H		E^2PROM function area	Transmission size	30H			
R2N 25H			R2 side head address	1C0H			
R2N 26H			(Fixed value: 4004H)	4004H			
R2N 27H			Master station side offset address	1C0H			

Address (hexadecimal)	Name			Default value	Update	Initialization	E^2PROM registration
R2N 28H	Automatic update area designation (*1)	User registration frame area	Transmission size	29H	Both	Required	Possible
R2N 29H			R2 side head address	1C7H			
R2N 2AH			(Fixed value: 4004H)	4004H			
R2N 2BH			Master station side offset address	1C7H			
R2N 2CH		Monitor transmission area 1	Transmission size	88H			
R2N 2DH			R2 side head address	118H			
R2N 2EH			(Fixed value: 4004H)	4004H			
R2N 2FH			Master station side offset address	118H			
R2N 30H		Monitor transmission area 2	Transmission size	200H			
R2N 31H			R2 side head address	200H			
R2N 32H			(Fixed value: 4004H)	4004H			
R2N 33H			Master station side offset address	200H			
R2N 34H to 3FH	System area (Unusable)			———	——	——	——
R2N 40H	RW update interval time designation			1	Both	Required	Possible
R2N 41H	RWw update validity designation			0			
R2N 42H	RWr update validity designation			1			
R2N 43H	RW refresh destination address designation		Master station→R2N (RWw0)	118H			
R2N 44H			R2N→Master station (RWr0)	1B0H			
R2N 45H			Master station→R2N (RWw1)	119H			
R2N 46H			R2N→Master station (RWr1)	1B1H			
R2N 47H			Master station→R2N (RWw2)	120H			
R2N 48H			R2N→Master station (RWr2)	1B2H			
R2N 49H			Master station→R2N (RWw3)	121H			
R2N 4AH			R2N→Master station (RWr3)	1B6H			
R2N 4BH to 6FH	System area (Unusable)			———	——	——	——
R2N 70H	Monitor interval time designation			0	Both	Required	Possible
R2N 71H	No. of monitor designation			0			
R2N 72H to 77H	System area (Unusable)			———	——	——	——
R2N 78H	Monitor designation –1		Monitor target designation	0	Both	Required	Possible
R2N 79H			Transmission data designation	0			

Address (hexadecimal)	Name		Default value	Update	Initialization	E^2PROM registration
R2N 7AH	Monitor designation –2	Monitor target designation	0	Both	Required	Possible
R2N 7BH		Transmission data designation	0			
R2N 7CH to F5H			0			
R2N F6H	Monitor designation –64	Monitor target designation	0			
R2N F7H		Transmission data designation	0			
R2N F8H to FFH	System area (Unusable)		———	——	——	——

(b) Parameter area

Address (hexadecimal)	Name		Default value	Update	Initialization	E^2PROM registration
R2N 100H	Flow control designation		1	Both	Required	Possible
R2N 101H	RS (RTS) signal status designation		0			
R2N 102H	Word/byte unit designation		0			
R2N 103H	ASCII-BIN conversion designation		0			
R2N 105H	Transient timeout time designation		0			
R2N 106H to 107H	System area (Unusable)		———	——	——	——
R2N 108H	Reception head frame No.		0	Both	Required	Possible
R2N 109H			0			
R2N 10AH			0			
R2N 10BH			0			
R2N 10CH	Reception end frame No.		AH	Both	Required	Possible
R2N 10DH			DH			
R2N 10EH			0			
R2N 10FH			0			
R2N 110H	Reception head frame/reception end frame abort designation		1			
R2N 111H	Reception end data size designation		0			
R2N 112H	Reception timeout time designation		0			
R2N 113H to 117H	System area (Unusable)		———	——	——	——
R2N 118H	Transmission frame - 1 area	Transmission head frame No.	0	Both	Not required	Possible
R2N 119H		Transmission end frame No.	0			

Address (hexadecimal)	Name			Default value	Update	Initialization	E^2PROM registration
R2N 11A$_H$	Transmission timeout time designation			0	Both	Not required	Possible
R2N 11B$_H$ to 11F$_H$	System area (Unusable)			———	——	——	——
R2N 120$_H$	Transmission frame - 2 area	Transmission table head No. designation		0	Both	Not required	Possible
R2N 121$_H$		No. of transmission tables		0			
R2N 122$_H$		Transmission table designation	No. 1	0			
R2N 123$_H$ to 184$_H$			↓				
R2N 185$_H$			No. 100				
R2N 186$_H$ to 18F$_H$	System area (Unusable)			———	——	——	——
R2N 19D$_H$ to 19F$_H$	System area (Unusable)			———	——	——	——

(c) Setting status storage area

Address (hexadecimal)	Name	Default value	Update	Initialization	E^2PROM registration
R2N 1A0H	Station No. setting switch	Follows switch setting	R2N	Not required	Not possible
R2N 1A1H	Data link transmission speed setting switch				
R2N 1A2H	Mode setting switch				
R2N 1A3H	RS-232-C transmission speed				
R2N 1A4H	RS-232-C data bit length				
R2N 1A5H	RS-232-C parity bit presence				
R2N 1A6H	RS-232-C stop bit length				
R2N 1A7H	Buffer memory default value setting status storage	0			

(d) Communication status storage area

Address (hexadecimal)	Name		Default value	Update	Initialization	E^2PROM registration
R2N 1A8H to 1AFH	Error code storage area	Error code history	0	R2N	Not required	Not possible
R2N 1B0H		General error code	0			
R2N 1B1H		Error code at transmission	0			
R2N 1B2H		Error code at reception	0			
R2N 1B3H	System area (Unusable)		———	——	——	——
R2N 1B4H	Actual transmission data size storage		0	R2N	Not required	Not possible
R2N 1B5H	Reception frame index No. storage		0			
R2N 1B6H	No. of data items in OS reception area data size storage		0			
R2N 1B7H to 1BEH	System area (Unusable)		———	——	——	——
R2N 1BFH	Software version storage		Follows version	R2N	Not required	Not possible

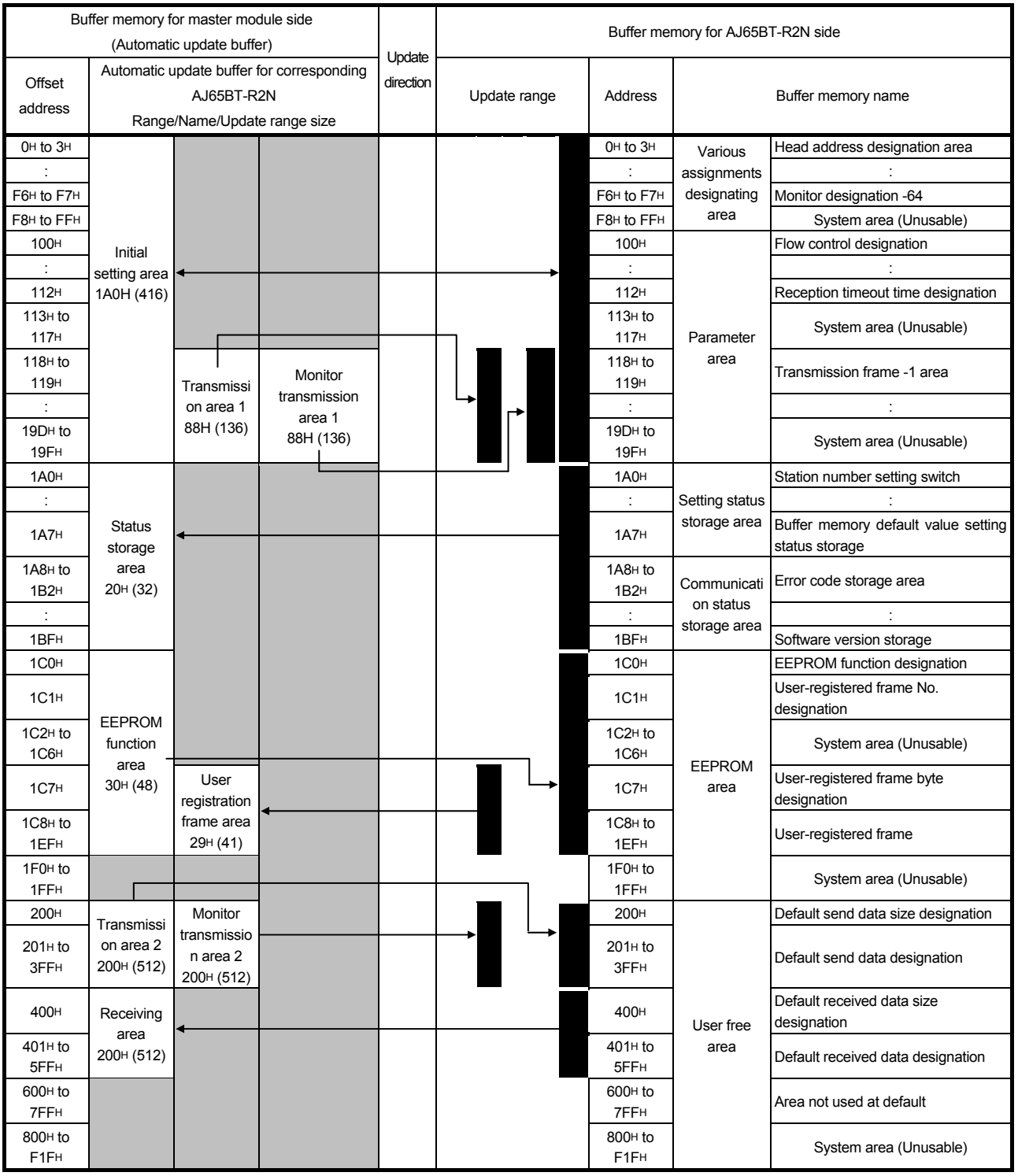
(e) E^2PROM area

Address (hexadecimal)	Name	Default value	Update	Initialization	E^2PROM registration
R2N 1C0H	E^2PROM function designation	0	M station	Not required	Not possible
R2N 1C1H	User-registered frame No. designation	0			
R2N 1C2H to 1C6H	System area (Unusable)	———	——	——	——
R2N 1C7H	User-registered frame byte designation	0	Both	Not required	Not possible
R2N 1C8H to 1EFH	User-registered frame	0			
R2N 1F0H to 1FFH	System area (Unusable)	———	——	——	——

(f) User free area

Address (hexadecimal)	Name	Default value	Update	Initialization	E^2PROM registration
R2N 200H	Default transmission data size designation area	0	M station	Not required	Not possible
R2N 201H to 3FFH	Default transmission data designation area	0			
R2N 400H	Default reception data size designation area	0	R2N	Not required	Not possible
R2N 401H to 5FFH	Default reception data designation area	0			
R2N 600H to 7FFH	Area not used at default	0	Follows transmission/ reception area setting	Not required	Not possible
R2N 800H to F1FH	System area (Unusable)	———	——	——	——

*1 The automatic update of the data between the automatic update buffer of the master module and the AJ65BT-R2N buffer memory will be performed automatically when the update conditions defined for each area are satisfied.
Also, because the direction of the data update by the automatic update is defined, the data in corresponding range of master module or AJ65BT-R2N is updated automatically.
The assignment range for the automatic update buffer memory default value set in AJ65BT-R2N and the direction of the data update are shown below.



(Automatic update timing) … M: Master module R2N:AJ65BT-R2N)

The overview of the update conditions for each update area is shown below.

1) Initial setting area (Update direction: R2N→M)
   When the AJ65BT-R2N has accepted the initial data read request (OFF→ON of RY19) from PLC CPU.

2) Initial setting area (Update direction: M→R2N)
   When the AJ65BT-R2N has accepted the initialization request (OFF→ON of RY4) from PLC CPU.

3) Transmission area 1, Transmission area 2 (Update direction: M→R2N)
   When the AJ65BT-R2N has accepted the transmission request (OFF→ON of RY0) from PLC CPU.

4) Monitor transmission area 1, Monitor transmission area 2 (Update direction: M→R2N)
   When the AJ65BT-R2N monitor transmission function is in use, and the AJ65BT-R2N has detected that the monitor transmission conditions set in the AJ65BT-R2N are satisfied.

5) Status storage area (Update direction: R2N→M)
   - When the AJ65BT-R2N has notified (OFF→ON of RXn0/RXn1) the transmission result (Normal/Error) to PLC CPU.
   - When the AJ65BT-R2N has notified (OFF→ON of RXn2/RXn3) the received data read request to PLC CPU.
   - When the AJ65BT-R2N has notified (OFF→ON of RXn4/RXn5) the initializing processing result (Normal/Error) to PLC CPU.
   - When the AJ65BT-R2N EEPROM function is in use, and the AJ65BT-R2N has notified (OFF→ON of RXn7/RXn8) the initializing processing result (Normal/Error) to PLC CPU.
   - When the AJ65BT-R2N has accepted the error reset request (OFF→ON of RY1A) from PLC CPU.
   - When the AJ65BT-R2N monitor transmission function is in use, and the AJ65BT-R2N has detected the error at the timing of data transmission to the external device.
   - When the AJ65BT-R2N has notified (OFF→ON of RX19) the initial data read completion to PLC CPU.

6) EEPROM function area (Update direction: M→R2N)
   When the AJ65BT-R2N has accepted the request to use the AJ65BT-R2N EEPROM function (OFF→ON of RYn7) from PLC CPU.

7) User registration frame area (Update direction: R2N→M)
   When the AJ65BT-R2N EEPROM function is in use, and the AJ65BT-R2N has notified (OFF→ON of RXn7/RXn8) the result of the requested processing (Normal/Error) to PLC CPU.

8) Receiving area (Update direction: R2N→M)
   When the AJ65BT-R2N has notified (OFF→ON of RXn2/RXn3) the received data read request to PLC CPU.

APPENDIX 9 I/O Signal/Remote register allocation list for the FR-E520-0.1KN

(1) I/O signal list

Signal direction: (FR-E520-0.1KN→Master)		Signal direction: (Mater→FR-E520-0.1KN)	
Device No.	Signal name	Device No.	Signal name
RXn0	Forward running	RYn0	Forward rotation command (STF)
RXn1	Reverse running	RYn1	Reverse 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	Error (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 (E^2PROM)	RYnE	Frequency setting command (E^2PROM)
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: Address allocated to the master station by the station number setting.

*1: Using Pr. 180 to Pr. 183 (input terminal (remote output) signal function selection), you can modify the signal function. (However, in some functions, the command cannot be turned ON/OFF by CC-Link.)

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

*3: The reserved input signal should be off. (Enter 0)

POINT
If an unused device (Reserved for the system.) is turned on/off from the sequence program, the function of the FR-E520-0.1KN is not guaranteed.

(2) Allocation of the remote register

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 monitored data is set to RWrn.
	RWwm+1	Set frequency	Specify the set frequency. At this time, whether it is written to RAM or E^2PROM is differentiated 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 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 completion of register setting. RXF switches on on completion of instruction execution.
	RWwm+3	Write data	Set the data specified by the above instruction code. (When 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 (monitor code) is set.
	RWrn+1	Output frequency	The present output frequency is always set.
	RWrn+2	Reply code	The reply code corresponding to RWm + 2 instruction code is set. 0 is set for a normal reply and a value other than 0 is set for a data error.
	RWrn+3	Read data	For a normal reply, the reply data to the instruction specified by the instruction code is set.

m, n: Address allocated to the master module by the station number setting.

APPENDIX 10 Buffer memory assignments of RX, RY, RWr, RWw

(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.

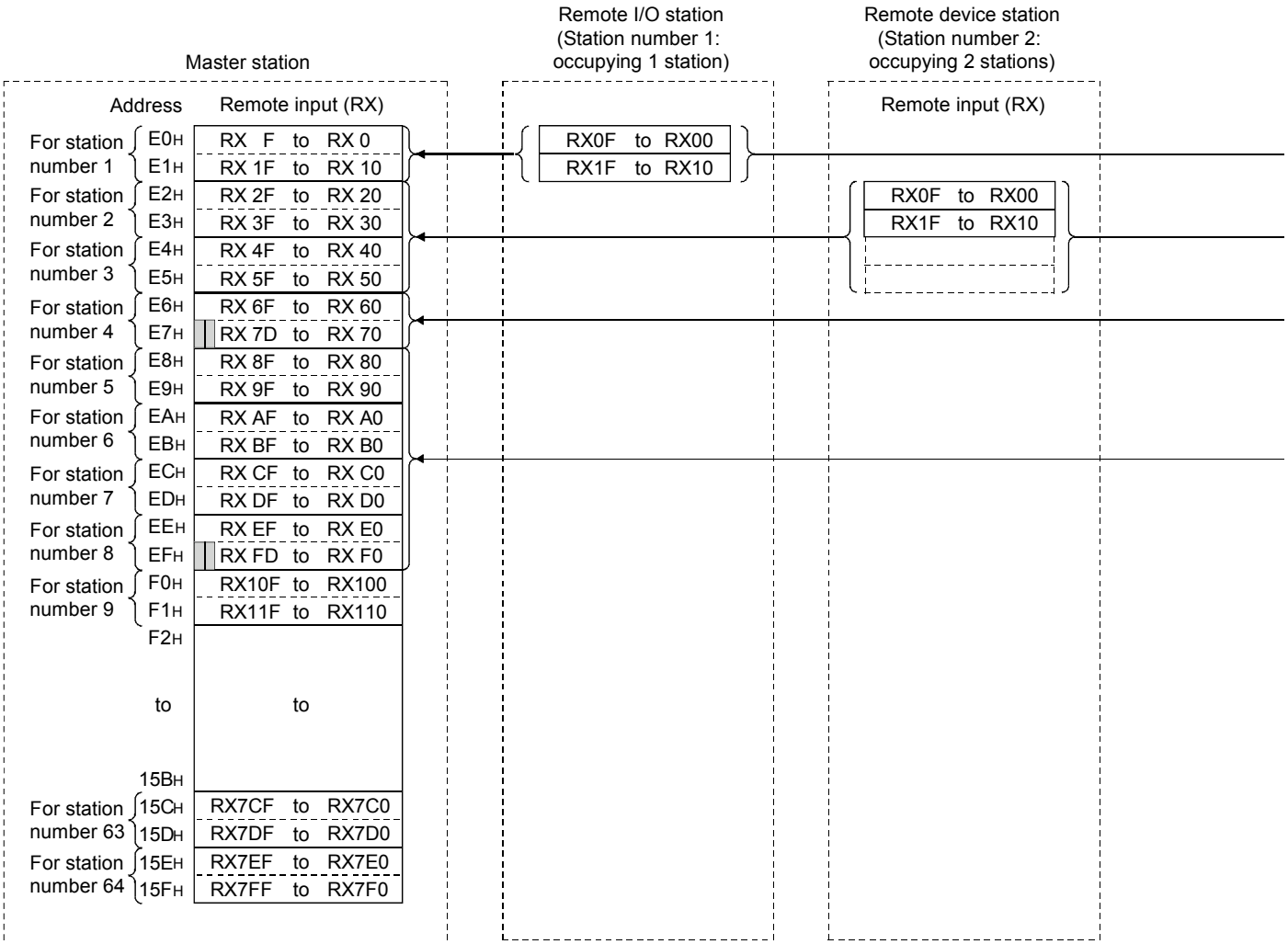


Table of buffer memory in master station and corresponding station numbers

Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	E0H to E1H	14	FAH to FBH	27	114H to 115H	40	12EH to 12FH	53	148H to 149H
2	E2H to E3H	15	FCH to FDH	28	116H to 117H	41	130H to 131H	54	14AH to 14BH
3	E4H to E5H	16	FEH to FFH	29	118H to 119H	42	132H to 133H	55	14CH to 14DH
4	E6H to E7H	17	100H to 101H	30	11AH to 11BH	43	134H to 135H	56	14EH to 14FH
5	E8H to E9H	18	102H to 103H	31	11CH to 11DH	44	136H to 137H	57	150H to 151H
6	EAH to EBH	19	104H to 105H	32	11EH to 11FH	45	138H to 139H	58	152H to 153H
7	ECH to EDH	20	106H to 107H	33	120H to 121H	46	13AH to 13BH	59	154H to 155H
8	EEH to EFH	21	108H to 109H	34	122H to 123H	47	13CH to 13DH	60	156H to 157H
9	F0H to F1H	22	10AH to 10BH	35	124H to 125H	48	13EH to 13FH	61	158H to 159H
10	F2H to F3H	23	10CH to 10DH	36	126H to 127H	49	140H to 141H	62	15AH to 15BH
11	F4H to F5H	24	10EH to 10FH	37	128H to 129H	50	142H to 143H	63	15CH to 15DH
12	F6H to F7H	25	110H to 111H	38	12AH to 12BH	51	144H to 145H	64	15EH to 15FH
13	F8H to F9H	26	112H to 113H	39	12CH to 12DH	52	146H to 147H	—	—

2) Local station

- Data to be sent to the master station is stored in the remote output (RY) of the address corresponding to the host station number.
- The input status from the remote I/O station, remote device station (RX) and other local station is stored.
- Two words are used per station.

