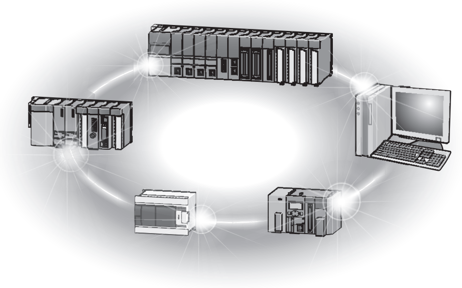
Programmable Controller

CC-Link System RS-232 Interface Module User's Manual (Nonprocedural Protocol Mode)



●SAFETY PRECAUTIONS●

(Always read these instructions before using this equipment.)

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

In this manual, the safety precautions are ranked as "⚠ WARNING" and "⚠ CAUTION".

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

Note that the ⚠CAUTION level may lead to a serious consequence according to the circumstances.
Always follow the instructions of both levels because they are important to personal safety.

Please save this manual to make it accessible when required and always forward it to the end user.

[Design Precautions]

⚠WARNING

- When controlling a running programmable controller (data modification) by connecting a peripheral to a CPU module or connecting a personal computer to an intelligent/special function module, create an interlock circuit on the sequence program so that the whole system will operate safely all the time.
  Also, before performing other controls (e.g. program modification, operating status change (status control)), read this manual carefully and ensure the safety.
  Especially, in the control from an external device to a programmable controller in a remote location, some programmable-controller-side problems cannot be resolved immediately due to a data communication failure.
  To prevent this, establish corrective procedures for communication failure between the external device and the programmable controller CPU, as well as creating an interlock circuit on the sequence program.

- In the case of a data link error, the operation status of a faulty station is as shown below. Using the communication status information, create an interlock circuit on the sequence program for the system to operate safely.
  Incorrect output or malfunction can lead to an accident.
  (1) All of general-purpose inputs from this module turn OFF.
  (2) All of general-purpose outputs from this module turn OFF.

- Depending on the module failure, inputs and outputs may turn ON or OFF incorrectly.
  For I/O signals that may cause a serious accident, provide an external monitoring circuit.

⚠CAUTION

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other.
  They should be installed 100 mm or more from each other.
  Not doing so could result in noise that would cause erroneous operation.
- Always use the data link terminal block for connection of a CC-Link dedicated cable to a master module.
  Care must be taken because, if the cable is incorrectly inserted into the general-purpose I/O terminal block instead of the data link terminal block, the module will break down.

[Security Precautions]

⚠WARNING

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

[Installation Precautions]

⚠CAUTION

- Use the programmable controller in an environment that meets the general specifications given in this manual.
  Using this programmable controller in an environment outside the range of the general specifications could result in electric shock, fire, erroneous operation, and damage to or deterioration of the product.
- Using a tool specified by the manufacturer, correctly press, crimp, or solder the wires of the connector and securely connect the connector to the module.
  Incomplete connection may cause a short circuit and/or malfunctions.
- Do not directly touch the module's conductive parts or electronic components.
  Touching the conductive parts could cause an operation failure or give damage to the module.
- Securely fix the module with the DIN rail or installation screws. Installation screws must be tightened within the specified torque range.
  A loose screw may cause a drop of the module, short circuit or malfunction.
  Overtightening may damage the screw, resulting in a drop of the module or a short circuit.
- Completely connect each cable connector to each receptacle.
  Incomplete connection may cause a malfunction due to poor contact.

[Wiring Precautions]

⚠CAUTION

- Be sure to shut off all phases of the external power supply used by the system before installation or wiring.
  Failure to do so may cause an electric shock, damage to the product and/or malfunctions.

- Attach the terminal cover to the product before energizing and operating the system after installation or wiring.
  Failure to do so may cause an electric shock.

- Be sure to ground the FG terminals and LG terminals to the protective ground conductor.
  Failure to do so may result in malfunctions.

- Use applicable solderless terminals and tighten them within the specified torque range. If any spade solderless terminal is used, it may be disconnected when a screw on the terminal block comes loose, resulting in failure.

- When wiring in the programmable controller, be sure that it is done correctly by checking the product's rated voltage and the terminal layout.
  Connecting a power supply that is different from the rating or incorrectly wiring the product could result in fire or damage.

- Tighten the terminal screws with the specified torque.
  If the terminal screws are loose, it could result in short circuits, fire, or erroneous operation.
  Overtightening a terminal screw may damage the screw, resulting in a short circuit or malfunction.

- Be sure there are no foreign substances such as sawdust or wiring debris inside the module.
  Such debris could cause fires, damage, or erroneous operation.

- Place the connection wires and cables in a duct or clamp them.
  If not, dangling cables may swing or inadvertently be pulled, resulting in damage to the module and/or cables or malfunctions due to poor cable connection.

- Do not install the control cable(s) together with the communication cable(s).
  Doing so may cause malfunctions due to noise.

- When disconnecting a communication or power cable from the module, do not pull it by holding the cable part.
  For a cable with connector, hold the connector and disconnect it from the module.
  For a cable without connector, loosen the connector screw and disconnect the cable.
  Pulling the cable that is still connected to the module may damage the module and/or cable and cause malfunctions due to poor cable connection.

⚠CAUTION

- Make sure that the interface type is correct before connecting the cable.
  Do not connect a cable to a module that has different interface specification.
  Doing so will cause a module failure.
- Using a tool specified by the manufacturer, correctly press, crimp, or solder the wires of the connector and securely connect the connector to the module.
  Failure to do so may result in a malfunction or failure of the module.

[Startup·Maintenance Precautions]

⚠CAUTION

- Before performing online operations (especially, program modification, forced output or operating status change) through connection between a running CPU module and a peripheral, read this manual carefully and ensure the safety.
  An improper operation will cause mechanical damage or accidents.
- Do not touch terminals while the power is ON.
  Doing so may cause an electric shock.
- Be sure to shut off all phases of the external power supply used by the system before cleaning or retightening the terminal screw or module fixing screw.
  Failure to do so may result in a failure or malfunction of the module.
  A loose screw may cause a drop of the module, short circuit or malfunction.
  Overtightening may damage the screw and/or module, resulting in a drop of the module, a short circuit or malfunctions.
- Do not touch any connector under the cover on the front of the module.
  Doing so may result in a failure or malfunction of the module.
- Do not disassemble or remodel the module.
  Doing so may cause a failure, malfunctions, personal injuries and/or a fire.
- Before handling the module, touch a conducting object such as a grounded metal to discharge the static electricity from the human body.
  Failure to do so may cause the module to fail or malfunction.
- Do not drop or apply a strong shock to the module since the case is made of resin.
  Doing so will damage the module.
- Be sure to shut off all phases of the external power supply before mounting or removing the module to/from the panel.
  Failure to do so may result in a failure or malfunction of the module.

⚠CAUTION

- Do not install/remove the terminal block more than 50 times after the first use of the product. (IEC 61131-2 compliant)
- Do not change the switch settings while the power is ON. Doing so may cause a failure or malfunctions.
- The terminal cover must be closed all the time, except during installation, wiring or operation check. If the cover remains open, it may cause damage to the module, a short circuit due to cable connection failure, or malfunctions.

[Disposal Precautions]

⚠CAUTION

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

●CONDITIONS OF USE FOR THE PRODUCT●

(1) MELSEC programmable controller ("the PRODUCT") shall be used in conditions;

i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and

ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.

MITSUBISHI ELECTRIC SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI ELECTRIC USER'S, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT. ("Prohibited Application")

Prohibited Applications include, but not limited to, the use of the PRODUCT in;

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

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

(3) Mitsubishi Electric shall have no responsibility or liability for any problems involving programmable controller trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

REVISIONS

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

Revision Date	* Manual Number	Description
Jul., 2007	SH(NA)-080685ENG-A	First edition
Sep., 2008	SH(NA)-080685ENG-B	Partially revised SAFETY PRECAUTIONS, ABOUT MANUALS, Compliance with the EMC and Low Voltage Directives, GENERIC TERMS AND ABBREVIATIONS, Section 2.2, 2.3, 3.2, 3.5.1, 5.1.1, 5.2, Appendix 1.1, Appendix 1.2 Added Section 2.4, 3.6.1, 3.6.2
Aug., 2010	SH(NA)-080685ENG-C	Partially revised SAFETY PRECAUTIONS, ABOUT MANUALS, GENERIC TERMS AND ABBREVIATIONS, Section 4.5.1, 5.1.1, Chapter 6, Chapter 7 Added CONDITIONS OF USE FOR THE PRODUCT
Oct., 2014	SH(NA)-080685ENG-D	Partially revised SAFETY PRECAUTIONS, Related manuals, Compliance with the EMC and Low Voltage Directives, HOW TO USE MANUALS, GENERIC TERMS AND ABBREVIATION, DEFINITIONS OF TERMINOLOGY, Section 1.1, 2.1 to 2.3, 3.1 to 3.4, 3.5.1, 3.6.1, 3.6.2, 3.7.1, 3.7.3, 3.9.1, 3.9.2, 4.1, 4.2, 4.2.1, 4.2.2, 4.3, 4.3.2, 4.3.3, 4.5.1 to 4.5.3, 4.5.6, 4.5.10, 5.1.1, 5.2, 5.4, Chapter 6, Section 7.7.1, Chapter 9, Section 9.1, 9.2, Appendix 1.1, 2 Added Section 2.5, 6.1.1, 6.1.3, Appendix 4 Change Section 6.1.1→6.1.2, Section 6.1.2→6.1.4
Jan., 2020	SH(NA)-080685ENG-E	Partially revised Section 5.2, 9.1
Nov., 2024	SH(NA)-080685ENG-F	Partially revised SAFETY PRECAUTIONS, CONDITIONS OF USE FOR THE PRODUCT, ABOUT MANUALS, Chapter 6, Section 6.1.3, Chapter 8, TRADEMARKS

Japanese Manual Version SH-080684-G

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INTRODUCTION

Thank you for purchasing the Mitsubishi Electric MELSEC-A series programmable controller.
Before using the product, please read this manual carefully to familiarize yourself with the features and performance of the A series programmable controller to ensure proper use of the product.

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ABOUT MANUALS

The following manuals are also related to this product.

Related manuals

Manual name	Manual number
CC-Link System RS-232 Interface Module User's Manual (MELSOFT Connection Mode) MELSOFT connection mode of AJ65BT-R2N	SH-080687ENG
MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Startup) Specifications, procedures before operation, system configuration, wiring, and communication examples of the CC-Link system master/local module	SH-081269ENG
MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Application) Functions, parameter settings, programming, troubleshooting, I/O signals, and buffer memory of the CC-Link system master/local module	SH-081270ENG
MELSEC-Q CC-Link System Master/Local Module User's Manual System configuration, performance specifications, functions, handling, wiring, and troubleshooting of the CC-Link system master/local module	SH-080394E
MELSEC-L CC-Link System Master/Local Module User's Manual Settings, specifications, handling, data communication methods, and troubleshooting of the built-in CC-Link function of the CPU module or the CC-Link system master/local module	SH-080895ENG
CC-Link System Master/Local Module Type AJ61QBT11/A1SJ61QBT11 User's Manual System configuration, performance specifications, functions, handling, wiring, and troubleshooting of the CC-Link system master/local module	IB-66722
CC-Link System Master/Local Module Type AJ61BT11/A1SJ61BT11 User's Manual System configuration, performance specifications, functions, handling, wiring, and troubleshooting of the CC-Link system master/local module	IB-66721
MELSEC iQ-R Programming Manual (Module Dedicated Instructions) Dedicated instructions for the intelligent function modules	SH-081976ENG
QnACPU Programming Manual (Special Function Module) Dedicated instructions for the special function module of the QnA series programmable controller CPU	SH-4013
Type AnSHCPU/AnACPU/AnUCPU/QCPU-A (A Mode) Programming Manual (Dedicated Instructions) Instructions extended for the AnSHCPU/AnACPU/AnUCPU	IB-66251

COMPLIANCE WITH THE EMC AND LOW VOLTAGE DIRECTIVES

(1) For programmable controller system

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

- User's manual for the CPU module or head module used
- Safety Guidelines
  (This manual is included with the CPU module, base unit, or head module.)

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

(2) For the product

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

HOW TO USE MANUALS

This section explains how to use manuals when using the AJ65BT-R2N CC-Link system RS-232 interface module.

(1) User's manuals for the AJ65BT-R2N

The following manuals describe the AJ65BT-R2N.
Refer the manual(s) suitable for the intended use.

	Hardware (Packed)	Nonprocedural Protocol Mode	MELSOFT Connection Mode
Purpose	CC-Link System RS-232 Interface Module User's Manual (Hardware)	CC-Link System RS-232 Interface Module User's Manual (Nonprocedural Protocol Mode)	CC-Link System RS-232 Interface Module User's Manual (MELSOFT Connection Mode)
Checking part names and specifications of AJ65BT-R2N	Outline	Details	Details
Confirming how to connect AJ65BT-R2N to external device	Outline	Details	Details
Checking remote I/O and remote register of AJ65BT-R2N		Details	Details
Confirming Nonprocedural protocol mode of AJ65BT-R2N •Functions •Program examples •Error code •Troubleshooting •Differences between AJ65BT-R2N and AJ65BT-R2		Details	
Confirming MELSOFT connection mode of AJ65BT-R2N •Functions •Error code •Troubleshooting •Differences between AJ65BT-R2N and AJ65BT-G4-S3			Details

(2) About this manual

Use this manual when you want to know the following:

(a) Features of the AJ65BT-R2N
  ☞Section 1.1 Features

(b) System configurations and applicable systems
  ☞Section 2.1 System Configuration
  Section 2.2 Applicable System

(c) Performance specifications of the AJ65BT-R2N
  ☞Section 3.2 Performance Specifications

(d) Functions of the AJ65BT-R2N
  ☞CHAPTER 4 FUNCTIONS

(e) Preparatory procedures and setting of the AJ65BT-R2N
  ☞Section 5.2 Set-up and Procedure Before Operation

(f) Other than using ACPU/QCPU (A mode)
  1) When using QCPU (Q mode)/QnACPU
    ☞Section 6.1 Setting of Each Station
    Section 6.3 Initial Setting for AJ65BT-R2N
    Section 6.9 Program Examples
  2) When using dedicated instructions in ACPU/QCPU (A mode)
    ☞Section 7.1 Setting of each station
    Section 7.3 Initial Setting for AJ65BT-R2N
    Section 7.9 Program Example
  3) When using the FROM/TO instruction in ACPU/QCPU (A mode)
    ☞Section 8.1 Setting of Each Station
    Section 8.3 Initial Setting for AJ65BT-R2N
    Section 8.9 Program Example

(g) How to solve the error that has occurred
  ☞Section 9.1 Troubleshooting in Nonprocedural Protocol Mode
  Section 9.2 Error code list

(h) Differences between the AJ65BT-R2N and existing products
  ☞Appendix 1 Differences between AJ65BT-R2N and AJ65BT-R2

(3) Page layout

Reference

Reference sections and reference manuals are shown with ☞ .

Chapter index

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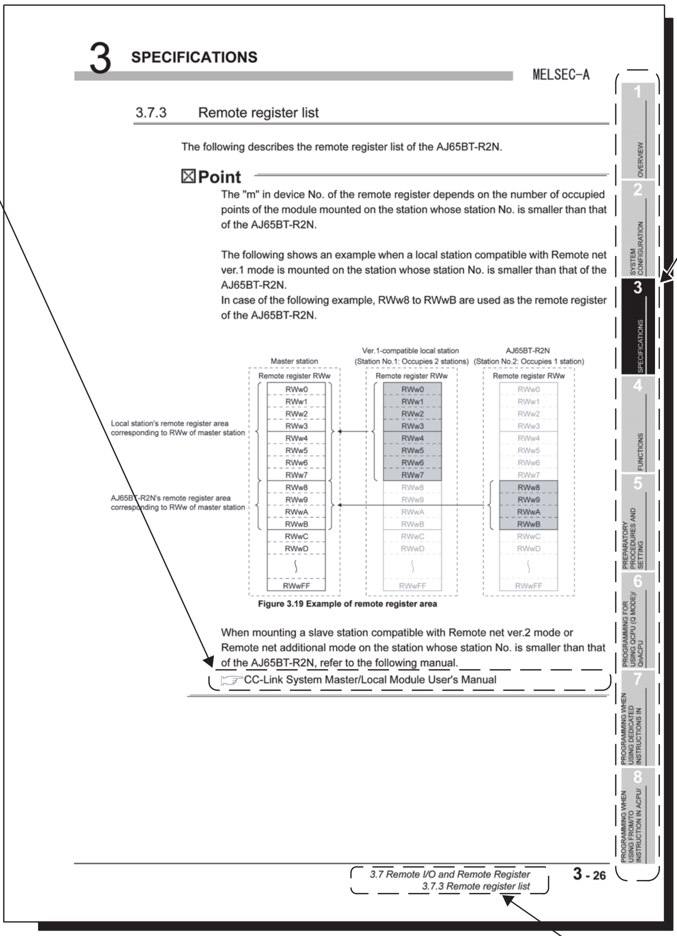

3 SPECIFICATIONS

MELSEC-A

3.7.3 Remote register list

The following describes the remote register list of the AJ65BT-R2N.

☒Point

The "m" in device No. of the remote register depends on the number of occupied points of the module mounted on the station whose station No. is smaller than that of the AJ65BT-R2N.

The following shows an example when a local station compatible with Remote net ver.1 mode is mounted on the station whose station No. is smaller than that of the AJ65BT-R2N.
In case of the following example, RWw8 to RWwB are used as the remote register of the AJ65BT-R2N.

Figure 3.19 Example of remote register area

When mounting a slave station compatible with Remote net ver.2 mode or Remote net additional mode on the station whose station No. is smaller than that of the AJ65BT-R2N, refer to the following manual.

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

3.7 Remote I/O and Remote Register
3.7.3 Remote register list

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Section title

The section of the current page can be viewed at a glance.

The above page is for the purpose of illustration only and is different from actual pages.
This manual also contains the following kinds of descriptions.

☒Point

Describes precautions or important functions related to the explanation on the page.

Remark

Indicates references and/or useful information about the explanation on the page.

GENERIC TERMS AND ABBREVIATIONS

Unless otherwise stated, this manual uses the following generic terms and abbreviations to describe the AJ65BT-R2N CC-Link system RS-232 interface module.

Generic term/ abbreviation	Description
AJ65BT-R2N	Abbreviation for the AJ65BT-R2N CC-Link system RS-232 interface module
RCPU	Generic term for the R04CPU, R08CPU, R16CPU, R32CPU, and R120CPU
QCPU (Q mode)	Generic term for the Basic model QCPU, High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU
LCPU	Generic term for the L02SCPU, L02SCPU-P, L02CPU, L02CPU-P, L06CPU, L06CPU-P, L26CPU, L26CPU-P, L26CPU-BT, and L26CPU-PBT
QCPU (A mode)	Generic term for the Q02CPU-A, Q02HCPU-A, and Q06HCPU-A
QnACPU	Generic term for the Q2ACPU, Q2ACPU-S1, Q2ASCPU, Q2ASCPU-S1, Q2ASHCPU, Q2ASHCPU-S1, Q3ACPU, Q4ACPU, and Q4ARCPU
AnNCPU	Generic term for the A0J2HCPU, A1SCPU, A1SCPUC24-R2, A1SHCPU, A1SJCPU, A1SJCPU-S3, A1SJHCPU, A1NCPU, A2CCPU, A2CCPUC24, A2CCPUC24-PRF, A2CJCPU, A2NCPU, A2NCPU-S1, A2SCPU, A2SHCPU, and A1FXCPU
AnACPU	Generic term for the A2ACPU, A2ACPU-S1, A3NCPU, and A3ACPU
AnUCPU	Generic term for the A2UCPU, A2UCPU-S1, A2USCPU, A2USCPU-S1, A2USHCPU-S1, A3UCPU, and A4UCPU
ACPU	Generic term for the AnNCPU, AnACPU, and AnUCPU
GX Developer	The product name of the software package for the MELSEC programmable controllers
GX Works2	
GX Works3	
Engineering tool	Generic term for GX Developer and GX Works2
External device	Generic term for equipment such as an ID controller, barcode reader or personal computer, which is connected to the AJ65BT-R2N for data communication.
Master module	Generic term for modules that can serve as a master station
Remote module	Module used as a remote I/O station, remote device station or intelligent device station Generic term for the AJ65BTB□□-□□, AJ65BTC□-□□, AJ65BT-64AD, AJ65BT-64DAV, and AJ65BT-64DAI, etc.
Link device	A device (RX, RY, RWr, RWw, SB, SW) in a CC-Link module

(Continued to the next page)

(From previous page)

Generic term/ abbreviation	Description
SB	Link special relay (for CC-Link) Bitwise information showing the module operating status or data link status of the master/local station
SW	Link special register (for CC-Link) Information in units of 16 bits, which shows the module operating status or data link status of the master/local station
RX	Remote input (for CC-Link) Bitwise information that is input from a remote station to a master station
RY	Remote output (for CC-Link) Bitwise information that is output from a master station to a remote station
RWw	Remote register (Write area for CC-Link) Information that is output from a master station to a remote station in units of 16 bits
RWr	Remote register (Read area for CC-Link) Information that is output from a master station to a remote station in units of 16 bits
Remote net ver.1 mode	Mode selected when not increasing the cyclic transmission data size, or when replacing the QJ61BT11 with the QJ61BT11N
Remote net ver.2 mode	Mode selected when constructing a new system with the cyclic transmission data size increased
Remote net additional mode	Mode selected when adding a Ver.2 station to a remote net ver.1 mode system and increasing the cyclic transmission data size

DEFINITIONS OF TERMINOLOGY

Definitions of the terms used in this manual are explained below.

Term	Description
Transient transmission	A function of communication with another station, which is used when requested by a dedicated instruction or engineering tool.
Cyclic transmission	A function by which data are periodically exchanged among master stations and other stations on the same system using link devices
M □□□$_H$	Buffer memory address of the master station
R2N □□□$_H$	Buffer memory address of the AJ65BT-R2N
Intelligent device station	A station that exchanges I/O signals (bit data) and I/O data (word data) with another station by cyclic transmission. This station responds to a transient transmission request from another station and also issues a transient transmission request to another station.
Auto-refresh buffer	Buffer memory of the master station, which is automatically refreshed with data in the buffer memory of the AJ65BT-R2N
Send-frame-1 area	By using the Send-frame-1 area, arbitrary data can be sent with one frame added to each of the beginning and end of the data. R2N 118_H to 119_H are used.
Send-frame-2 area	By using the Send-frame-2 area, up to 100 frames can be added to the data to be sent. R2N 120_H to 185_H are used.
Registration frame	Data name for fixed format data to be contained in a message transferred between the AJ65BT-R2N and external device. It is registered to the module with the frame function and used for data transmission/reception. There are two frame types: Default registration frames that have been registered in the AJ65BT-R2N and User registration frames that the user is required to register to the E^2PROM.
Buffer memory auto-refresh function	Function that automatically refreshes the buffer memory of the AJ65BT-R2N and the auto-refresh buffer of the master station
Local station	Station that has a programmable controller CPU and can communicate with the master station and other local stations
Master station	Station that controls remote stations, local stations, and intelligent device stations.
Nonprocedural protocol	Procedure for exchanging any data between the external device and AJ65BT-R2N

PACKING LIST

The following is included in the package of the AJ65BT-R2N CC-Link system RS-232 interface module.

Model	Product name	Quantity
AJ65BT-R2N	The AJ65BT-R2N CC-Link system RS-232 interface module	1

CHAPTER 1 OVERVIEW

This manual describes the specifications, functions, preparatory procedures and setting, and troubleshooting of the AJ65BT-R2N CC-Link system RS-232 interface module (hereinafter referred to as AJ65BT-R2N).
When applying a program example introduced in this manual to an actual system, make sure to examine the applicability and confirm that it will not cause system control problems.
The AJ65BT-R2N can exchange data with an RS-232 connection type external device, such as a barcode reader, ID controller or personal computer.

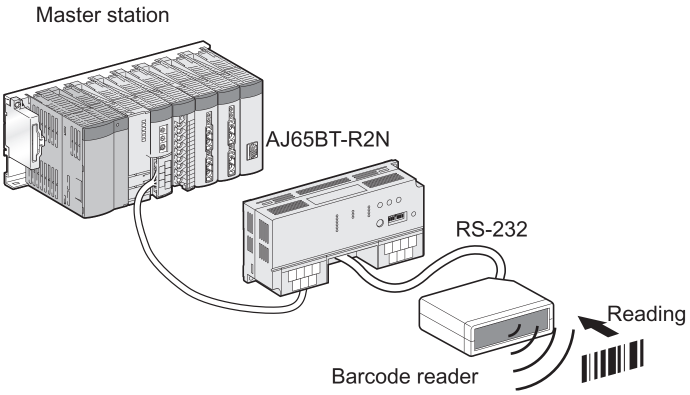


Figure 1.1 When connecting a barcode reader

Remark

This manual describes the functions, preparatory procedures and setting, and troubleshooting in the Nonprocedural protocol mode.
For those in the MELSOFT connection mode, refer to the following manual.

☞CC-Link System RS-232 Interface Module User's Manual (MELSOFT Connection Mode)

1.1 Features

This section explains the features of the AJ65BT-R2N.

(1) Nonprocedural data communication is available using an RS-232 cable.

Any data can be sent and received in a nonprocedural way by connecting an RS-232 cable between the AJ65BT-R2N and an external device.

Variable or fixed length data can be transmitted, to meet the specifications of external devices.

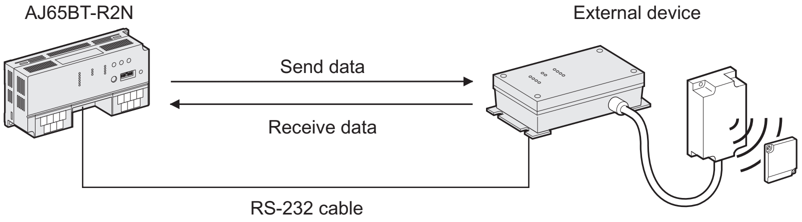


Figure 1.2 Nonprocedural communication function

(2) Communication method between master module and AJ65BT-R2N is selectable.

The following two kinds of communications are available between a master module and the AJ65BT-R2N.

- Send/receive buffer communication function
- Buffer memory auto-refresh function

☞Section 4.1.1 (1) Selecting the send/receive buffer communication function or the buffer memory auto-refresh function

(a) The send/receive buffer communication function allows effective use of the transmission path.
By using this function, only the necessary data of the specified size can be sent/received at any given timing.
This can improve the transmission line efficiency (link scan time) because unnecessary data will not be transferred.
☞Section 4.2 Send/Receive Buffer Communication Function

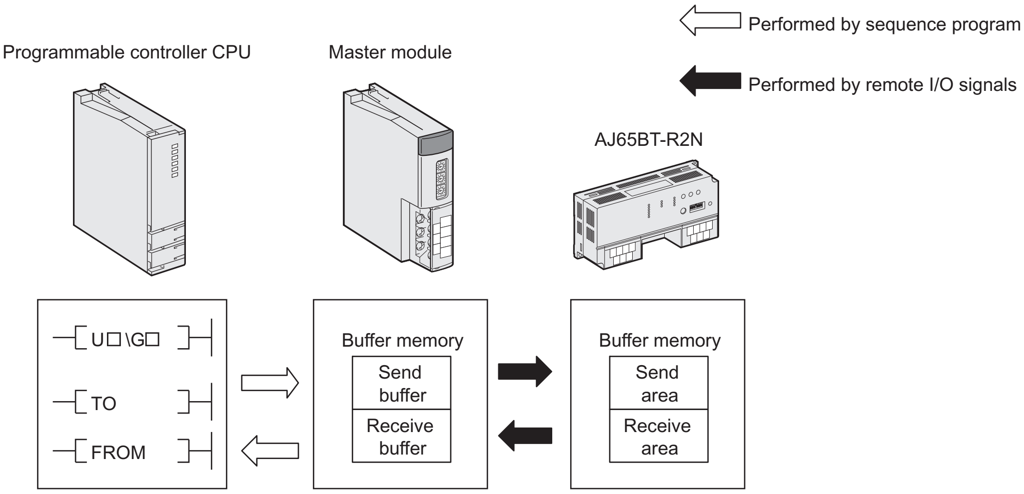


Figure 1.3 Send/receive buffer communication function

(b) The buffer memory auto-refresh function makes communication easier.
The buffer memories of the AJ65BT-R2N and master station are refreshed automatically at a timing set in the AJ65BT-R2N.
The buffer memory auto-refresh function eliminates the need for creating programs for reading/writing data between the AJ65BT-R2N and master station.
Data can be read or written with intelligent function module devices or FROM/TO instructions, which makes programming easier.
☞Section 4.3 Buffer Memory Auto-Refresh Function

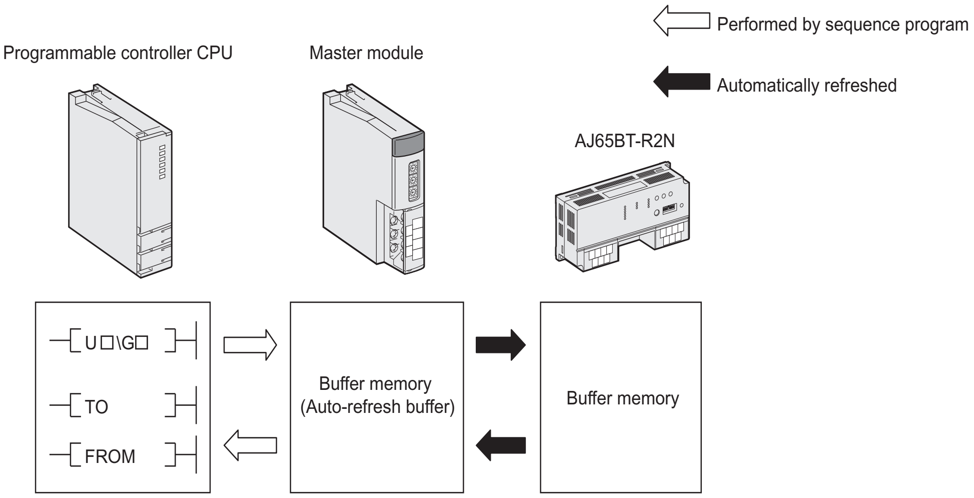


Figure 1.4 Buffer memory auto-refresh function

(3) Frames can be added at the time of data exchange with the external device.

Any fixed data (frame) can be added to the beginning and end of the original data, which allows data communications in any data format appropriate to the specifications of the external device.

There are two frame types: Default registration frames that have been registered in the AJ65BT-R2N and User registration frames that the user is required to register to the E^{2}PROM.

☞Section 4.5.1 Frame function

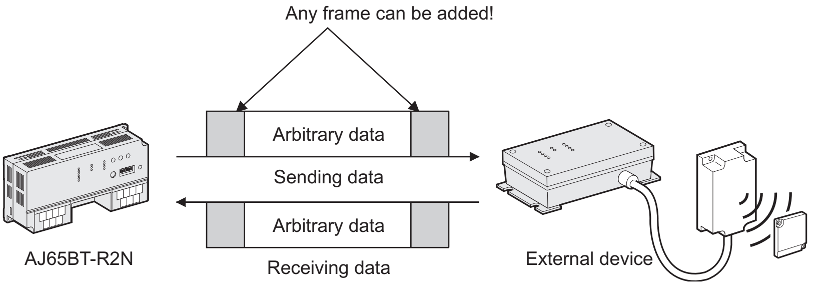


Figure 1.5 User registration frame function

(4) Data can be sent automatically upon satisfaction of user-defined conditions.

When user-specified send conditions (values in RX, RY and/or RW) are met, data are automatically sent to the external device.

☞Section 4.5.2 Monitoring-based transmission function

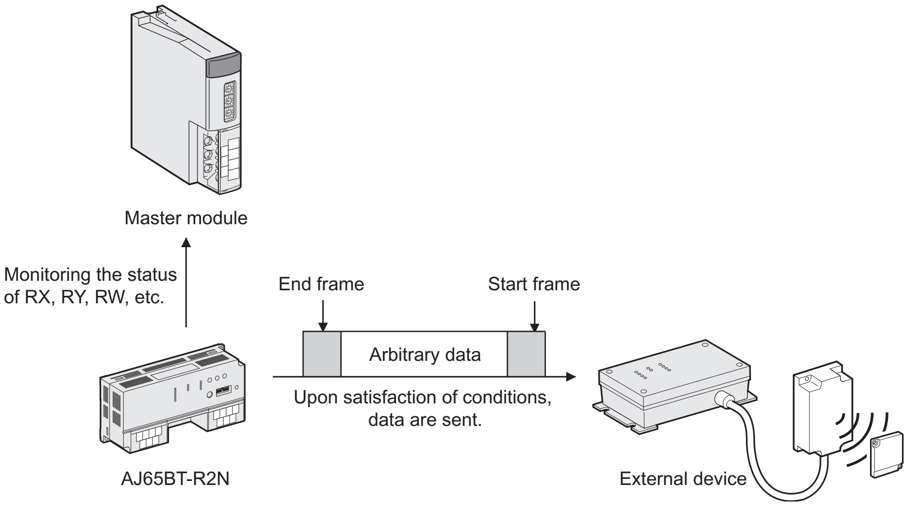


Figure 1.6 Monitoring-based transmission function

(5) General-purpose inputs and outputs (2 points for each) are featured as standard.

General-purpose inputs and outputs (2 points for each) are provided as standard. Synchronizing signals with a barcode reader or ID controller can be directly input or output without placing any other remote I/O module.

(6) Engineering tool connection allows access to another station.

The AJ65BT-R2N can access a programmable controller CPU by connecting a personal computer running the engineering tool.
For details, refer to the following manual.

☞CC-Link System RS-232 Interface Module User's Manual (MELSOFT Connection Mode)

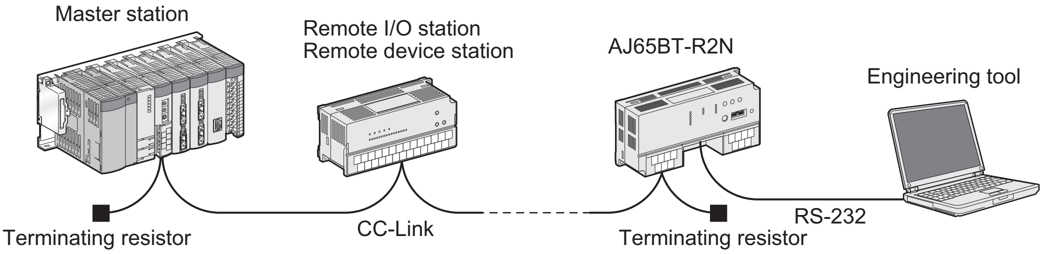


Figure 1.7 Connection with the engineering tool

CHAPTER 2 SYSTEM CONFIGURATION

2.1 System Configuration

This section gives system configuration examples for using the AJ65BT-R2N.
Up to 26 AJ65BT-R2Ns can be connected to a single master station.

(1) System configuration examples when using Nonprocedural protocol mode

(a) When connecting a barcode reader

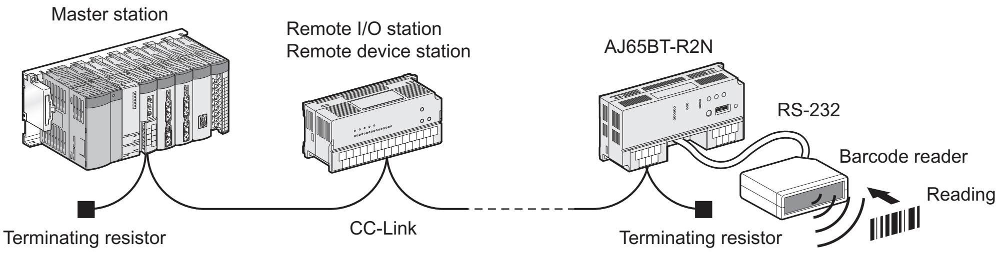


Figure 2.1 When connecting a barcode reader

(b) When connecting an ID controller

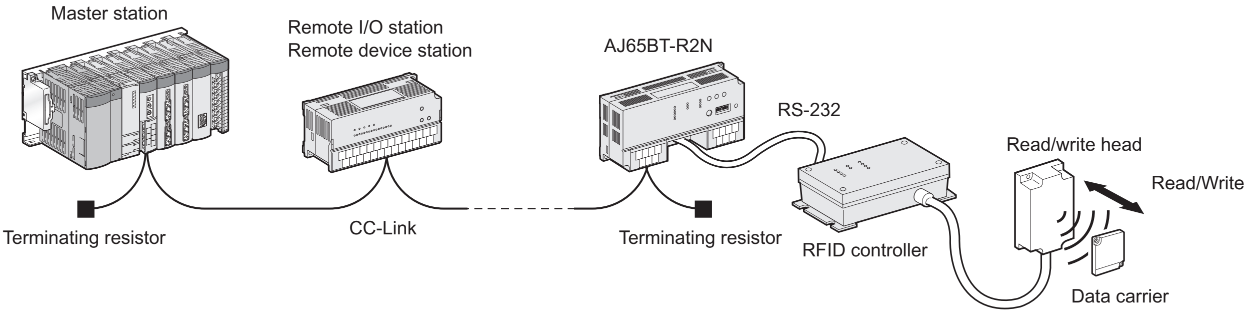


Figure 2.2 When connecting an ID controller

(2) System configuration example when using MELSOFT connection mode

(a) When connecting the engineering tool

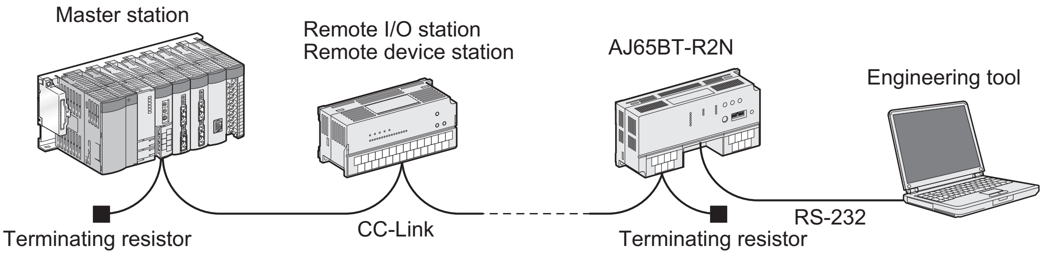


Figure 2.3 When connecting the engineering tool

2.2 Applicable System

This section describes applicable systems.

(1) Applicable master modules

The following master modules can be used with the AJ65BT-R2N.

Table 2.1 Applicable master modules

Master module		Applicability
Series	**Model**	
MELSEC iQ-R series	RJ61BT11	○
Q series	QJ61BT11N	○
	QJ61BT11	
L series	L26CPU-BT	○
	L26CPU-PBT	
	LJ61BT11	
QnA series	AJ61QBT11	○
	A1SJ61QBT11	
A series	AJ61BT11	○
	A1SJ61BT11	
Personal computer board	A80BD-J61BT11	○
	A80BDE-J61BT11	
	Q80BD-J61BT11N	
	Q81BD-J61BT11	
FX series	FX_{2N}-16CCL-M	×

○: Applicable, ×: N/A

Remark

For a master module other than the above, contact the manufacturer before using it.

(2) Software package

When using MELSOFT connection mode, use the following software package.

Table 2.2 Software package

Product name	Model	Remarks
GX Developer	SWnD5C-GPPW-E	Use Version 6 or later. ("n" in the model name must be 6 or greater.)
GX Works2	•SWnDNC-GXW2-E •SWnDND-GXW2-E	-

2.3 Precautions for System Configuration

This section describes precautions for system configuration.

(1) Restrictions on using dedicated instructions

When using the A series programmable controller CPU or the master module, the dedicated instructions are not available in some cases.
For details of restrictions, refer to the following manual.

☞User's manual for each A series master module
Type AnSHCPU/AnACPU/AnUCPU/QCPU-A (A Mode) Programming Manual (Dedicated Instructions)

(2) Functions and supported versions of the related products

The following shows the year and month of manufacture, function versions, software versions of the related products that support the AJ65BT-R2N functions, and explains how to check the information.
For the availability of the MELSOFT connection function of when routing through a network, refer to the following.

☞CC-Link System RS-232 Interface Module User's Manual (MELSOFT Connection Mode

Table 2.3 Supported versions of the related products

Supported versions of the related products			Function	
			Nonprocedural protocol mode	MELSOFT connection mode
Master/local module	MELSEC iQ-R series	RJ61BT11	○	×
	Q series	QJ61BT11N	○	○ (Function version B or later for accessing to the non control CPU mounted on the master/ local module in the multiple CPU systems)
		QJ61BT11		
	L series	L26CPU-BT	○	○
		L26CPU-PBT		
		LJ61BT11		
	QnA series	AJ61QBT11	Year and month of manufacture is 9707 or later, and function version is B or later	Function version B or later and software version J or later
		A1SJ61QBT11		
	A series	AJ61BT11		
		A1SJ61BT11		
	Personal computer board	A80BD-J61BT11	○	×
		A80BDE-J61BT11		
		Q80BD-J61BT11N		
		Q81BD-J61BT11		
Software package	GX Developer		○	Version 6 or later
	GX Works2		○	○
	GX Works3		○	×

○: Applicable, ×: N/A

(a) Checking the function version of a Q series programmable controller

1) Checking it on the "rating plate" on the side face of the module
The suffix of the SERIAL code indicates the function version of the module.

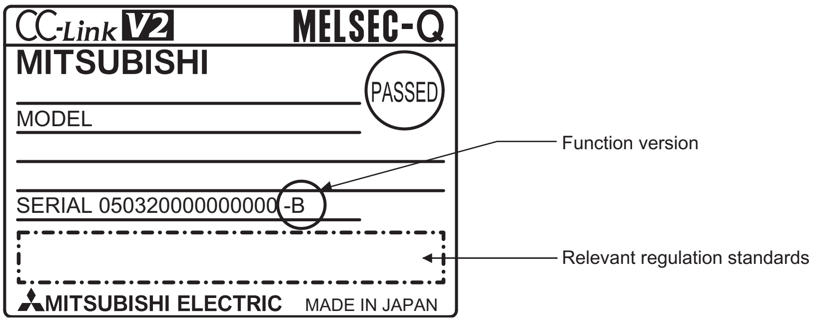
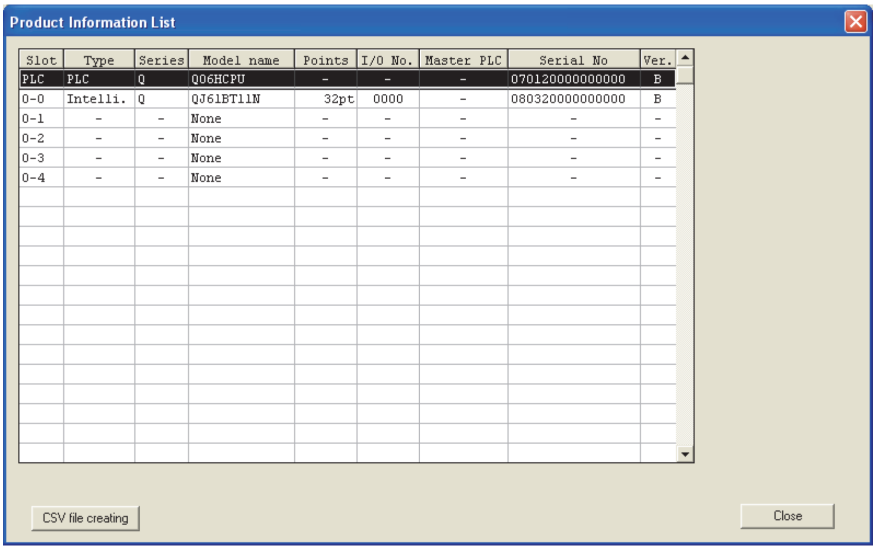


Figure 2.4 Rating plate

2) Checking it in GX Developer
The following explains how to check the function version of the module by using GX Developer.
The function version is displayed on the "Product Information List" or "Module's Detailed Information" screen of GX Developer.
How to check the function version on the "Product Information List" screen is shown below.

[Operation procedure]
[Diagnostics] → [System Monitor] → [Product Information List]



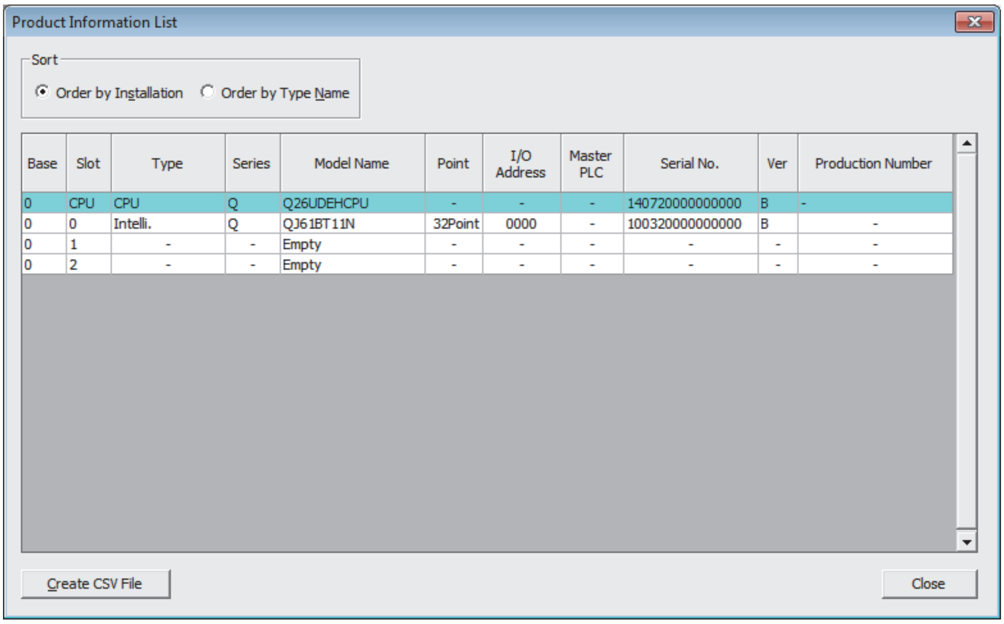
Slot	Type	Series	Model name	Points	I/O No.	Master PLC	Serial No	Ver.
PLC	PLC	Q	Q06HCPU	-	-	-	070120000000000	B
0-0	Intelli.	Q	QJ61BT11N	32pt	0000	-	080320000000000	B
0-1	-	-	None	-	-	-	-	-
0-2	-	-	None	-	-	-	-	-
0-3	-	-	None	-	-	-	-	-
0-4	-	-	None	-	-	-	-	-

Figure 2.5 Product information list

[Ver.]
The function version of the module is displayed in the Ver. column.

3) Checking it in GX Works2
The following explains how to check the function version of the module by using GX Works2.
The function version is displayed on the "Product Information List" or "Module's Detailed Information" screen of GX Works2.
How to check the function version on the "Product Information List" screen is shown below.

[Operation procedure]
[Diagnostics] → [System Monitor] → [Product Information List]



Product Information List

Sort
● Order by Installation ○ Order by Type Name

Base	Slot	Type	Series	Model Name	Point	I/O Address	Master PLC	Serial No.	Ver	Production Number
0	CPU	CPU	Q	Q26UDEHCPU	-	-	-	140720000000000	B	-
0	0	Intelli.	Q	QJ61BT11N	32Point	0000	-	100320000000000	B	-
0	1	-	-	Empty	-	-	-	-	-	-
0	2	-	-	Empty	-	-	-	-	-	-

Figure 2.6 Product Information List

[Ver.]
The function version of the module is displayed in the Ver. column.

(b) Checking the year and month of manufacture, function version and software version of a QnA or A series programmable controller

1) Checking the year and month of manufacture and function version on the "rating plate" on the side of the module
The year and month of manufacture and the function version are shown in the DATE field of the rating plate.

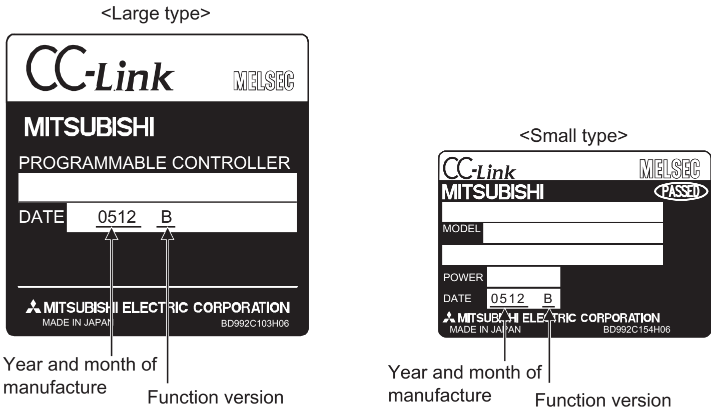


Figure 2.7 Rating plate

2) Checking the software version by the module version label sticked on the module front
The software version of the module is printed on the module version label.

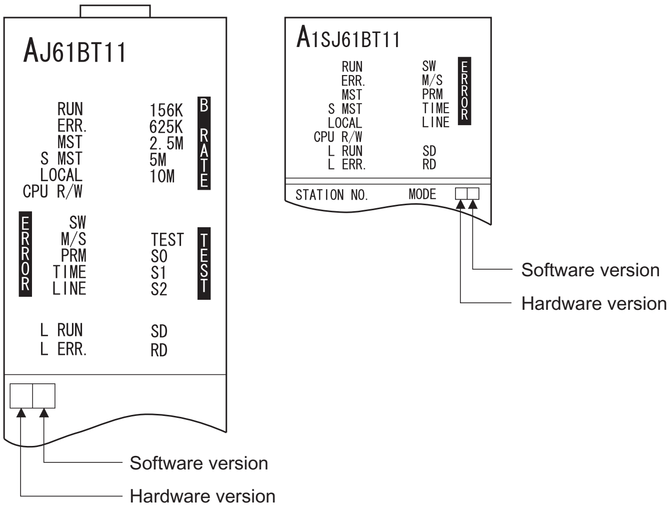
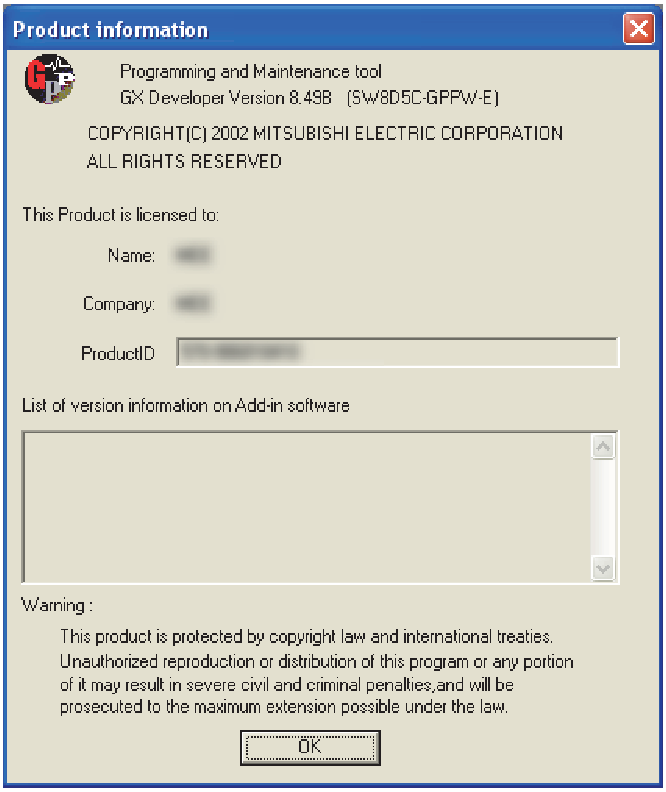


Figure 2.8 Module version label

(c) Checking the software version of the GX Developer

1) Check the software version of the GX Developer.
The software version is displayed on the "Product information" screen of GX Developer.
[Operation procedure]
[Help] → [Product information]



Programming and Maintenance tool
GX Developer Version 8.49B (SW8D5C-GPPW-E)

COPYRIGHT(C) 2002 MITSUBISHI ELECTRIC CORPORATION
ALL RIGHTS RESERVED

This Product is licensed to:

Name: [redacted]

Company: [redacted]

ProductID [redacted]

List of version information on Add-in software

Warning :

This product is protected by copyright law and international treaties. Unauthorized reproduction or distribution of this program or any portion of it may result in severe civil and criminal penalties,and will be prosecuted to the maximum extension possible under the law.

Figure 2.9 Product information

2.4 Checking the Hardware Version

The hardware version of the AJ65BT-R2N can be checked in the DATE section on the rating plate.

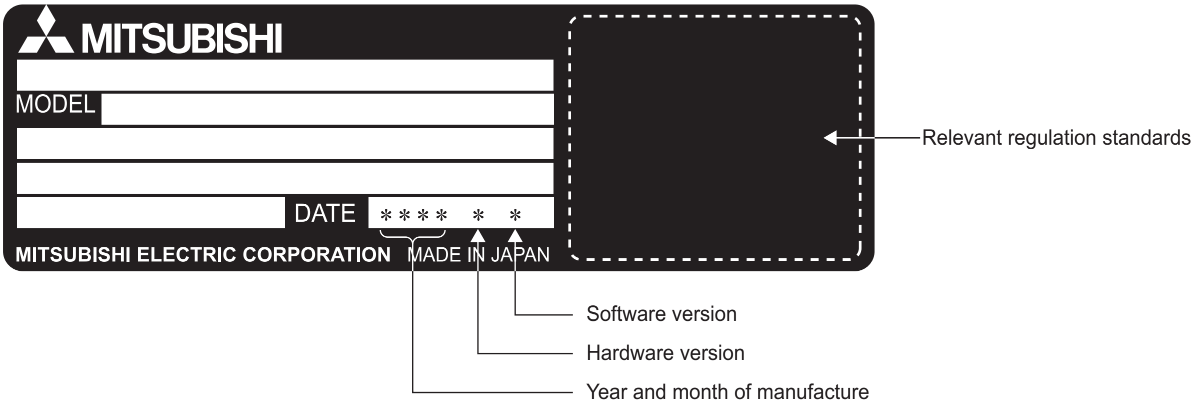


Figure 2.10 Hardware version

2.5 Checking the Production Number (SERIAL)

The production number (SERIAL) of the AJ65BT-R2N can be checked in the SERIAL section on the rating plate.

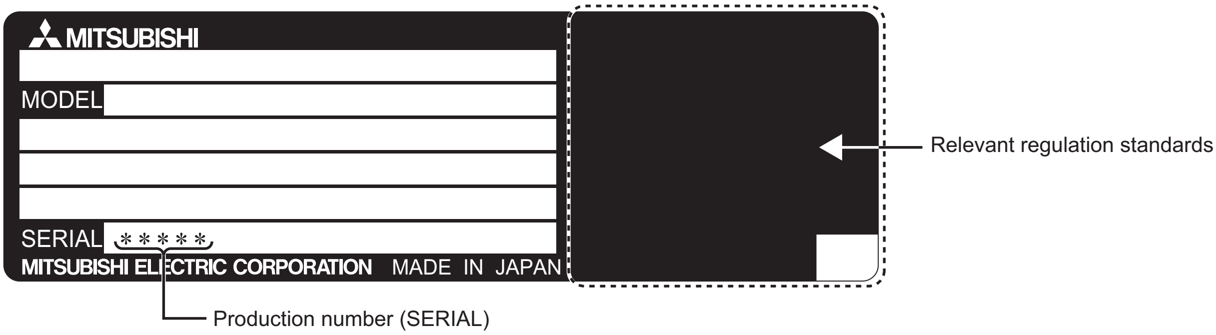


Figure 2.11 Production number

CHAPTER 3 SPECIFICATIONS

3.1 General Specifications

This section describes general specifications of the AJ65BT-R2N.

Table 3.1 General specifications

<table>
<tr><th>Item</th><th colspan="6">Specifications</th></tr>
<tr><td>Operating ambient temperature</td><td colspan="6">0 to 55℃</td></tr>
<tr><td>Storage ambient temperature</td><td colspan="6">-20 to 75℃</td></tr>
<tr><td>Operating ambient humidity</td><td colspan="6" rowspan="2">10 to 90%RH, condensation not allowed</td></tr>
<tr><td>Storage ambient humidity</td></tr>
<tr><td rowspan="5">Vibration resistance</td><td rowspan="5">Compliant with JIS B 3502, IEC 61131-2</td><th></th><th>Frequency</th><th>Constant acceleration</th><th>Half amplitude</th><th>No. of sweeps</th></tr>
<tr><td rowspan="2">For intermittent vibration</td><td>5 to 8.4Hz</td><td>—</td><td>3.5mm</td><td rowspan="2">10 times each in X, Y, and Z directions</td></tr>
<tr><td>8.4 to 150Hz</td><td>9.8m/s^2</td><td>—</td></tr>
<tr><td rowspan="2">For continuous vibration</td><td>5 to 8.4Hz</td><td>—</td><td>1.75mm</td><td rowspan="2">—</td></tr>
<tr><td>8.4 to 150Hz</td><td>4.9m/s^2</td><td>—</td></tr>
<tr><td>Shock resistance</td><td colspan="6">Compliant with JIS B 3502, IEC 61131-2 (147m/s^2, 3 times each in X, Y and Z directions)</td></tr>
<tr><td>Operating atmosphere</td><td colspan="6">No corrosive gases</td></tr>
<tr><td>Operating altitude[*1]</td><td colspan="6">0 to 2000m</td></tr>
<tr><td>Installation location</td><td colspan="6">Inside control panel</td></tr>
<tr><td>Overvoltage category[*2]</td><td colspan="6">Ⅱ or lower</td></tr>
<tr><td>Pollution degree[*3]</td><td colspan="6">2 or lower</td></tr>
</table>

* 1 Do not use or store the programmable controller in an environment where the atmospheric pressure is higher than the one at 0m elevation.
  Doing so may cause malfunctions. For use in a compressed-air environment, please consult your local Mitsubishi representative.
* 2 It indicates the device is to be connected to which power distribution part, within the area from the public electricity network to machinery on the premises.
  Category Ⅱ applies to devices to which power is supplied from fixed installations. The surge voltage withstand for devices rated up to 300V is 2500V.
* 3 This is an index showing the degree of the conductive pollution that can occur in the environment where the device is used.
  In Pollution degree 2, only nonconductive pollution occurs. Occasionally, however, temporary conductivity caused by condensation can be expected.