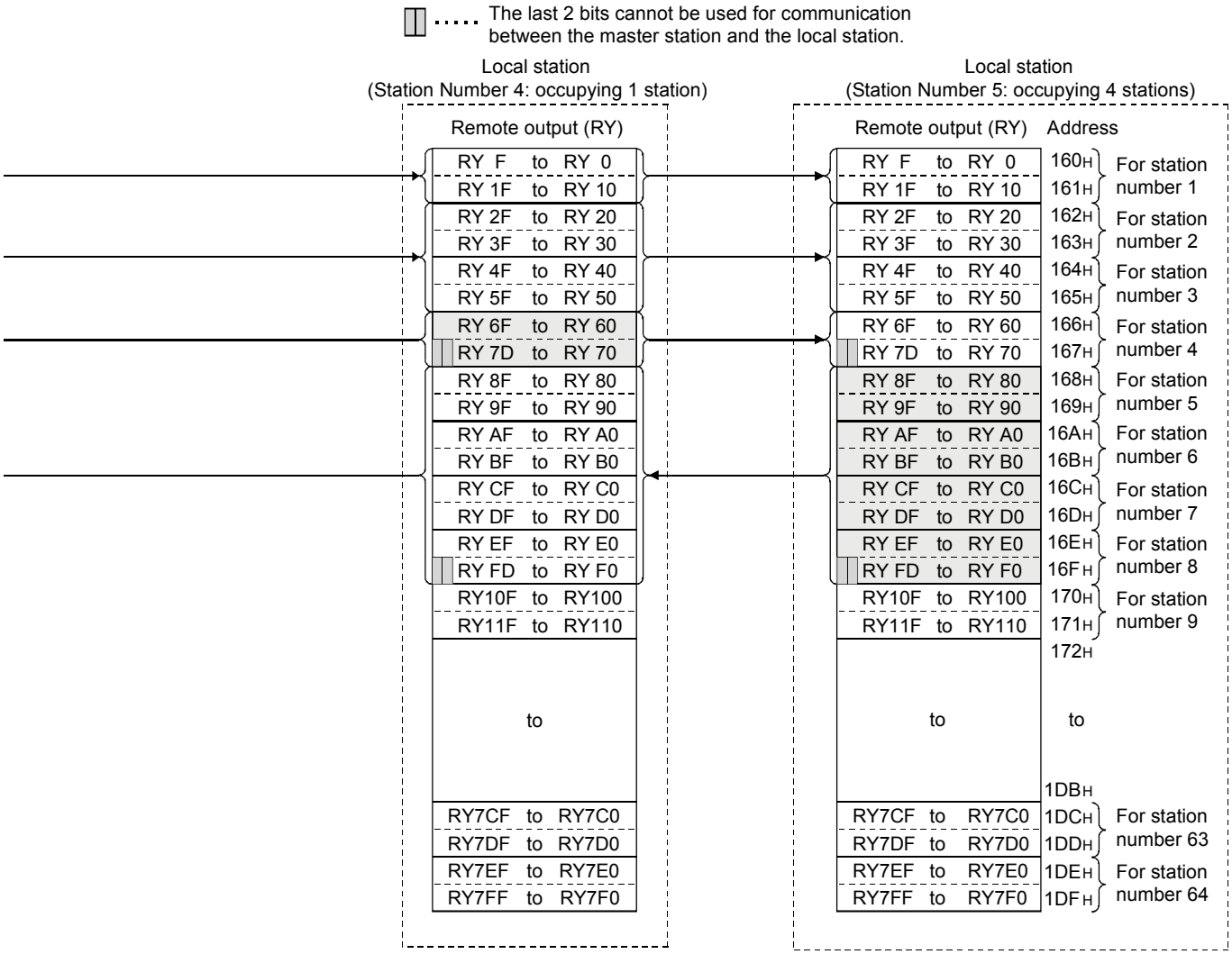


Table of buffer memory addresses in local station and corresponding station numbers

Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	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.

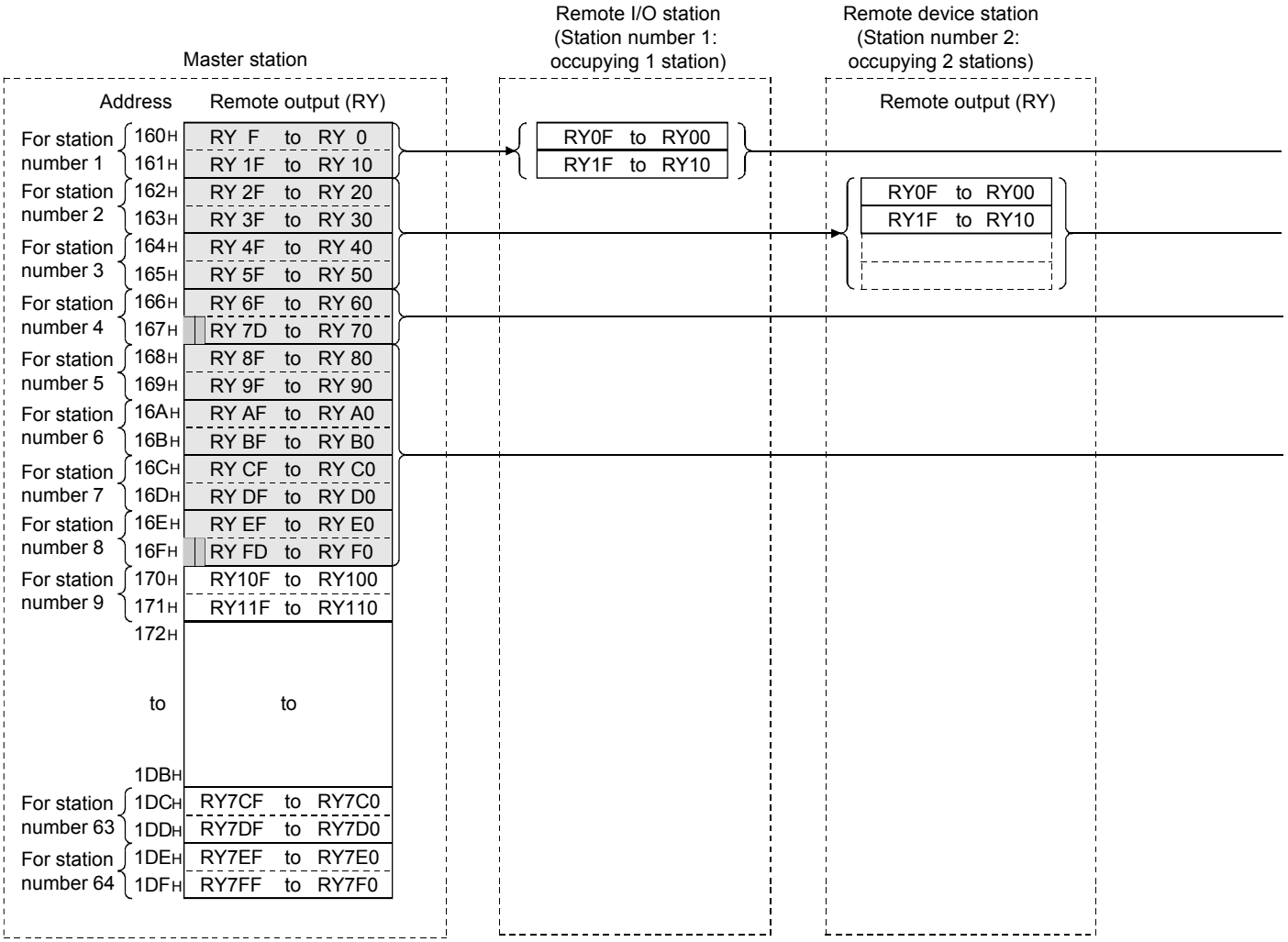


Table of buffer memory addresses in master station and corresponding station numbers

Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	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	—	—

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.

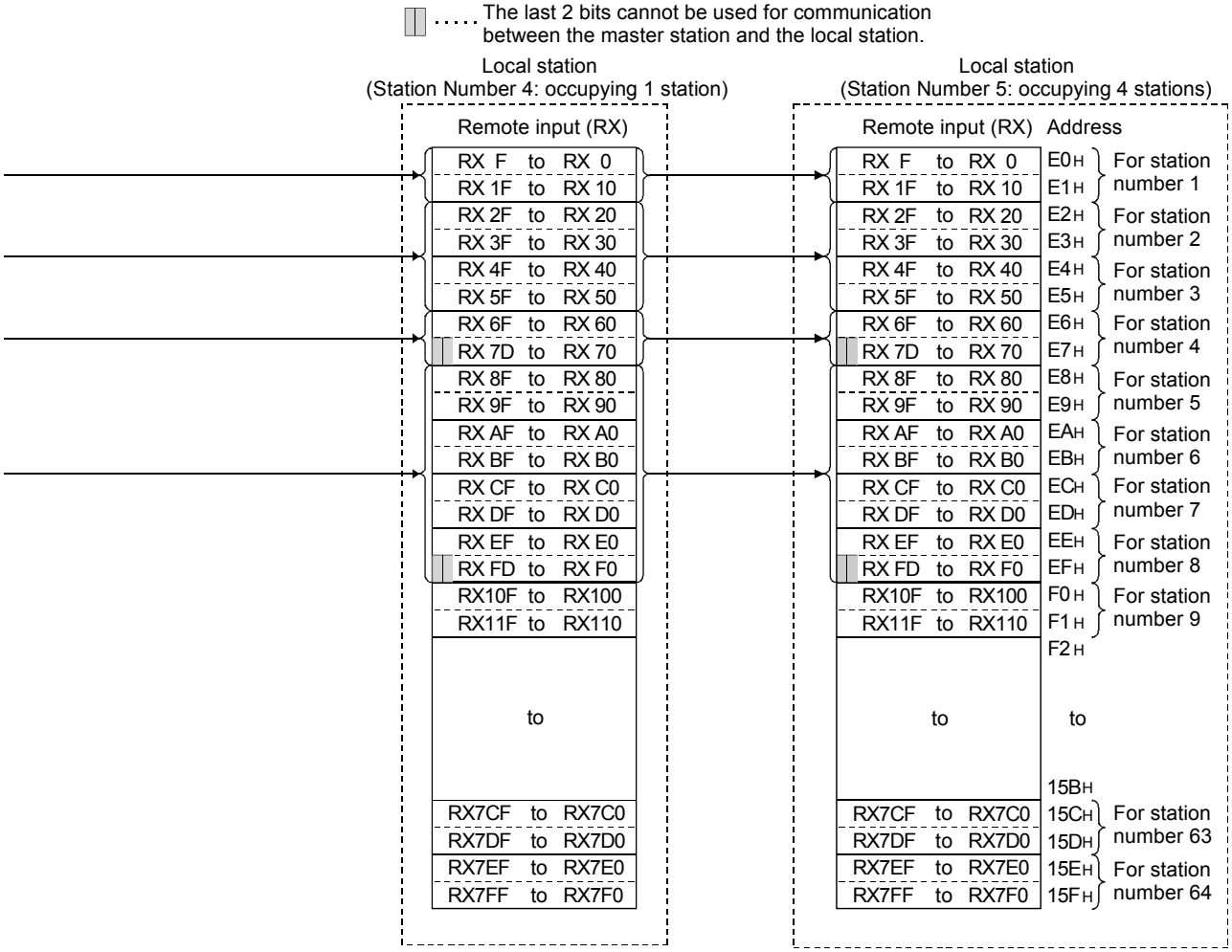


Table of buffer memory in local station and corresponding station numbers

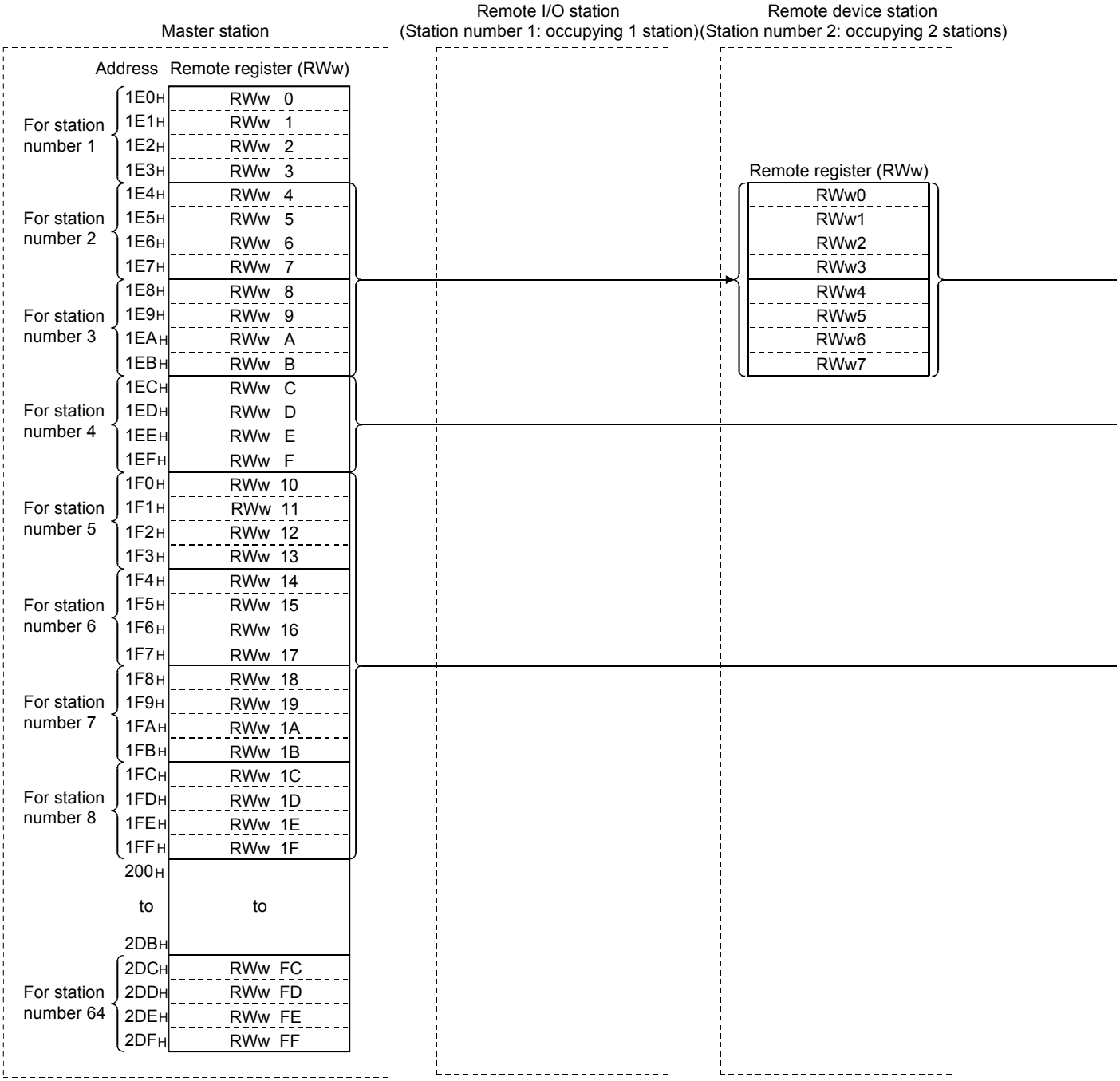
Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	$E0_H$ to $E1_H$	14	FA_H to FB_H	27	114_H to 115_H	40	$12E_H$ to $12F_H$	53	148_H to 149_H
2	$E2_H$ to $E3_H$	15	FC_H to FD_H	28	116_H to 117_H	41	130_H to 131_H	54	$14A_H$ to $14B_H$
3	$E4_H$ to $E5_H$	16	FE_H to FF_H	29	118_H to 119_H	42	132_H to 133_H	55	$14C_H$ to $14D_H$
4	$E6_H$ to $E7_H$	17	100_H to 101_H	30	$11A_H$ to $11B_H$	43	134_H to 135_H	56	$14E_H$ to $14F_H$
5	$E8_H$ to $E9_H$	18	102_H to 103_H	31	$11C_H$ to $11D_H$	44	136_H to 137_H	57	150_H to 151_H
6	EA_H to EB_H	19	104_H to 105_H	32	$11E_H$ to $11F_H$	45	138_H to 139_H	58	152_H to 153_H
7	EC_H to ED_H	20	106_H to 107_H	33	120_H to 121_H	46	$13A_H$ to $13B_H$	59	154_H to 155_H
8	EE_H to EF_H	21	108_H to 109_H	34	122_H to 123_H	47	$13C_H$ to $13D_H$	60	156_H to 157_H
9	$F0_H$ to $F1_H$	22	$10A_H$ to $10B_H$	35	124_H to 125_H	48	$13E_H$ to $13F_H$	61	158_H to 159_H
10	$F2_H$ to $F3_H$	23	$10C_H$ to $10D_H$	36	126_H to 127_H	49	140_H to 141_H	62	$15A_H$ to $15B_H$
11	$F4_H$ to $F5_H$	24	$10E_H$ to $10F_H$	37	128_H to 129_H	50	142_H to 143_H	63	$15C_H$ to $15D_H$
12	$F6_H$ to $F7_H$	25	110_H to 111_H	38	$12A_H$ to $12B_H$	51	144_H to 145_H	64	$15E_H$ to $15F_H$
13	$F8_H$ to $F9_H$	26	112_H to 113_H	39	$12C_H$ to $12D_H$	52	146_H to 147_H	—	—

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

(a) Master station (RWw)→remote device station (RWw)/local station (RWr)

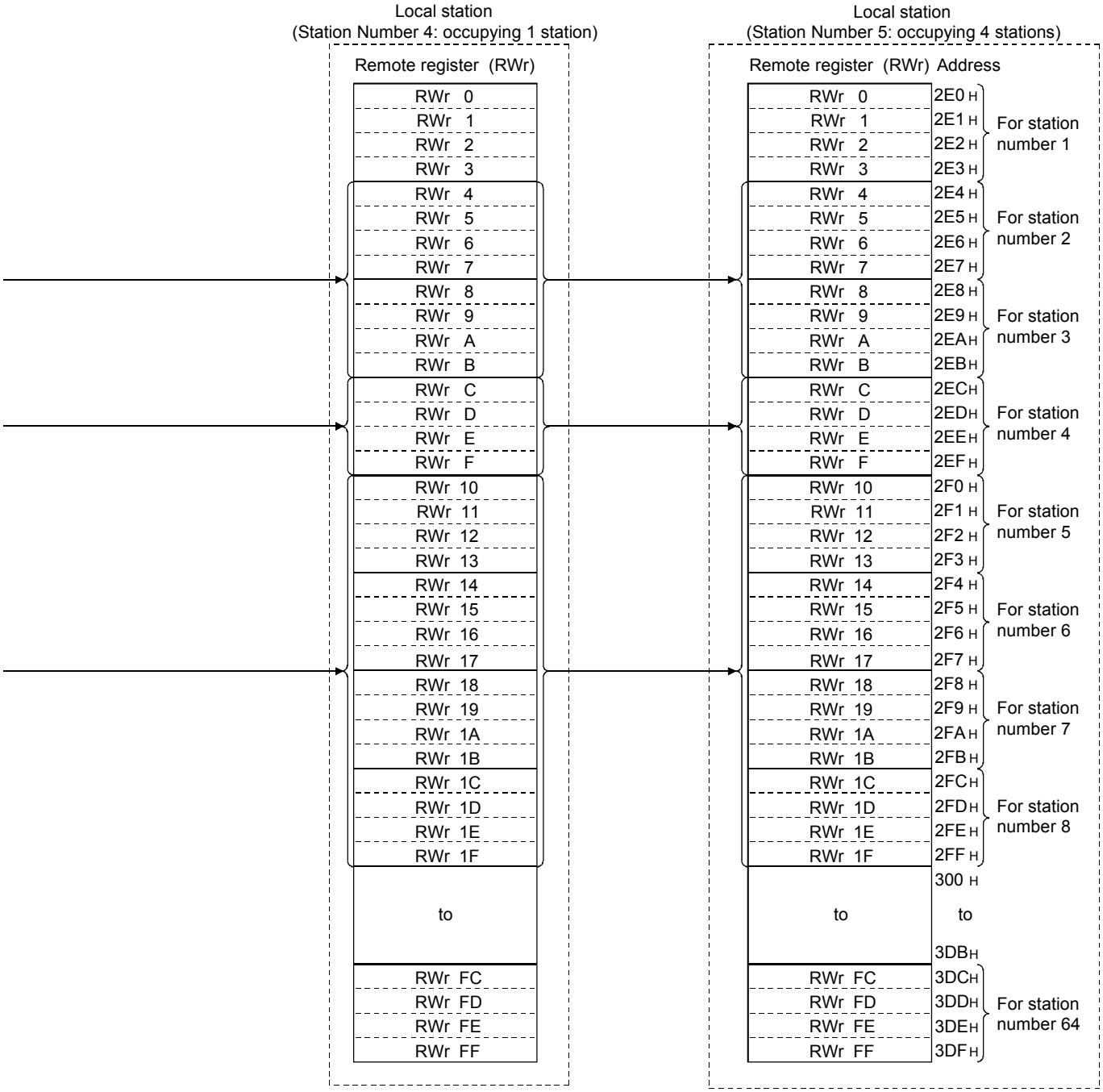
1) Master station

- The data to be sent to the remote register (RWw) of the remote device station and the remote registers (RWr) of all local stations are stored.
- Four words are used per station.



2) Local station

- The data sent to the remote register (RWw) of the remote device station can also be received.
- Four words are used per station.



The following tables show the station numbers and corresponding buffer memory addresses.

[Master station]

Table of station numbers and corresponding buffer memory addresses

Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	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

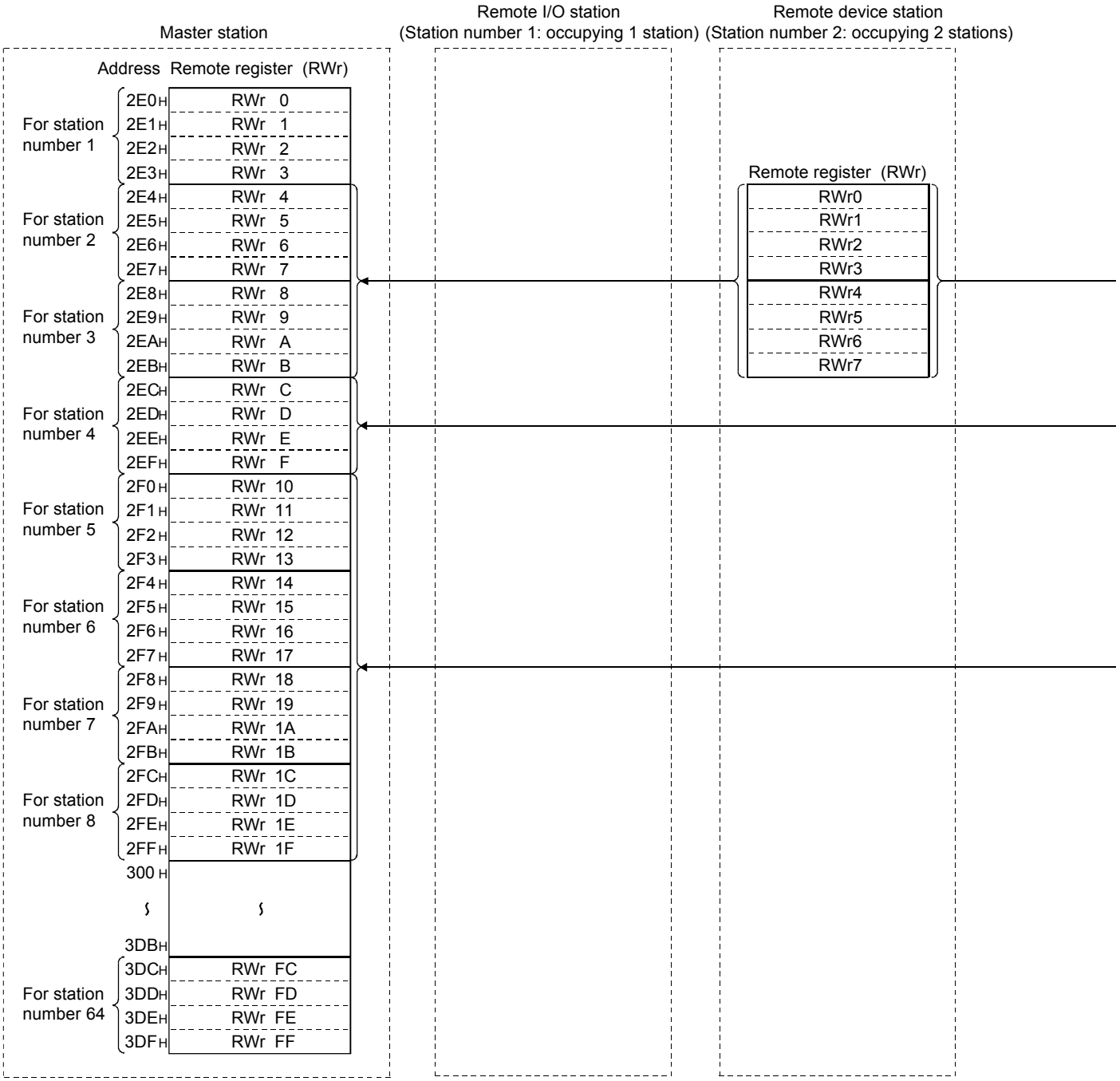
Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	2E0H to 2E3H	14	314H to 317H	27	348H to 34BH	40	37CH to 37FH	53	3B0H to 3B3H
2	2E4H to 2E7H	15	318H to 31BH	28	34CH 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)

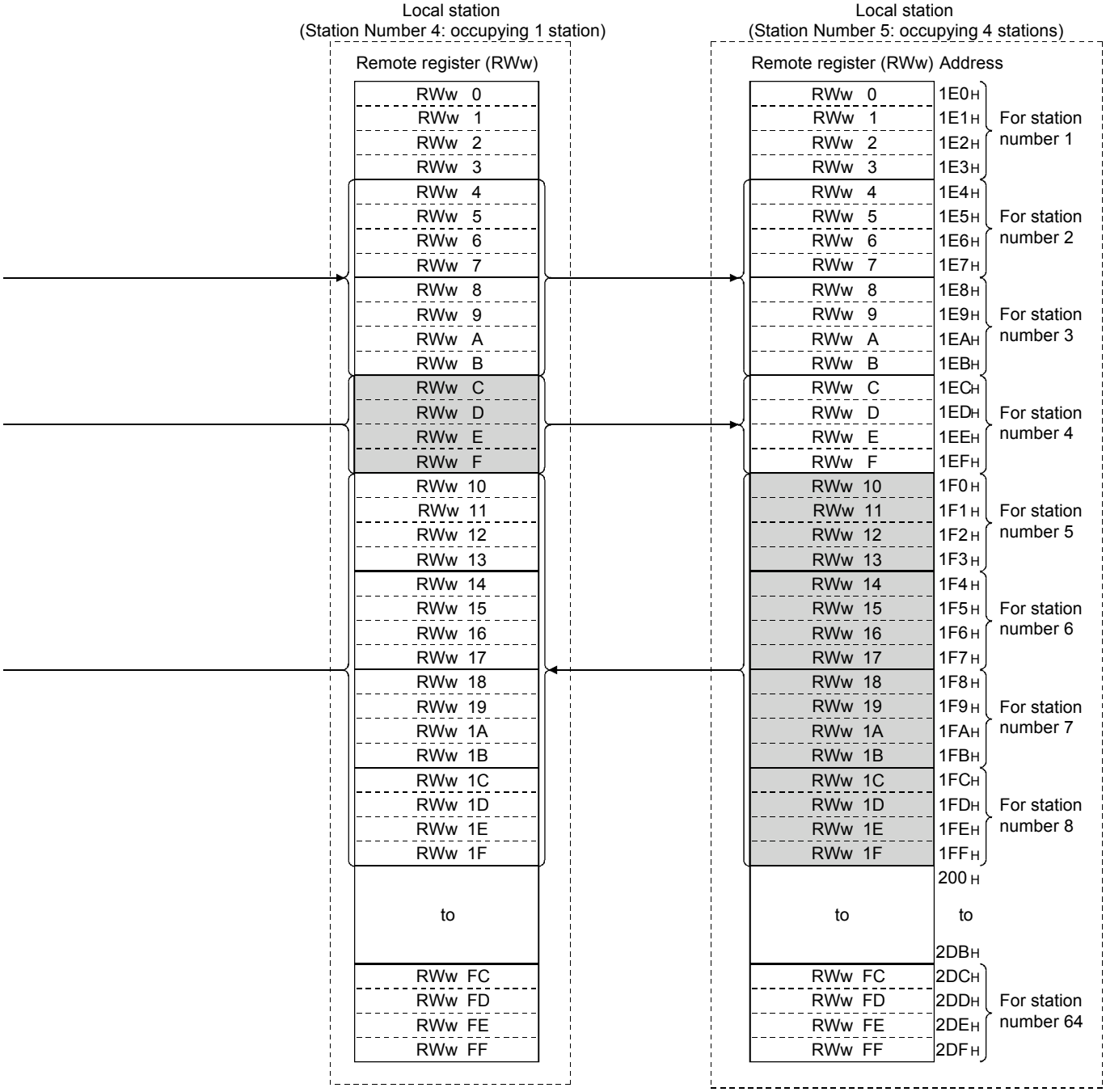
1) Master station

- The send data from the remote register (RWr) of the remote device station and the remote register (RWw) of the local station is stored.
- Four words are used per station.



2) Local station

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



The following tables show the station numbers and corresponding buffer memory addresses.

[Master station]

Table of station numbers and corresponding buffer memory addresses

Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	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 number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	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 relays (SBs)

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

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

For details on the link special relays (SB0000 to SB01FF), see APPENDIX 3.

The following table shows the relationship between buffer memory addresses 5E0H to 5FFH and 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 (SWs)

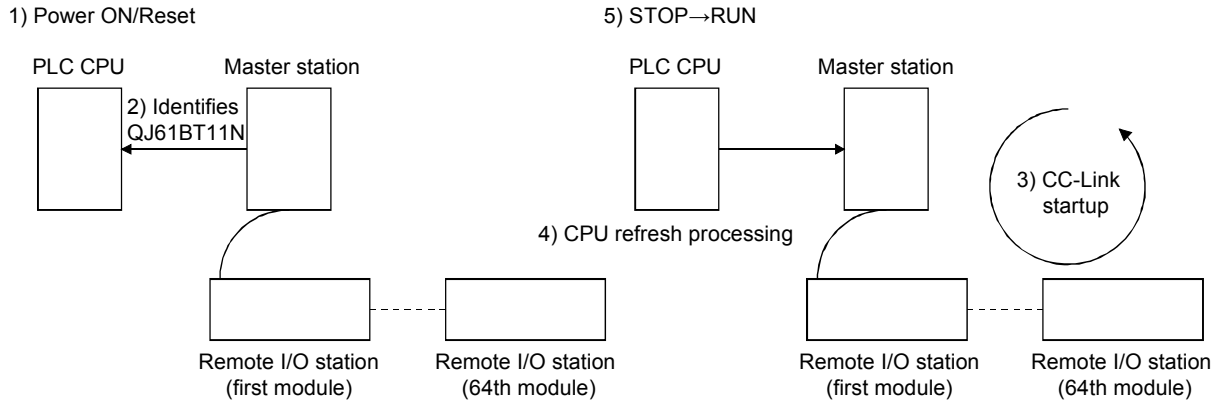
The link special registers store the data link status using word data. Buffer memory addresses 600H to 7FFH correspond to link special registers SW0000 to SW01FF. For more details on the link special registers (SW0000 to SW01FF), see APPENDIX 3.

APPENDIX 11 How to enable the data link simply by powering system on (Automatic CC-Link startup)

With this data link, the CC-Link startup and the refresh of all data are performed automatically simply by powering on when the system consists of the master station QJ61BT11N connected to the remote I/O station, remote device station, and intelligent device station.

When using this function, the sequence program which performs CC-Link startup and the refresh of all data is not 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

When using the QJ61BT11N of the function version A, the automatic CC-Link startup can be performed with a system configuration consisting the master station and remote I/O stations only.

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

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

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 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	Delay time is not specified.

Content of buffer memory size specification for intelligent device station

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

POINT

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

(2) Make sure to perform line tests for all stations if an automatic CC-Link startup is performed and changes such as replacement of a module, etc. are made to the system during data link operation.
Stations whose data link has already been established (only stations whose station numbers overlap) may also go down if stations with overlapping head station numbers return to the system.

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

(4) In case of a multiple PLC system where each CPU controls several QJ61BT11N modules, the automatic CC-Link startup is performed on the QJ61BT11N that has the smallest head I/O number.

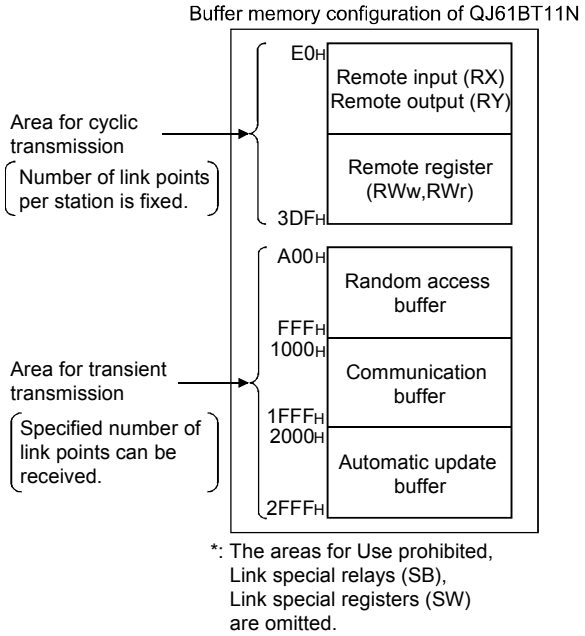
(2) Execution conditions

(a) When the parameters are not set, the automatic CC-Link startup function is applicable only to one "QJ61BT11N". Even when more than one QJ61BT11N is mounted on the base unit, the automatic CC-Link startup function is applicable only to the first one. It is applied to the QJ61BT11N that has the smallest start I/O number, as seen from the PLC CPU side.

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

APPENDIX 12 EXERCISE 5 (TRANSIENT TRANSMISSION: COMMUNICATION WITH RS-232 INTERFACE MODULE)

In this exercise, communication with the intelligent device station is performed using transient transmission function.
The intelligent device station is able to perform cyclic transmission using link devices (RX,RY,RWr,RWw) assigned in the master station. In the same time it is able to perform also transient transmission. (Transient transmission is also possible with local station.)
The intelligent device station can communicate the RS-232 interface module type AJ65BT-R2N by using the communication buffer and the automatic update buffer of the master module.



In the exercise 5, the data reading/writing is performed using RIFT and RITO dedicated instructions between the AJ.... and the master stations' automatic update buffer

- RIFR : This instruction reads the data from the automatic update buffer of the specified station or the random access buffer in the host master module.
- RITO : This instruction writes the data from the automatic update buffer of the specified station or the random access buffer in the host master module.

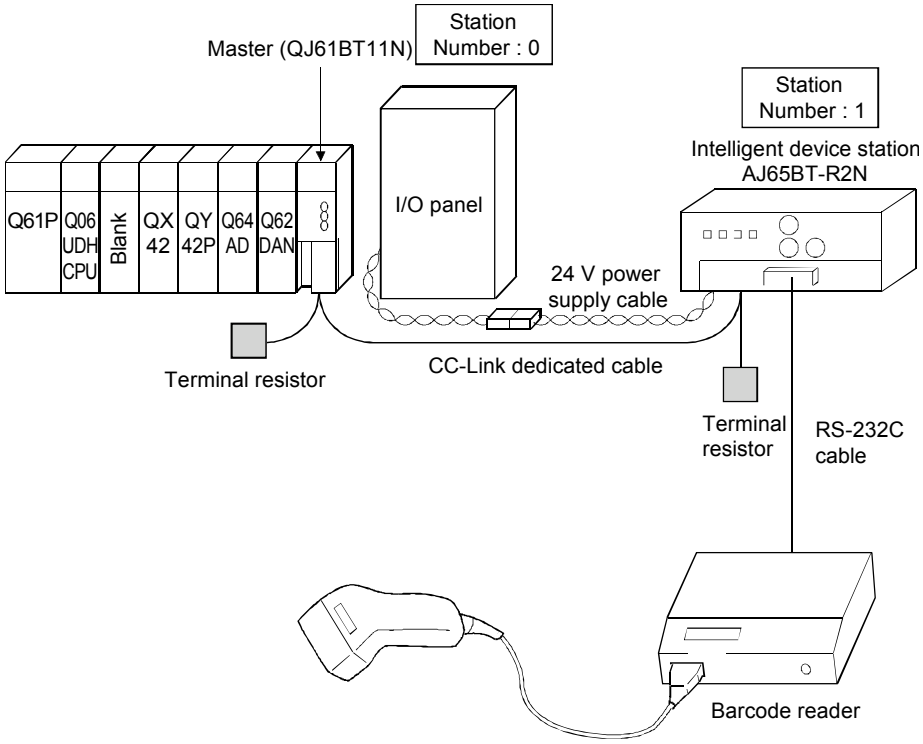
In addition, through the communication buffer of the master module, data can be sent directly to the specified station as the transient transmission.
Dedicated instructions are used as follows.

Target station	Instruction	Description
Master station Local station	RIRD	Reads data from the buffer memory or the PLC CPU device of the specified station.
	RIWT	Writes data into the buffer memory or the PLC CPU device of the specified station.
Intelligent device station	RIRD	Reads data from the buffer memory of the specified station.
	RIWT	Writes data into 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 into the buffer memory of that station.

For information on the CC-Link dedicated instructions, refer to the APPENDIX 4.

Appendix 12.1 System configuration

The system configuration used in the practice of the exercise 5 is as follows.
The configuration is the same as the exercise 1 for the master module setting.