3.2 Performance Specifications

This section describes performance specifications of the AJ65BT-R2N.

Table 3.2 Performance specifications

Item			Specifications
RS-232			—
	Interface		RS-232 compliant (D-Sub 9P)
	Communication method		Full-duplex communication method
	Synchronization method		Asynchronous method
	Transmission speed		300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600[*1], 115200[*1](bps) (Select with RS-232 transmission setting switches.)
	Transmission distance		Up to 15m
	Data format	Start bit	1
		Data bit	7/8
		Parity bit	1 (Vertical parity)/None
		Stop bit	1/2
	Error detection	Parity check	Checked (even/odd)/Not checked
	Communication control (Flow control)		DTR/DSR (ER/DR) control DC1/DC3 control
	OS reception area		5120 bytes
CC-Link			—
	Transmission path		Bus (RS-485)
	CC-Link station type		Intelligent device station
	Connection cable		CC-Link dedicated cable/CC-Link high-performance cable/CC-Link Ver.1.10-compatible cable[*2]
	No. of occupied stations		1 station (RX/RY: 32 points each, RWw/RWr: 4 points each)
No. of writes to E^{2}PROM			Up to 100,000 times
Withstand voltage			One minute at 500VAC between all external DC terminals and ground
Insulation resistance			500VDC between all external DC terminals and ground, 10MΩ or more with insulation resistance tester
Noise immunity			DC type noise voltage: 500Vp-p Tested by noise simulator of noise width of 1μs, and noise frequency of 25 to 60Hz
Module fixing screw			M4×0.7mm×16mm or larger DIN-rail mounting is also possible.
Applicable DIN rail			TH35-7.5Fe, TH35-7.5Al, TH35-15Fe (Compliant with IEC 60715)
External power supply			24VDC (Ripple ratio: 5% or less) (Allowable voltage range: 20.4 to 26.4VDC)
			Current consumption: 0.11A (TYP. 24VDC)
Allowable momentary power failure time			1ms
External dimensions			80(H)×170(W)×47(D) [mm]
Weight			0.40kg

* 1 Unless data are sent concurrently from the AJ65BT-R2N and external-device sides in Nonprocedural protocol mode, communication at 57600bps or 115200bps is available.
If data is communicated simultaneously, the RS-232 receive overrun error (BB23$_H$) may occur.

* 2 Combined use of CC-Link Ver.1.10-compatible cables, CC-Link dedicated cables (Ver.1.00) and/or CC-Link high-performance cables is not allowed.
If cables of different types are used, normal data transmission cannot be ensured.
Also, terminating resistors appropriate to the cable type must be used.

3.3 Function List

This section describes function list of the AJ65BT-R2N.

Table 3.3 Function List

Function		Description	Reference section
Nonprocedural protocol mode		—	—
	Send/receive buffer communication function	When only the necessary data in the required size is specified by the user, sends/ receives it in a given timing.	Section 4.2
	Buffer memory auto-refresh function	Automatically refreshes the buffer memories of the AJ65BT-R2N and master station at a timing set in the AJ65BT-R2N.	Section 4.3
	AJ65BT-R2N initialization function	Performs the following processing. •Stop the processing in execution •Initialize the AJ65BT-R2N •Enable the setting written to a buffer memory	Section 4.4
	Frame function	Sends the data with adding the specific data, and receives the data where the specific data from the external device is added.	Section 4.5.1
	Monitoring-based transmission function	Sends data specified in the send table if the send condition specified by the user is met.	Section 4.5.2
	Send cancel function	Cancels the send processing which has already been requested to the AJ65BT-R2N from the master module.	Section 4.5.3
	Forced receive completion function	Forcibly completes data reception from the external device, and reads the received data if the data reception is not completed.	Section 4.5.4
	Flow control function	Discontinues or restarts data sending depending on the status of the OS reception area of the AJ65BT-R2N or the request from the external device.	Section 4.5.5
	ASCII-binary conversion function	Sends/receives data in ASCII code when data is communicated between the AJ65BT-R2N and the external device.	Section 4.5.6
	RW refresh function	Assigns a part of a buffer memory of the AJ65BT-R2N to the remote register (RW), and monitors the buffer memory.	Section 4.5.7
	OS reception area clear function	Clears data in the OS reception area of the AJ65BT-R2N.	Section 4.5.8
	E^2PROM function	Registers the setting value of the AJ65BT-R2N to E^2PROM, and uses the setting value of the buffer memory registered in E^2PROM as an initial value at the time of the AJ65BT-R2N startup.	Section 4.5.9
	RS-232 signal control function	Reads the signal status of the RS-232 interface stored in a buffer memory of the AJ65BT-R2N, and controls output.	Section 4.5.10
MELSOFT connection mode		—	—
	MELSOFT connection function	Accesses the programmable controller CPU when connecting the AJ65BT-R2N to the engineering tool.	*1

[1] For details of MELSOFT connection mode, refer to the following manual.
CC-Link System RS-232 Interface Module User's Manual (MELSOFT Connection Mode)

3.4 CC-Link Dedicated Cable Specifications

In CC-Link systems, use CC-Link dedicated cables.
The performance of the CC-Link system cannot be guaranteed when any other than dedicated CC-Link cables is used.
For more information, visit the following website.

☞CC-Link Partner Association (www.cc-link.org)

Remark

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

3.5 RS-232 Interface Specifications

3.5.1 RS-232 connector specifications

The following describes specifications of the RS-232 connector connected to the external device.

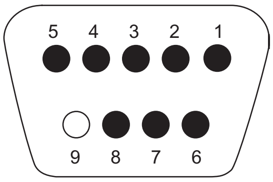


Figure 3.1 RS-232 connector

Table 3.4 RS-232 connector specifications

Pin No.	Mnemonic	Signal name	Signal direction
			AJ65BT-R2N ↔ External device
1	CD	Receive carrier detect	←
2	RD (RXD)	Receive data	←
3	SD (TXD)	Send data	→
4	DTR (ER)	Data terminal ready	→
5	SG	Signal ground	↔
6	DSR (DR)	Data set ready	←
7	RS (RTS)	Request to send	→
8	CS (CTS)	Clear to send	←
9	Unused	—	—

(1) Control signal

The following shows each control signal.

(a) CD signal

The CD signal status can be read by the CD signal (RXnB).

The AJ65BT-R2N cannot use the CD signal as the control signal for sending/receiving data to/from the external device.

The control status of the CD signal can be checked by the CD signal (RXnB).

- ON: The status of CD signal is turned ON.
- OFF: The status of CD signal is turned OFF.

(b) DTR (ER) signal

When the DTR/DSR (ER/DR) control is implemented, the AJ65BT-R2N is turned ON/OFF depending on the size of an empty area of the OS reception area for storing receive data.

(The DTR (ER) signal is turned ON when the AJ65BT-R2N is ready to receive data.)

If the DTR/DSR (ER/DR) control is not implemented, the AJ65BT-R2N follows the DTR (ER) signal.

(c) DSR (DR) signal

When the DTR/DSR (ER/DR) control is implemented, data will not be sent to the external device from the AJ65BT-R2N at OFF.
Always turn ON the external device when it is ready to receive the signal.
If the DTR/DSR (ER/DR) control is not implemented, the status of the DSR (DR) signal will be ignored.
The control status of the DSR (DR) signal can be checked by the DSR (DR) signal (RXnA).

- ON: Data can be sent to the external device from the AJ65BT-R2N.
- OFF: Data cannot be sent to the external device from the AJ65BT-R2N.

(d) RS (RTS) signal

The AJ65BT-R2N follows the setting of the RS (RTS) signal status specification (R2N 101H) and the RS (RTS) signal.

(e) CS (CTS) signal

When the CS (CTS) signal is OFF, it will not be sent to the external device from the AJ65BT-R2N.
Always turn ON the external device when it is ready to receive the signal.
The control status of the CS (CTS) signal can be checked by the CS (CTS) signal (RXn9).

- ON: Data can be sent to the external device from the AJ65BT-R2N.
- OFF: Data cannot be sent to the external device from the AJ65BT-R2N.

(2) Interface connector

Connectors of 9-pin D-sub (female) screw type (mating screw M2.6) are used as RS-232 interface connectors for the AJ65BT-R2N.
For the relevant models, refer to Appendix 4.
For the AJ65BT-R2N side cable, use a connector shell appropriate to the above.
The screw size for the connector is M2.6.
Use the following model as a connector shell of the AJ65BT-R2N side connection cable.

- DDK Ltd.
  Plug, shell: 17JE-23090-02 (D8A) (-CG)

3.5.2 RS-232 cable specifications

Use an RS-232 cable that is compliant with the RS-232 standard, in a length of 15m or less.

(Recommended cable)

- Oki Electric Cable Co., Ltd.
  7/0.127□P HRV-SV (□: Specify the number of pairs.)

3.6 General-purpose I/O Specifications

This section describes general-purpose I/O specifications of the AJ65BT-R2N.

3.6.1 Hardware version B or later, or production number (SERIAL) (first five digits) of "16041" or later

(1) General-purpose I/O terminal block

The following shows a general-purpose I/O terminal block.

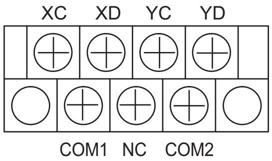
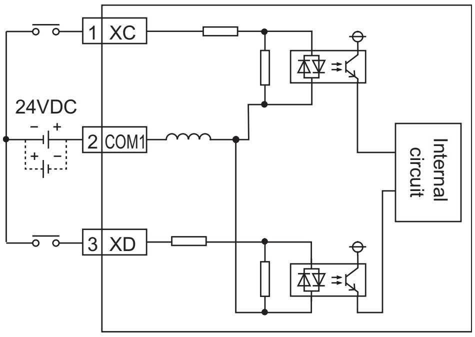


Figure 3.2 General-purpose I/O terminal block

(2) General-purpose input specifications

Table 3.5 General-purpose input specifications

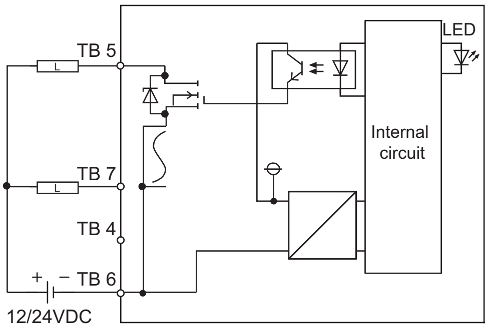
<table>
<tr><th colspan="2" rowspan="2">Item</th><th colspan="5">DC input (Positive common/negative common shared type)</th></tr>
<tr><th>AJ65BT-R2N</th><th colspan="4">External connection view</th></tr>
<tr><td colspan="2">No. of input points</td><td>2 points</td><td colspan="4" rowspan="12"> </td></tr>
<tr><td colspan="2">Insulation method</td><td>Photocoupler</td></tr>
<tr><td colspan="2">Rated input voltage</td><td>24VDC (Ripple ratio: 5% or less)</td></tr>
<tr><td colspan="2">Rated input current</td><td>Approx. 7mA</td></tr>
<tr><td colspan="2">Operating voltage range</td><td>19.2 to 28.8VDC</td></tr>
<tr><td colspan="2">Max. No. of simultaneous input points</td><td>100%</td></tr>
<tr><td colspan="2">ON voltage/ON current</td><td>14V or more/3.5mA or more</td></tr>
<tr><td colspan="2">OFF voltage/OFF current</td><td>6V or less/1.7mA or less</td></tr>
<tr><td colspan="2">Input resistance</td><td>Approx. 3.3kΩ</td></tr>
<tr><td rowspan="2">Response time</td><td>OFF → ON</td><td>10ms or less</td></tr>
<tr><td>ON → OFF</td><td>10ms or less</td></tr>
<tr><td colspan="2">Wiring method for common</td><td>2 points/common (COM1)
Positive common/negative common shared type</td></tr>
<tr><td colspan="2">External connection method</td><td>7-point terminal block (M3.5 screw)</td><th>Terminal No.</th><th>Signal name</th><th>Terminal No.</th><th>Signal name</th></tr>
<tr><td colspan="2">Applicable wire size</td><td>0.75 to 2mm²</td><td>TB1</td><td>XC</td><td>TB3</td><td>XD</td></tr>
<tr><td colspan="2">Applicable solderless terminal</td><td>RAV1.25-3.5, RAV2-3.5 (Compliant with JIS C 2805)</td><td>TB2</td><td>COM1</td><td>—</td><td>—</td></tr>
</table>

(3) General-purpose output specifications

Table 3.6 General-purpose output specifications

Item		Transistor output (Sink type)
		AJ65BT-R2N
No. of output points		2 points
Insulation method		Photocoupler
Rated load voltage		12 to 24VDC (+20/-15%) (Ripple ratio: 5% or less)
Operating load voltage range		10.2 to 28.8VDC
Max. load current		0.1A/point 0.2A/common
Max. inrush current		0.7A, 10ms or less
Leakage current at OFF		0.1mA or lower
Max. voltage drop at ON		0.1VDC(TYP.)0.1A, 0.2VDC(MAX.)0.1A
Response time	OFF → ON	1ms or less
	ON → OFF	1ms or less (Resistance load)
External power supply of output section	Voltage	12/24VDC (Ripple ratio: 5% or less) (Allowable voltage range: 10.2 to 28.8VDC)
	Current	10mA (at 24VDC) (MAX all points ON)
Surge suppressor		Zener diode
Wiring method for common		2 points/common (COM2)
External connection method		7-point terminal block (M3.5 screw)
Applicable wire size		0.75 to 2mm^2
Applicable solderless terminal		RAV1.25-3.5, RAV2-3.5 (Compliant with JIS C 2805)
Protective function		Provided •Overheat protective function operates in unit of 1 point. •Overload protective function operates in unit of 1 point. (Detection disabled)

External connection view



Terminal No.	Signal name	Terminal No.	Signal name
TB4	NC	TB6	COM2
TB5	YC	TB7	YD

3.6.2 Hardware version A

(1) General-purpose I/O terminal block

The following shows a general-purpose I/O terminal block.

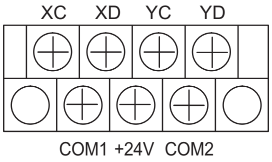


Figure 3.3 General-purpose I/O terminal block

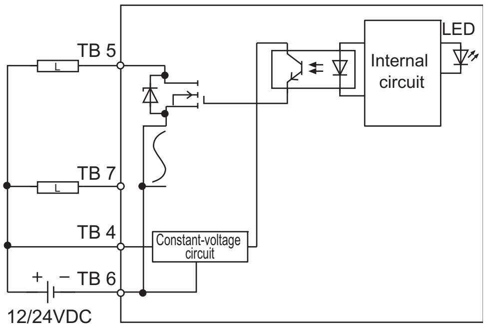
(2) General-purpose input specifications

They are the same as those of hardware version B or later, or production number (SERIAL) (first five digits) of "16041" or later.

☞Section 3.6.1 (2) General-purpose input specifications

(3) General-purpose output specifications

Table 3.7 General-purpose output specifications

Item		Transistor output (Sink type)	
		AJ65BT-R2N	External connection view
No. of output points		2 points	
Insulation method		Photocoupler	
Rated load voltage		12 to 24VDC (+20/-15%) (Ripple ratio: 5% or less)	
Operating load voltage range		10.2 to 28.8VDC	
Max. load current		0.1A/point 0.2A/common	
Max. inrush current		0.7A, 10ms or less	
Leakage current at OFF		0.1mA or lower	
Max. voltage drop at ON		0.1VDC(TYP.)0.1A, 0.2VDC(MAX.)0.1A	
Response time	OFF → ON	1ms or less	
	ON → OFF	1ms or less (Resistance load)	
External power supply of output section	Voltage	12/24VDC (Ripple ratio: 5% or less) (Allowable voltage range: 10.2 to 28.8VDC)	
	Current	10mA (at 24VDC) (MAX all points ON)	
Surge suppressor		Zener diode	
Wiring method for common		2 points/common (COM2)	
External connection method		7-point terminal block (M3.5 screw)	
Applicable wire size		0.75 to 2mm^2	
Applicable solderless terminal		RAV1.25-3.5, RAV2-3.5 (Compliant with JIS C 2805)	
Protective function		Provided •Overheat protective function operates in unit of 1 point. •Overload protective function operates in unit of 1 point. (Detection disabled)	

Terminal No.	Signal name	Terminal No.	Signal name
TB4	+24V	TB6	COM2
TB5	YC	TB7	YD

3.7 Remote I/O and Remote Register

This section describes the remote I/O and remote register of the AJ65BT-R2N.

3.7.1 Remote I/O list

The remote I/O list of the AJ65BT-R2N is shown below.

☒Point

The "n" in device No. of the remote I/O depends on the number of occupied points of the module mounted on the station whose station No. is smaller than that of the AJ65BT-R2N.

The following shows an example when a local station compatible with Remote net ver.1 mode is mounted on the station whose station No. is smaller than that of the AJ65BT-R2N.
In case of the following example, RX40 to RX5F are used as the remote input of the AJ65BT-R2N.

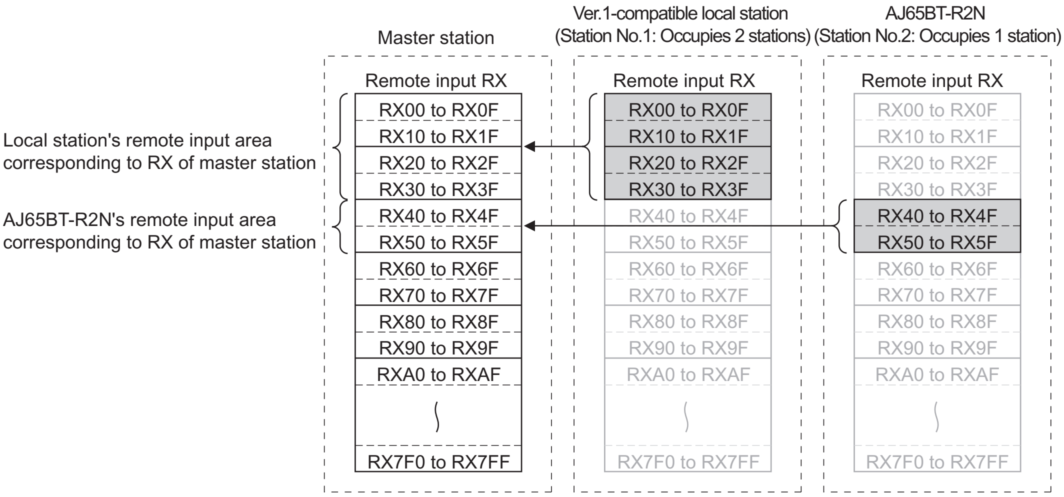


Figure 3.4 Example of remote input area

When mounting a device station compatible with Remote net ver.2 mode or Remote net additional mode on the station whose station No. is smaller than that of the AJ65BT-R2N, refer to the following manual.

☞User's manual for the master module used

(1) In Nonprocedural protocol mode (When Mode setting switch is 0 to 4)

Table 3.8 I/O signal list for Nonprocedural protocol mode

Signal direction: AJ65BT-R2N → Master station			Signal direction: Master station → AJ65BT-R2N		
Device No.	**Signal name**		**Device No.**	**Signal name**	
RXn0	Send complete signal		RYn0	Send request signal	
RXn1	Send failed signal		RYn1	Send cancel request signal	
RXn2	Normal receive data read request signal		RYn2	Receive data read completion signal	
RXn3	Error receive data read request signal		RYn3	Forced receive completion request signal	
RXn4	Initialization complete signal		RYn4	Initialization request signal	
RXn5	Initialization failed signal		RYn5	Use prohibited	
RXn6	OS reception area cleared signal		RYn6	OS reception area clear request signal	
RXn7	E^{2}PROM function complete signal		RYn7	E^{2}PROM function request signal	
RXn8	E^{2}PROM function failed signal		RYn8	Use prohibited	
RXn9	Signal status	CS (CTS) signal	RYn9	Signal setting	RS (RTS) signal*1
RXnA		DSR (DR) signal	RYnA		DTR (ER) signal*2
RXnB		CD signal	RYnB	Use prohibited	
RXnC	General-purpose external input signal		RYnC	General-purpose external output signal	
RXnD			RYnD		
RXnE	Use prohibited		RYnE	Use prohibited	
RXnF			RYnF		
RX(n+1)0			RY(n+1)0		
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	Mode setting switch status signal		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	Use prohibited		RY(n+1)8		
RX(n+1)9	Initial data read completion signal		RY(n+1)9	Initial data read request signal	
RX(n+1)A	Error status signal		RY(n+1)A	Error reset request signal	
RX(n+1)B	Remote station ready signal		RY(n+1)B	Use prohibited	
RX(n+1)C	Use prohibited		RY(n+1)C		
RX(n+1)D			RY(n+1)D		
RX(n+1)E	Intelligent device station access completion signal		RY(n+1)E	Intelligent device station access request signal	
RX(n+1)F	Use prohibited		RY(n+1)F	Use prohibited	

* 1 The setting of the RS signal is invalid when the RS (RTS) signal status specification ($\boxed{\text{R2N}}$ 101$_{H}$) is 0 (always ON).

* 2 The setting of the ER signal is invalid when Flow control specification ($\boxed{\text{R2N}}$ 100$_{H}$) is 1 (The flow is performed by the DTR/DSR (ER/DR) control).

(2) In MELSOFT connection mode (When Mode setting switch is 5)

Table 3.9 I/O signal list for MELSOFT connection mode

Signal direction AJ65BT-R2N → Master station			Signal direction Master station → AJ65BT-R2N	
Device No.	**Signal name**		**Device No.**	**Signal name**
RXn0	Use prohibited		RYn0	Use prohibited
RXn1			RYn1	
RXn2			RYn2	
RXn3			RYn3	
RXn4			RYn4	
RXn5			RYn5	
RXn6			RYn6	
RXn7			RYn7	
RXn8			RYn8	
RXn9	Signal status	CS (CTS) signal	RYn9	
RXnA		DSR (DR) signal	RYnA	
RXnB		CD signal	RYnB	
RXnC	General-purpose external input signal		RYnC	General-purpose external output signal
RXnD			RYnD	
RXnE	Use prohibited		RYnE	Use prohibited
RXnF			RYnF	
RX(n+1)0			RY(n+1)0	
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	Mode setting switch status signal		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	Use prohibited		RY(n+1)8	
RX(n+1)9			RY(n+1)9	
RX(n+1)A			RY(n+1)A	
RX(n+1)B			RY(n+1)B	
RX(n+1)C			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	

☒Point

Do not output (turn ON) the "Use prohibited" signal among the I/O signals for the programmable controller CPU.
Doing so may cause malfunction of the programmable controller system.

3.7.2 Remote I/O details

The following describes details of the remote I/O of the AJ65BT-R2N.

(1) Send request signal (RYn0), Send complete signal (RXn0), and Send failed signal (RXn1)

The signals are used to send data to the external device from the AJ65BT-R2N.

(a) When normally completed

1) When turning ON Send request signal (RYn0) after writing the send data to the send area of the AJ65BT-R2N, the data is sent to the external device from the AJ65BT-R2N.

2) When transmission is normally completed, Send complete signal (RXn0) turns ON.

3) Turn OFF Send request signal (RYn0) after Send complete signal (RXn0) is turned ON.

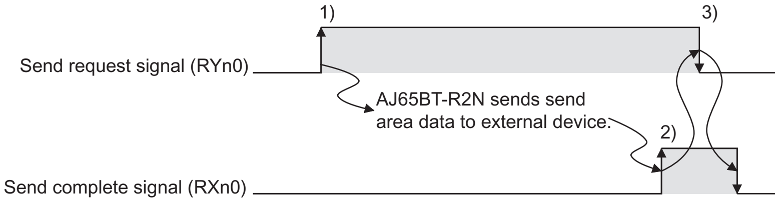


Figure 3.5 Send request signal (RYn0) and Send complete signal (RXn0)

(b) When failed

1) When turning ON Send request signal (RYn0) after writing the send data to the send area of the AJ65BT-R2N, the data is sent to the external device from the AJ65BT-R2N.

2) When failed, Send failed signal (RXn1) turns ON.
When sending data is failed, an error occurred is stored into the send error code (R2N 1B1H).

3) Turn OFF Send request signal (RYn0) after Send failed signal (RXn1) is turned ON.

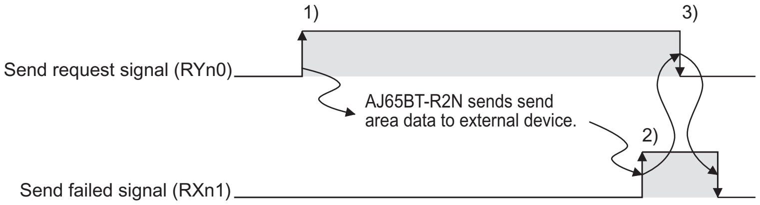


Figure 3.6 Send request signal (RYn0) and Send failed signal (RXn1)

(2) Send cancel request signal (RYn1)

The signal is used to cancel sending data to the external device after turning ON Send request signal (RYn0).

1) To cancel sending data to the external device is started when Send cancel request signal (RYn1) is turned ON after turning ON Send request signal (RYn0).

2) Send failed signal (RXn1) is turned ON when sending data is forcibly canceled.[*1]

3) Turn OFF Send request signal (RYn0) and Send cancel request signal (RYn1) after Send failed signal (RXn1) is turned ON.

[* 1] In some cases, sending data may be completed before Send cancel request signal (RYn1) is turned ON, which leads to turn ON Send complete signal.
Create an interlock circuit so that Send cancel request signal (RYn1) will not be accepted except for when requesting to send data.

☞Section 4.5.3 Send cancel function

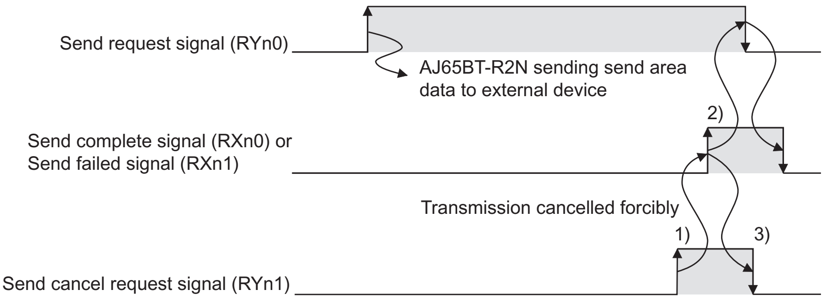


Figure 3.7 Send cancel request signal (RYn1)

(3) Receive data read completion signal (RYn2), Normal receive data read request signal (RXn2), and Error receive data read request signal (RXn3)

The signals are used to receive data to the AJ65BT-R2N from the external device.

(a) When normally completed

1) Normal receive data read request signal (RXn2) is turned ON when data is normally received to the AJ65BT-R2N from the external device.
   At this time, the data received is stored into the receive area of the AJ65BT-R2N.
2) The data in the receive area of the AJ65BT-R2N is read after Normal receive data read request signal (RXn2) is turned ON.
   Turn ON Receive data read completion signal (RYn2) after reading data is completed.
3) Normal receive data read request signal (RXn2) is turned OFF after turning ON Receive data read completion signal (RYn2).
4) Turn OFF Receive data read completion signal (RYn2) after turning OFF Normal receive data read request signal (RXn2).

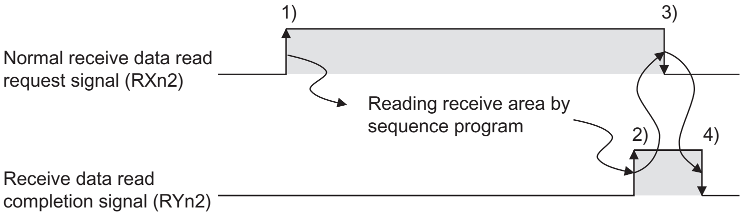


Figure 3.8 Receive data read completion signal (RYn2) and Normal receive data read request signal (RXn2)

(b) When failed

1) Error receive data read request signal (RXn3) is turned ON when data is failed to be received to the AJ65BT-R2N from the external device.
   At this time, the data received is stored into the receive area of the AJ65BT-R2N.

2) The data in the receive area of the AJ65BT-R2N is read after Error receive data read request signal (RXn3) is turned ON.
   Turn ON Receive data read completion signal (RYn2) after reading data is completed.
   When receiving data is failed, an error occurred is stored into the receive error code (R2N 1B2H).