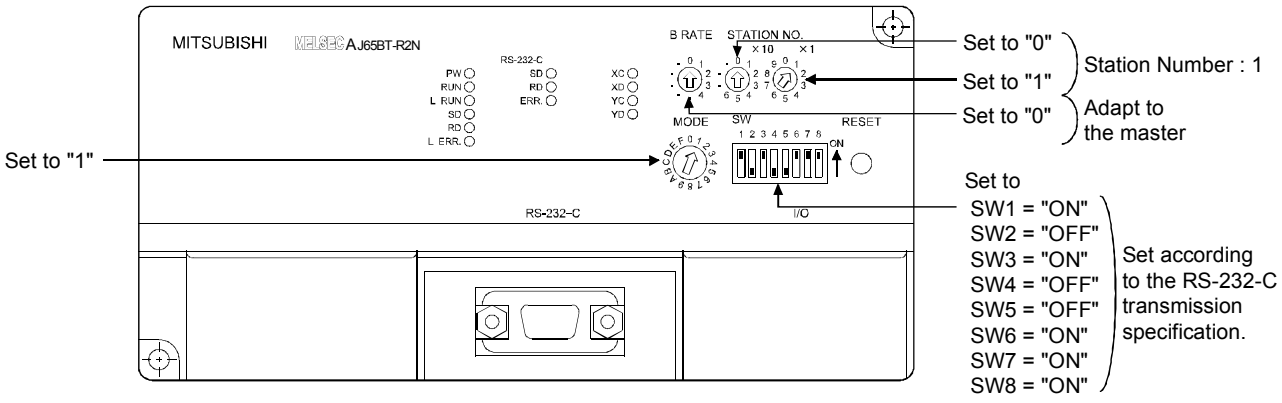


Appendix 12.2 Intelligent device station and external device settings and wiring

This paragraph provides information on the setting and wiring of the intelligent device station (AJ65BT-R2N) and the external device (Bar code reader) setting.

Appendix 12.2.1 Module settings

The settings of AJ65BT-R2N are described.
For more details about module functions and specifications, refer to the AJ65BT-R2N User's Manual (Details).

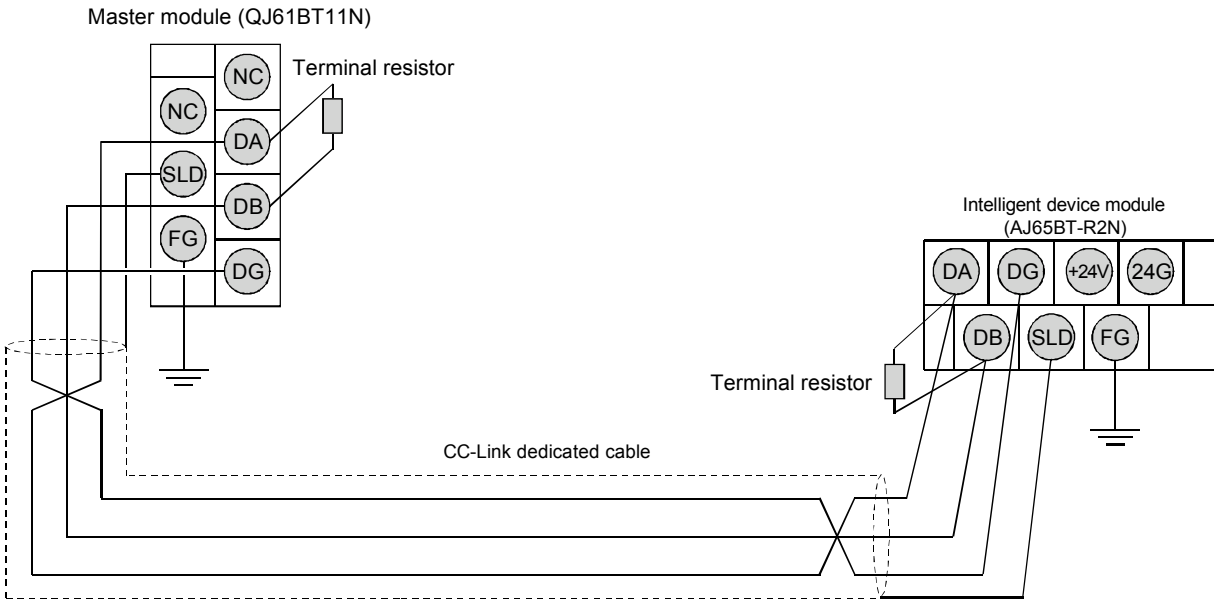


RS-232-C transmission specification in the setting above

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

Appendix 12.2.2 Module wiring

The connection of CC-Link dedicated cable and the terminal resistor needed for exercise 5 is described.
The wiring for the connection of 24 V power supply cable should be the same as remote I/O station. (See section 3.4.2)
Turn of the power before wiring the CC-Link dedicated cable or the 24 V power supply cable.

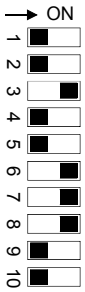


Appendix 12.2.3 Barcode reader setting

The setting and specification of the barcode reader are described.

(1) Barcode reader setting

(Tohken TCD-4000/TBR-4000)

Setting switch		Setting switch status			
	1	OFF	Baud rate 9600 bps		
	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 specification

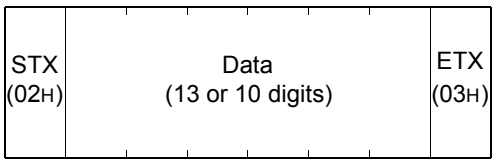
(a) Asynchronous RS-232C Interface

(b) 7 bits ASCII code

(c) Data specification
- Start bit ·····1 bit
- Data ·····7 bits
- Parity (Even) ·····1 bit
- Stop bit ·····2 bits

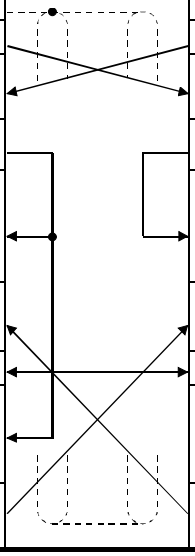
(d) Baud Baud rate 300 to 19200 (bps) can be selected

Format of the data transmitted from the barcode reader



Note: In case of 10 digits, the first and last position are replaced with "*" .

(2) Wiring

AJ65BT-R2N side		Wiring and signal direction	Barcode reader side		Name	Description (based on the barcode reader)
Signal name	Pin No.		Pin No.	Signal name		
FG	1		1	FG	Frame ground	Cable shield terminal
SD	2		2	SD	Send data	Terminal for data sending
RD	3		3	RD	Received data	Terminal for data receiving
RS	4		4	RS	Transmission request	When the Host station became able to make transmission, turn on and a signal will be send to the CS of the host station (simplified), at the same time, the send indicated signal which have send data to the others stations.
CS	5		5	CS	Clear to send	
DR	6		6	DR	Data Set Ready	Receives enable signal from other station
SG	7		7	SG	Signal ground	Signal ground terminal
CD	8		8	CD	Data channel Received carrier detection	Terminal which received ON signals when there is send data from other station
ER	20		20	ER	Data terminal ready	Terminal which send signals when the host station became operational

[Barcode examples]

JAN

USS-39(Code 39)

Set the network parameters/automatic parameters as follows and write them in the PLC CPU.

About the setting and writing operation refer to the section 3.5.2 to 3.5.4.

• Network parameters/automatic refresh parameters

[Number of Modules "1"]

Number of Modules 1 Boards Blank : No Setting ☑ Set the station information in the CC-Link configuration window

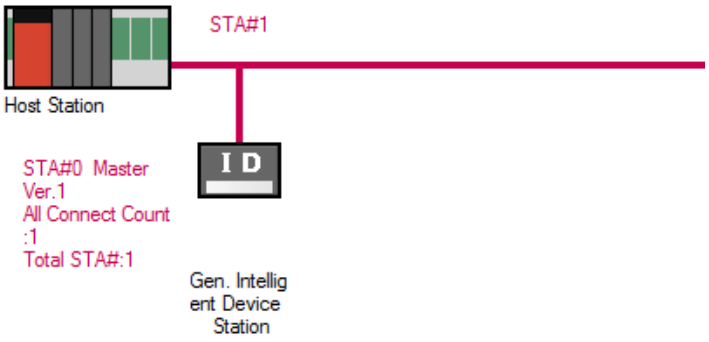
	1	2
Start I/O No.	00A0	
Operation Setting	Operation Setting	
Type	Master Station	
Master Station Data Link Type	PLC Parameter Auto Start	
Mode	Remote Net(Ver.1 Mode)	
Total Module Connected(*1)	0	
Remote input(RX)	X100	
Remote output(RY)	Y100	
Remote register(RWr)		
Remote register(RWw)		
Ver.2 Remote 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	
Standby Master Station No.(*1)		
PLC Down Select	Stop	
Scan Mode Setting	Asynchronous	
Delay Time Setting	0	
Station Information Setting	CC-Link Configuration Setting	
Remote Device Station Initial Setting	Initial Setting	
Interrupt Settings	Interrupt Settings	

• Station information

	Station No.	Model Name	Station Type	Version	# of STA Occupied	Expanded Cyclic Setting	Remote Station Points	Reserved/Err Invalid STA	Intelligent Buffer Size(word)		
									Send	Receive	Auto
	0/0	Host Station	Master Station								
	1/1	Gen. Intelligent Device Station	Intelligent Device Station	Ver.1	1 Station Occupied	Single	32 Points	No Setting	0	0	1536

Specify the number of points to be used for the transient transmission in "Intelligent Buffer Select", and 1536(600H) word to the automatic update buffer.

<REFERENCE> The station information for the exercise 5 can be shown as below.



REMARK

The default value for the total area size in the master station automatic update buffer at AJ65BT-R2N is 600H. (→Refer to the next page.)

Because the size of automatic update area of the master station is 1000H, you can connect up to two AJ65BT-R2Ns with default status.

To use three AJ65BT-R2Ns modules or more, it is necessary to make the automatic update size smaller for each module.

<REFERENCE>

1. The sending/receiving data between the area for the automatic update function assigned by the AJ65BT-R2N buffer memory and the corresponding master module automatic update buffer are performed automatically when the update conditions defined for each area are satisfied.
   Also, the direction of sending/receiving data is defined for each area.
   In this exercise, perform the sending/receiving data by automatic update function using the AJ65BT-R2N initial settings.
   The automatic update function area of the AJ65BT-R2N initial settings and the direction of sending/receiving data by automatic update are shown below.
   For more details, refer to APPENDIX 8.

Assignments of automatic update area at initial setting (AJ65BT-R2N)			Data direction
Address	Name		
0H to 19FH (0H to FFH) (100H to 19FH)	Initial setting area (Area for designating various assignments) (Parameter area)		Master station ←→ AJ65BT-R2N
118H to 19FH		Transmission area 1	Master station –→ AJ65BT-R2N
		Monitor transmission area 1	
1A0H to 1BFH (1A0H to 1A7H) (1A8H to 1BFH)	Status storage area (Setting status storage area) (Communication status storage area)		AJ65BT-R2N –→ Master station
1C0H to 1EFH	E^2PROM area		Master station –→ AJ65BT-R2N
1C7H to 1EFH		User registration frame area	
1F0 to 1FF	Area not used		–
200H to 3FFH	User free area	Transmission area 2	Master station –→ AJ65BT-R2N
		Monitor transmission area 2	
400H to 5FFH		Receiving area	AJ65BT-R2N –→ Master station
600 to 7FF		Area not used	–

2. When using three AJ65BT-R2Ns, refer to the APPENDIX 1.
   When using more than three modules, refer to the RS-232C Interface Module Type AJ65BT-R2N User's Manual (Details).

Appendix 12.4 Initial settings of AJ65BT-R2N

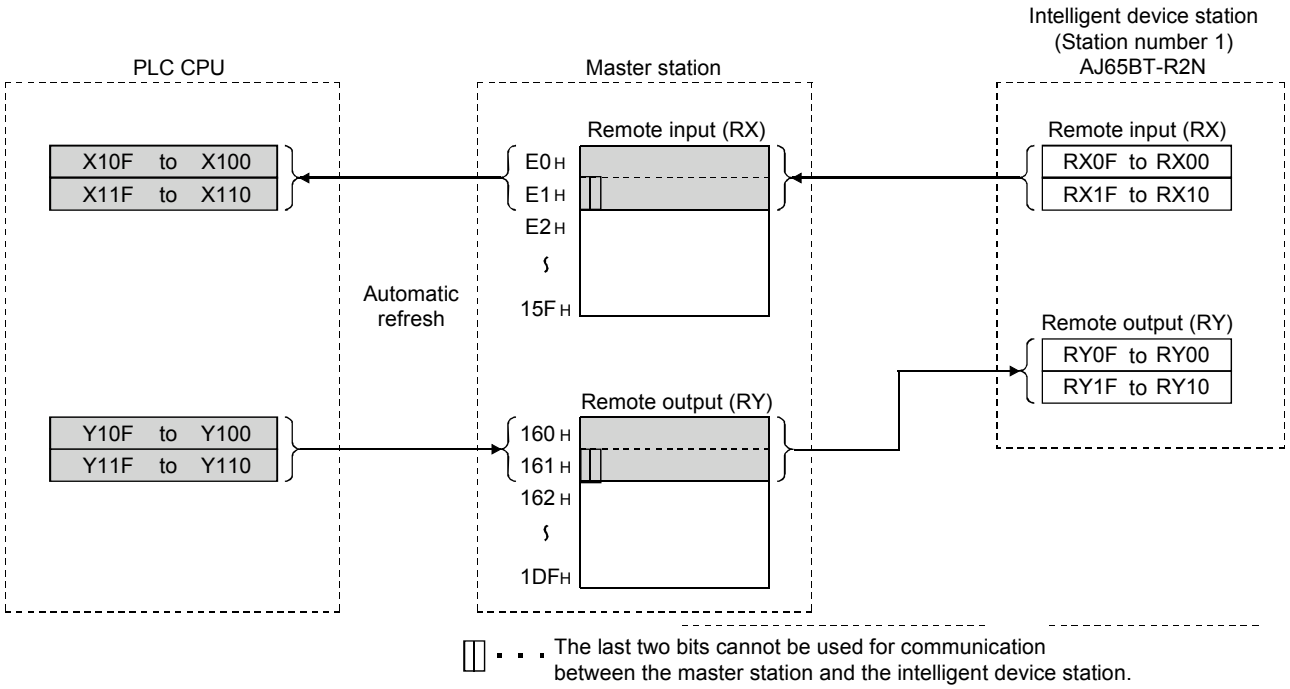
In case of AJ65BT-R2N, it is necessary to configure the initial settings required for communication with the master station and the external device.
Items required for this exercise are shown below. (For more details about the initial settings, refer to the AJ65BT-R2N User's Manual (Details).)

Setting Items (parameter)	Setting value (Decimal)	Description	AJ65BT-R2N Buffer memory address (Hexadecimal)
Word/byte unit designation	1	Bit	102H
Reception head frame No.	2	STX	108H
Reception end frame No.	3	ETX	10CH
Reception timeout time	20	2 seconds	112H

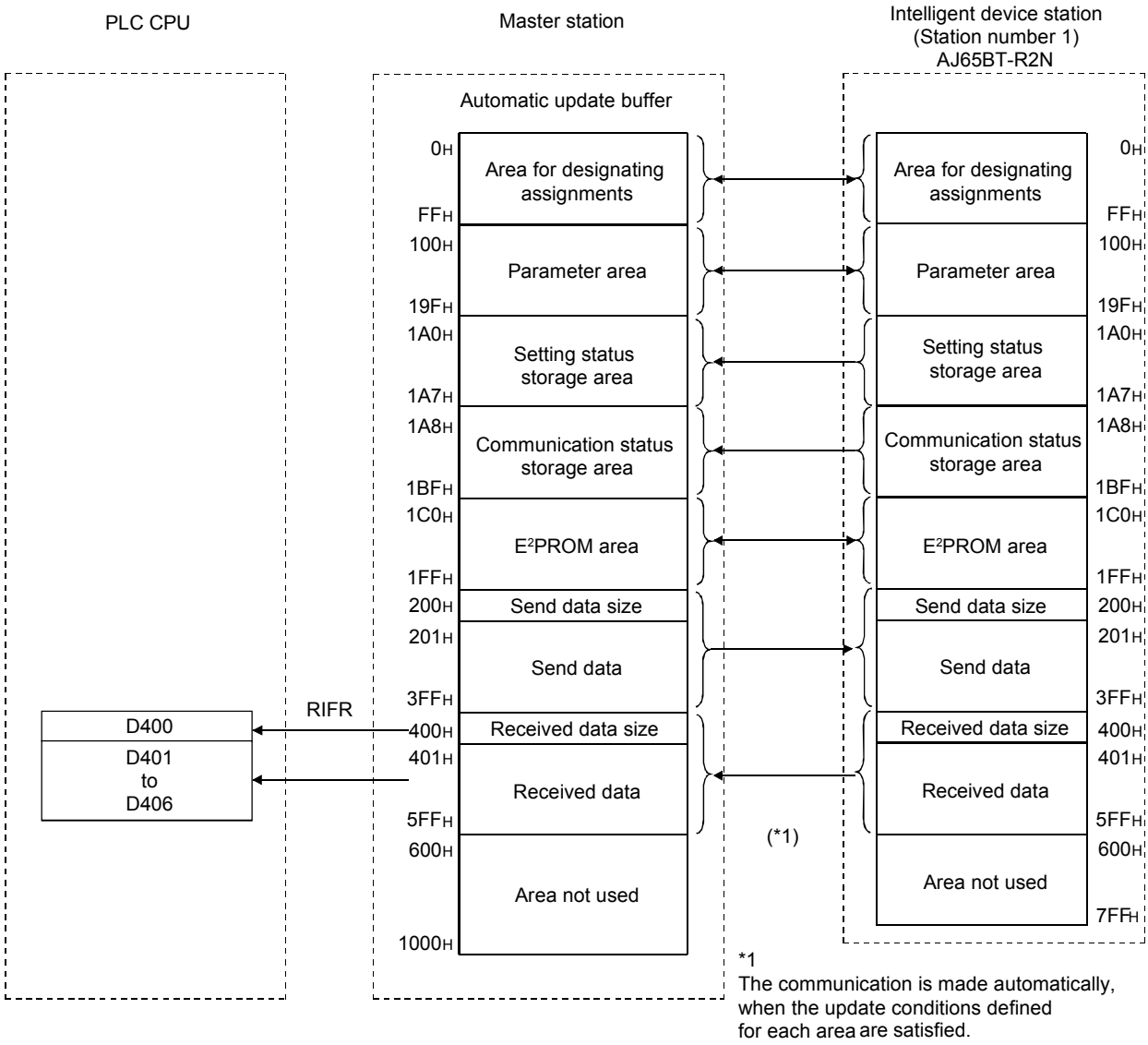
(1) Refresh support

The relationship between the PLC CPU, master station buffer memory and the refresh of the intelligent device station is as shown below.

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



[Automatic update buffer]…(When the automatic update buffer assignment is set to default value)



Note1: Remote registers (RWw, RWr) are not used in this exercise.

(2) Setting Sheet

(a) Station information setting sheet

Station No.	Station Type	Number of Occupied Stations	Reserve/Invalid Station Select	Intelligent Buffer Select (Word)		
				Send	Receive	Automatic
1	Intelligent device station	1	Not set	—	—	1536
2						
3						
4						
5						
6						
7						
8						
9						
10						

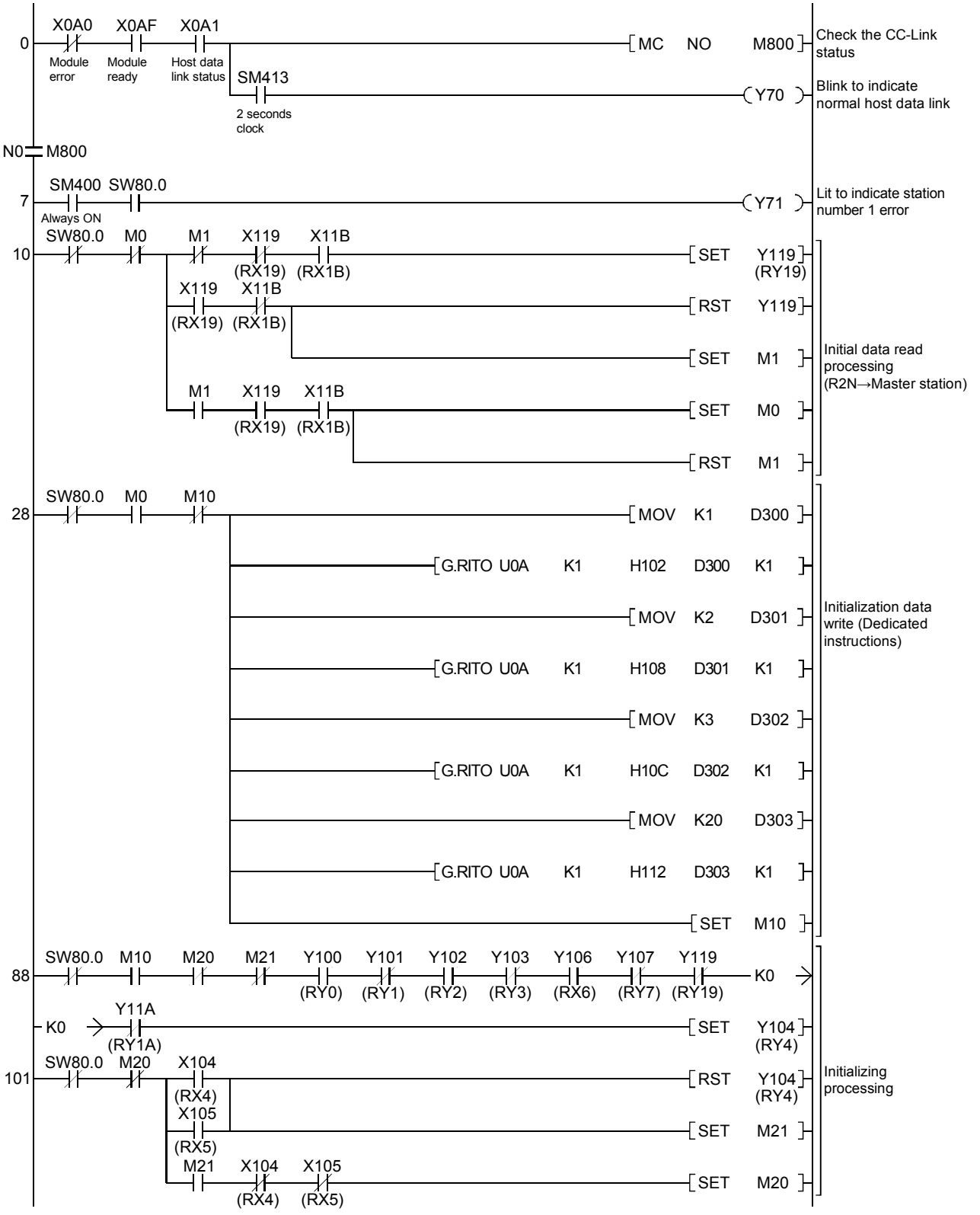
(b) Device assignment table

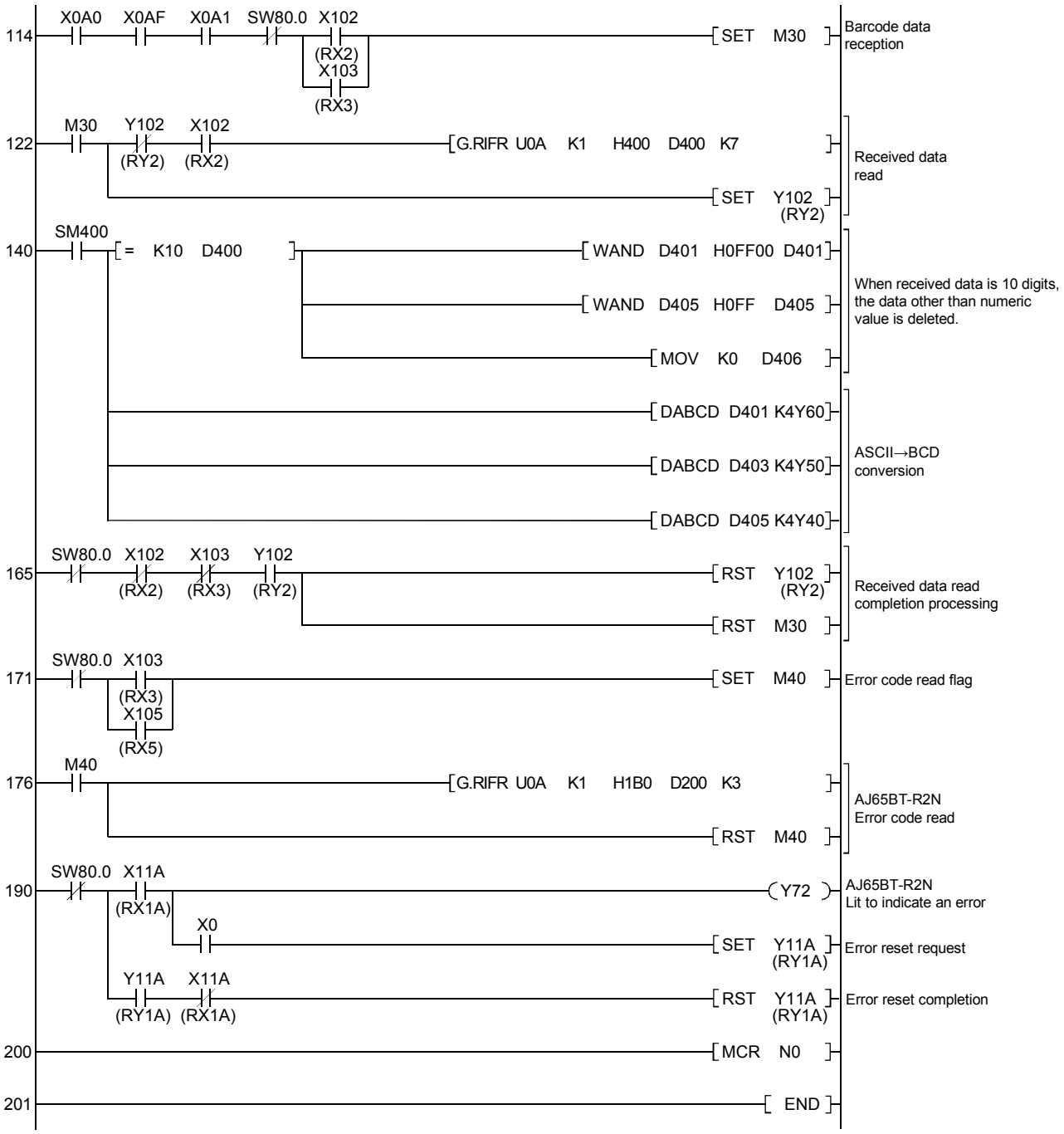
Device / Station No.	RX → (X)		RY ← (Y)		RWw → ( )		RWr ← ( )	
	Remote device	CPU device	Remote device	CPU device	Remote device	CPU device	Remote device	CPU device
1	RX0 to RXF	X100 to X10F	RY0 to RYF	Y100 to Y10F				
	RX10 to RX1F	X110 to X11F	RY10 to RY1F	Y110 to Y11F				
2								
3								
4								
5								
6								
7								
8								
9								
10								

(3) Sequence program

Create a sequence program as below and write it to the PLC CPU.

Program name	EX5




114
X0A0
X0AF
X0A1
SW80.0
X102
(RX2)
X103
(RX3)
SET M30
Barcode data reception
122
M30
Y102
(RY2)
X102
(RX2)
G.RIFR U0A K1 H400 D400 K7
SET Y102
(RY2)
Received data read
140
SM400
= K10 D400
WAND D401 H0FF00 D401
WAND D405 H0FF D405
MOV K0 D406
When received data is 10 digits, the data other than numeric value is deleted.
DABCD D401 K4Y60
DABCD D403 K4Y50
DABCD D405 K4Y40
ASCII→BCD conversion
165
SW80.0
X102
(RX2)
X103
(RX3)
Y102
(RY2)
RST Y102
(RY2)
RST M30
Received 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-R2N Error code read
190
SW80.0
X11A
(RX1A)
Y72
AJ65BT-R2N Lit to indicate 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 of the master station via the AJ65BT-R2N.
The CPU executes the writing/reading of automatic update buffer with the dedicated instructions.

Operation of the training kit

(1) Push the RUN/STOP/RESET switch of the PLC CPU in the "RESET" position one time (1 second).It is reset.

(2) Set the RUN/STOP/RESET switch of the PLC CPU to "RUN".
Y70…… Flashing according to the host station data link status (X0A1) (data link is normal)

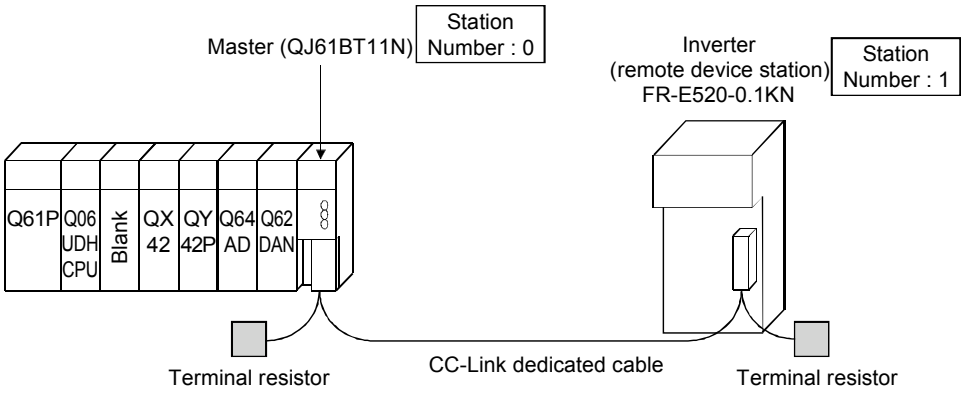
(3) The barcode is read by the barcode reader.
The barcode is displayed on the digital display of the Y40 to Y6F.
If the read barcode consists 10 digits, "0" is displayed as the first digit (Y6F to Y6C) and the 10th to 12th digit (Y4B to Y40).
If the read barcode consists 13 digits, the 13th digit is not displayed.

APPENDIX 13 EXERCISE 6 (CONNECTION WITH INVERTER)

In this exercise, inverter with CC-Link connectivity is being used. Set its parameters via the network and perform system operation.

Appendix 13.1 System configuration

The system configuration used in the practice of the exercise 6 is as follows. The master module setting is the same the exercise 1.



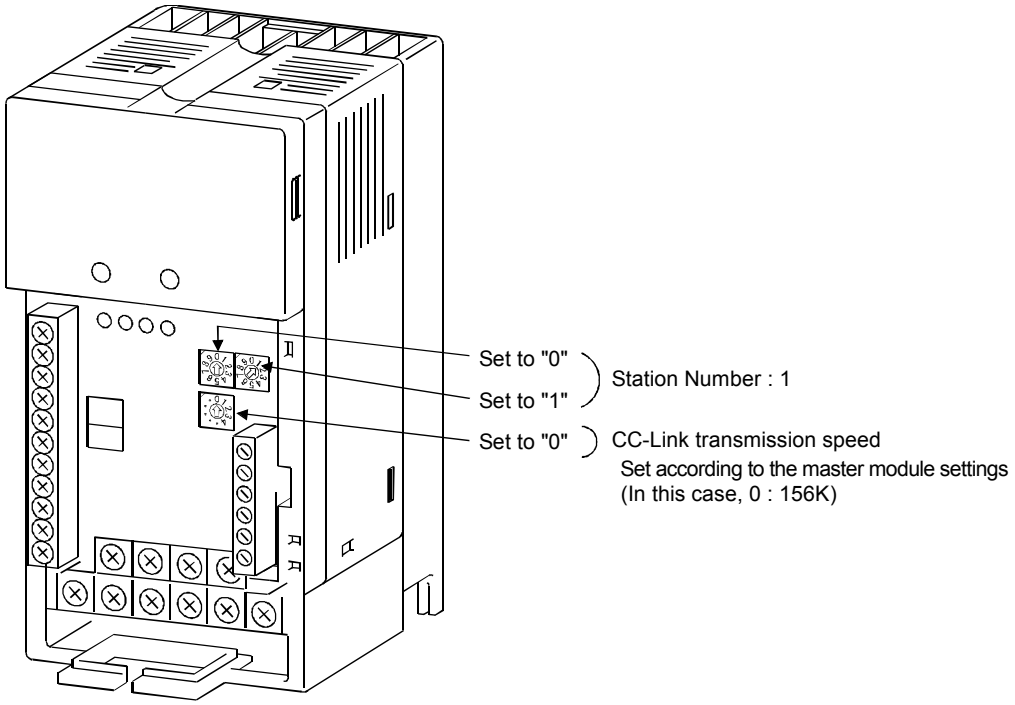
The inverter is a remote device station in CC-Link network.

Appendix 13.2 Inverter setting and connection

This section describes the setting of the transistorized inverter (FR-E520-0.1KN) with CC-Link connectivity.

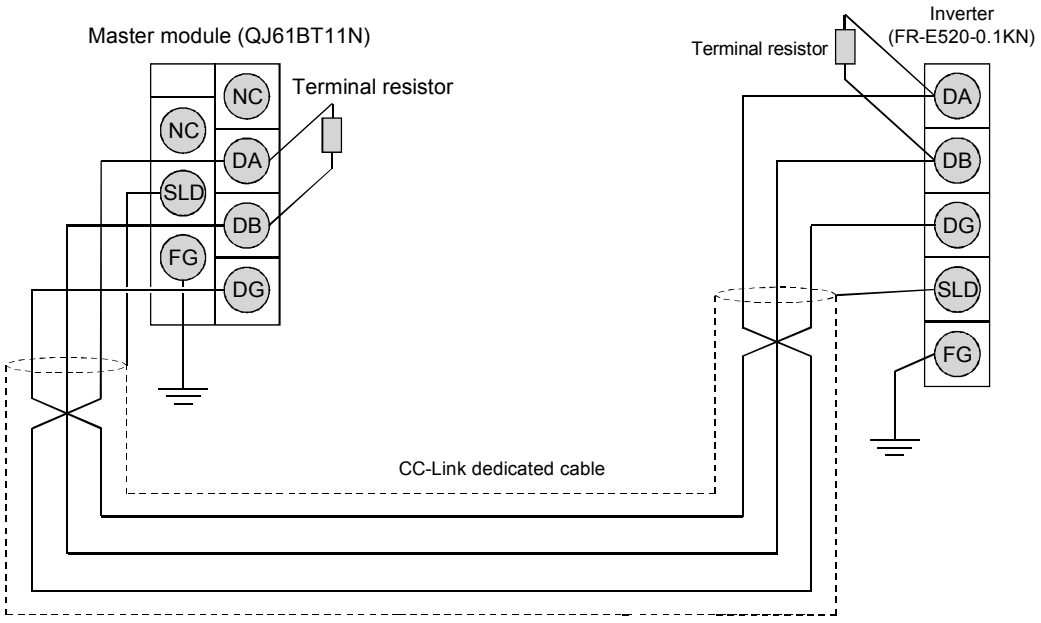
Appendix 13.2.1 Module settings

The settings of FR-E520-0.1KN are described.
For more details about the function and specification, refer to the inverter's Instruction Manual.



Appendix 13.2.2 Module wiring

This paragraph provides information on the wiring between the CC-Link dedicated cable and the terminal resistor.
Use 3-phase 200 V for the connection.
Turn of the power before wiring the CC-Link dedicated cable or the power supply cable.



Appendix 13.3 Network parameter/automatic refresh parameter settings

Set the network parameter/automatic refresh parameter as follows and write them in the PLC CPU.

For the setting and writing operation, refer to the section 3.5.2 to 3.5.4.

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

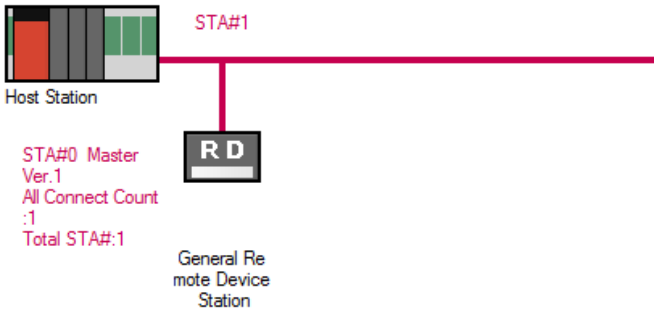
Number of Modules 1 Boards Blank : No Setting ☑ Set the station information in the CC-Link configuration window

	1	2
Start I/O No.	00A0	
Operation Setting	Operation Setting	
Type	Master Station	
Master Station Data Link Type	PLC Parameter Auto Start	
Mode	Remote Net(Ver.1 Mode)	
Total Module Connected(*1)	0	
Remote input(RX)	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	
Standby Master Station No.(*1)		
PLC Down Select	Stop	
Scan Mode Setting	Asynchronous	
Delay Time Setting	0	
Station Information Setting	CC-Link Configuration Setting	
Remote Device Station Initial Setting	Initial Setting	
Interrupt Settings	Interrupt Settings	

- Station information

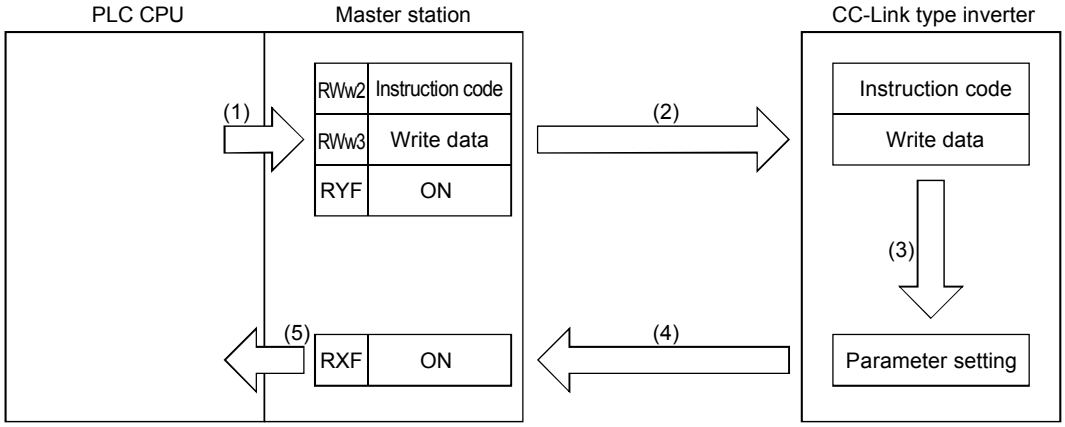
	Station No.	Model Name	Station Type	Version	# of STA Occupied	Expanded Cyclic Setting	Remote Station Points	Reserved/Err Invalid STA	Intelligent Buffer Size(word)		
									Send	Receive	Auto
	0/0	Host Station	Master Station								
RD	1/1	General Remote Device Station	Remote Device Station	Ver.1	1 Station Occupied	Single	32 Points	No Setting			

<REFERENCE> The station information for the exercise 5 is can be shown as below.



Appendix 13.4 Inverter parameter setting

It is necessary to set multiple parameters before running the inverter.
Inverter with CC-Link connectivity can be parameterized using the remote output (RY) and remote register (RWw).
An overview of the parameter setting by the CC-Link is shown below.
For the I/O signal of the inverter FR-E500-0.1KN and the remote register, refer to APPENDIX 9.
For the setting method via the parameter module and details of each parameter, refer to the Instruction Manual of Inverter.