3) Error receive data read request signal (RXn3) is turned OFF after turning ON Receive data read completion signal (RYn2).

4) Turn OFF Receive data read completion signal (RYn2) after turning OFF Error receive data read request signal (RXn3).

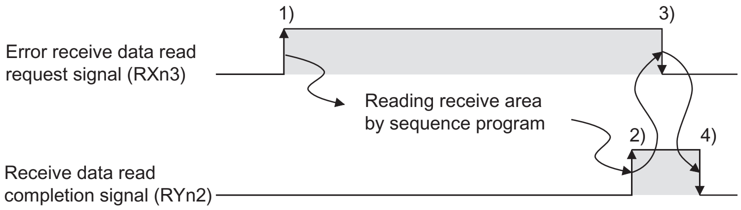


Figure 3.9 Receive data read completion signal (RYn2) and Error receive data read request signal (RXn3)

(4) Forced receive completion request signal (RYn3)

The signal is used to forcibly receive data from the external device.

1) Normal receive data read request signal (RXn2) or Error receive data read request signal (RXn3) is turned ON when turning ON Forced receive completion request signal (RYn3) if the data reception is not completed.
At this time, data received in the OS reception area up to now is stored into the receive area of the AJ65BT-R2N.
When Error receive data read request signal (RXn3) is turned ON, an error occurred is stored into the receive error code ($\boxed{\text{R2N}}$ 1B2H).

2) The data in the receive area of the AJ65BT-R2N is read after Normal receive data read request signal (RXn2) or Error receive data read request signal (RXn3) is turned ON.
Turn OFF Forced receive completion request signal (RYn3) and turn ON Receive data read completion signal (RYn2) after reading data is completed.

3) Normal receive data read request signal (RXn2) or Error receive data read request signal (RXn3) is turned OFF after turning ON Receive data read completion signal (RYn2).

4) Turn OFF Receive data read completion signal (RYn2) after turning OFF Normal receive data read request signal (RXn2) or Error receive data read request signal (RXn3).

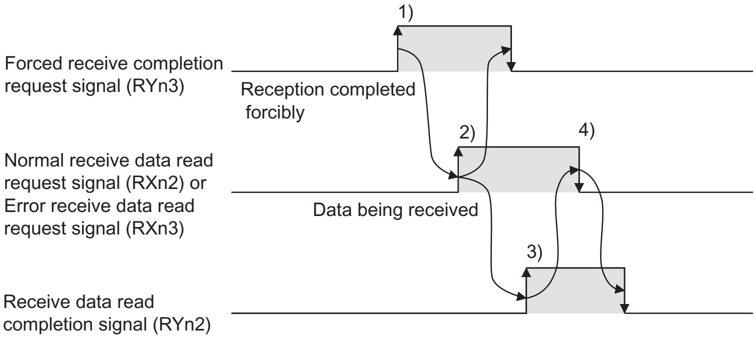


Figure 3.10 Forced receive completion request signal (RYn3)

(5) Initialization request signal (RYn4), Initialization complete signal (RXn4), and Initialization failed signal (RXn5)

The signals are used to initialize the setting of the AJ65BT-R2N.

(a) When normally completed

1) Initialization of the AJ65BT-R2N is started when Initialization request signal (RYn4) is turned ON after writing data for initialization to the buffer memory of the AJ65BT-R2N.
2) When the initialization of the AJ65BT-R2N is completed normally, Initialization complete signal (RXn4) is turned ON.
3) Turn OFF Initialization request signal (RYn4) after Initialization complete signal (RXn4) is turned ON.

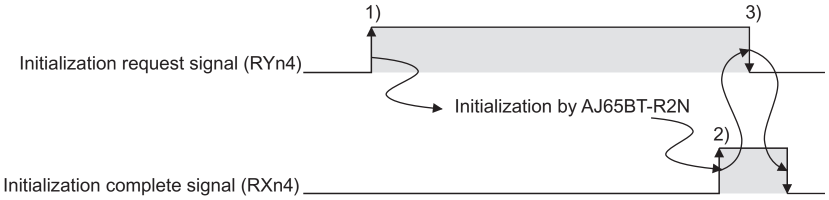


Figure 3.11 Initialization request signal (RYn4) and Initialization complete signal (RXn4)

(b) When failed

1) Initialization of the AJ65BT-R2N is started when Initialization request signal (RYn4) is turned ON after writing data for initialization to the buffer memory of the AJ65BT-R2N.
2) When the initialization of the AJ65BT-R2N is failed, Initialization failed signal (RXn5) is turned ON.
When initialization is failed, an error occurred is stored into General error codes (R2N 1B0H).
3) Turn OFF Initialization request signal (RYn4) after Initialization failed signal (RXn5) is turned ON.

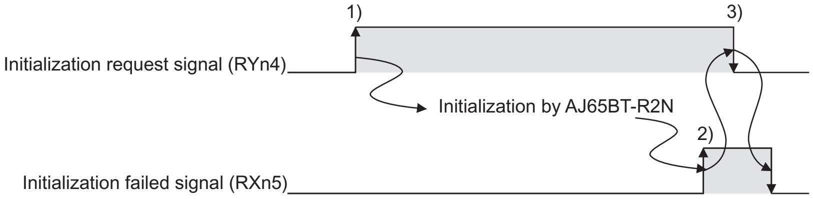


Figure 3.12 Initialization request signal (RYn4) and Initialization failed signal (RXn5)

(6) OS reception area clear request signal (RYn6) and OS reception area cleared signal (RXn6)

The signals are used to clear OS reception area of the AJ65BT-R2N.

1) Clearing OS reception area of the AJ65BT-R2N is started when turning ON OS reception area clear request signal (RYn6).

2) OS reception area cleared signal (RXn6) is turned ON when clearing data of OS reception area is completed.

3) Turn OFF OS reception area clear request signal (RYn6) after OS reception area cleared signal (RXn6) is turned ON.

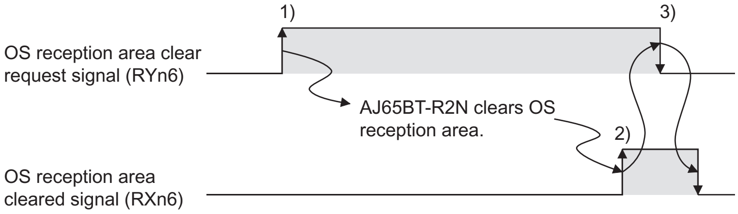


Figure 3.13 OS reception area clear request signal (RYn6) and OS reception area cleared signal (RXn6)

(7) E^2PROM function request signal (RYn7), E^2PROM function complete signal (RXn7), and E^2PROM function failed signal (RXn8)

The signals are used to register the setting value of the buffer memory of the AJ65BT-R2N to E^2PROM or initialize it.

(a) When normally completed

1) Registration of the setting value to E^2PROM or initialization of it is started when turning ON E^2PROM function request signal (RYn7) after data is written to E^2PROM function specification (R2N 1C0H).
2) E^2PROM function complete signal (RXn7) is turned ON when registration of the setting value to E^2PROM or initialization of it is completed normally.
3) Turn OFF E^2PROM function request signal (RYn7) after E^2PROM function complete signal (RXn7) is turned ON.

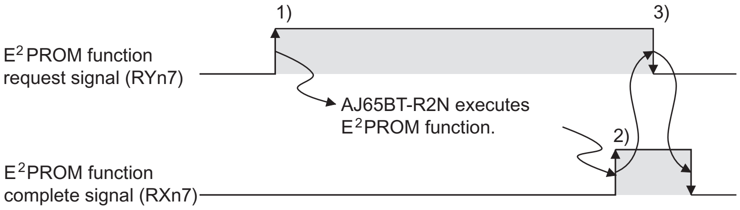


Figure 3.14 E^2PROM function request signal (RYn7) and E^2PROM function complete signal (RXn7)

(b) When failed

1) Registration of the setting value to E^2PROM or initialization of it is started when turning ON E^2PROM function request signal (RYn7) after data is written to E^2PROM function specification (R2N 1C0H).
2) E^2PROM function failed signal (RXn8) is turned ON when registration of the setting value to E^2PROM or initialization of it is failed.
When failed, an error occurred is stored into General error codes (R2N 1B0H).
3) Turn OFF E^2PROM function request signal (RYn7) after E^2PROM function failed signal (RXn8) is turned ON.

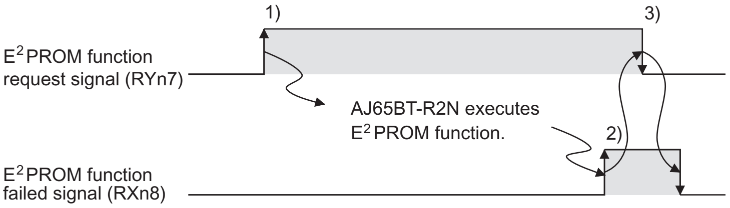


Figure 3.15 E^2PROM function request signal (RYn7) and E^2PROM function failed signal (RXn8)

(8) Signal setting: RS (RTS) signal (RYn9)

1) This is used to turn ON/OFF the RS (RTS) signal in the RS-232 communication.
2) However, when RS (RTS) signal status specification (R2N 101H) is 0 (always ON), the RS (RTS) signal (RYn9) is always ON regardless of turning it ON/OFF.
3) When controlling the RS (RTS) signal by the RS (RTS) signal (RYn9), set 1 (which follows ON/OFF of the RS (RTS) signal (RYn9)) to RS (RTS) signal status specification (R2N 101H).

(9) Signal setting: DTR (ER) signal (RYnA)

1) This is used to turn ON/OFF the DTR (ER) signal in the RS-232 communication.
2) This is available when 0 (not executing flow control) or 2 (executing flow control by the DC code control) is set to Flow control specification (R2N 100H).

(10) Signal status: CS (CTS) signal (RXn9), DSR (DR) signal (RXnA), and CD signal (RXnB)

This is used to check the status of the control signals (CS (CTS) signal, DSR (DR) signal, and CD signal) in RS-232 communication.
For signal status of each control signal, refer to the following.
☞Section 3.5.1 RS-232 connector specifications

(11) General-purpose external output signal (RYnC and RYnD)

General-purpose external output signals (RYnC and RYnD) are used to turn ON/OFF the general-purpose external outputs (YC and YD) of the AJ65BT-R2N.
RYnC corresponds to YC, and RYnD corresponds to YD, respectively.

(12) General-purpose external input signal (RXnC and RXnD)

General-purpose external input signals (RXnC and RXnD) are used to check the status of the general-purpose external inputs (XC and XD) of the AJ65BT-R2N.
General-purpose external input signals (RXnC and RXnD) are indicated by ON/OFF.
RXnC corresponds to XC, and RXnD corresponds to XD, respectively.

(13)Mode setting switch status signal (RX(n+1)4 to RX(n+1)7)

Mode setting switch status signals (RX(n+1)4 to RX(n+1)7) are used to check the status of Mode setting switch.

Table 3.10 Mode setting switch status signal

Mode setting switch	Name			RX(n+1)7	RX(n+1)6	RX(n+1)5	RX(n+1)4
0	Nonprocedural protocol mode	Send/receive buffer communication function	Mode 0	0	0	0	0
1		Buffer memory auto-refresh function	Mode 1	0	0	0	1
2			Mode 2	0	0	1	0
3			Mode 3	0	0	1	1
4			Mode 4	0	1	0	0
5	MELSOFT connection mode			0	1	0	1
6	Unused			0	1	1	0
7				0	1	1	1
8				1	0	0	0
9				1	0	0	1
A				1	0	1	0
B				1	0	1	1
C				1	1	0	0
D				1	1	0	1
E				1	1	1	0
F				1	1	1	1

(14)Initial data read request signal (RY(n+1)9) and Initial data read completion signal (RX(n+1)9)

The signals are used to read the initial value of the AJ65BT-R2N to the auto-refresh buffer before initialization of the AJ65BT-R2N when the buffer memory auto-refresh function is used.

1) Reading the initial value of the AJ65BT-R2N is started when Initial data read request signal (RY(n+1)9) is turned ON.
   Remote station ready signal (RX(n+1)B) is turned OFF when Initial data read request signal (RY(n+1)9) is turned ON.
2) When reading the initial value to the auto-refresh buffer is completed, Initial data read completion signal (RX(n+1)9) is turned ON, leading to turn OFF Initial data read request signal (RY(n+1)9).
3) After turning OFF Initial data read request signal (RY(n+1)9), Initial data read completion signal (RX(n+1)9) is turned OFF and Remote station ready signal (RX(n+1)B) is turned ON.
4) Initialization of the AJ65BT-R2N.
   ☞(5) Initialization request signal (RYn4), Initialization complete signal (RXn4), and Initialization failed signal (RXn5) in this section

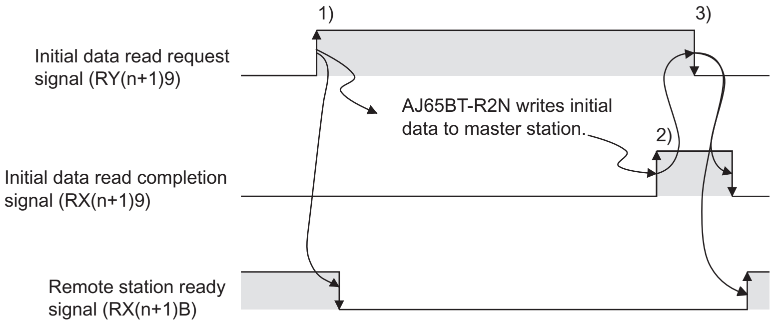


Figure 3.16 Initial data read request signal (RY(n+1)9) and Initial data read completion signal (RX(n+1)9)

(15)Error reset request signal (RY(n+1)A) and Error status signal (RX(n+1)A)

The signals are used to check the ERR. LED status of the AJ65BT-R2N.

- ON: ERR. LED is ON
- OFF: ERR. LED is OFF

For errors due to failure of initialization, refer to (b).
For errors due to failure other than initialization, refer to (a).

(a) When Initialization failed signal (RXn5) is OFF

1) Error status signal (RX(n+1)A) is turned ON if an error occurs.

   An error occurred is stored into Error code storage area (R2N 1A8H to 1B2H).

2) Turn ON Error reset request signal (RY(n+1)A) after removing the cause of an error.

3) Error status signal (RX(n+1)A) is turned OFF after turning ON Error reset request signal (RY(n+1)A).

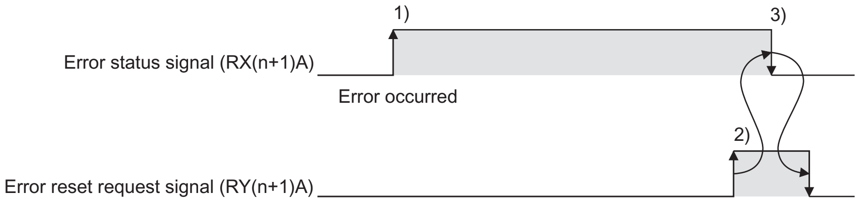


Figure 3.17 Error reset request signal (RY(n+1)A) and Error status signal (RX(n+1)A) (When Initialization failed signal (RXn5) is OFF)

(b) When Initialization failed signal (RXn5) is ON

It is necessary to initialize the AJ65BT-R2N if Initialization failed signal (RXn5) is turned ON.

In this case, Error status signal (RX(n+1)A) cannot be turned OFF by turning ON Error reset request signal (RY(n+1)A).

1) Error status signal (RX(n+1)A) is turned ON if an error occurs.

An error occurred is stored into Error code storage area (R2N 1A8H to 1B2H).

2) After reviewing the initial setting of the AJ65BT-R2N, turn ON Initialization request signal (RYn4) again to reinitialize the AJ65BT-R2N.

☞(5) Initialization request signal (RYn4), Initialization complete signal (RXn4), and Initialization failed signal (RXn5) in this section

3) Error status signal (RX(n+1)A) is turned OFF when reinitialization is completed normally and Initialization complete signal (RXn4) is turned ON.

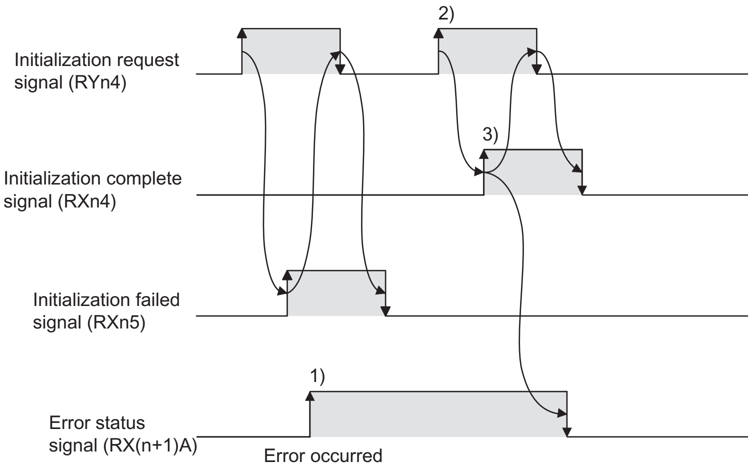


Figure 3.18 Error reset request signal (RY(n+1)A) and Error status signal (RX(n+1)A) (When Initialization failed signal (RXn5) is ON)

(16)Remote station ready signal (RX(n+1)B)

Remote station ready signal (RX(n+1)B) is used to check whether the AJ65BT-R2N can operate or not.

☞(14) Initial data read request signal (RY(n+1)9) and Initial data read completion signal (RX(n+1)9) in this section

Table 3.11 Remote station ready signal

Status	Description
ON	Status where the AJ65BT-R2N can operate or when Initial data read request signal (RY(n+1)9) is turned OFF.
OFF	When the initialization error of the AJ65BT-R2N occurs (setting value error of the buffer memory of the AJ65BT-R2N) or when Initial data read request signal (RY(n+1)9) is turned ON.

(17)Intelligent device station access request signal (RY(n+1)E) and Intelligent device station access completion signal (RX(n+1)E)

The signals are used to send contents written to the send buffer of the master station to the AJ65BT-R2N when the FROM/TO instruction is used in the ACPU/QCPU (A mode).

1) The data of send buffer of the master station is sent to the AJ65BT-R2N when turning ON Intelligent device station access request signal (RY(n+1)E) after writing data to send buffer of the master station.
2) If the requested access is completed, Intelligent device station access completion signal (RX(n+1)E) is turned ON.
3) After Intelligent device station access completion signal (RX(n+1)E) is turned ON, turn OFF Intelligent device station access request signal (RY(n+1)E).

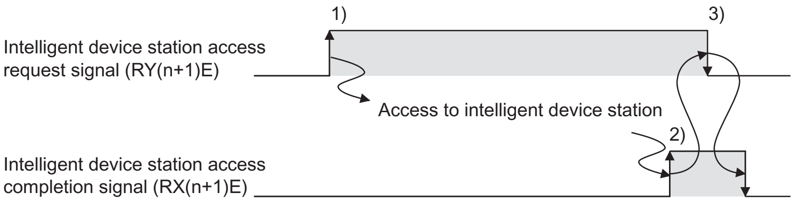


Figure 3.19 Intelligent device station access request signal (RY(n+1)E) and Intelligent device station access completion signal (RX(n+1)E)

3.7.3 Remote register list

The following describes the remote register list of the AJ65BT-R2N.

☒Point

The "m" in device No. of the remote register depends on the number of occupied points of the module mounted on the station whose station No. is smaller than that of the AJ65BT-R2N.

The following shows an example when a local station compatible with Remote net ver.1 mode is mounted on the station whose station No. is smaller than that of the AJ65BT-R2N.
In case of the following example, RWw8 to RWwB are used as the remote register of the AJ65BT-R2N.

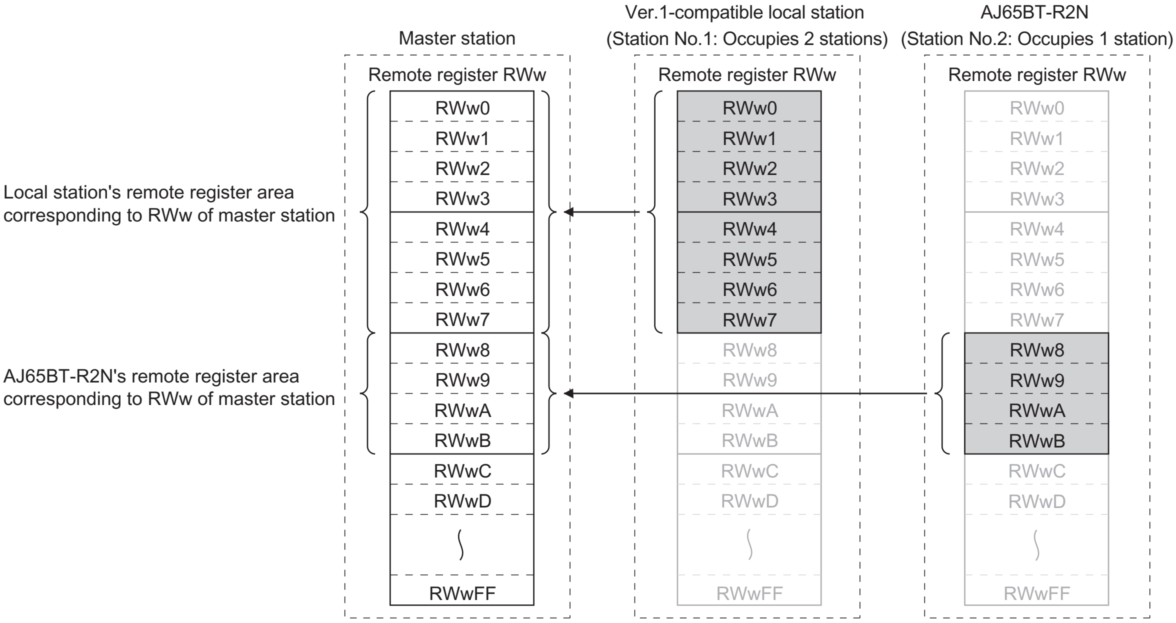


Figure 3.20 Example of remote register area

When mounting a device station compatible with Remote net ver.2 mode or Remote net additional mode on the station whose station No. is smaller than that of the AJ65BT-R2N, refer to the following manual.

☞User's manual for the master module used

(1) In Nonprocedural protocol mode

Table 3.12 Remote register list in Nonprocedural protocol mode

Device No.	Signal name	Device No.	Signal name
RWrm	General error codes (R2N $1B0_H$)[*1]	RWwm	Unused[*1]
RWr(m+1)	Error codes generated when sending (R2N $1B1_H$)[*1]	RWw(m+1)	
RWr(m+2)	Error codes generated when receiving (R2N $1B2_H$)[*1]	RWw(m+2)	
RWr(m+3)	No. of data stored in OS reception area(R2N $1B6_H$)[*1]	RWw(m+3)	

* 1 Contents at the time of default of RW refresh function.
Other buffer memories can be assigned by the setting of RW refresh function.

(2) In MELSOFT connection mode

Table 3.13 Remote register list in MELSOFT connection mode

Device No.	Signal name	Device No.	Signal name
RWrm	Use prohibited	RWwm	Use prohibited
RWr(m+1)		RWw(m+1)	
RWr(m+2)		RWw(m+2)	
RWr(m+3)		RWw(m+3)	

3.8 Buffer Memory

3.8.1 Buffer memory list

The following describes the buffer memory list.
Contents of buffer memory of the AJ65BT-R2N can be returned to default by turning ON power supply of the AJ65BT-R2N again or reset operation.
However, if registering the changed contents of buffer memory of the AJ65BT-R2N to the E^2PROM of the AJ65BT-R2N, the initial value of E^2PROM will be written when turning ON power supply of the AJ65BT-R2N.
The following shows how buffer memory list is organized.

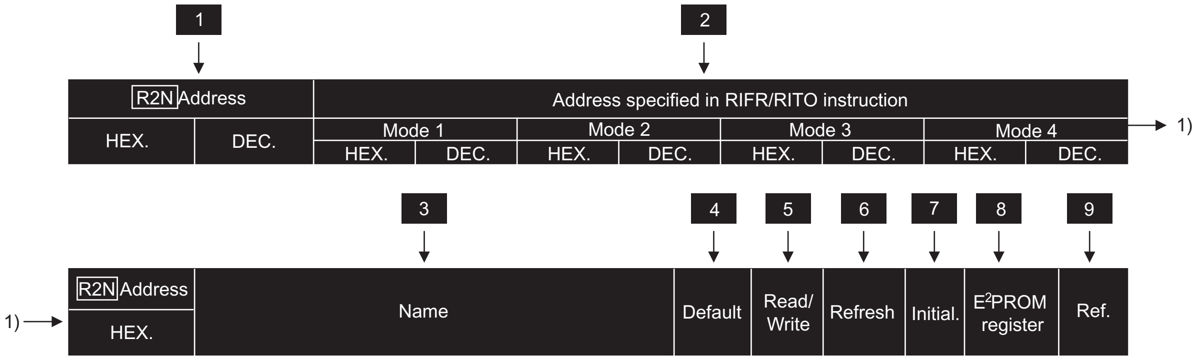


Figure 3.21 Organization of list

Table 3.14 Organization of list

No.	Name	Description
1	R2N Address	The address of buffer memory of the AJ65BT-R2N in hexadecimal or decimal.
2	Address specified by RIFR/ RITO instruction	The address specified by the RIFR/RITO instruction shown per mode. In mode 1, address can be changed by changing the auto-refresh buffer assignment. In modes 2 to 4, the auto-refresh buffer assignment cannot be changed.
3	Name	The name of buffer memory of the AJ65BT-R2N.
4	Default	The value at factory default setting of the AJ65BT-R2N.
5	Read/Write	Applicability of reading/writing. •R: Readable only •W: Writable only •R/W: Readable and writable
6	Refresh	Shows which of the master station or the AJ65BT-R2N refreshes the buffer memory value of the AJ65BT-R2N. •M: Refresh is performed by the master station •R2N: Refresh is performed by the AJ65BT-R2N •Both: Refresh is performed by the master station and the AJ65BT-R2N
7	Initial.	Shows whether the initialization is necessary or not when changing the buffer memory value of the AJ65BT-R2N. •Needed: Initialization is necessary •Not needed: Initialization is not necessary
8	E^2PROM register	Shows whether contents of buffer memory of the AJ65BT-R2N can be registered to the E^2PROM of the AJ65BT-R2N or not. •Available: Registration to E^2PROM is possible •N/A: Registration to E^2PROM is not possible
9	Ref.	Chapter and section of the detailed description.