(1) The Instruction code and Write data are set to the remote registers using the sequence program. Then, instruction code execution request signal (RYF) is turned ON.
(2) Send to the inverter via the data link
(3) Corresponding parameter value is changed according to the instruction code.
(4) When the writing is finished, the instruction code execution completion signal (RXF) turns ON
(5) Writing completion is confirmed with the instruction code execution completion signal

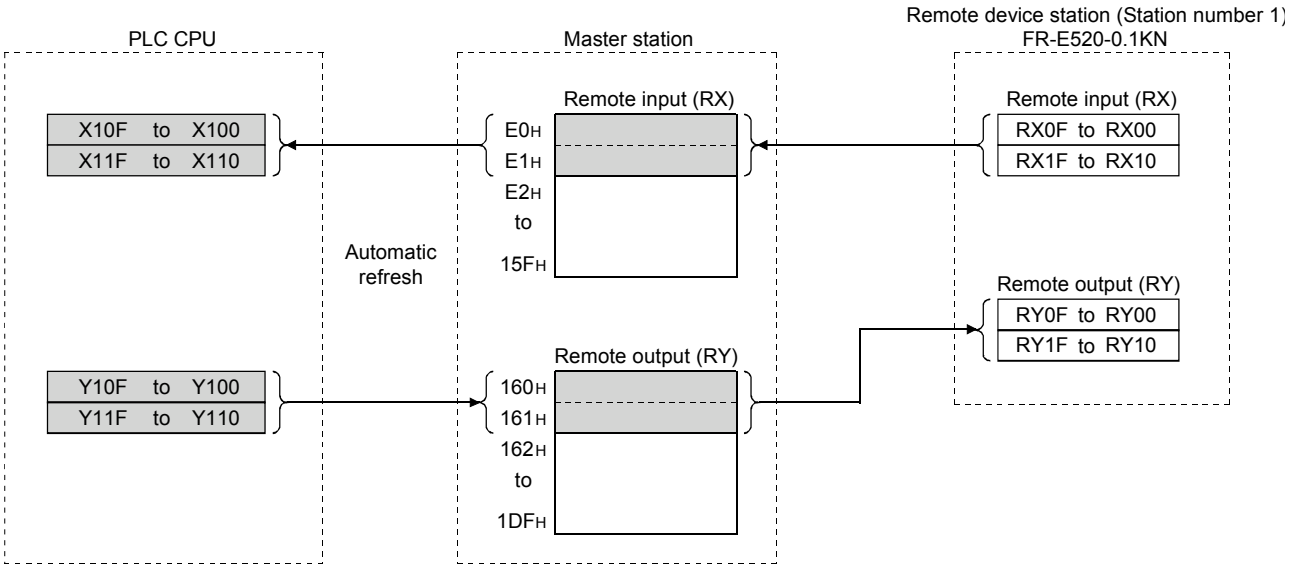
*: The instruction code is defined for each content of inverter operation.
<Example> Operation mode write ····· FBH
Pr.4 multi-speed setting (high speed) write····· 84H

Appendix 13.5 Sequence program

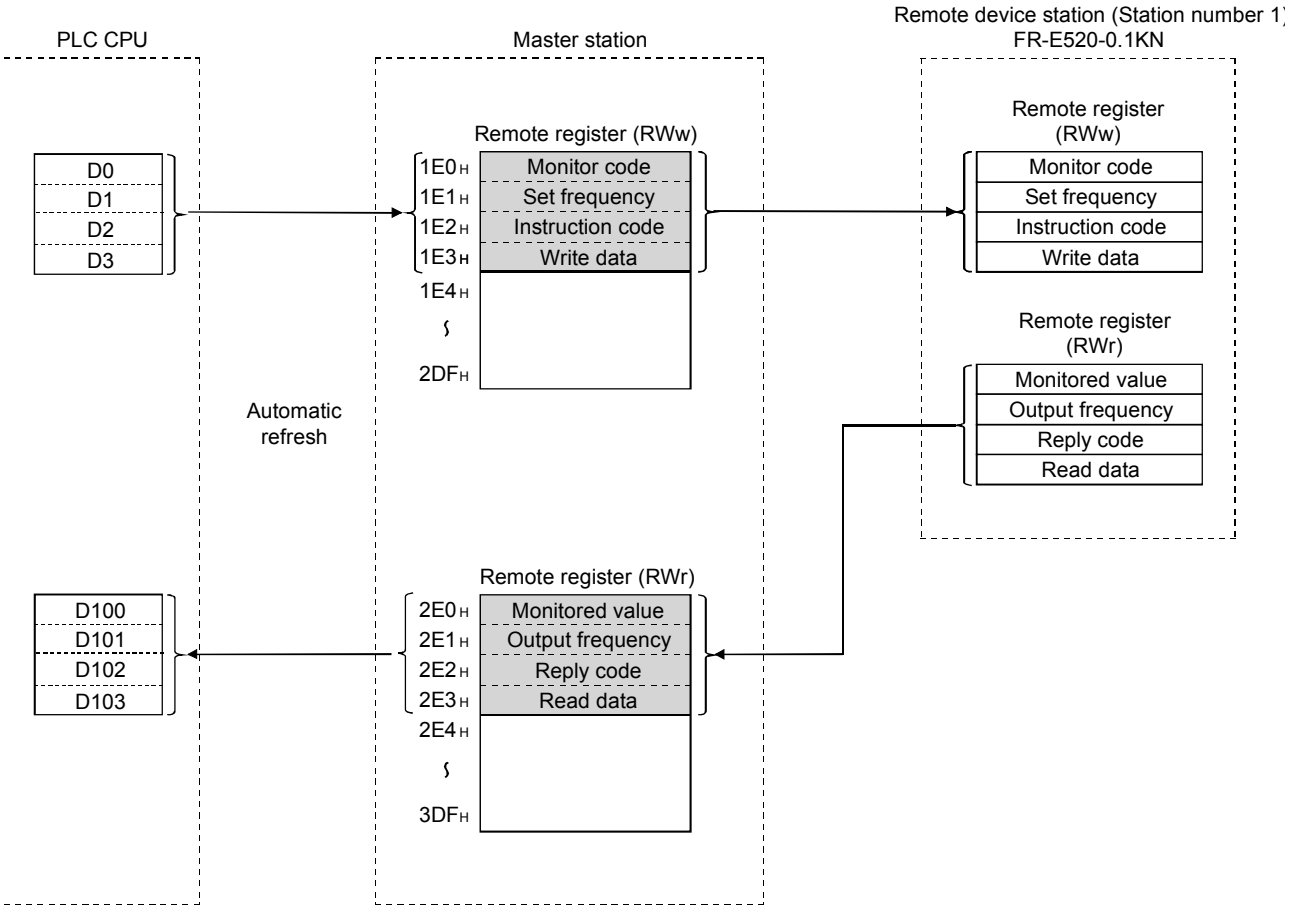
(1) Refresh support

The relationship between the PLC CPU, master station buffer memory and the refresh of the remote device station is as shown below.

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



[Remote register (Rww, RWr)]



(2) Setting Sheet

(a) Station information setting sheet

Station No.	Station Type	Number of Occupied Stations	Reserve/Invalid Station Select	Intelligent Buffer Select (Word)		
				Send	Receive	Automatic
1	Intelligent device station	1	Not set	—	—	—
2						
3						
4						
5						
6						
7						
8						
9						
10						

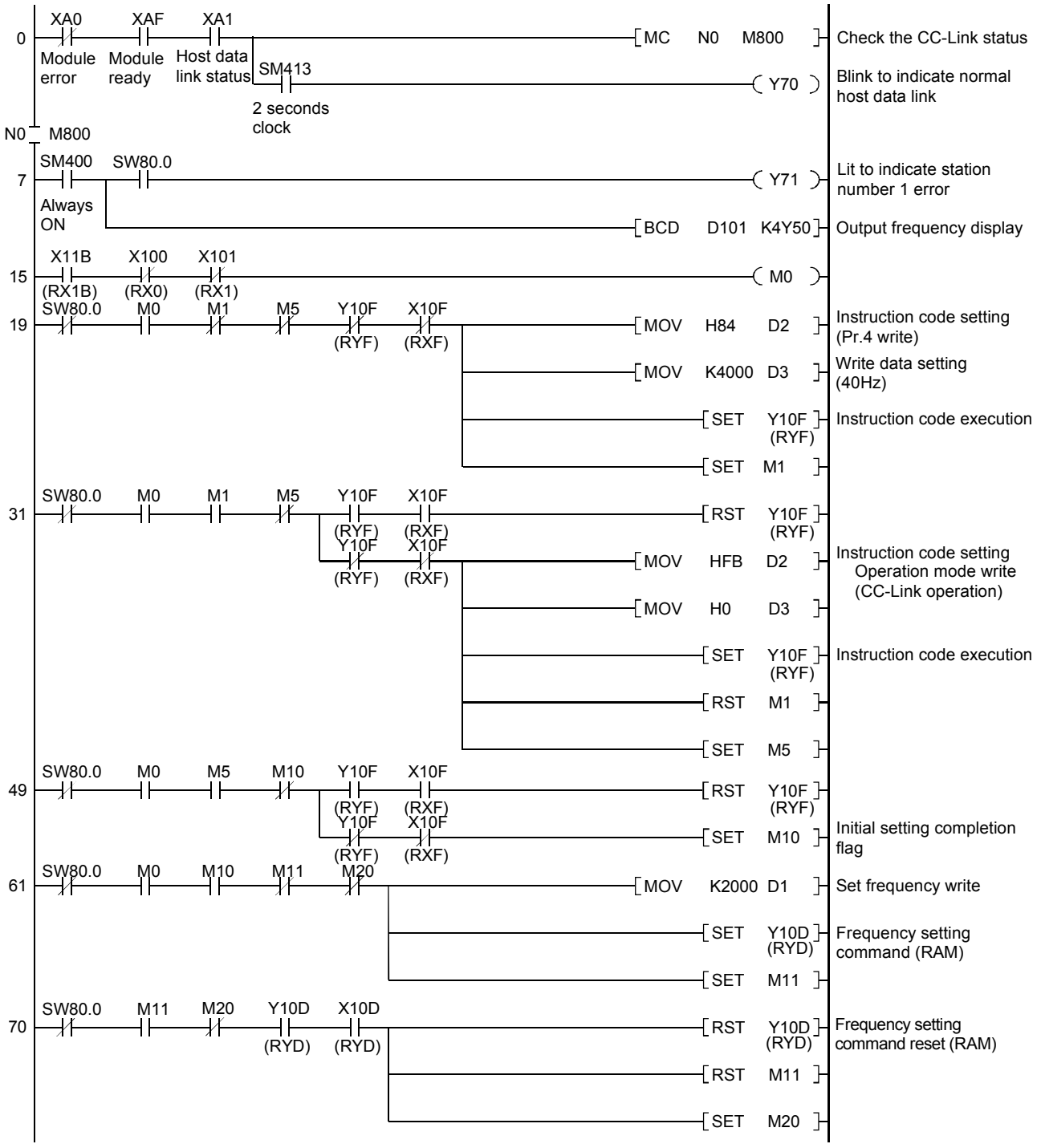
(b) Device assignment table

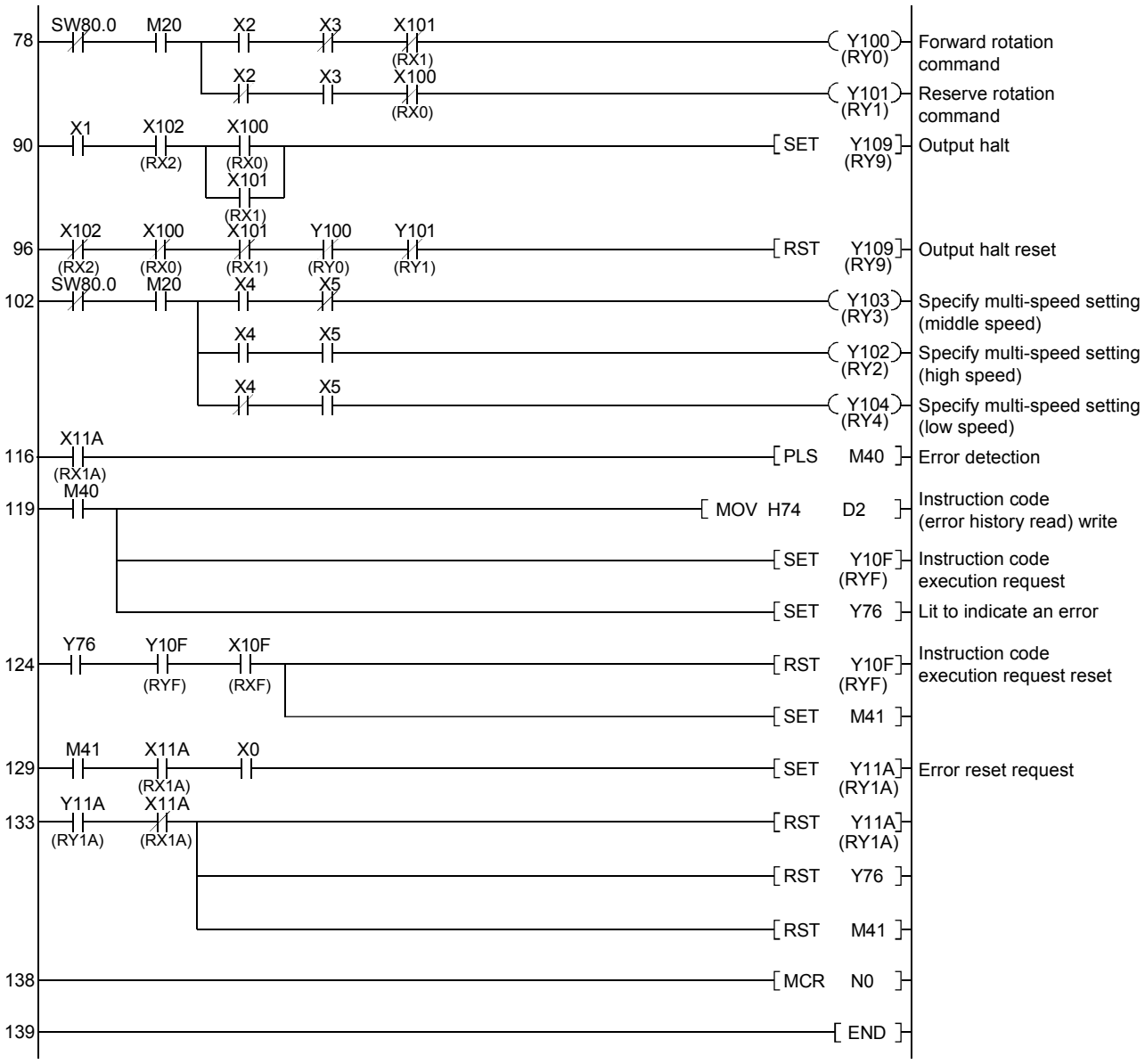
Device / Station No.	RX → (X)		RY ← (Y)		RWw → (D)		RWr → (D)	
	Remote device	CPU device	Remote device	CPU device	Remote device	CPU device	Remote device	CPU device
1	RX0 to RXF RX10 to RX1F	X100 to X10F X110 to X11F	RY0 to RYF RY10 to RY1F	Y100 to Y10F Y110 to Y11F	RWw0 to RWw3	D0 to D3	RWr0 to RWr3	D100 to D103
2								
3								
4								
5								
6								
7								
8								
9								
10								

(3) Sequence program

Create a sequence program as below and write it to the PLC CPU.

Program name	EX6




78
SW80.0
M20
X2
X3
X101
(RX1)
Y100
(RY0)
Forward rotation command
X2
X3
X100
(RX0)
Y101
(RY1)
Reserve rotation command
90
X1
X102
(RX2)
X100
(RX0)
X101
(RX1)
SET Y109
(RY9)
Output halt
96
X102
(RX2)
X100
(RX0)
X101
(RX1)
Y100
(RY0)
Y101
(RY1)
RST Y109
(RY9)
Output halt reset
102
SW80.0
M20
X4
X5
Y103
(RY3)
Specify multi-speed setting (middle speed)
X4
X5
Y102
(RY2)
Specify multi-speed setting (high speed)
X4
X5
Y104
(RY4)
Specify 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)
Instruction code execution request
SET Y76
Lit to indicate an error
124
Y76
Y10F
(RYF)
X10F
(RXF)
RST Y10F
(RYF)
Instruction code execution request 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

Operation of the training kit

(1) Push the RUN/STOP/RESET switch of the PLC CPU in the "RESET" position one time (1 second). It is reset.

(2) Set the RUN/STOP/RESET switch of the PLC CPU to "RUN".
Y70·····Flashing according to the host station data link status (X0A1) (data link is normal)
Y71·····Lighting up according to other station data link status (X0A1) (Lit to indicate station number 1 error)
(An error occurs in inverter because of the PLC CPU reset)

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

(4) Set X2 to ON.
Forward rotation starts with set frequency (20.00Hz) of E^2PROM .
Y5F-Y50 digital display ·····"2000" is displayed (Output frequency).

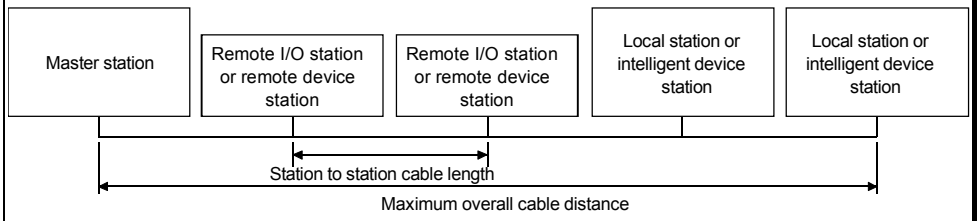
(5) Set X4 to ON. (X2 = ON, X3 = OFF, X4 = ON, X5 = OFF)
Forward rotation with the frequency (30.00Hz) which is the initial value of the parameter (multi-speed setting (middle speed)).
Y5F-Y50 digital display ·····"3000" is displayed (Output frequency).

(6) Set X5 to ON. (X2 = ON, X3 = OFF, X4 = ON, X5 = ON)
Forward rotation with the frequency (40.00Hz) which is the initial value of the parameter (multi-speed setting (high speed)).
Y5F-Y50 digital display ·····"4000" is displayed (Output frequency).

(7) Set X4 to OFF. (X2 = ON, X3 = OFF, X4 = ON, X5 = ON)
Forward rotation with the frequency(10.00Hz) which is the initial value of the parameter (multi-speed setting (low speed)).

(8) Set X1 to ON
Inverter frequency output is stopped.
(The motor coasts to a stop.)
* When decelerating to stop, turn OFF X2 (Forward rotation command) and X3 (Reverse rotation command).