(1) Area for various assignments (R2N 0H to FFH)

Table 3.15 Area for various assignments (R2N 0H to FFH)

R2N Address		Address specified by RIFR/RITO instruction							
HEX.	DEC.	Mode 1		Mode 2		Mode 3		Mode 4	
		HEX.	DEC.	HEX.	DEC.	HEX.	DEC.	HEX.	DEC.
0H	0	0H	0	0H	0	—	—	—	—
1H	1	1H	1	1H	1	—	—	—	—
2H	2	2H	2	2H	2	—	—	—	—
3H	3	3H	3	3H	3	—	—	—	—
4H to FH	4 to 15	4H	4	4H	4	—	—	—	—
10H	16	10H	16	10H	16	—	—	—	—
11H	17	11H	17	11H	17	—	—	—	—
12H	18	12H	18	12H	18	—	—	—	—
13H	19	13H	19	13H	19	—	—	—	—
14H	20	14H	20	14H	20	—	—	—	—
15H	21	15H	21	15H	21	—	—	—	—
16H	22	16H	22	16H	22	—	—	—	—
17H	23	17H	23	17H	23	—	—	—	—
18H	24	18H	24	18H	24	—	—	—	—
19H	25	19H	25	19H	25	—	—	—	—
1AH	26	1AH	26	1AH	26	—	—	—	—
1BH	27	1BH	27	1BH	27	—	—	—	—
1CH	28	1CH	28	1CH	28	—	—	—	—
1DH	29	1DH	29	1DH	29	—	—	—	—
1EH	30	1EH	30	1EH	30	—	—	—	—
1FH	31	1FH	31	1FH	31	—	—	—	—
20H	32	20H	32	20H	32	—	—	—	—
21H	33	21H	33	21H	33	—	—	—	—
22H	34	22H	34	22H	34	—	—	—	—
23H	35	23H	35	23H	35	—	—	—	—
24H	36	24H	36	24H	36	—	—	—	—
25H	37	25H	37	25H	37	—	—	—	—
26H	38	26H	38	26H	38	—	—	—	—
27H	39	27H	39	27H	39	—	—	—	—
28H	40	28H	40	28H	40	—	—	—	—
29H	41	29H	41	29H	41	—	—	—	—
2AH	42	2AH	42	2AH	42	—	—	—	—
2BH	43	2BH	43	2BH	43	—	—	—	—
2CH	44	2CH	44	2CH	44	—	—	—	—
2DH	45	2DH	45	2DH	45	—	—	—	—
2EH	46	2EH	46	2EH	46	—	—	—	—
2FH	47	2FH	47	2FH	47	—	—	—	—
30H	48	30H	48	30H	48	—	—	—	—
31H	49	31H	49	31H	49	—	—	—	—
32H	50	32H	50	32H	50	—	—	—	—
33H	51	33H	51	33H	51	—	—	—	—
34H to 3FH	52 to 63	34H	52	34H	52	—	—	—	—

R2N Address HEX.	Name			Default	Read/ Write	Refresh	Initial.	E^2PROM register	Ref.
0H	Start address specification area		Send area, start address specification	*1	R/W	M	Needed	Available	Section 4.2
1H			Send area size specification						
2H			Receive area, start address specification						
3H			Receive area size specification						
4H to FH	System area			—	—	—	—	—	—
10H	Auto-refresh area specification	Status data storage area	Transfer size	*1	R/W	M	Needed	Available	Section 4.3.1
11H			AJ65BT-R2N side start address						
12H			Fixed value						
13H			Master station side offset address						
14H		Send area 1)	Transfer size						
15H			AJ65BT-R2N side start address						
16H			Fixed value						
17H			Master station side offset address						
18H		Send area 2)	Transfer size						
19H			AJ65BT-R2N side start address						
1AH			Fixed value						
1BH			Master station side offset address						
1CH		Receive area	Transfer size						
1DH			AJ65BT-R2N side start address						
1EH			Fixed value						
1FH			Master station side offset address						
20H		Initial setting area	Transfer size						
21H			AJ65BT-R2N side start address						
22H			Fixed value						
23H			Master station side offset address						
24H		E^2PROM function area	Transfer size						
25H			AJ65BT-R2N side start address						
26H			Fixed value						
27H			Master station side offset address						
28H		User registration frame area	Transfer size						
29H			AJ65BT-R2N side start address						
2AH			Fixed value						
2BH			Master station side offset address						
2CH		Monitoring-based transmission area 1)	Transfer size						
2DH			AJ65BT-R2N side start address						
2EH			Fixed value						
2FH			Master station side offset address						
30H		Monitoring-based transmission area 2)	Transfer size						
31H			AJ65BT-R2N side start address						
32H			Fixed value						
33H			Master station side offset address						
34H to 3FH	System area			—	—	—	—	—	—

(Continued to next page)

Table 3.15 Area for various assignments (R2N 0_H to FF_H)(Continued)

R2N Address		Address specified by RIFR/RITO instruction							
HEX.	DEC.	Mode 1		Mode 2		Mode 3		Mode 4	
		HEX.	DEC.	HEX.	DEC.	HEX.	DEC.	HEX.	DEC.
40_H	64	40_H	64	40_H	64	—	—	—	—
41_H	65	41_H	65	41_H	65	—	—	—	—
42_H	66	42_H	66	42_H	66	—	—	—	—
43_H	67	43_H	67	43_H	67	—	—	—	—
44_H	68	44_H	68	44_H	68	—	—	—	—
45_H	69	45_H	69	45_H	69	—	—	—	—
46_H	70	46_H	70	46_H	70	—	—	—	—
47_H	71	47_H	71	47_H	71	—	—	—	—
48_H	72	48_H	72	48_H	72	—	—	—	—
49_H	73	49_H	73	49_H	73	—	—	—	—
$4A_H$	74	$4A_H$	74	$4A_H$	74	—	—	—	—
$4B_H$ to $6F_H$	75 to 111	$4B_H$	75	$4B_H$	75	—	—	—	—
70_H	112	70_H	112	70_H	112	—	—	—	—
71_H	113	71_H	113	71_H	113	—	—	—	—
72_H to 77_H	114 to 119	72_H	114	72_H	114	—	—	—	—
78_H	120	78_H	120	78_H	120	—	—	—	—
79_H	121	79_H	121	79_H	121	—	—	—	—
$7A_H$ to $F7_H$	122 to 247	$7A_H$	122	$7A_H$	122	—	—	—	—
$F8_H$ to FF_H	248 to 255	$F8_H$	248	$F8_H$	248	—	—	—	—

(From previous page)

R2N Address HEX.	Name		Default	Read/ Write	Refresh	Initial.	E^2PROM register	Ref.
40_H	RW refresh interval specification		1	R/W	M	Needed	Available	Section 4.5.7
41_H	RWw refresh enable/disable setting		0_H					
42_H	RWr refresh enable/disable setting		1_H					
43_H	RW refresh target address specification	Master station → AJ65BT-R2N(RWwm)	118_H					
44_H		AJ65BT-R2N → Master station (RWrm)	$1B0_H$					
45_H		Master station → AJ65BT-R2N(RWw(m+1))	119_H					
46_H		AJ65BT-R2N → Master station (RWr(m+1))	$1B1_H$					
47_H		Master station → AJ65BT-R2N(RWw(m+2))	120_H					
48_H		AJ65BT-R2N → Master station (RWr(m+2))	$1B2_H$					
49_H		Master station → AJ65BT-R2N(RWw(m+3))	121_H					
$4A_H$		AJ65BT-R2N → Master station (RWr(m+3))	$1B6_H$					
$4B_H$ to $6F_H$	System area		—	—	—	—	—	—
70_H	Monitoring interval specification		0	R/W	M	Needed	Available	Section 4.5.2
71_H	No. of monitoring settings		0					
72_H to 77_H	System area		—	—	—	—	—	—
78_H	Monitoring setting - 1	Monitoring target	0_H	R/W	M	Needed	Available	Section 4.5.2
79_H		Send data specification	0_H					
$7A_H$ to $F7_H$	Monitoring setting - 2 to - 64	Same as Monitoring setting - 1	0_H					
$F8_H$ to FF_H	System area		—	—	—	—	—	—

* 1 Shows the default of Start address specification area and Auto-refresh area specification per mode.
In modes 0 and 1, default can be changed by E^{2}PROMregistration function.
In modes 2 to 4, default cannot be changed.

Table 3.16 Default of Start address specification area and Auto-refresh area specification per mode

R2N Address		Name		
HEX.	DEC.			
0_H	0	Start address specification area		Send area, start address specification
1_H	1			Send area size specification
2_H	2			Receive area, start address specification
3_H	3			Receive area size specification
10_H	16	Auto-refresh area specification	Status data storage area	Transfer size
11_H	17			AJ65BT-R2N side start address
12_H	18			Fixed value
13_H	19			Master station side offset address
14_H	20		Send area 1)	Transfer size
15_H	21			AJ65BT-R2N side start address
16_H	22			Fixed value
17_H	23			Master station side offset address
18_H	24		Send area 2)	Transfer size
19_H	25			AJ65BT-R2N side start address
$1A_H$	26			Fixed value
$1B_H$	27			Master station side offset address
$1C_H$	28		Receive area	Transfer size
$1D_H$	29			AJ65BT-R2N side start address
$1E_H$	30			Fixed value
$1F_H$	31			Master station side offset address
20_H	32		Initial setting area	Transfer size
21_H	33			AJ65BT-R2N side start address
22_H	34			Fixed value
23_H	35			Master station side offset address
24_H	36		E^{2}PROM function area	Transfer size
25_H	37			AJ65BT-R2N side start address
26_H	38			Fixed value
27_H	39			Master station side offset address
28_H	40		User registration frame area	Transfer size
29_H	41			AJ65BT-R2N side start address
$2A_H$	42			Fixed value
$2B_H$	43			Master station side offset address
$2C_H$	44		Monitoring-based transmission area 1)	Transfer size
$2D_H$	45			AJ65BT-R2N side start address
$2E_H$	46			Fixed value
$2F_H$	47			Master station side offset address
30_H	48		Monitoring-based transmission area 2)	Transfer size
31_H	49			AJ65BT-R2N side start address
32_H	50			Fixed value
33_H	51			Master station side offset address

R2N Address HEX.	Mode 0	Mode 1	Mode 2	Mode 3	Mode 4
0H	200H		200H		
1H	200H		100H	80H	60H
2H	400H		400H		
3H	200H		100H	80H	60H
10H	20H		20H		
11H	1A0H		1A0H		
12H	4004H		4004H		
13H	1A0H		1A0H	A0H	20H
14H	88H		88H	88H	8H
15H	118H		118H		
16H	4004H		4004H		
17H	118H		118H	18H	18H
18H	200H		100H	80H	60H
19H	200H		200H		
1AH	4004H		4004H		
1BH	200H		200H	100H	40H
1CH	200H		100H	80H	60H
1DH	400H		400H		
1EH	4004H		4004H		
1FH	400H		300H	180H	A0H
20H	1A0H		1A0H	A0H	20H
21H	0H		0H	100H	100H
22H	4004H		4004H		
23H	0H		0H		
24H	30H		30H	30H	0H
25H	1C0H		1C0H	1C0H	0H
26H	4004H		4004H		
27H	1C0H		1C0H	C0H	0H
28H	29H		29H	29H	0H
29H	1C7H		1C7H	1C7H	0H
2AH	4004H		4004H		
2BH	1C7H		1C7H	C7H	0H
2CH	88H		88H	88H	8H
2DH	118H		118H		
2EH	4004H		4004H		
2FH	118H		118H	18H	18H
30H	200H		100H	80H	60H
31H	200H		200H		
32H	4004H		4004H		
33H	200H		200H	100H	40H

(2) Area for parameters (R2N 100H to 19FH)

Table 3.17 Area for parameters (R2N 100H to 19FH)

R2N Address		Address specified by RIFR/RITO instruction							
HEX.	DEC.	Mode 1		Mode 2		Mode 3		Mode 4	
		HEX.	DEC.	HEX.	DEC.	HEX.	DEC.	HEX.	DEC.
100H	256	100H	256	100H	256	0H	0	0H	0
101H	257	101H	257	101H	257	1H	1	1H	1
102H	258	102H	258	102H	258	2H	2	2H	2
103H	259	103H	259	103H	259	3H	3	3H	3
104H	260	104H	260	104H	260	4H	4	4H	4
105H	261	105H	261	105H	261	5H	5	5H	5
106H to 107H	262 to 263	106H	262	106H	262	6H	6	6H	6
108H	264	108H	264	108H	264	8H	8	8H	8
109H	265	109H	265	109H	265	9H	9	9H	9
10AH	266	10AH	266	10AH	266	AH	10	AH	10
10BH	267	10BH	267	10BH	267	BH	11	BH	11
10CH	268	10CH	268	10CH	268	CH	12	CH	12
10DH	269	10DH	269	10DH	269	DH	13	DH	13
10EH	270	10EH	270	10EH	270	EH	14	EH	14
10FH	271	10FH	271	10FH	271	FH	15	FH	15
110H	272	110H	272	110H	272	10H	16	10H	16
111H	273	111H	273	111H	273	11H	17	11H	17
112H	274	112H	274	112H	274	12H	18	12H	18
113H to 117H	275 to 279	113H	275	113H	275	13H	19	13H	19
118H	280	118H	280	118H	280	18H	24	18H	24
119H	281	119H	281	119H	281	19H	25	19H	25
11AH	282	11AH	282	11AH	282	1AH	26	1AH	26
11BH to 11FH	283 to 287	11BH	283	11BH	283	1BH	27	1BH	27
120H	288	120H	288	120H	288	20H	32	—	—
121H	289	121H	289	121H	289	21H	33	—	—
122H to 185H	290 to 299	122H	290	122H	290	22H	34	—	—
186H to 19FH	390 to 415	186H	390	186H	390	86H	134	—	—

R2N Address	Name			Default	Read/Write	Refresh	Initial.	E^{2}PROM register	Ref.
HEX.									
100H	Flow control specification			1H	R/W	M	Needed	Available	Section 4.5.5
101H	RS (RTS) signal status specification			0H					Section 4.5.10
102H	Word/byte specification			0H			Not needed		Section 4.2
103H	ASCII-binary conversion specification			0H			Needed		Section 4.5.6
104H	System area			—	—	—	—	—	—
105H	Transient timeout time specification			0	R/W	M	Needed	Available	Section 4.3
106H to 107H	System area			—	—	—	—	—	—
108H	Receive start frame No.	1		0H	R/W	M	Needed	Available	Section 4.5.1
109H		2		0H					
10AH		3		0H					
10BH		4		0H					
10CH	Receive end frame No.	1		AH					
10DH		2		DH					
10EH		3		0H					
10FH		4		0H					
110H	Receive start/end frame elimination			1H					
111H	No. of receive end data			0H					Section 4.2, Section 4.3
112H	Receive timeout time specification			0					
113H to 117H	System area			—	—	—	—	—	—
118H	Send-frame-1 area	Send start frame No.		0H	R/W	M	Not needed	Available	Section 4.5.1
119H		Send end frame No.		0H					
11AH	Send timeout time specification			0					Section 4.2, Section 4.3
11BH to 11FH	System area			—	—	—	—	—	—
120H	Send-frame-2 area	Transmission table start No. specification		0	R/W	M	Not needed	Available	Section 4.5.1
121H		No. of transmission tables		0					
122H to 185H		Transmission table specification	No.1 to No.100	0H					
186H to 19FH	System area			—	—	—	—	—	—

(3) Setting status storage area (R2N 1A0H to 1A7H)

Table 3.18 Setting status storage area (R2N 1A0H to 1A7H)

R2N Address		Address specified by RIFR/RITO instruction							
HEX.	DEC.	Mode 1		Mode 2		Mode 3		Mode 4	
		HEX.	DEC.	HEX.	DEC.	HEX.	DEC.	HEX.	DEC.
1A0H	416	1A0H	416	1A0H	416	A0H	160	20H	32
1A1H	417	1A1H	417	1A1H	417	A1H	161	21H	33
1A2H	418	1A2H	418	1A2H	418	A2H	162	22H	34
1A3H	419	1A3H	419	1A3H	419	A3H	163	23H	35
1A4H	420	1A4H	420	1A4H	420	A4H	164	24H	36
1A5H	421	1A5H	421	1A5H	421	A5H	165	25H	37
1A6H	422	1A6H	422	1A6H	422	A6H	166	26H	38
1A7H	423	1A7H	423	1A7H	423	A7H	167	27H	39

(4) Communication status storage area (R2N 1A8H to 1BFH)

Table 3.19 Communication status storage area (R2N 1A8H to 1BFH)

R2N Address		Address specified by RIFR/RITO instruction							
HEX.	DEC.	Mode 1		Mode 2		Mode 3		Mode 4	
		HEX.	DEC.	HEX.	DEC.	HEX.	DEC.	HEX.	DEC.
1A8H to 1AFH	424 to 431	1A8H	424	1A8H	424	A8H	168	28H	40
1B0H	432	1B0H	432	1B0H	432	B0H	176	30H	48
1B1H	433	1B1H	433	1B1H	433	B1H	177	31H	49
1B2H	434	1B2H	434	1B2H	434	B2H	178	32H	50
1B3H	435	1B3H	435	1B3H	435	B3H	179	33H	51
1B4H	436	1B4H	436	1B4H	436	B4H	180	34H	52
1B5H	437	1B5H	437	1B5H	437	B5H	181	35H	53
1B6H	438	1B6H	438	1B6H	438	B6H	182	36H	54
1B7H to 1BEH	439 to 446	1B7H	439	1B7H	439	B7H	183	37H	55
1BFH	447	1BFH	447	1BFH	447	BFH	191	3FH	63

	R2N Address	Name	Default	Read/ Write	Refresh	Initial.	E^2PROM register	Ref.
	HEX.							
	1A0$_H$	Station No. setting switch	0*1	R	R2N	Not needed	N/A	Section 5.4
	1A1$_H$	Data link transmission speed setting switch	156*1					
	1A2$_H$	Mode setting switch	0$_H$*1					
	1A3$_H$	RS-232 transmission speed	300*1					
	1A4$_H$	RS-232 data bit length	8*1					
	1A5$_H$	RS-232 parity bit	0*1					
	1A6$_H$	RS-232 stop bit length	1*1					
	1A7$_H$	Buffer memory default setting status storage	0$_H$					Section 4.5.9

* 1 The switch setting status at factory default setting.

	R2N Address	Name		Default	Read/ Write	Refresh	Initial.	E^2PROM register	Ref.
	HEX.								
	1A8$_H$ to 1AF$_H$	Error code storage area	Error code history	0$_H$	R	R2N	Not needed	N/A	Section 9.2
	1B0$_H$		General error codes	0$_H$					
	1B1$_H$		Error codes generated when sending	0$_H$					
	1B2$_H$		Error codes generated when receiving	0$_H$					
	1B3$_H$	System area		—	—	—	—	—	—
	1B4$_H$	No. of actual send data		0$_H$	R	R2N	Not needed	N/A	Section 4.2, Section 4.3
	1B5$_H$	Receive frame index No. storage		0$_H$					Section 4.5.1
	1B6$_H$	No. of data stored in OS reception area		0$_H$					Section 4.2, Section 4.3
	1B7$_H$ to 1BE$_H$	System area		—	—	—	—	—	—
	1BF$_H$	Software version storage		*1	R	R2N	Not needed	N/A	—

* 1 Varies depending on software version.

(5) E^{2}PROMarea (R2N 1C0$_H$ to 1FF$_H$)

Table 3.20 E^{2}PROM area (R2N 1C0$_H$ to 1FF$_H$)

R2N Address		Address specified by RIFR/RITO instruction							
HEX.	DEC.	Mode 1		Mode 2		Mode 3		Mode 4	
		HEX.	DEC.	HEX.	DEC.	HEX.	DEC.	HEX.	DEC.
1C0$_H$	448	1C0$_H$	448	1C0$_H$	448	C0$_H$	192	—	—
1C1$_H$	449	1C1$_H$	449	1C1$_H$	449	C1$_H$	193	—	—
1C2$_H$ to 1C6$_H$	450 to 454	1C2$_H$	450	1C2$_H$	450	C2$_H$	194	—	—
1C7$_H$	455	1C7$_H$	455	1C7$_H$	455	C7$_H$	199	—	—
1C8$_H$ to 1EF$_H$	456 to 495	1C8$_H$	456	1C8$_H$	456	C8$_H$	200	—	—
1F0$_H$ to 1FF$_H$	496 to 511	1F0$_H$	496	1F0$_H$	496	F0$_H$	240	—	—

(6) User-defined area (R2N 200$_H$ to F1F$_H$)

Table 3.21 User-defined area (R2N 200$_H$ to F1F$_H$)

R2N Address		Address specified by RIFR/RITO instruction							
HEX.	DEC.	Mode 1		Mode 2		Mode 3		Mode 4	
		HEX.	DEC.	HEX.	DEC.	HEX.	DEC.	HEX.	DEC.
200$_H$	512	200$_H$	512	200$_H$	512	100$_H$	256	40$_H$	64
201$_H$ to 3FF$_H$	513 to 1023	201$_H$ to 3FF$_H$	513 to 1023	201$_H$ to 2FF$_H$	513 to 767	101$_H$ to 17F$_H$	257	41$_H$ to 9F$_H$	65 to 159
400$_H$	1024	400$_H$	1024	300$_H$	768	180$_H$	384	A0$_H$	160
401$_H$ to 5FF$_H$	1025 to 1535	401$_H$ to 5FF$_H$	1025 to 1535	301$_H$ to 3FF$_H$	769 to 1023	181$_H$ to 1FF$_H$	385 to 511	A1$_H$ to FF$_H$	161 to 255
600$_H$ to 7FF$_H$	1536 to 2047	—	—	—	—	—	—	—	—
800$_H$ to F1F$_H$	2048 to 3871	—	—	—	—	—	—	—	—

	R2N Address	Name	Default	Read/Write	Refresh	Initial.	E^2PROM register	Ref.
	HEX.							
	1C0$_H$	E^2PROM function specification	0$_H$	R/W	M	Not needed	N/A	Section 4.5.1, Section 4.5.9
	1C1$_H$	User registration frame No.	0$_H$					Section 4.5.1
	1C2$_H$ to 1C6$_H$	System area	—	—	—	—	—	—
	1C7$_H$	No. of user registration frame bytes	0$_H$	R/W	Both	Not needed	N/A	Section 4.5.1
	1C8$_H$ to 1EF$_H$	User registration frame	0$_H$					
	1F0$_H$ to 1FF$_H$	System area	—	—	—	—	—	—

	R2N Address	Name	Default	Read/Write	Refresh	Initial.	E^2PROM register	Ref.
	HEX.							
	200$_H$	Send data size specification area (at default)	0$_H$	R/W	M	Not needed	N/A	—
	201$_H$ to 3FF$_H$	Send data area (at default)	0$_H$					
	400$_H$	Receive data size specification area (at default)	0$_H$		R2N	Not needed	N/A	—
	401$_H$ to 5FF$_H$	Receive data area (at default)	0$_H$					
	600$_H$ to 7FF$_H$	Unused area (at default)	0$_H$		*1	Not needed	N/A	—
	800$_H$ to F1F$_H$	System area	—	—	—	—	—	—

[1] The send area is refreshed by the M station, and the receive area is refreshed by the R2N, respectively.

3.9 Processing Time

3.9.1 Transmission delay time

The following shows the transmission delay time.

(1) Calculation formula

Table 3.22 Calculation formula of transmission delay time

Description	Calculation formula (Unit: ms)	
	Master station: MELSEC iQ-R/Q/L series	Master station: QnA/A series
Master station (RX/RWr) ← AJ65BT-R2N (RX/RWr)	SM＋LS×3＋RS	SM＋LS×3＋RS
Master station (RY/RWw) → AJ65BT-R2N (RY/RWw)	SM＋LS×2＋RS	
Master station (RX) → General-purpose input (RXnC, RXnD)	SM＋LS×3＋10	
Master station (RY)→ General-purpose output (RYnC, RYnD)	SM＋LS×3＋2	

SM: Master station sequence program scan time

LS: Link scan time

(For details, refer to the manual for the master module.)

RS: Internal processing time in the AJ65BT-R2N[1]

[1] The internal processing time in the AJ65BT-R2N (RS) is calculated by the following formula.
RS＝LS×K (Constant)

Table 3.23 Constant corresponding to transmission speed

Transmission speed	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps
K (Constant)	2	2	4	8	32

(2) Calculation example

The following shows a calculation example of transmission delay time from the master station (RY/RWw) to the AJ65BT-R2N (RY/RWw).

(Example) An example for connecting the AJ65BT-R2N in the following conditions is shown below.

- SM: 20ms
- Transmission speed: 156kbps
- AJ65BT-R2N: Only one

(a) When master station is MELSEC iQ-R/Q/L series

$$\begin{aligned}\text{LS} &= 51.2 \times \{27 + (8 \times 4.8) + (8 \times 9.6) + (1 \times 30) + (1 \times 4.8) + (1 \times 9.6)\} \\ &\quad + 1300 + 0 + 0 \\ &\fallingdotseq 10854[\mu\text{s}]\ (10.90[\text{ms}])\end{aligned}$$

$$\begin{aligned}\text{Transmission delay time} &= \text{SM} + \text{LS} \times 2 + \text{RS} \\ &= 20 + 10.9 \times 2 + 10.9 \times 2 \\ &\fallingdotseq 63.60[\text{ms}]\end{aligned}$$

(b) When master station is QnA/A series

$$\begin{aligned}\text{LS} &= 51.2 \times \{29.4 + (8 \times 4.8) + (8 \times 9.6) + (1 \times 32.4) + (1 \times 4.8) + (1 \times 9.6)\} \\ &\quad + 1300 \\ &\fallingdotseq 11100[\mu\text{s}]\ (11.10[\text{ms}])\end{aligned}$$

$$\begin{aligned}\text{Transmission delay time} &= \text{SM} + \text{LS} \times 3 + \text{RS} \\ &= 20 + 11.1 \times 3 + 11.1 \times 2 \\ &= 75.50[\text{ms}]\end{aligned}$$

3.9.2 Transmission time

The following shows the transmission time.

(1) When buffer memory auto-refresh function is used

The following shows the transmission time when using the buffer memory auto-refresh function.

The send time is time required for the AJ65BT-R2N from turning ON Send request signal (RYn0) to turning ON Send complete signal (RXn0).
The receive time is time required for the AJ65BT-R2N from starting data reception to turning ON Normal receive data read request signal (RXn2) or Error receive data read request signal (RXn3).

(a) Calculation formula

Table 3.24 Calculation formula when using the buffer memory auto-refresh function

Description		Calculation formula (Unit: ms)
Master station: MELSEC iQ-R/Q/L series	Send time	SM×2＋LS×4＋RS＋Data send time[*1] ＋Request/response scan of the area to be refreshed at sending data[*2]
	Receive time	SM＋LS×2＋RS＋Data receive time[*1] ＋Request/response scan of the area to be refreshed at receiving data[*2]
Master station: QnA/A series	Send time	SM×2＋LS×6＋RS＋Data send time[*1] ＋Request/response scan of the area to be refreshed at sending data[*2]
	Receive time	SM＋LS×3＋RS＋Data receive time[*1] ＋Request/response scan of the area to be refreshed at receiving data[*2]

SM: Master station sequence program scan time
LS: Link scan time
(For details, refer to the manual for the master module.)
RS: Internal processing time in the AJ65BT-R2N
(☞Section 3.9.1 (1) Calculation formula)

* 1 Data send (receive) time
It depends on No. of data, RS-232 transmission speed etc.

(Example) An example for calculating the send time in the following conditions is shown below.

•No. of data	: 200 bytes
•Transmission speed	: 9600bps
•Data bit length	: 8
•Stop bit length	: 1
•Parity bit	: Even

Send time ＝No. of data bytes×(Data bit length＋Stop bit length＋Parity bit length＋1)
＝200×10÷9600
≒0.208[s](208.0[ms])

* 2 Request/response scan of area to be refreshed at sending (receiving) data
Request/response scan of each area to be refreshed automatically at the time of sending (receiving) data.
Status data storage area and Send areas 1) and 2) are refreshed at default of sending data, and Status data storage area and Receive area are refreshed at default of receiving data.

- Request/response scan of area where data from the master station is written to the AJ65BT-R2N

  (No. of data to be auto-refreshed $+16) \div 72 \times$ LS [ms] (Fractional part rounded up)

- Request/response scan of area where data from the AJ65BT-R2N is written to the master station

  (No. of data to be auto-refreshed $+16) \div 16 \times$ LS [ms] (Fractional part rounded up)

(b) Calculation example

1) Send time

The following shows a calculation example of send time when sending data of 10 words (20 bytes).

Table 3.25 Setting example

Item	Description
Transfer size of each area	Default
Transmission speed	156kbps
No. of modules connected	Only one AJ65BT-R2N
Master station sequence program scan time	20ms
Transmission speed	9600bps
Data bit length	8
Stop bit length	1
Parity bit	Even

- When master station is MELSEC iQ-R/Q/L series

$$\begin{aligned} \text{LS} &= 51.2 \times \{27+(8\times 4.8)+(8\times 9.6)+(1\times 30)+(1\times 4.8)+(1\times 9.6)\} \\ &\quad +1300+0+0 \\ &\fallingdotseq 10854[\mu\text{s}]\ (10.90[\text{ms}]) \end{aligned}$$

$$\begin{aligned} \text{Data send time} &= 20\times 10 \div 9600 \\ &\fallingdotseq 0.0208[\text{s}]\ (20.80[\text{ms}]) \end{aligned}$$

$$\begin{aligned} \text{Send time} &= 20\times 2+10.9\times 4+(10.9\times 2)^{*1}+20.8^{*2}+\{(136+16)\div 72\times 10.9\}^{*3} \\ &\quad +\{(512+16)\div 72\times 10.9\}^{*4}+\{(32+16)\div 16\times 10.9\}^{*5} \\ &= 126.2+3\times 10.9+8\times 10.9+3\times 10.9 \\ &= 278.8[\text{ms}] \end{aligned}$$

- When master station is QnA/A series

$$\begin{aligned}
\text{LS} &= 51.2\times\{29.4+(8\times4.8)+(8\times9.6)+(1\times32.4)+(1\times4.8)+(1\times9.6)\} \\
&\quad +1300 \\
&\fallingdotseq 11100[\mu\text{s}]\ (11.10[\text{ms}])
\end{aligned}$$

$$\begin{aligned}
\text{Data send time} &= 20\times10\div9600 \\
&\fallingdotseq 0.0208[\text{s}]\ (20.80[\text{ms}])
\end{aligned}$$

$$\begin{aligned}
\text{Send time} &= 20\times2+11.1\times6+(11.1\times2)^{*1}+20.8^{*2}+\{(136+16)\div72\times11.1\}^{*3} \\
&\quad +\{(512+16)\div72\times11.1\}^{*4}+\{(32+16)\div16\times11.1\}^{*5} \\
&= 149.6+3\times11.1+8\times11.1+3\times11.1 \\
&= 305.0[\text{ms}]
\end{aligned}$$

* 1 RS (Internal processing time in the AJ65BT-R2N)
* 2 Data send time
* 3 Request/response scan of Send area 1) (88H (size of 136 words))
* 4 Request/response scan of Send area 2) (200H (size of 512 words))
* 5 Request/response scan of Status data storage area (20H (size of 32 words))

2) Receive time

The following shows a calculation example of receive time when receiving data of 10 words (20 bytes).