(1) Specification of CC-Link (Ver1.10)

<table>
<tr><th colspan="2">Item</th><th>Specification</th></tr>
<tr><td rowspan="2">Control specifications</td><td>Maximum number of link points</td><td>Remote I/O (RX, RY) : 2048 points each
Remote register (RWw) : 256 words
Remote register (RWr) : 256 words</td></tr>
<tr><td>Number of link points per station</td><td>Remote I/O (RX, RY) : 32 points each
Remote register (RWw) : 4 words
Remote register (RWr) : 4 words</td></tr>
<tr><td rowspan="9">Communication Specifications</td><td>Transmission speed</td><td>10 Mbps/5 Mbps/2.5 Mbps/625 kbps/156 kbps</td></tr>
<tr><td>Communication method</td><td>Broadcast polling method</td></tr>
<tr><td>Synchronization method</td><td>Flag synchronization method</td></tr>
<tr><td>Encoding method</td><td>NRZI method</td></tr>
<tr><td>Transmission path</td><td>Bus (EIA RS485 compliant)</td></tr>
<tr><td>Transmission format</td><td>HDLC compliant</td></tr>
<tr><td>Error control system</td><td>CRC ($X^{16} + X^{12} + X^5 + 1$)</td></tr>
<tr><td>Number of connected modules</td><td>64
However, the following conditions must be satisfied:
{(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 station modules Maximum 64
B: Number of remote device station modules Maximum 42
C: Number of local station/standby master stations/ intelligent device station modules Maximum 26</td></tr>
<tr><td>Remote station number</td><td>1 to 64</td></tr>
<tr><td>Maximum overall cable distance and station to station cable length</td><td> 

Version 1.10 compatible CC-Link dedicated cable (terminal resistor of 110Ω used)
<table>
<tr><th>Transmission rate</th><th>Station to station cable length</th><th>Maximum overall cable distance</th></tr>
<tr><td>156 kbps</td><td rowspan="5">20cm or more</td><td>1,200m</td></tr>
<tr><td>625 kbps</td><td>900m</td></tr>
<tr><td>2.5 Mbps</td><td>400m</td></tr>
<tr><td>5 Mbps</td><td>160m</td></tr>
<tr><td>10 Mbps</td><td>100m</td></tr>
</table>
When products compatible with Ver.1.10 and products compatible with Ver.1.00 are mixed, Ver.1.00 specifications apply for station to station cable length and maximum overall cable distance.</td></tr>
<tr><td>Connection cable</td><td>CC-Link dedicated cable compatible with Ver1.10.
• Use CC-Link certified dedicated cable.
• Operation cannot be guaranteed with a noun-certified cable.
• If the cables are all compatible with the Ver1.10, it is possible to mix cables from different manufacturers.
• About the specification of the CC-Link dedicated cable and contact, refer to the CC-Link Partner Association product catalog, and also, CC-Link Partner Association website http://www.cc-link.org.</td></tr>
<tr><td>Function</td><td colspan="2">Automatic Refresh function *1
RAS function
(Standby master, Automatic return, Link special relay, error detection via register, test, monitor)
Remote I/O mode *1
Scan synchronous function
CC-Link automatic startup*2
Reserved station function
Error invalid station setting function
Duplex function support*2
*1 Can be used in combination with a CPU but it is also possible that it cannot be used.
*2 Function only for Q Series.</td></tr>
</table>

(2) Differences between CC-Link Ver.2 and Ver.1

By performing expanded cyclic settings in Ver.2, it is possible to increase the amount of cyclic data.

(a) Specification of CC-Link Ver.1

Item		Specification		
Maximum number of link points		Remote I/O (RX, RY): 2048 points each	Remote register (RWw): 256 words	Remote register (RWw): 256 words
Number of link points per station		Remote I/O (RX, RY): 32 points each	Remote register (RWw): 4 words each	Remote register (RWr): 4 words each
Link points per number of occupied stations	Occupying 1 station	Remote I/O (RX, RY): 32 points each	Remote register (RWw): 4 words each	Remote register (RWr): 4 words each
	Occupying 2 stations	Remote I/O (RX, RY): 64 points each	Remote register (RWw): 8 words each	Remote register (RWr): 8 words each
	Occupying 3 stations	Remote I/O (RX, RY): 96 points each	Remote register (RWw): 12 words each	Remote register (RWr): 12 words each
	Occupying 4 stations	Remote I/O (RX, RY): 128 points each	Remote register (RWw): 16 words each	Remote register (RWr): 16 words each
Number of connected modules		(1) Total number of modules (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 (2) Number of connected station modules (16 × A) + (54 × B) + (88 × C) ≤ 2304 A: Number of remote I/O station modules ····· Maximum 64 B: Number of remote device station modules ····· Maximum 42 C: Number of local station/standby master stations/intelligent device station modules ····· Maximum 26		

(b) Specification of CC-Link Ver.2

Item			Specification			
Maximum number of link points			Remote I/O (RX, RY): 8192 points each, remote register (RWw): 2048 points, remote register (RWr): 2048 points			
Expanded cyclic setting			Single	Double	Triple	Quadruple
Number of link points per station		Remote I/O (RX, RY) Remote register (RWw) Remote register (RWr)	32 points each 4 Words 4 Words	32 points each 8 Words 8 Words	64 points each 16 Words 16 Words	128 points each 32 Words 32 Words
Link points per number of occupied stations	Occupying 1 station	Remote I/O (RX, RY) Remote register (RWw) Remote register (RWr)	32 points each 4 Words 4 Words	32 points each 8 Words 8 Words	64 points each 16 Words 16 Words	128 points each 32 Words 32 Words
	Occupying 2 stations	Remote I/O (RX, RY) Remote register (RWw) Remote register (RWr)	64 points each 8 Words 8 Words	96 points each 16 Words 16 Words	192 points each 32 Words 32 Words	384 points each 64 Words 64 Words
	Occupying 3 stations	Remote I/O (RX, RY) Remote register (RWw) Remote register (RWr)	96 points each 12 Words 12 Words	160 points each 24 Words 24 Words	320 points each 48 Words 48 Words	640 points each 96 Words 96 Words
	Occupying 4 stations	Remote I/O (RX, RY) Remote register (RWw) Remote register (RWr)	128 points each 16 Words 16 Words	224 points each 32 Words 32 Words	448 points each 64 Words 64 Words	896 points each 128 Words 128 Words
Number of connected modules			(1) Total number of modules (a + a2 + a4 + a8) + (b + b2 + b4 + b8) × 2 + (c + c2 + c4 + c8) × 3 + (d + d2 + d4 + d8) × 4 ≤ 64 (2) Number of all the remote I/O points (a × 32 + a2 × 32 + a4 × 64 + a8 × 128) + (b × 64 + b2 × 96 + b4 × 192 + b8 × 384) + (c × 96 + c2 × 160 + c4 × 320 + c8 × 640) + (d × 128 + d2 × 224 + d4 × 448 + d8 × 896) ≤ 8192 (3) Number of all the remote register words (a × 4 + a2 × 8 + a4 × 16 + a8 × 32) + (b × 8 + b2 × 16 + b4 × 32 + b8×64) + (c × 12 + c2 × 24 + c4 × 48 + c8×96) + (d × 16 + d2 × 32 + d4 × 64 + d8 × 128) ≤ 2048 a: 1 occupied station single number of module a2: 1 occupied station double number of module a4: 1 occupied station quadruple number of module a8: 1 occupied station octuple number of module B: 2 occupied stations single number of module b2: 2 occupied stations double number of module b4: 2 occupied stations quadruple number of module b8: 2 occupied stations octuple number of module c: 3 occupied stations single number of module c2: 1 occupied stations double number of module c4: 3 occupied stations quadruple number of module c8: 3 occupied stations octuple number of module d: 4 occupied stations single number of module d2: 1 occupied stations double number of module d4: 4 occupied stations quadruple number of module d8: 4 occupied stations octuple number of module (4) Number of connected station modules 16 × A + 54 × B + 88 × C ≤ 2304 A: Number of remote I/O station modules ····· Maximum 64 B: Number of remote device station modules ····· Maximum 42 C: Number of local station/standby master stations/intelligent device station modules ····· Maximum 26			

* (2) and (3) must be calculated only for Ver.2 mode.

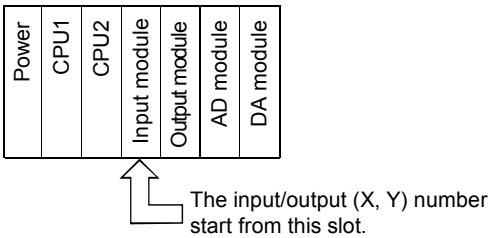
* There are no change about the specification of cable and wiring in CC-Link Ver.2. Use Ver.1 compatible cable for the connection with Ver.2 compatible device.

In this practice a single CPU configuration will be used. When a second CPU is installed to make multiple CPU configurations, it is required to set the multiple CPU parameters.
The system operation with multiple CPUs is shown below.

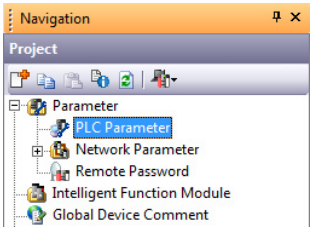
(1) Parameter setting for multiple CPU (Not required for configuration with one CPU)
In this course, only one QCPU is used but, it is required to set the PLC parameter to each CPU for the following reasons.

Each CPU must recognize from which slot on a main base the I/O numbers start.

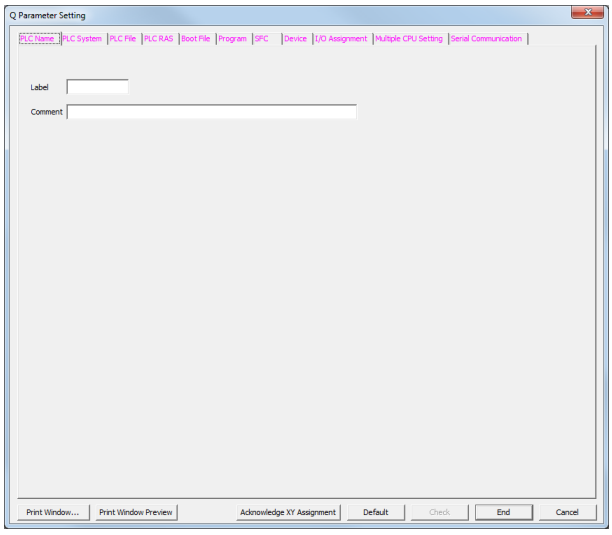
<When using 2 CPUs>



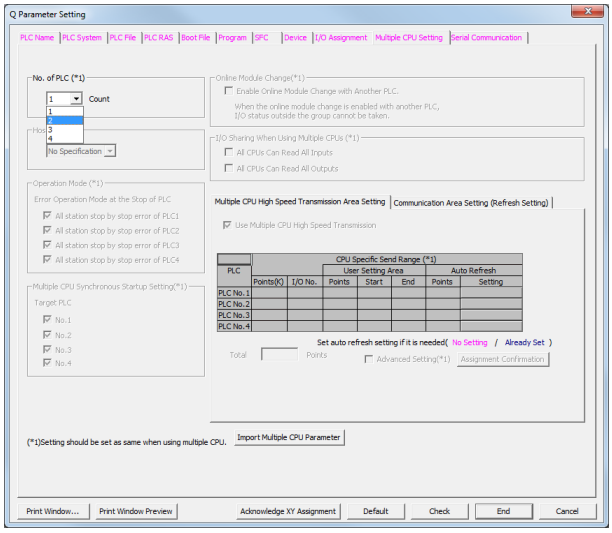
Set 2 as the number of CPUs installed on a main base in [Multiple CPU setting] parameter



(1) Double click on "PLC Parameter" in the GX Works2 Project View.

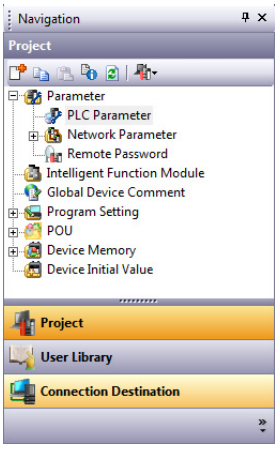


(2) The [Q Parameter Setting] dialog box is displayed. Click on [Multiple CPU Setting] tab.

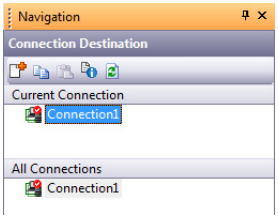


(3) Set to "2" in [No. of PLC] and click on the [End] button.

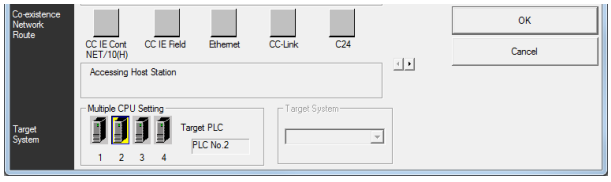
(2) Writing of the parameter to the second CPU (Not required for configuration with one CPU)



(1) Click on Connection Destination in the selection area in the Navigation window view.



(2) The Connection Destination view is. Double click on "Connection1" in "Current Connection".

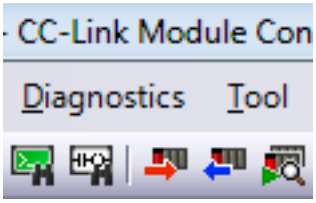


(3) The Connection Destination setting dialog box is displayed.
Select "2" in [Multiple CPU Setting].

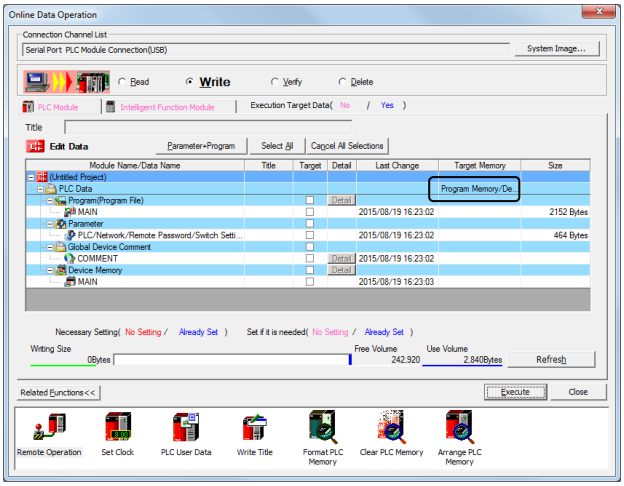
(4) Click OK .

(To the next page)

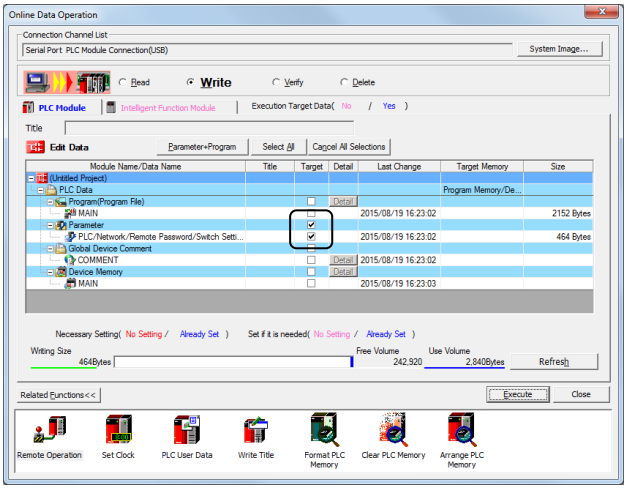
(From the previous page)



(5) Click the in the toolbar.
(Set the status of QCPU RUN/STOP/RESET switch on STOP.)

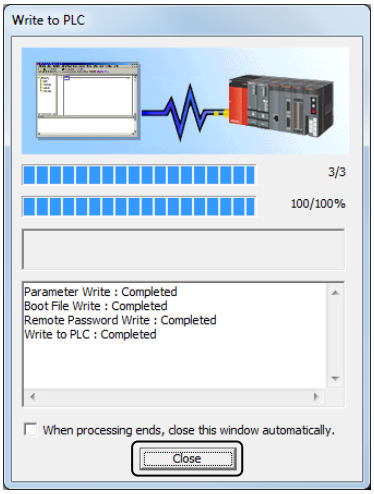


(6) [Online Data Operation] dialog box is displayed. Check that "Target Memory" displays "Program memory/Device memory".



(7) Check the parameter (PLC/Network/Remote Password/Switch Setting).

(8) Click Execute .



(9) When the writing is finished, a dialog box will appear on the left. Click on the button Close .

(10) Change the Connection destination PC back to "1" by following the procedure (1) to (4) above.

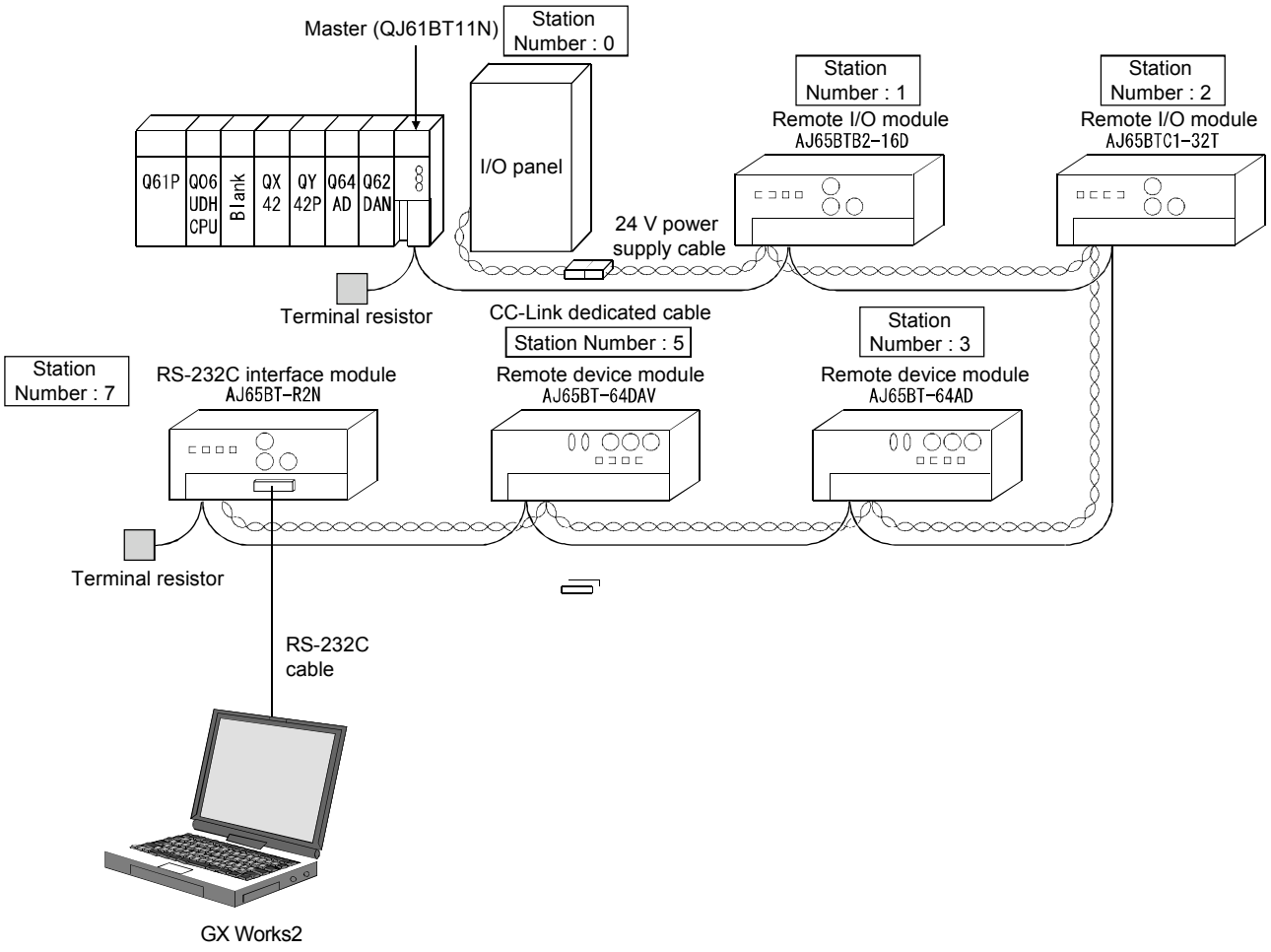
(11) Click Close on the Online Data Operation dialog box to close the dialog box.

APPENDIX 16 EXERCISE 7 (Connecting GX Works2 to the CPU via AJ65BT-R2N of GX Works2)

In this exercise, connect the GX Works2 to the AJ65BT-R2N, and access the CPU in the CC-Link system.