Table 3.26 Setting example

Item	Description
Transfer size of each area	Default
Transmission speed	156kbps
No. of modules connected	Only one AJ65BT-R2N
Master station sequence program scan time	20ms
Transmission speed	9600bps
Data bit length	8
Stop bit length	1
Parity bit	Even

- When master station is MELSEC iQ-R/Q/L series

$$\begin{aligned}\text{LS} &= 51.2\times\{27+(8\times4.8)+(8\times9.6)+(1\times30)+(1\times4.8)+(1\times9.6)\}\\ &\quad+1300+0+0\\ &\fallingdotseq 10854[\mu\text{s}]\ (10.90[\text{ms}])\end{aligned}$$

$$\begin{aligned}\text{Data receive time} &= 20\times10\div9600\\ &\fallingdotseq 0.0208[\text{s}]\ (20.80[\text{ms}])\end{aligned}$$

$$\begin{aligned}\text{Receive time} &= 20+10.9\times2+(10.9\times2)^{*1}+20.8^{*2}+\{(32+16)\div16\times10.9\}^{*3}\\ &\quad+\{(512+16)\div16\times10.9\}^{*4}\\ &= 84.4+3\times10.9+33\times10.9\\ &= 476.8[\text{ms}]\end{aligned}$$

- When master station is QnA/A series

$$\begin{aligned}\text{LS} &= 51.2\times\{29.4+(8\times4.8)+(8\times9.6)+(1\times32.4)+(1\times4.8)+(1\times9.6)\}\\ &\quad+1300\\ &\fallingdotseq 11100[\mu\text{s}]\ (11.10[\text{ms}])\end{aligned}$$

$$\begin{aligned}\text{Data receive time} &= 20\times10\div9600\\ &\fallingdotseq 0.0208[\text{s}]\ (20.80[\text{ms}])\end{aligned}$$

$$\begin{aligned}\text{Receive time} &= 20+11.1\times3+(11.1\times2)^{*1}+20.8^{*2}+\{(32+16)\div16\times11.1\}^{*3}\\ &\quad+\{(512+16)\div16\times11.1\}^{*4}\\ &= 96.3+3\times11.1+33\times11.1\\ &= 495.9[\text{ms}]\end{aligned}$$

* 1 RS (Internal processing time in the AJ65BT-R2N)
* 2 Data receive time
* 3 Request/response scan of Status data storage area (20H (size of 32 words))
* 4 Request/response scan of Receive area (200H (size of 512 words))

(2) When send/receive buffer communication function is used

The following shows transmission time when using the send/receive buffer communication function.

The send time is time required for the AJ65BT-R2N from turning ON Send request signal (RYn0) to turning ON Send complete signal (RXn0).
The receive time is time required for the AJ65BT-R2N from starting data reception to turning ON Normal receive data read request signal (RXn2) or Error receive data read request signal (RXn3).

(a) Calculation formula

Table 3.27 Calculation formula when using send/receive buffer communication function

Description		Calculation formula (Unit: ms)
Master station: MELSEC iQ-R/Q/L series	Send time	SM × 2 ＋ LS × 4 ＋ RS ＋ Data send time*1 ＋ Transient transmission time*2
	Receive time	SM ＋ LS × 2 ＋ RS ＋ Data receive time*1 ＋ Transient transmission time*2
Master station: QnA/A series	Send time	SM × 2 ＋ LS × 6 ＋ RS ＋ Data send time*1 ＋ Transient transmission time*2
	Receive time	SM ＋ LS × 3 ＋ RS ＋ Data receive time*1 ＋ Transient transmission time*2

SM: Master station sequence program scan time
LS: Link scan time
(For details, refer to the manual for the master module.)
RS: Internal processing time in the AJ65BT-R2N
(☞ Section 3.9.1 (1) Calculation formula)

* 1 Data send (receive) time
It depends on No. of data, RS-232 transmission speed etc.

(Example) An example for calculating the send time in the following conditions is shown below.

•No. of data :200 bytes
•Transmission speed :9600bps
•Data bit length :8
•Stop bit length :1
•Parity bit :Even

Send time ＝ No. of data bytes × (Data bit length ＋ Stop bit length ＋ Parity bit length ＋ 1)
＝ 200 × 10 ÷ 9600
≒ 0.208[s](208.0[ms])

* 2 Transient transmission time
Time for writing data from the master station to the AJ65BT-R2N at sending data.
Time for reading data from the AJ65BT-R2N to the master station at receiving data.
For details of calculation formula, refer to the manual for each master module.

(b) Calculation example

1) Send time

The following shows a calculation example of send time when sending data of 10 words (20 bytes).

Table 3.28 Setting example

Item	Description
Transmission speed	156kbps
No. of modules connected	Only one AJ65BT-R2N
Master station sequence program scan time	20ms
Transmission speed	9600bps
Data bit length	8
Stop bit length	1
Parity bit	Even

- When master station is MELSEC iQ-R/Q/L series

$$\begin{aligned}\text{LS} &= 51.2\times\{27+(8\times4.8)+(8\times9.6)+(1\times30)+(1\times4.8)+(1\times9.6)\}\\ &\quad +1300+0+0\\ &\fallingdotseq 10854[\mu s]\ (10.90[ms])\end{aligned}$$

$$\begin{aligned}\text{Data send time} &= 20\times10\div9600\\ &\fallingdotseq 0.0208[s]\ (20.80[ms])\end{aligned}$$

$$\begin{aligned}\text{Send time} &= 20\times2+10.9\times4+(10.9\times2)^{*1}+20.8^{*2}+1+10.9\\ &\quad \times[6+\{(11+16)\div72\}\times1.13]^{*3}\\ &= 126.2+78.717\\ &= 204.917\\ &\fallingdotseq 205.0[ms]\end{aligned}$$

- When master station is QnA/A series

$$\begin{aligned}\text{LS} &= 51.2\times\{29.4+(8\times4.8)+(8\times9.6)+(1\times32.4)+(1\times4.8)+(1\times9.6)\}\\ &\quad +1300\\ &\fallingdotseq 11100[\mu s]\ (11.10[ms])\end{aligned}$$

$$\begin{aligned}\text{Data send time} &= 20\times10\div9600\\ &\fallingdotseq 0.0208[s]\ (20.80[ms])\end{aligned}$$

$$\begin{aligned}\text{Send time} &= 20\times2+11.1\times6+(11.1\times2)^{*1}+20.8^{*2}+\{20+11.1+(11+16)\div72\\ &\quad \times11.1+11.1+20+11.1\times2+11.1+11.1+11.1\}\times1^{*3}\\ &= 149.6+(20+11.1+11.1+11.1+20+22.2+11.1+11.1+11.1)\\ &= 149.6+128.8\\ &= 278.4[ms]\end{aligned}$$

* 1 RS (Internal processing time in the AJ65BT-R2N)
* 2 Data send time
* 3 Transient transmission time (size of 10 words + 1 word (No. of send data))

2) Receive time

The following shows a calculation example of receive time when receiving data of 10 words (20 bytes).

Table 3.29 Setting example

Item	Description
Transmission speed	156kbps
No. of modules connected	Only one AJ65BT-R2N
Master station sequence program scan time	20ms
Transmission speed	9600bps
Data bit length	8
Stop bit length	1
Parity bit	Even

- When master station is MELSEC iQ-R/Q/L series

$$\begin{aligned}\text{LS} &= 51.2\times\{27+(8\times4.8)+(8\times9.6)+(1\times30)+(1\times4.8)+(1\times9.6)\}\\&\quad+1300+0+0\\&\fallingdotseq 10854[\mu s]\ (10.90[ms])\end{aligned}$$

$$\begin{aligned}\text{Data receive time} &= 20\times10\div9600\\&\fallingdotseq 0.0208[s]\ (20.80[ms])\end{aligned}$$

$$\begin{aligned}\text{Receive time} &= 20+10.9\times2+(10.9\times2)^{*1}+20.8^{*2}+1+10.9\\&\quad\times[6+\{(10+16)\div16\}\times1.067]^{*3}\\&= 84.4+89.6606\\&= 174.0606\\&\fallingdotseq 174.1[ms]\end{aligned}$$

- When master station is QnA/A series

$$\begin{aligned}\text{LS} &= 51.2\times\{29.4+(8\times4.8)+(8\times9.6)+(1\times32.4)+(1\times4.8)+(1\times9.6)\}\\&\quad+1300\\&\fallingdotseq 11100[\mu s]\ (11.10[ms])\end{aligned}$$

$$\begin{aligned}\text{Data receive time} &= 20\times10\div9600\\&\fallingdotseq 0.0208[s]\ (20.80[ms])\end{aligned}$$

$$\begin{aligned}\text{Receive time} &= 20+11.1\times3+(11.1\times2)^{*1}+20.8^{*2}+\{20+11.1+11.1+11.1+20\\&\quad+11.1\times2+(10+16)\div16\times11.1+11.1+11.1\}\times1^{*3}\\&= 96.3+(20+11.1+11.1+11.1+20+22.2+22.2+11.1+11.1)\\&= 96.3+139.9\\&= 236.2[ms]\end{aligned}$$

* 1 RS (Internal processing time in the AJ65BT-R2N)
* 2 Data receive time
* 3 Transient transmission time (size of 10 words)

CHAPTER 4 FUNCTIONS

4.1 Selecting Mode and Function(s)

The modes of the AJ65BT-R2N are shown below.
Select a mode that is suitable for the intended use.

(1) Communication with nonprocedural protocol

Use the Nonprocedural protocol mode for exchanging data by nonprocedural protocol through an RS-232 cable connected between the AJ65BT-R2N and external device.
For selection of functions used in Nonprocedural protocol mode, refer to the following.

☞ Section 4.1.1 Function selection in Nonprocedural protocol mode

(2) Connection with the engineering tool

Use the MELSOFT connection function when accessing a programmable controller CPU via the AJ65BT-R2N from a personal computer where the engineering tool is installed.
For the MELSOFT connection function, refer to the following.

☞ CC-Link System RS-232 Interface Module User's Manual (MELSOFT Connection Mode)

(3) Hardware test

Perform the hardware test when checking whether a single unit of the AJ65BT-R2N operates normally or not.
For the hardware test, refer to the following.

☞ Section 5.5.1 Hardware test

4.1.1 Function selection in Nonprocedural protocol mode

(1) Selecting the send/receive buffer communication function or the buffer memory auto-refresh function

The table below shows comparisons between the send/receive buffer communication function and the buffer memory auto-refresh function.

Select the function that is suitable for your system.

Table 4.1 Function comparisons

No.	Item		Description	
			Send/receive buffer communication function	Buffer memory auto-refresh function
1	No. of modules connected	16 or less	Setting for auto-refresh buffer assignments is not required.	Mode setting is required depending on No. of modules connected.
		17 or more		Setting for auto-refresh buffer assignments is required.
2	Processing speed		Faster than that of the buffer memory auto-refresh function because the send/receive data size can be specified.	Slower than that of the send/receive buffer communication function because all of data are sent/received at a time.
3	Send/receive data size		Regardless of the No. of modules connected, data of the specified size can be sent/received.	As the No. of modules increases, the send/receive data size decreases.
4	Send/receive program	Dedicated instruction	More than one dedicated instruction cannot be executed to the same station during the same scan. Processing for waiting for completion of the previous instruction execution is required.	More than one dedicated instruction cannot be executed to the same station during the same scan.
		FROM/TO instruction	Program is complicated.	Program is simple.

Remark

When accessing the buffer memory of the AJ65BT-R2N, use of a dedicated instruction simplifies the AJ65BT-R2N address specification.

Use of the FROM/TO instruction makes address specification complicated since other connected stations need to be considered.

(2) Selecting other function(s)

Refer to the following for functions other than the send/receive buffer communication function and the buffer memory auto-refresh function, and select desired function(s).

(a) Function used when initializing the AJ65BT-R2N

Table 4.2 Function selection

Function name	Description
AJ65BT-R2N initialization function	Initializes the AJ65BT-R2N and enables the settings written to the buffer memory.

(b) Functions used for data communication

Table 4.3 Function selection

Function name	Description
Frame function	•Adds an arbitrary frame to the start and/or end of send data. •Sends up to 100 frames. •Distinguishes an arbitrary frame which is added to the beginning of receive data. •Distinguishes characters other than CR or LF at the end of receive data.
Monitoring-based transmission function	•Sends data to the external device, depending on the status change of master station's remote input (RX), remote output (RY) or remote register (RW), CC-Link or programmable controller CPU.
Send cancel function	•Cancels transmission to the external device.
Forced receive completion function	•Terminates reception of data that are being received from the external device, and reads the received data.
Flow control function	•Notifies whether data reception is available or not, with the DTR/DSR (ER/DR) signal control or the DC code control.
ASCII-binary conversion function	•Converts binary data to ASCII data before transmission. •Converts received ASCII data to binary data.
RW refresh function	•Automatically refreshes remote registers (RWr) of the master station with buffer memory data of the AJ65BT-R2N. •Refreshes remote registers (RWr) of the master station with information other than error codes of the AJ65BT-R2N. •Automatically refreshes the AJ65BT-R2N buffer memory with data in remote registers (RWw) of the master station.
OS reception area clear function	•Clears the OS reception area data.
E^2PROM function	•Allows registration of set values in the buffer memory to the E^2PROM to use them as initial values at startup.
RS-232 signal control function	•Checks RS-232 input signals. •Changes the ON/OFF status of the RS-232 output signal.

4.2 Send/Receive Buffer Communication Function

By using this function, only the necessary data of the specified size can be sent/received at any given timing.
This can improve the transmission line efficiency (link scan time) because unnecessary data will not be transferred.

(1) Overview of send/receive processing

(a) When using dedicated instructions
The RIWT and RIRD instructions are used for transmission and reception accordingly.

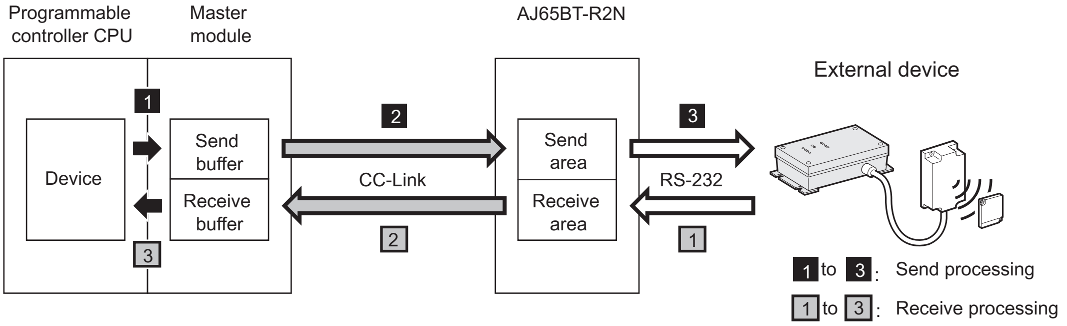


Figure 4.1 Overview of send/receive processing

- Send processing

Table 4.4 Overview of send processing

No.	Processing
1, 2	With the RIWT instruction, the send data are written from the programmable controller CPU devices to the send area of the AJ65BT-R2N.
3	Send request signal (RYn0) is turned ON to send the send data from the send area of the AJ65BT-R2N to the external device.

- Receive processing

Table 4.5 Overview of receive processing

No.	Processing
1	When the AJ65BT-R2N normally completes data reception from the external device, Normal receive data read request signal (RXn2) turns ON.[1]
2, 3	With the RIRD instruction, the receive data are read from the receive area of the AJ65BT-R2N to the programmable controller CPU devices.

[1] If the reception fails, Error receive data read request signal (RXn3) turns ON.

Remark

The RISEND and RIRCV instructions can be also used for the communication.
For a sample program using the RISEND and RIRCV instructions, refer to the following.
Section 6.9.2 Program example for sending/receiving data with GP.RISEND/GP.RIRCV instruction

(b) When using the FROM/TO instruction in ACPU/QCPU (A mode)

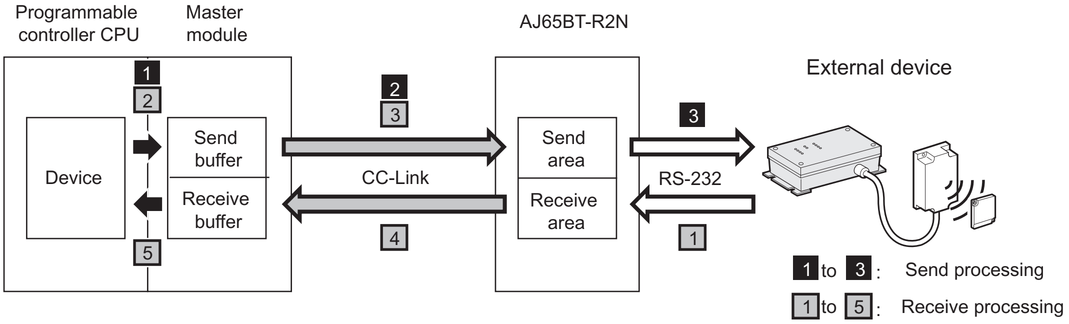


Figure 4.2 Overview of send/receive processing

- Send processing

Table 4.6 Overview of send processing

No.	Processing
1	With the TO instruction, control data and send data are written from the programmable controller CPU devices to the send buffer of the master module.
2	Intelligent device station access request signal (RY(n+1)E) is turned on to write the control data and send data from the send buffer of the master module to the send area of the AJ65BT-R2N.
3	Send request signal (RYn0) is turned ON to send the send data from the send area of the AJ65BT-R2N to the external device.

- Receive processing

Table 4.7 Overview of receive processing

No.	Processing
1	When the AJ65BT-R2N normally completes data reception from the external device, Normal receive data read request signal (RXn2) turns ON.[*1]
2	With the TO instruction, control data that specifies receive data to be read are written to the send buffer of the master module.
3	Intelligent device station access request signal (RY(n+1)E) is turned ON to write the control data from the send buffer of the master module to the send area of the AJ65BT-R2N.
4	The receive data are read from the receive area of the AJ65BT-R2N to the receive buffer of the master module.
5	With the FROM instruction, the receive data are read from the receive buffer of the master module to the programmable controller CPU devices.

[*1] If the reception fails, Error receive data read request signal (RXn3) turns ON.

(2) Initial setting

Configure the following settings.

- Mode of AJ65BT-R2N
- Network parameters of AJ65BT-R2N
- Initial setting for the send/receive buffer communication function

(a) Mode setting of the AJ65BT-R2N

Set the Mode setting switch of the AJ65BT-R2N to 0 (Send/receive buffer communication function).

For the Mode setting switch, refer to the following.

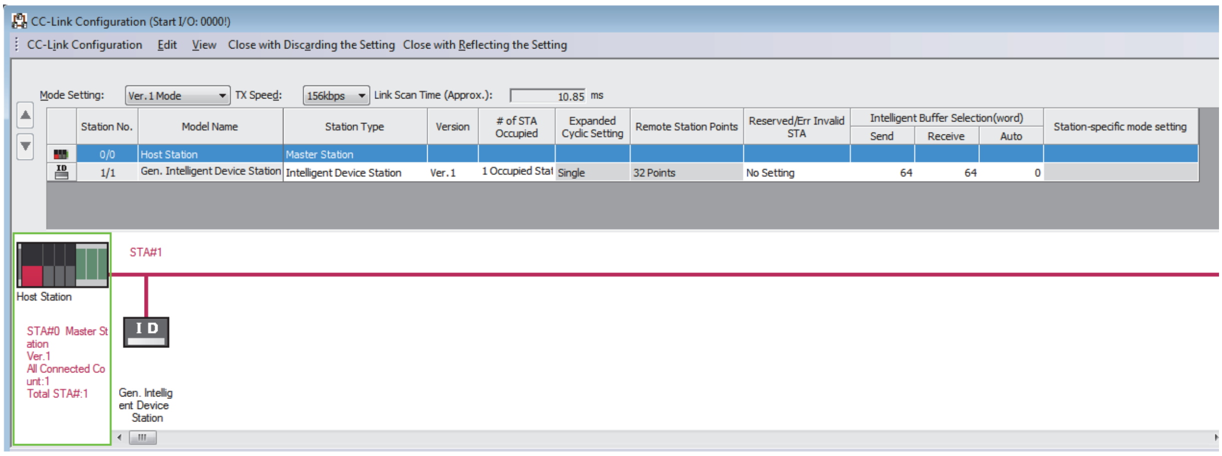
☞ Section 5.4 Part Names and Settings

(b) Network parameter setting of the AJ65BT-R2N

Set network parameters of the AJ65BT-R2N as shown below.

1) When using RCPU

Set the following using GX Works3.



Mode Setting: Ver.1 Mode TX Speed: 156kbps Link Scan Time (Approx.): 10.85 ms

Station No.	Model Name	Station Type	Version	# of STA Occupied	Expanded Cyclic Setting	Remote Station Points	Reserved/Err Invalid STA	Intelligent Buffer Selection(word)			Station-specific mode setting
								Send	Receive	Auto	
0/0	Host Station	Master Station									
1/1	Gen. Intelligent Device Station	Intelligent Device Station	Ver.1	1 Occupied Stat	Single	32 Points	No Setting	64	64	0	

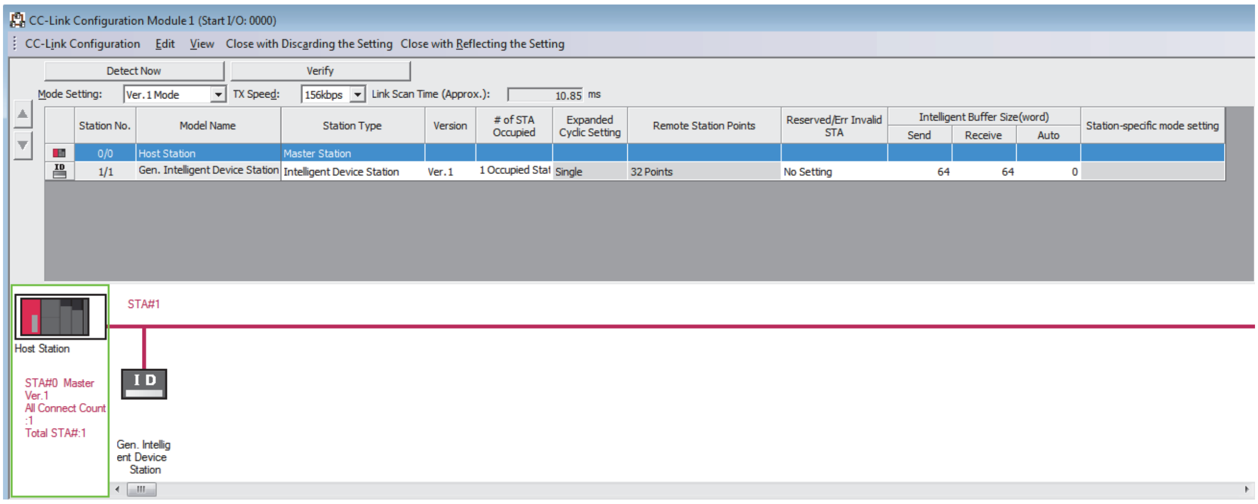
Figure 4.3 When using RCPU

For the intelligent buffer select (word), set the following.

Table 4.8 When using RCPU

Item		Description
Intelligent buffer select (word)	Send	(Send data size (words))＋(5 words)
	Receive	(Receive data size (words))＋(5 words)
	Automatic	0

2) When using LCPU
Set the following using GX Works2.



Mode Setting: Ver.1 Mode
TX Speed: 156kbps
Link Scan Time (Approx.): 10.85 ms

Station No.	Model Name	Station Type	Version	# of STA Occupied	Expanded Cyclic Setting	Remote Station Points	Reserved/Err Invalid STA	Intelligent Buffer Size(word)			Station-specific mode setting
								Send	Receive	Auto	
0/0	Host Station	Master Station									
1/1	Gen. Intelligent Device Station	Intelligent Device Station	Ver.1	1 Occupied Stat	Single	32 Points	No Setting	64	64	0	

STA#0 Master
Ver.1
All Connect Count
:1
Total STA#:1

Figure 4.4 When using LCPU

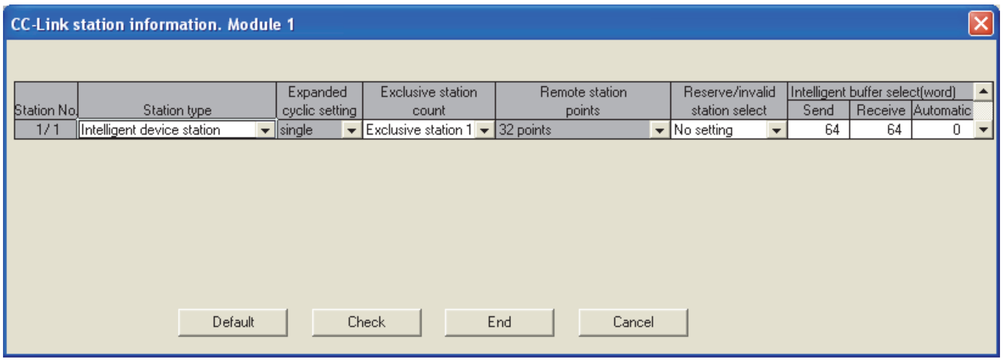
For the intelligent buffer select (word), set the following.

Table 4.9 When using LCPU

Item		Description
Intelligent buffer select (word)	Send	(Send data size (words))＋(5 words)
	Receive	(Receive data size (words))＋(5 words)
	Automatic	0

3) When using QCPU (Q mode)/QnACPU

- When QCPU (Q mode) is used, set the following using the engineering tool.
  This section describes the parameter setting of when GX Developer is used.
  When GX Works2 is used, refer to the following.
  ☞MELSEC-Q CC-Link System Master/Local Module User's Manual
- When QnACPU is used, set the following using GX Developer.



CC-Link station information. Module 1

Station No.	Station type	Expanded cyclic setting	Exclusive station count	Remote station points	Reserve/invalid station select	Intelligent buffer select(word)		
						Send	Receive	Automatic
1/1	Intelligent device station	single	Exclusive station 1	32 points	No setting	64	64	0

Figure 4.5 When using QCPU (Q mode)/QnACPU

For the station type and intelligent buffer select (word), set the following.

Table 4.10 When using QCPU (Q mode)/QnACPU

Item		Description
Station type		•When the CC-Link mode is "Remote net - ver.1 mode" Intelligent device station •When the CC-Link mode is "Remote net - ver.2 mode" or "Remote net - additional mode" Ver.1 intelligent device station
Intelligent buffer select (word)	Send	(Send data size (words))＋(5 words)
	Receive	(Receive data size (words))＋(5 words)
	Automatic	0

4) When using dedicated instructions in ACPU/QCPU (A mode)
Set the following on the sequence program.

Table 4.11 When using dedicated instructions in ACPU/QCPU (A mode)

Item		M Address		Description
		HEX.	DEC.	
Station information	Station type	20_H to $5F_H$	32 to 95	2 (Intelligent device station)
	No. of occupied stations			1
	Station No.			Station No. set with the Station No. setting switch on the AJ65BT-R2N
Send/receive or auto-refresh buffer assignment	Send	80_H to CD_H	128 to 205	•Using RIWT instruction: (Send data size (words))＋(4 words) •Using RISEND instruction: (Send data size (words))＋(5 words)
	Receive			•Using RIRD instruction: (Receive data size (words))＋(4 words) •Using RIRCV instruction: (Receive data size (words))＋(5 words)
	Auto			0

5) When using the FROM/TO instruction in ACPU/QCPU (A mode)
Set the following on the sequence program.

Table 4.12 When using the FROM/TO instruction in ACPU/QCPU (A mode)

Item		M Address		Description
		HEX.	DEC.	
Station information	Station type	20_H to $5F_H$	32 to 95	2 (Intelligent device station)
	No. of occupied stations			1
	Station No.			Station No. set with the Station No. setting switch on the AJ65BT-R2N
Send/receive or auto-refresh buffer assignment	Send	80_H to CD_H	128 to 205	(Send data size (words))＋(7 words)
	Receive			(Receive data size (words))＋(7 words)
	Auto			0

(c) Buffer memory used for the send/receive buffer communication function
The following buffer memory area is used for the initial setting and status check of the send/receive buffer communication function.

Table 4.13 Initial setting of the send/receive buffer communication function

R2N Address	Name	Description
0_H	Send area, start address specification	Specify the start address of the send area (Send data size specification area＋Send data area). Specify an area that does not overlap with the receive area. •Setting range: 200_H to $7FE_H$ (Default: ☞ Section 3.8)
1_H	Send area size specification	Specify the size of the send area (Send data size specification area＋Send data area). Specify an area that does not overlap with the receive area. •Setting range: 2_H to $5FE_H$ (Unit: Word, Default: ☞ Section 3.8)
2_H	Receive area, start address specification	Specify the start address of the receive area (Receive data size specification area＋Receive data area). Specify an area that does not overlap with the send area. •Setting range: 200_H to $7FE_H$ (Default: ☞ Section 3.8)
3_H	Receive area size specification	Specify the size of the receive area (Receive data size specification area＋Receive data area). Specify an area that does not overlap with the send area. •Setting range: 2_H to $5FE_H$ (Unit: Word, Default: ☞ Section 3.8)
102_H	Word/byte specification	Specify the unit of data handled in the following areas. (1) No. of receive end data (R2N 111_H) (2) No. of actual send data (R2N $1B4_H$) (3) No. of data stored in OS reception area (R2N $1B6_H$) (4) Send data size specification area (R2N 200_H (at default)) (5) Receive data size specification area (R2N 400_H (at default)) •0_H: In word units •1_H: In byte units •Setting range: 0_H, 1_H (Default: 0_H)
111_H	No. of receive end data	For receiving fixed length data, specify the number of data to be received. When using the frame function to receive fixed length data, specify the number of data excluding the start and end frame data. The value changes depending on the setting of Word/byte specification (R2N 102_H). •0_H: Receive variable length data with frame function •Setting range (in word units): 0_H to (Receive area size − 1) (Default: 0_H) •Setting range (in byte units): 0_H to (Receive area size − 1) × 2 (Default: 0_H)
112_H	Receive timeout time specification	Specify a timeout time for receiving data from the external device. A receive timeout occurs during data reception when the specified timeout time has been reached. If a receive timeout occurs, Error receive data read request signal (RXn3) turns ON, and the receive timeout error ($BB21_H$) is stored in Error codes generated when receiving (R2N $1B2_H$). When the frame function is used, the receive timeout time includes the time for receiving the start and/or end frame. •0: Infinitely wait for receive completion •Setting range: 0, 1 to 32767 (Unit: ×100ms, Default: 0)
$11A_H$	Send timeout time specification	Specify a time (send timeout time) if transmission is to be terminated when a specific time has elapsed after starting transmission to the external device (after Send request signal (RYn0) turns ON). •0: Infinitely wait for send completion •Setting range: 0, 1 to 32767 (Unit: ×100ms, Default: 0)

(Continued to next page)

(From previous page)

Table 4.13 Initial setting of the send/receive buffer communication function (Continued)

R2N Address	Name	Description
1B4H	No. of actual send data	Upon completion of transmission, the number of the data that were actually sent is stored. When the frame function is used, this area stores the number of the entire send data including the start and end frames. When the ASCII-binary conversion function is active. the number of converted send data is stored. The value changes depending on the setting of Word/byte specification (R2N 102H).
1B6H	No. of data stored in OS reception area	Number of the data stored in the OS reception area is stored. The information stored is updated every 100ms. The value changes depending on the setting of Word/byte specification (R2N 102H).

Point

Initialize the AJ65BT-R2N if a set value in R2N 0H to 101H and 103H to 112H is changed.

☞ Section 4.4 AJ65BT-R2N Initialization Function

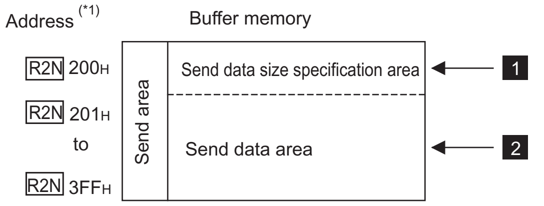
4.2.1 Send processing

(1) Send area

Data to be sent to the external device are stored in the send area.

(a) Composition of the send area

The send area is composed of Send data size specification area and Send data area.



*1 When Send area, start address specification (R2N 0H) is 200H

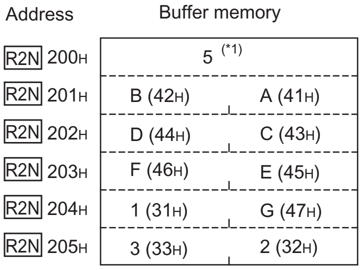
Figure 4.6 Composition of the send area

Table 4.14 Composition of the send area

No.	Name	Description
1	Send data size specification area	Number of send data is stored. The value changes depending on the setting of Word/byte specification (R2N 102H).
2	Send data area	Send data are stored in order starting from the lower byte of the lowest address.

(b) A storage example of the send area

The following shows an example of storing "ABCDEFG123" in the send area when sending it to the external device. (In the case of: Send area, start address specification (R2N 0H): 200H, and Word/byte specification (R2N 102H): 0H (In word units))



Address	Buffer memory	
R2N 200H	5 (*1)	
R2N 201H	B (42H)	A (41H)
R2N 202H	D (44H)	C (43H)
R2N 203H	F (46H)	E (45H)
R2N 204H	1 (31H)	G (47H)
R2N 205H	3 (33H)	2 (32H)

*1 When Word/byte specification (R2N 102H) is 1H (Bytes), AH (10) is stored.

Figure 4.7 A storage example of the send area

(2) Transmission procedures

(a) When using dedicated instructions

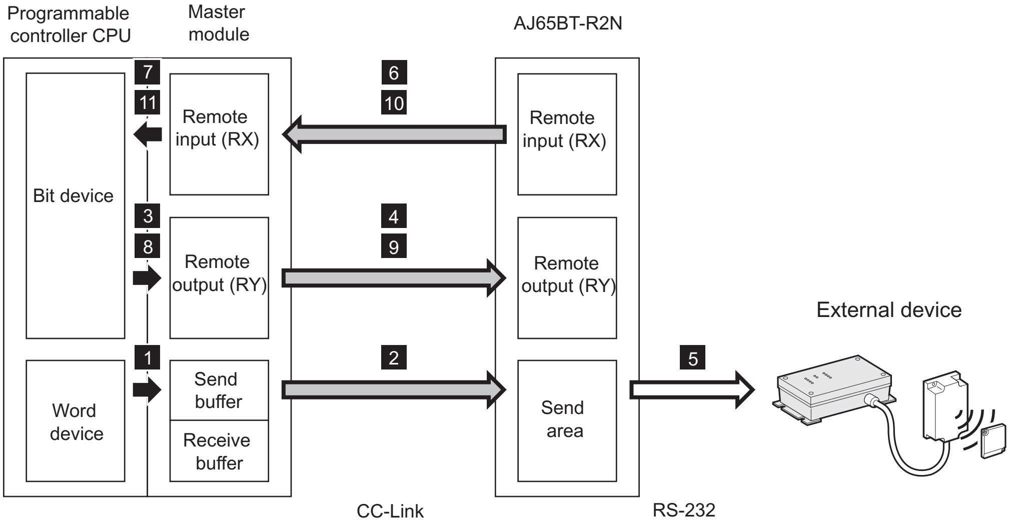


Figure 4.8 Transmission procedures when using the send/receive buffer communication function

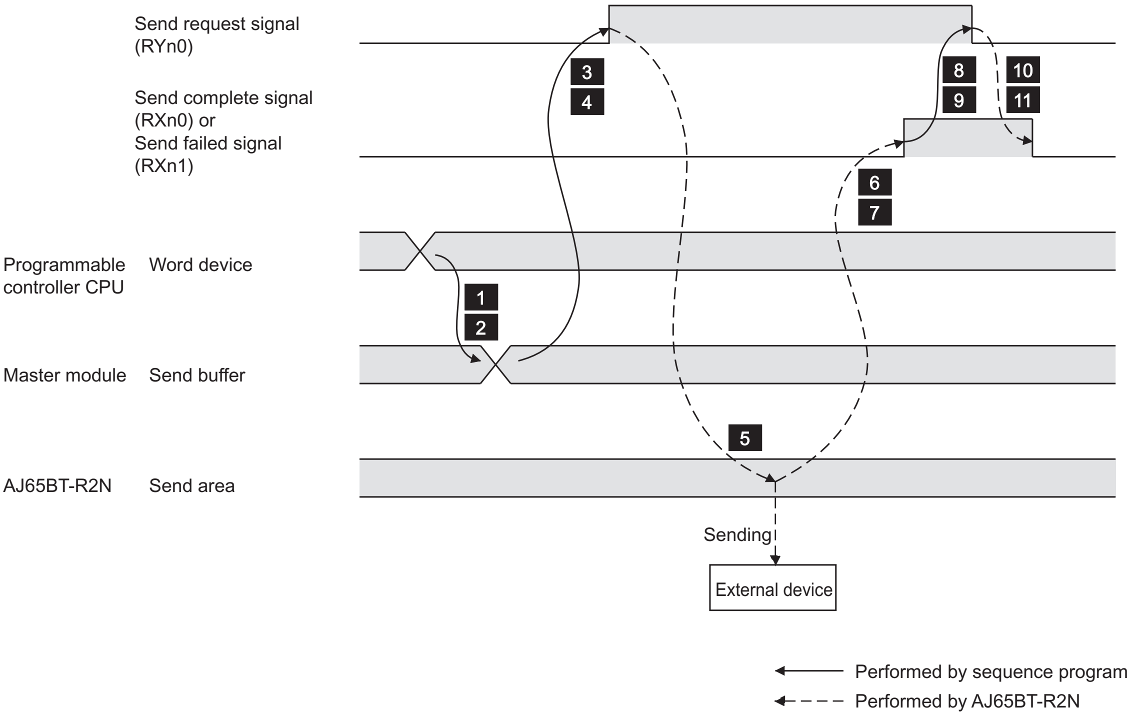


Figure 4.9 Timing chart when using the send/receive buffer communication function

Table 4.15 Transmission procedures when using the send/receive buffer communication function

No.	Processing
1, 2	With the RIWT instruction, the send data are written from the word devices of the programmable controller CPU to the send area of the AJ65BT-R2N.
3, 4	Send request signal (RYn0) is turned ON.
5	The send data are sent from the send area of the AJ65BT-R2N to the external device.
6, 7	When transmission is normally completed, Send complete signal (RXn0) turns ON. When failed, Send failed signal (RXn1) turns ON.
8, 9	Send request signal (RYn0) is turned OFF.
10, 11	Send complete signal (RXn0) and Send failed signal (RXn1) are turned OFF.

(b) When using the FROM/TO instruction in ACPU/QCPU (A mode)

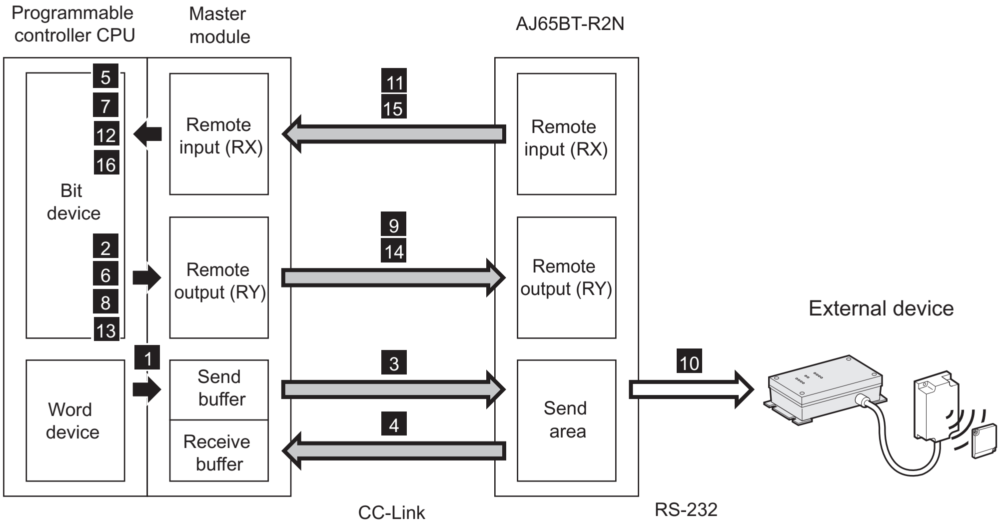


Figure 4.10 Transmission procedures when using the send/receive buffer communication function

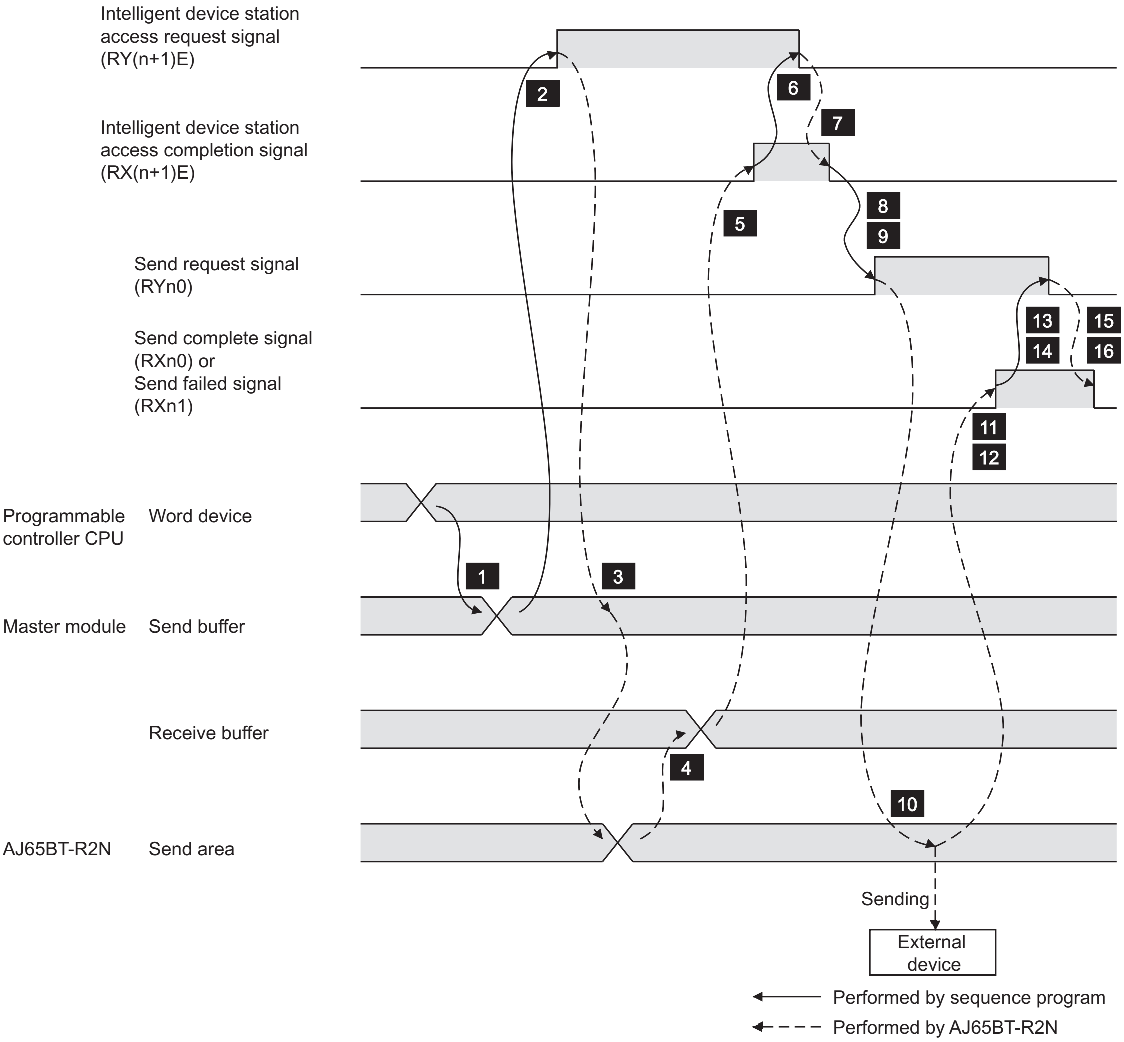


Figure 4.11 Timing chart when using the send/receive buffer communication function

Table 4.16 Transmission procedures when using the send/receive buffer communication function

No.	Processing
1	With the TO instruction, control data and send data are written from the programmable controller CPU devices to the send buffer of the master module.
2	Intelligent device station access request signal (RY(n+1)E) is turned ON.
3	Control data and send data are sent from the send buffer of the master module to the AJ65BT-R2N.
4	A transmission result is written from the AJ65BT-R2N to the receive buffer.
5	Intelligent device station access completion signal (RX(n+1)E) turns ON.
6	Intelligent device station access request signal (RY(n+1)E) is turned OFF.
7	Intelligent device station access completion signal (RX(n+1)E) turns OFF.
8, 9	Send request signal (RYn0) is turned ON.
10	The send data are sent from the send area of the AJ65BT-R2N to the external device.
11, 12	When transmission is normally completed, Send complete signal (RXn0) turns ON. When failed, Send failed signal (RXn1) turns ON.
13, 14	Send request signal (RYn0) is turned OFF.
15, 16	Send complete signal (RXn0) and Send failed signal (RXn1) are turned OFF.

Remark

When using the FROM/TO instruction, the station No. or buffer memory address of the access target is specified in control data.
For sample programs using the FROM/TO instruction, refer to the following.
☞ CHAPTER 8 PROGRAMMING WHEN USING FROM/TO INSTRUCTION IN ACPU/QCPU (A MODE)

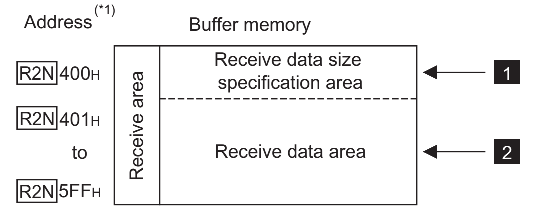
4.2.2 Receive processing

(1) Receive area

Data received from the external device are stored in the receive area.
Read the received data from the receive area to the programmable controller CPU .

(a) Composition of the receive area

The receive area is composed of Receive data size specification area and Receive data area.



*1 When Receive area, start address specification (R2N 2H) is 400H

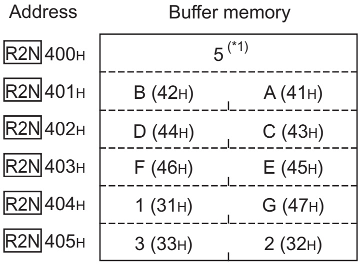
Figure 4.12 Composition of the receive area

Table 4.17 Composition of the receive area

No.	Name	Description
1	Receive data size specification area	Number of receive data is stored. The value changes depending on the setting of Word/byte specification (R2N 102H).
2	Receive data area	Receive data are stored in order starting from the lower byte of the lowest address.

(b) A storage example of the receive area

The following shows an example of storing "ABCDEFG123" in the receive area when receiving it from the external device. (In the case of: Receive area, start address specification (R2N 2H): 400H, Word/byte specification (R2N 102H): 0H)



Address	Buffer memory	
R2N 400H	5(*1)	
R2N 401H	B (42H)	A (41H)
R2N 402H	D (44H)	C (43H)
R2N 403H	F (46H)	E (45H)
R2N 404H	1 (31H)	G (47H)
R2N 405H	3 (33H)	2 (32H)

*1 When Word/byte specification (R2N 102H) is 1H (Bytes), AH (10) is stored.

Figure 4.13 A storage example of the receive area

(2) Reception procedures

When the send/receive buffer communication function is used, the following receive processing is performed.

(a) When using dedicated instructions

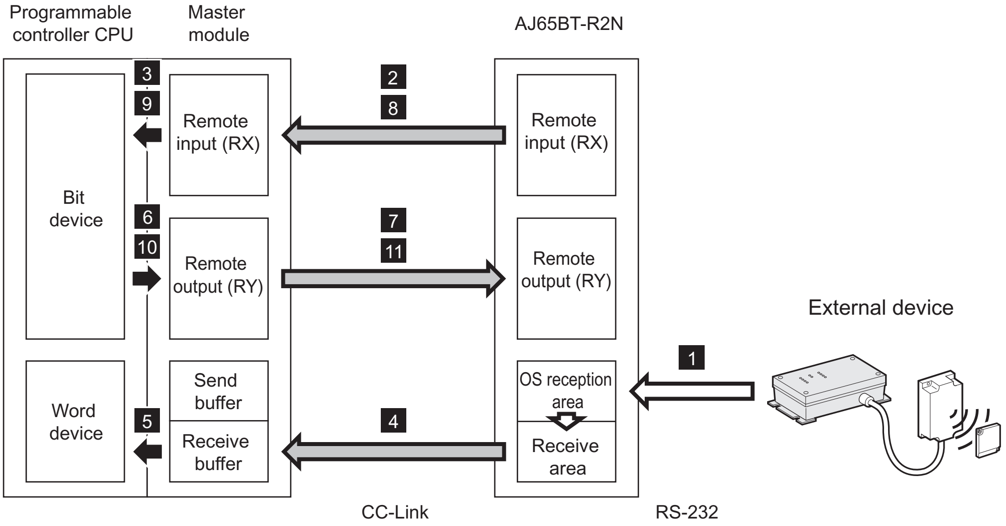


Figure 4.14 Receive processing when using the send/receive buffer communication function

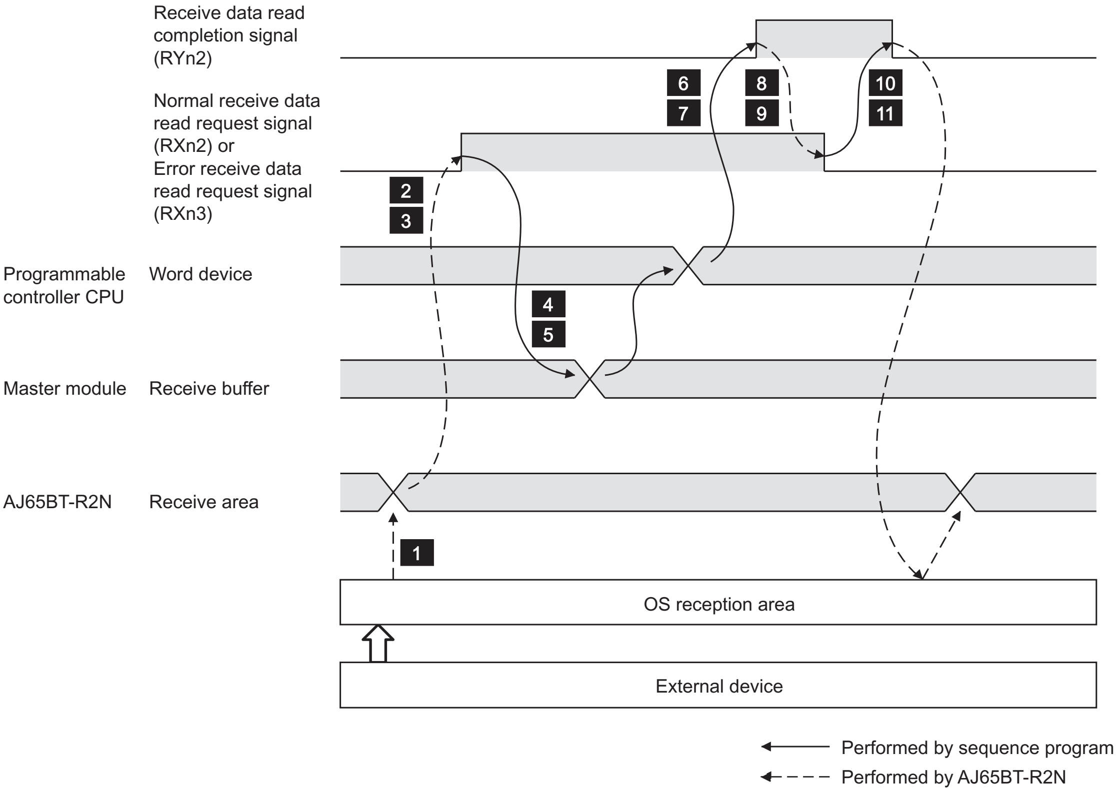


Figure 4.15 Timing chart when using the send/receive buffer communication function

Table 4.18 Reception procedures when using the send/receive buffer communication function

No.	Processing
1	Data are received from the external device through the OS reception area, and stored in the receive area.
2, 3	When reception is normally completed, Normal receive data read request signal (RXn2) turns ON. When failed, Error receive data read request signal (RXn3) turns ON.
4, 5	With the RIRD instruction, the receive data are read from the receive area of the AJ65BT-R2N to the programmable controller CPU devices.
6, 7	Receive data read completion signal (RYn2) is turned ON.
8, 9	Normal receive data read request signal (RXn2) and Error receive data read request signal (RXn3) turn OFF.
10, 11	Receive data read completion signal (RYn2) is turned OFF.

(b) When using the FROM/TO instruction in ACPU/QCPU (A mode)

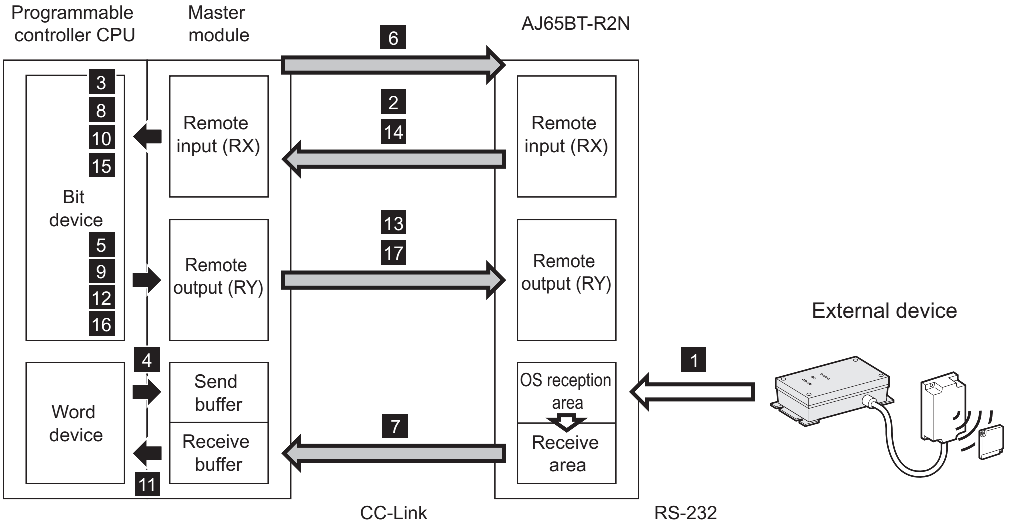


Figure 4.16 Receive processing when using the send/receive buffer communication function

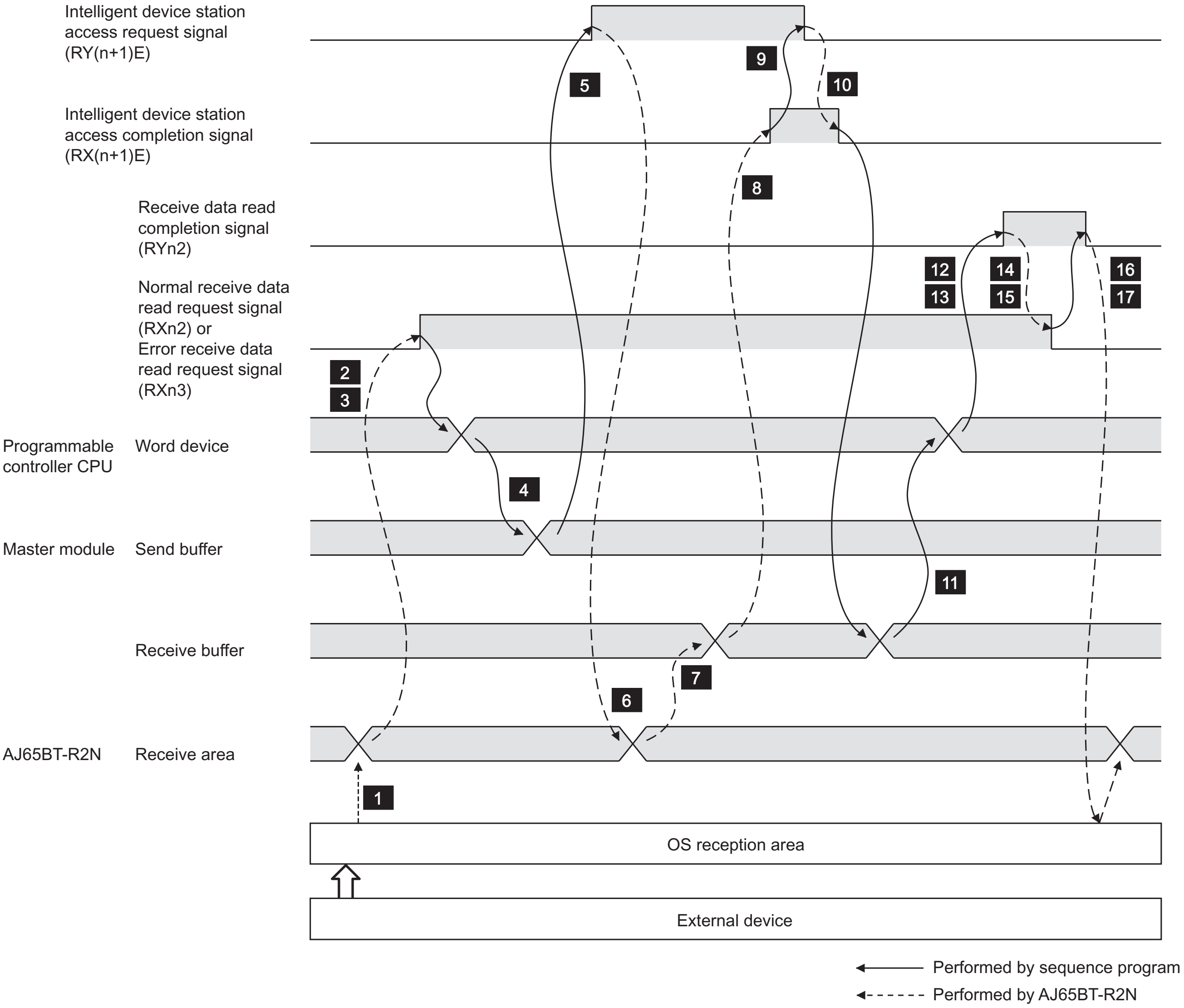


Figure 4.17 Timing chart when using the send/receive buffer communication function

Table 4.19 Reception procedures when using the send/receive buffer communication function

No.	Processing
1	Data are received from the external device through the OS reception area, and stored in the receive area.
2, 3	When reception is normally completed, Normal receive data read request signal (RXn2) turns ON. When failed, Error receive data read request signal (RXn3) turns ON.
4	With the TO instruction, control data are written from the programmable controller CPU devices to the send buffer of the master module.
5	Intelligent device station access request signal (RY(n+1)E) is turned ON.
6	A read request set in control data is sent to the AJ65BT-R2N.
7	Control data and receive data in the receive area of the AJ65BT-R2N are stored in the receive buffer of the master module.
8	Intelligent device station access completion signal (RX(n+1)E) turns ON.
9	Intelligent device station access request signal (RY(n+1)E) is turned OFF.
10	Intelligent device station access completion signal (RX(n+1)E) turns OFF.
11	With the FROM instruction, the receive data are read from the receive buffer of the master module to the programmable controller CPU devices.
12, 13	Receive data read completion signal (RYn2) is turned ON.
14, 15	Normal receive data read request signal (RXn2) and Error receive data read request signal (RXn3) turn OFF.
16, 17	Receive data read completion signal (RYn2) is turned OFF.