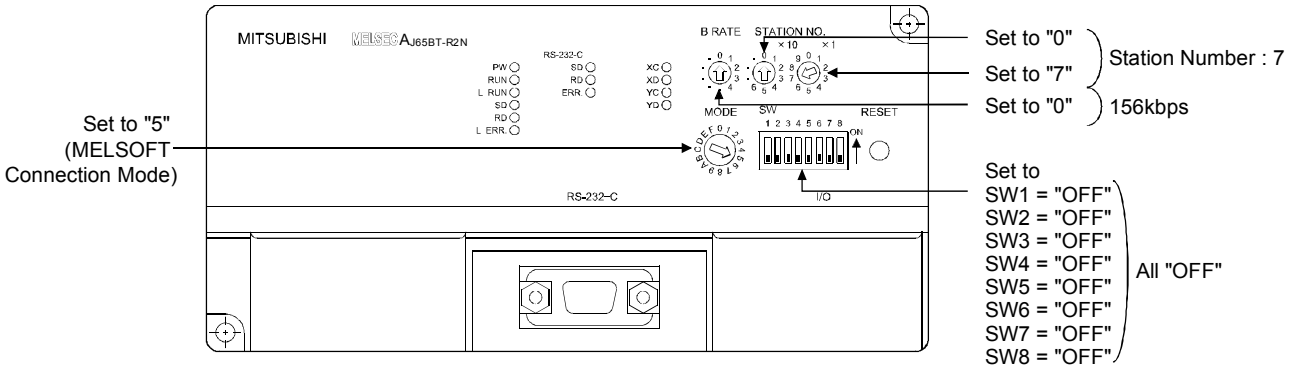
Appendix 16.1 System configuration

The system configuration used in the practice of the exercise 7 is as follows. The master module setting is the same the exercise 1.



Appendix 16.2 AJ65BT-R2N Settings

The settings of AJ65BT-R2N are described.
For more details about module functions and specifications, refer to the AJ65BT-R2N User's Manual (Details).



Appendix 16.3 Network parameter/Station information settings

Set the network parameter/station information as follows and write them to the PLC CPU.
For the setting and writing operation refer to the section 3.5.2 to 3.5.4.

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

Number of Modules: 1 Boards Blank : No Setting Set the station information in the CC-Link configuration window

	1	2
Start I/O No.	00A0	
Operation Setting	Operation Setting	
Type	Master Station	
Master Station Data Link Type	PLC Parameter Auto Start	
Mode	Remote Net(Ver.1 Mode)	
Total Module Connected(*1)	0	
Remote input(RX)	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	
Standby Master Station No.(*1)		
PLC Down Select	Stop	
Scan Mode Setting	Asynchronous	
Delay Time Setting	0	
Station Information Setting	CC-Link Configuration Setting	
Remote Device Station Initial Setting	Initial Setting	
Interrupt Settings	Interrupt Settings	

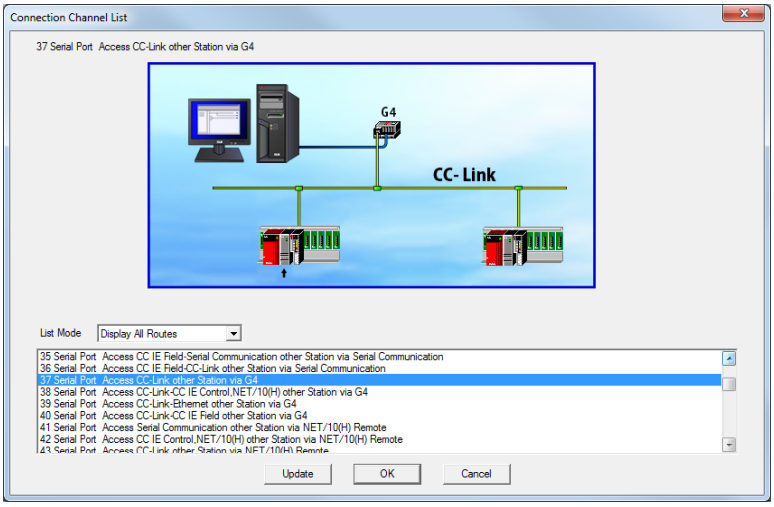
- Station information

	Station No.	Model Name	Station Type	Version	# of STA Occupied	Expanded Cyclic Setting	Remote Station Points	Reserved/Err Invalid STA	Intelligent Buffer Size(word)		
									Send	Receive	Auto
	0/0	Host Station	Master Station								
	1/1	AJ65BTB2-16D	Remote I/O Station	Ver.1	1 Station Occupied	Single	32 Points	No Setting			
	2/2	AJ65BTC1-32T	Remote I/O Station	Ver.1	1 Station Occupied	Single	32 Points	No Setting			
	3/3	AJ65BT-64AD	Remote Device Station	Ver.1	2 Stations Occupied	Single	64 Points	No Setting			
	4/5	AJ65BT-64DAV	Remote Device Station	Ver.1	2 Stations Occupied	Single	64 Points	No Setting			
	5/7	Gen. Intelligent Device Station	Intelligent Device Station	Ver.1	1 Station Occupied	Single	32 Points	No Setting	64	64	128

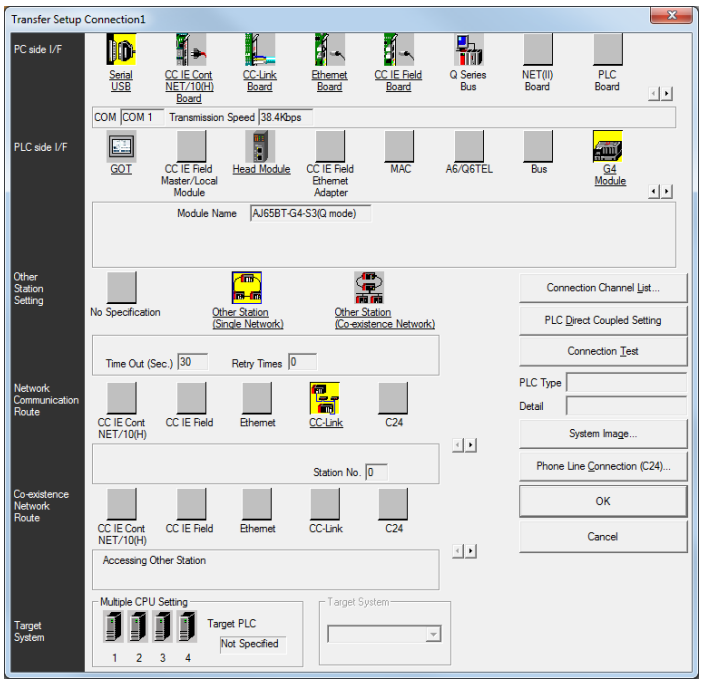
Appendix 16.4 GX Works2 Connection Destination specification

(1) Connection Channel List

Select the number 37 "Serial Port Acces CC-Link other Station via G4".



(2) Transfer Setup specification

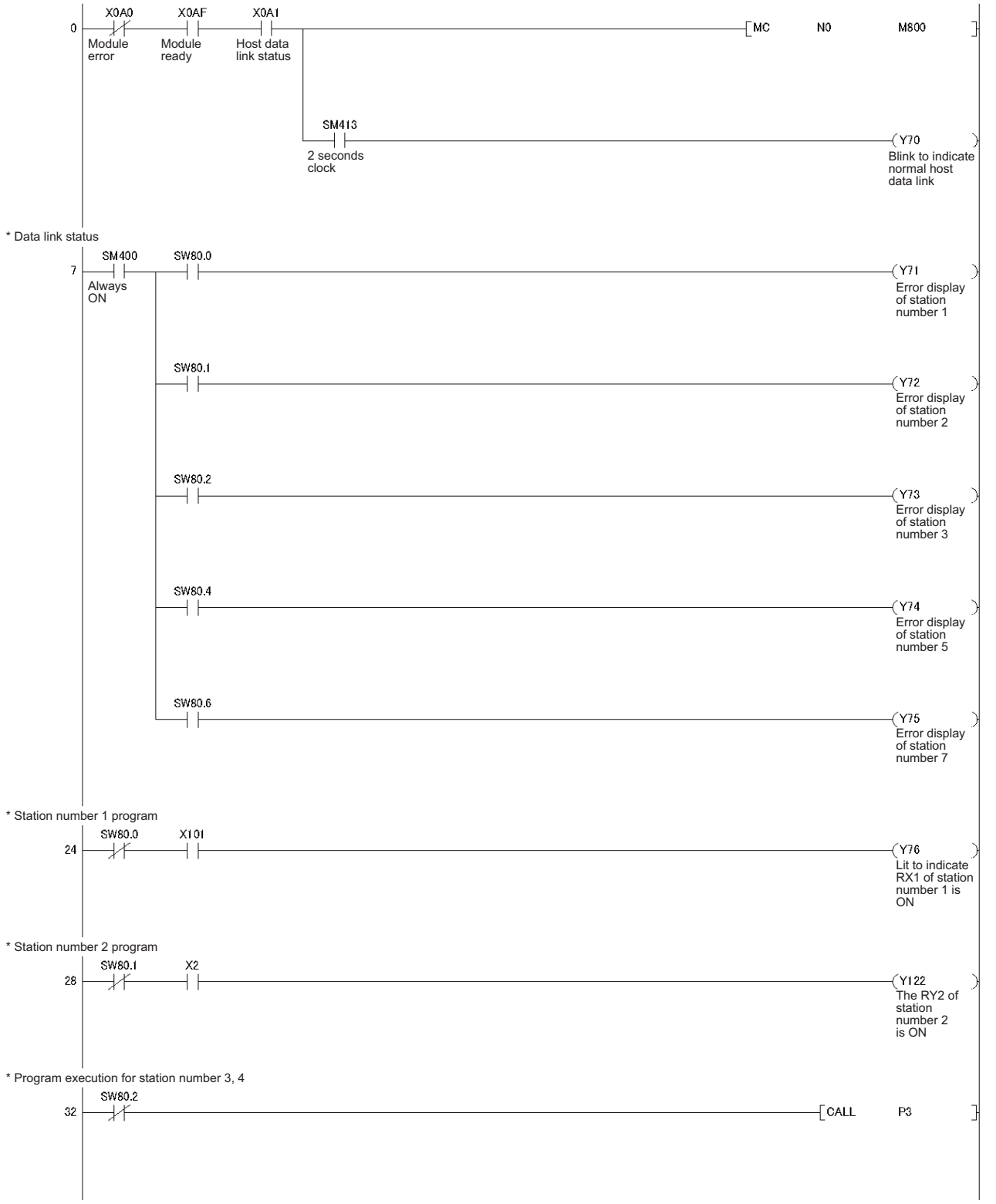


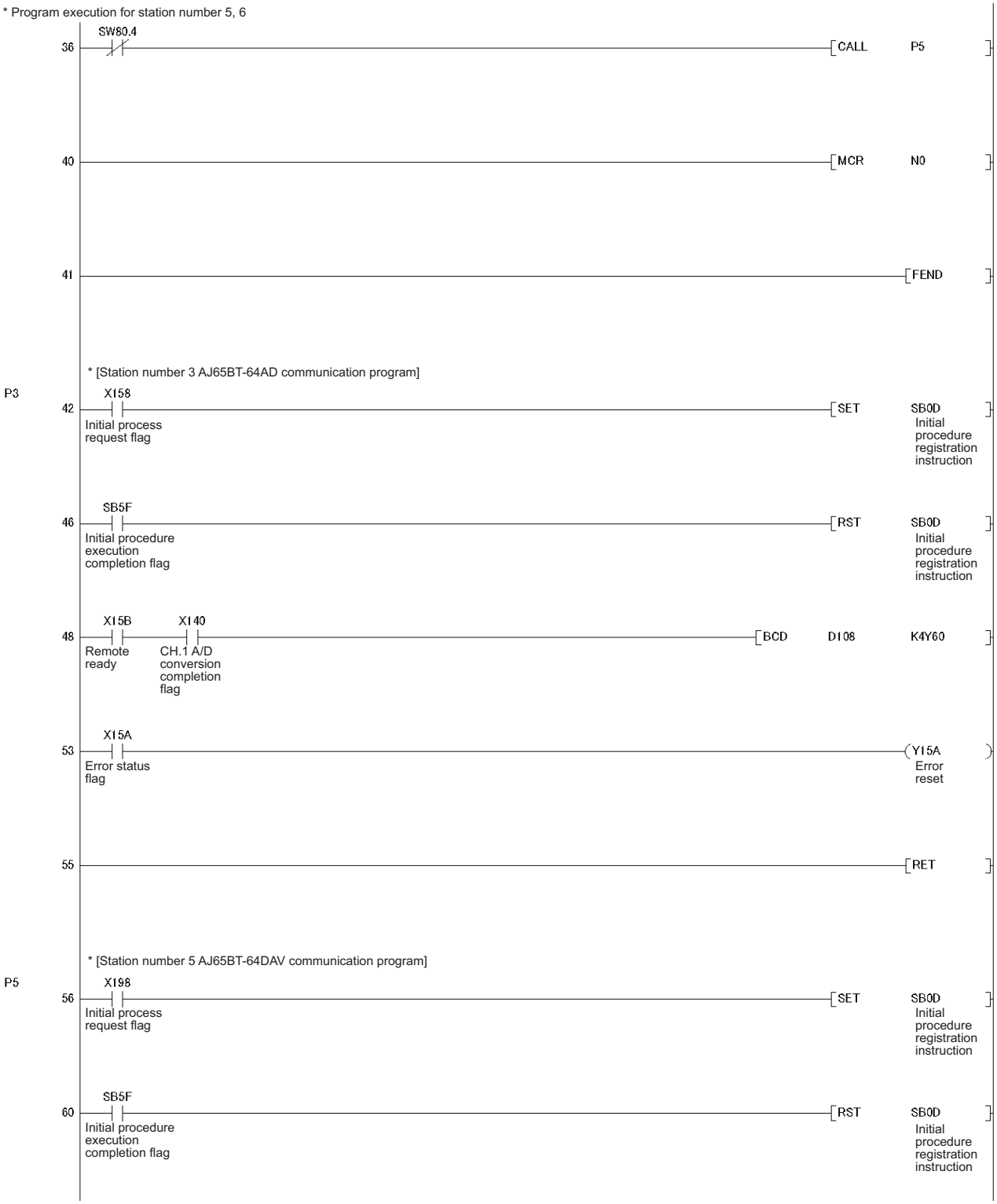
Setting item	Setting	Detailed setting
PC side I/F	Serial	PC side I/F serial detailed setting • COM port: COM1 • Transmission speed: 38.4 Kbps
PLC side I/F	G4 module	PLC side I/F G4 module detailed setting • PLC Type: AJ65BT-G4-S3 (Q mode)
Other Station Setting	Other station (Single Network)	Other station detailed setting • Check at Communication time: 30s • Retry times: 0
Network Communication Route	CC-Link	Network route CC-Link detailed setting • Station No. 0

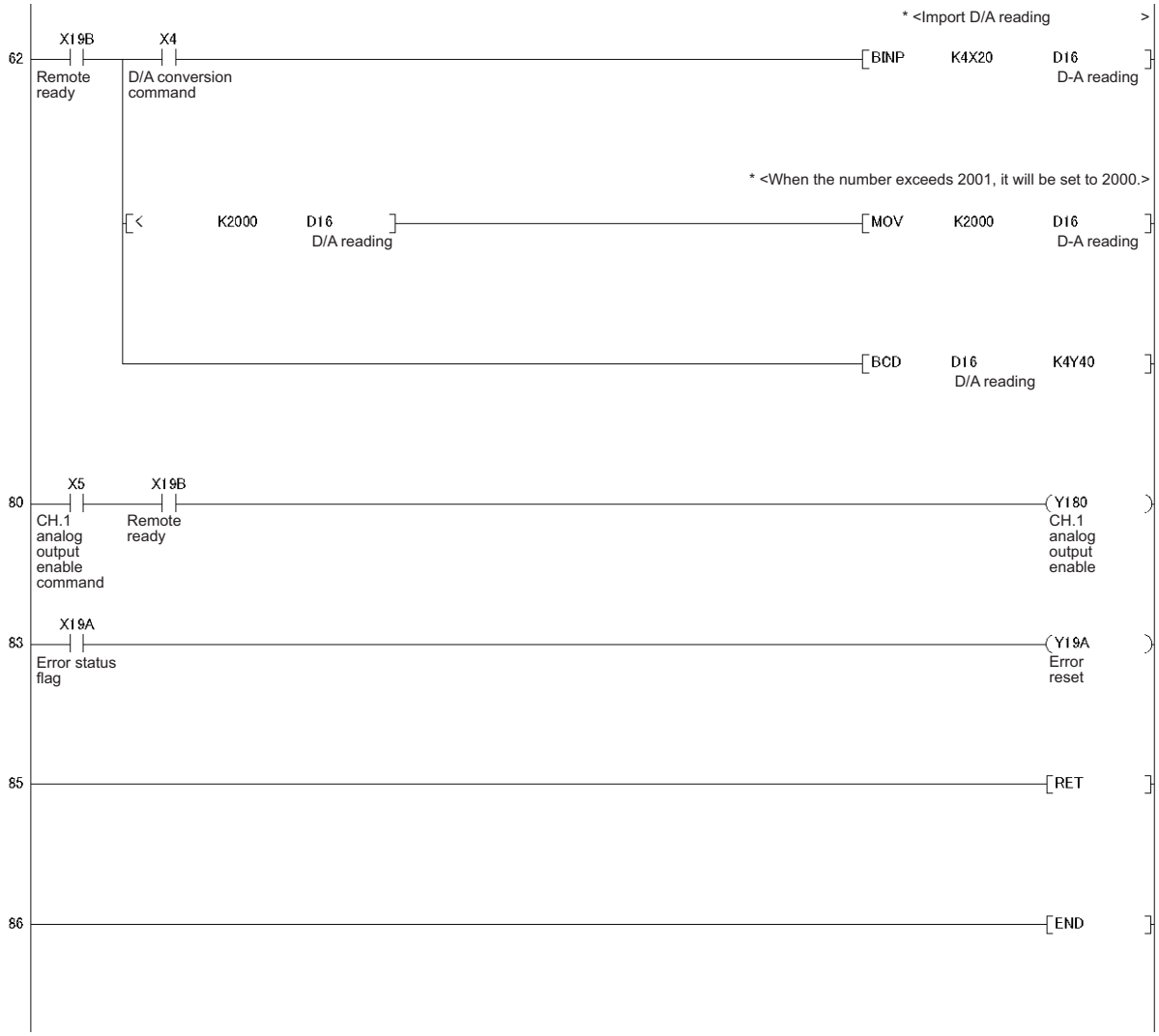
Appendix 16.5 Sequence program

Create a sequence program as below and write it to the PLC CPU.

Program name	EX7




* Program execution for station number 5, 6
SW80.4
36
CALL P5
40
MCR N0
41
FEND
* [Station number 3 AJ65BT-64AD communication program]
P3
X158
42
Initial process request flag
SET SB0D Initial procedure registration instruction
SB5F
46
Initial procedure execution completion flag
RST SB0D Initial procedure registration instruction
X15B
X140
48
Remote ready
CH.1 A/D conversion completion flag
BCD D108 K4Y60
X15A
53
Error status flag
Y15A Error reset
55
RET
* [Station number 5 AJ65BT-64DAV communication program]
P5
X198
56
Initial process request flag
SET SB0D Initial procedure registration instruction
SB5F
60
Initial procedure execution completion flag
RST SB0D Initial procedure registration instruction


* <Import D/A reading >
62
X19B
Remote ready
X4
D/A conversion command
BINP K4X20 D16
D-A reading
* <When the number exceeds 2001, it will be set to 2000.>
< K2000 D16
D/A reading
MOV K2000 D16
D-A reading
BCD D16 K4Y40
D/A reading
80
X5
CH.1 analog output enable command
X19B
Remote ready
Y180
CH.1 analog output enable
83
X19A
Error status flag
Y19A
Error reset
85
RET
86
END

Mitsubishi Programmable Controllers Training Manual
CC-Link (for GX Works2)

MODEL	
MODEL CODE	

SH-081376ENG-A (1403) MEE

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