Remark

When using the FROM/TO instruction, the station No. or buffer memory address of the access target is specified in control data.
For sample programs using the FROM/TO instruction, refer to the following.
☞ CHAPTER 8 PROGRAMMING WHEN USING FROM/TO INSTRUCTION IN ACPU/QCPU (A MODE)

4.3 Buffer Memory Auto-Refresh Function

The buffer memories of the AJ65BT-R2N and master station are refreshed automatically at a timing set in the AJ65BT-R2N.
The buffer memory auto-refresh function eliminates the need for creating programs for reading/writing data between the AJ65BT-R2N and master station.
Data can be read or written with intelligent function module devices or FROM/TO instructions, which makes programming easier.

(1) Overview of send/receive processing

The RITO or TO instruction is used when sending, and the RIRD or FROM instruction is used when receiving.

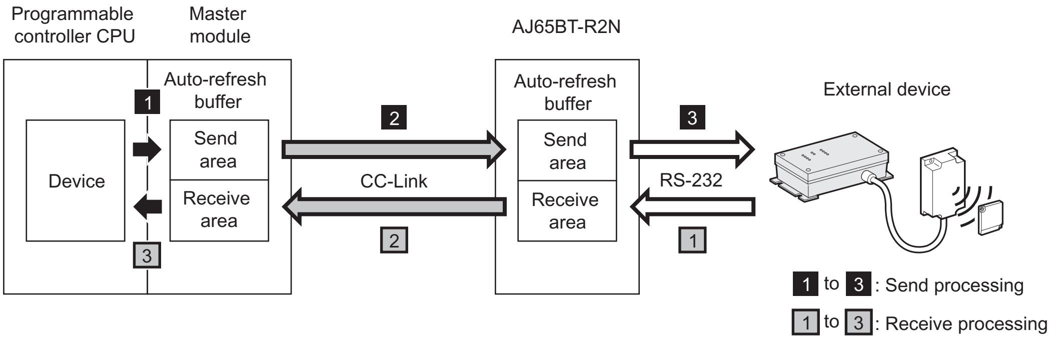


Figure 4.18 Overview of send/receive processing

- Send processing

Table 4.20 Overview of send processing

No.	Processing
1	With the RITO or TO instruction, the send data are written from the programmable controller CPU devices to the send area of the master module.
2, 3	Send request signal (RYn0) is turned ON to send the send data from the send area of the master module to the external device.

- Receive processing

Table 4.21 Overview of receive processing

No.	Processing
1, 2	When the AJ65BT-R2N normally completed reception from the external device, the receive data in the receive area of the AJ65BT-R2N are stored in the receive area of the master module. Normal receive data read request signal (RXn2) turns ON.[1]
3	With the RIFR or FROM instruction, the receive data are read from the receive area of the master module to the programmable controller CPU devices.

[1] If the reception fails, Error receive data read request signal (RXn3) turns ON.

(2) Precautions on the access target address

The buffer memory specification of the AJ65BT-R2N is different depending on using the RIFR/RITO or FROM/TO instruction.

(a) When using RIFR/RITO instruction

Specify the buffer memory address of the AJ65BT-R2N.

(b) When using FROM/TO instruction

Specify the buffer memory address of the master station, to which the buffer memory of the AJ65BT-R2N is assigned.

(Example)

Using the buffer memory auto-refresh function, data in Station No. setting switch ($\boxed{\text{R2N}}$ 1A0$_H$) of station No.2 are read out.

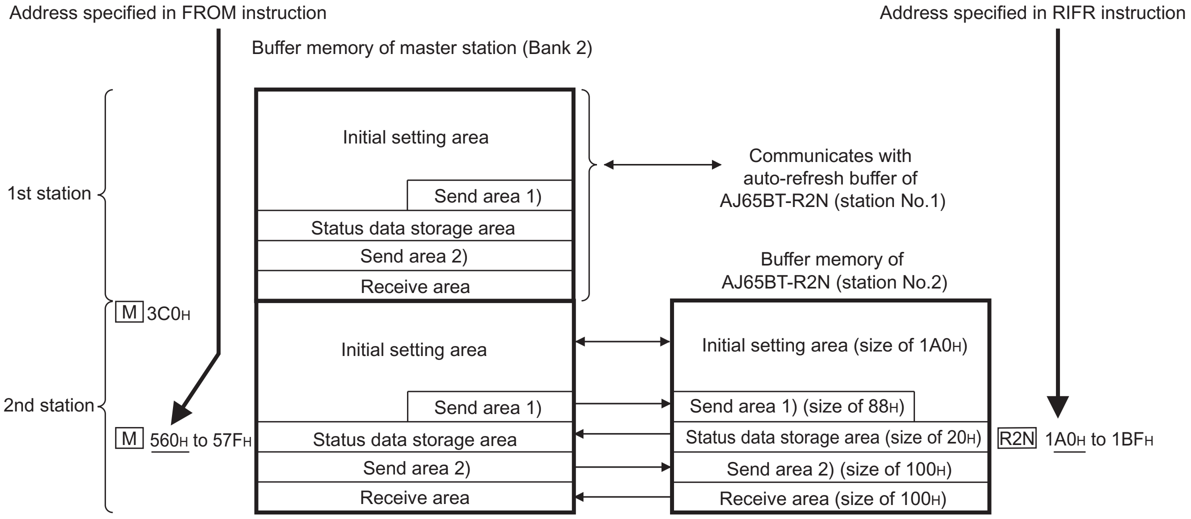


Figure 4.19 Address specification method by instruction (for ACPU)

Table 4.22 Address specification method by instruction

Instruction	Specification method
RIFR	Specify station No.2, and the address of Station No. setting switch ($\boxed{\text{R2N}}$ 1A0$_H$). `[GP.RIFR U0 K2 H1A0 D200 K1 ]` Station No. (K2), Address (H1A0)
FROM	Specify the address assigned to the buffer memory (bank 2) of the master station ($\boxed{\text{M}}$ 560$_H$). `[FROM H0 H560 D200 K1 ]` Address (H560)

(3) Initial setting

Configure the following settings.

- Mode of AJ65BT-R2N
- Network parameters of AJ65BT-R2N
- Initial data reading
- Initial setting for the buffer memory auto-refresh function

(a) Mode of the AJ65BT-R2N

Set a mode of the AJ65BT-R2N depending on the number of connected modules as shown below.

Table 4.23 Mode of the AJ65BT-R2N

No. of modules connected	Mode setting switch[*1]	Remarks
1 to 2	Mode 1	For auto-refresh buffer assignment in each mode, refer to the following. ☞ Section 3.8.1 Buffer memory list
3 to 4	Mode 2	
5 to 8	Mode 3	
9 to 16	Mode 4	
17 or more	Mode 1	Referring to the following, change the auto-refresh buffer assignment. ☞ Section 4.3.1 Details of the auto-refresh buffer

* 1 For the Mode setting switch, refer to the following.
☞ Section 5.4 Part Names and Settings

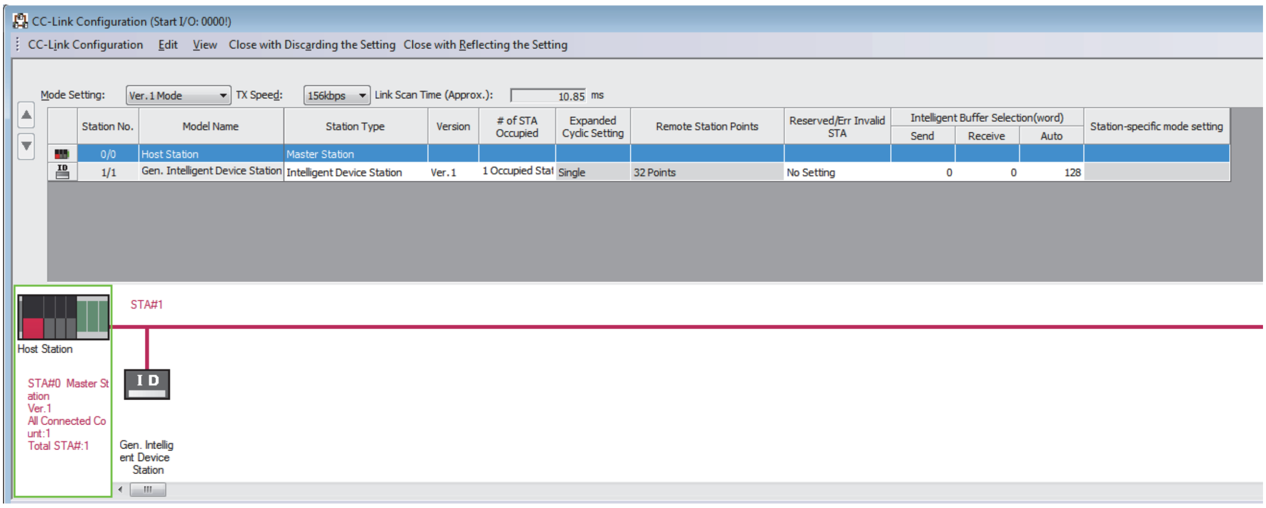
Remark

For using a function of the area that is not assigned to the auto-refresh buffer, use the RIRD, RIWT, RIRCV, or RISEND instruction.
Such function cannot be used with the RIFR or RITO instruction.

Ex.)When the Mode setting switch is set to Mode 4, the E^2PROM function cannot be used with the RIFR or RITO instruction.

(b) Network parameter setting of the AJ65BT-R2N

1) When using RCPU
Set the following using GX Works3.



Mode Setting: Ver.1 Mode
TX Speed: 156kbps
Link Scan Time (Approx.): 10.85 ms

Station No.	Model Name	Station Type	Version	# of STA Occupied	Expanded Cyclic Setting	Remote Station Points	Reserved/Err Invalid STA	Intelligent Buffer Selection(word)			Station-specific mode setting
								Send	Receive	Auto	
0/0	Host Station	Master Station									
1/1	Gen. Intelligent Device Station	Intelligent Device Station	Ver.1	1 Occupied Stat	Single	32 Points	No Setting	0	0	128	

STA#0 Master Station
Ver.1
All Connected Count:1
Total STA#:1

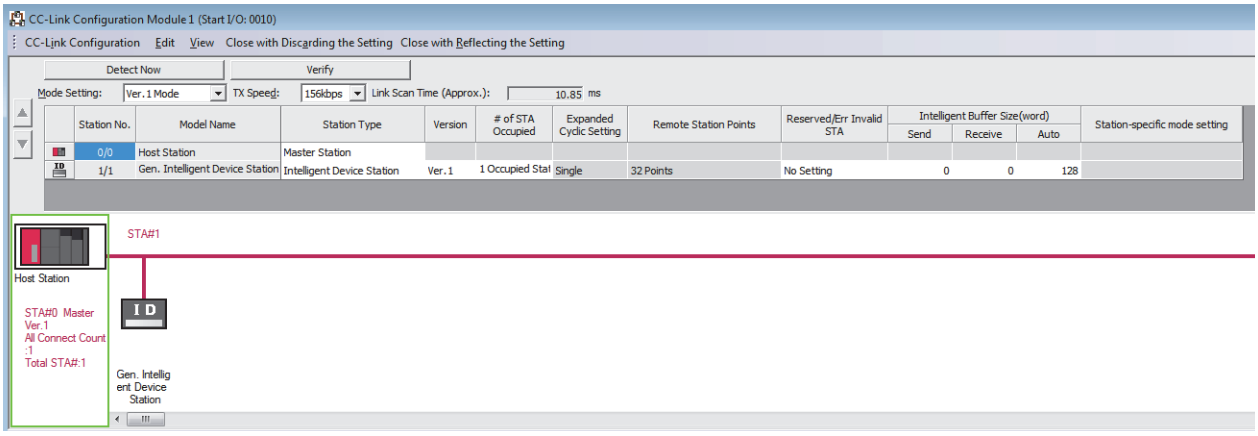
Figure 4.20 When using RCPU

For the intelligent buffer select (word), set the following.

Table 4.24 When using RCPU

Item		Description	
		Mode setting switch setting	**Description**
Intelligent buffer select (word)	Automatic	Mode 1	•Default assignments: 600_H •Changed assignments: Auto-refresh buffer size (words)
		Mode 2	400_H
		Mode 3	200_H
		Mode 4	100_H

2) When using LCPU
Set the following using GX Works2.



Mode Setting: Ver.1 Mode TX Speed: 156kbps Link Scan Time (Approx.): 10.85 ms

Station No.	Model Name	Station Type	Version	# of STA Occupied	Expanded Cyclic Setting	Remote Station Points	Reserved/Err Invalid STA	Intelligent Buffer Size(word)			Station-specific mode setting
								Send	Receive	Auto	
0/0	Host Station	Master Station									
1/1	Gen. Intelligent Device Station	Intelligent Device Station	Ver.1	1 Occupied Stat	Single	32 Points	No Setting	0	0	128	

Figure 4.21 When using LCPU

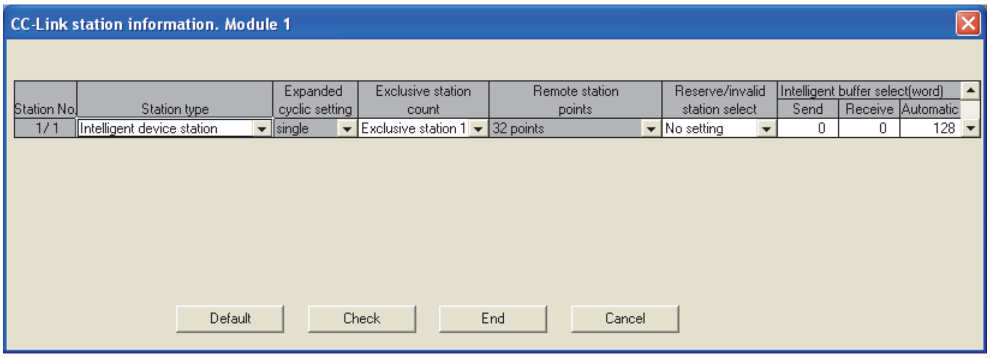
For the automatic intelligent buffer select (word), set the following.

Table 4.25 When using LCPU

Item		Description	
		Mode setting switch setting	**Description**
Intelligent buffer select (word)	Automatic	Mode 1	•Default assignments: 600H •Changed assignments: Auto-refresh buffer size (words)
		Mode 2	400H
		Mode 3	200H
		Mode 4	100H

3) When using QCPU (Q mode)/QnACPU

- When QCPU (Q mode) is used, set the following using the engineering tool.
  This section describes the parameter setting of when GX Developer is used.
  When GX Works2 is used, refer to the following.
  ☞MELSEC-Q CC-Link System Master/Local Module User's Manual
- When QnACPU is used, set the following using GX Developer.



Station No.	Station type	Expanded cyclic setting	Exclusive station count	Remote station points	Reserve/invalid station select	Intelligent buffer select(word) Send	Intelligent buffer select(word) Receive	Intelligent buffer select(word) Automatic
1/1	Intelligent device station	single	Exclusive station 1	32 points	No setting	0	0	128

Figure 4.22 When using QCPU (Q mode)/QnACPU

For the station type and automatic intelligent buffer select (word), set the following.

Table 4.26 When using QCPU (Q mode)/QnACPU

Item		Description	
Station type		•When the CC-Link mode is "Remote net - ver.1 mode" Intelligent device station •When the CC-Link mode is "Remote net - ver.2 mode" or "Remote net - additional mode" Ver.1 intelligent device station	
Intelligent buffer select (word)	Automatic	**Mode setting switch setting**	**Description**
		Mode 1	•Default assignments: 600_{H} •Changed assignments: Auto-refresh buffer size (words)
		Mode 2	400_{H}
		Mode 3	200_{H}
		Mode 4	100_{H}

4) When using dedicated instructions in ACPU/QCPU (A mode)
Set the following on the sequence program.

Table 4.27 When using dedicated instructions in ACPU/QCPU (A mode)

<table>
<tr><th colspan="2" rowspan="2">Item</th><th colspan="2">M Address</th><th colspan="2" rowspan="2">Description</th></tr>
<tr><th>HEX.</th><th>DEC.</th></tr>
<tr><td rowspan="3">Station information</td><td>Station type</td><td rowspan="3">20H
to
5FH</td><td rowspan="3">32
to
95</td><td colspan="2">2 (Intelligent device station)</td></tr>
<tr><td>No. of occupied stations</td><td colspan="2">1</td></tr>
<tr><td>Station No.</td><td colspan="2">Station No. set with the Station No. setting switch on the AJ65BT-R2N</td></tr>
<tr><td rowspan="7">Send/receive or auto-refresh buffer assignment</td><td>Send</td><td rowspan="7">80H
to
CDH</td><td rowspan="7">128
to
205</td><td colspan="2" rowspan="2">0</td></tr>
<tr><td>Receive</td></tr>
<tr><td rowspan="5">Auto</td><th>Mode setting switch setting</th><th>Description</th></tr>
<tr><td>Mode 1</td><td>•Default assignments: 600H
•Changed assignments: Auto-refresh buffer size (words)</td></tr>
<tr><td>Mode 2</td><td>400H</td></tr>
<tr><td>Mode 3</td><td>200H</td></tr>
<tr><td>Mode 4</td><td>100H</td></tr>
</table>

5) When using the FROM/TO instruction in ACPU/QCPU (A mode)
Set the following on the sequence program.

Table 4.28 When using the FROM/TO instruction in ACPU/QCPU (A mode)

<table>
<tr><th colspan="2" rowspan="2">Item</th><th colspan="2">M Address</th><th colspan="2" rowspan="2">Description</th></tr>
<tr><th>HEX.</th><th>DEC.</th></tr>
<tr><td rowspan="3">Station information</td><td>Station type</td><td rowspan="3">20H
to
5FH</td><td rowspan="3">32
to
95</td><td colspan="2">2 (Intelligent device station)</td></tr>
<tr><td>No. of occupied stations</td><td colspan="2">1</td></tr>
<tr><td>Station No.</td><td colspan="2">Station No. set with the Station No. setting switch on the AJ65BT-R2N</td></tr>
<tr><td rowspan="7">Send/receive or auto-refresh buffer assignment</td><td>Send</td><td rowspan="7">80H
to
CDH</td><td rowspan="7">128
to
205</td><td colspan="2" rowspan="2">0</td></tr>
<tr><td>Receive</td></tr>
<tr><td rowspan="5">Auto</td><th>Mode setting switch setting</th><th>Description</th></tr>
<tr><td>Mode 1</td><td>•Default assignments: 600H
•Changed assignments: Auto-refresh buffer size (words)</td></tr>
<tr><td>Mode 2</td><td>400H</td></tr>
<tr><td>Mode 3</td><td>200H</td></tr>
<tr><td>Mode 4</td><td>100H</td></tr>
</table>

(c) Initial data reading
Be sure to read out the initial data from the AJ65BT-R2N to the master module before making the initial setting for the buffer memory auto-refresh function.
For a sample program for reading initial data, refer to the following.
☞ Section 6.3.2 For the buffer memory auto-refresh function

(d) Buffer memory used for the buffer memory auto-refresh function
The following buffer memory area is used for the initial setting and status check of the buffer memory auto-refresh function.

Table 4.29 Initial setting of the buffer memory auto-refresh function

R2N Address	Name	Description
0H	Send area, start address specification	Specify the start address of the send area (Send data size specification area＋Send data area). Specify an area that does not overlap with the receive area. •Setting range: 200H to 7FEH (Default: ☞ Section 3.8)
1H	Send area size specification	Specify the size of the send area (Send data size specification area＋Send data area). Specify an area that does not overlap with the receive area. •Setting range: 2H to 5FEH (Unit: Word, Default: ☞ Section 3.8)
2H	Receive area, start address specification	Specify the start address of the receive area (Receive data size specification area＋Receive data area). Specify an area that does not overlap with the send area. •Setting range: 200H to 7FEH (Default: ☞ Section 3.8)
3H	Receive area size specification	Specify the size of the receive area (Receive data size specification area＋Receive data area). Specify an area that does not overlap with the send area. •Setting range: 2H to 5FEH (Unit: Word, Default: ☞ Section 3.8)
102H	Word/byte specification	Specify the unit of data handled in the following areas. (1) No. of receive end data (R2N 111H) (2) No. of actual send data (R2N 1B4H) (3) No. of data stored in OS reception area (R2N 1B6H) (4) Send data size specification area (R2N 200H (at default)) (5) Receive data size specification area (R2N 400H (at default)) •0H: In word units •1H: In byte units •Setting range: 0H, 1H (Default: 0H)
105H	Transient timeout time specification	Specify a timeout time for data communication which is based on the buffer memory auto-refresh function and is performed between the master module and AJ65BT-R2N. •0, 5: Specified as 5 seconds. •Setting range: 0, 1 to 360 (Unit: Seconds, Default: 0)
111H	No. of receive end data	For receiving fixed length data, specify the number of data to be received. When using the frame function to receive fixed length data, specify the number of data excluding the start and end frame data. The value changes depending on the setting of Word/byte specification (R2N 102H). •0H: Receive variable length data with frame function •Setting range (in word units): 0H to (Receive area size－1) (Default: 0H) •Setting range (in byte units): 0H to (Receive area size－1) ×2 (Default: 0H)

(Continued to next page)

(From previous page)

Table 4.29 Initial setting of the buffer memory auto-refresh function (Continued)

R2N Address	Name	Description
112H	Receive timeout time specification	Specify a timeout time for receiving data from the external device. A receive timeout occurs during data reception when the specified timeout time has been reached. If a receive timeout occurs, Error receive data read request signal (RXn3) turns ON, and the receive timeout error (BB21H) is stored in Error codes generated when receiving (R2N 1B2H) When the frame function is used, the receive timeout time includes the time for receiving the start and/or end frame. •0: Infinitely wait for receive completion •Setting range: 0, 1 to 32767 (Unit: × 100ms, Default: 0)
11AH	Send timeout time specification	Specify a time (send timeout time) if transmission is to be terminated when a specific time has elapsed after starting transmission to the external device (after Send request signal (RYn0) turns ON). •0: Infinitely wait for send completion •Setting range: 0, 1 to 32767 (Unit: × 100ms, Default: 0)
1B4H	No. of actual send data	Upon completion of transmission, the number of the data that were actually sent is stored. When the frame function is used, this area stores the number of the entire send data including the start and end frames. When the ASCII-binary conversion function is active, the number of converted send data is stored. The value changes depending on the setting of Word/byte specification (R2N 102H).
1B6H	No. of data stored in OS reception area	Number of the data stored in the OS reception area is stored. The information stored is updated every 100ms. The value changes depending on the setting of Word/byte specification (R2N 102H).

☒Point

Initialize the AJ65BT-R2N if a set value in R2N 0H to 101H and 103H to 112H is changed.

☞ Section 4.4 AJ65BT-R2N Initialization Function

4.3.1 Details of the auto-refresh buffer

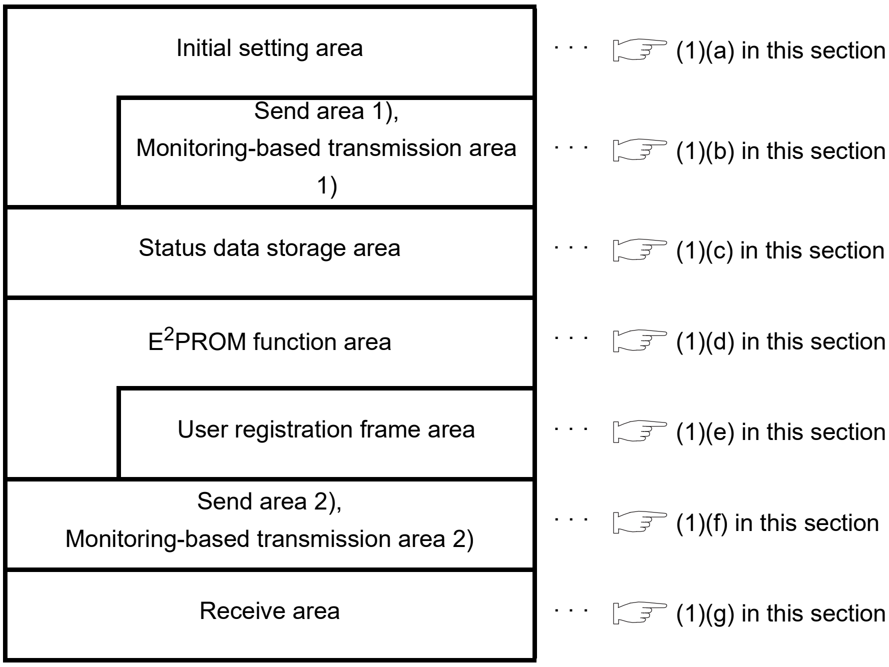
The auto-refresh buffer is an area for data communication between the master module and AJ65BT-R2N, and is operated by the buffer memory auto-refresh function.
When changing the auto-refresh buffer assignments, refer to this section.

☒Point

- Assignments of each area cannot be changed if the AJ65BT-R2N is in Mode 2 to Mode 4.
  Use Mode 0 or Mode 1 to change any assignment.
  For changing the mode, refer to the following.
  ☞ Section 5.4 Part Names and Settings
- The default shown in each area setting is for the case where the AJ65BT-R2N is in Mode 1.
  For defaults in Modes 2 to 4, refer to the following.
  ☞ Section 3.8 Buffer Memory

(1) Configuration of the auto-refresh buffer

The auto-refresh buffer is composed of the following areas.



Initial setting area · · · ☞ (1)(a) in this section

Send area 1), Monitoring-based transmission area 1) · · · ☞ (1)(b) in this section

Status data storage area · · · ☞ (1)(c) in this section

E^2PROM function area · · · ☞ (1)(d) in this section

User registration frame area · · · ☞ (1)(e) in this section

Send area 2), Monitoring-based transmission area 2) · · · ☞ (1)(f) in this section

Receive area · · · ☞ (1)(g) in this section

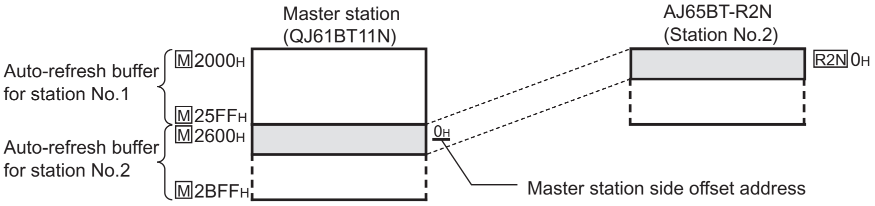
Figure 4.23 Configuration of the auto-refresh buffer

Usage of each area, assignment setting, and refresh timing are explained on the following pages.

(a) Initial setting area
The initial settings of each AJ65BT-R2N function are configured in this area.

1) Assignment settings
Assignment settings in the Initial setting area can be changed.
When reducing the transfer size, remove any unnecessary buffer memory from the assignments.
If the entire area is not used, it can be set as unused.

Table 4.30 Assignment settings

R2N Address	Name	Description
20H	Transfer size	Specify an initial setting area size. •0H: Initial setting area not used •Setting range: 0H to 1A0H (Unit: Word, Default: 1A0H)
21H	AJ65BT-R2N side start address	Specify the start address of the Initial setting area that is assigned to the AJ65BT-R2N buffer memory. •0H: Initial setting area not used •Setting range: 0H to 19FH (Default: 0H)
22H	Fixed value	4004H (Fixed)
23H	Master station side offset address	Specify the offset address of the Initial setting area that is assigned to the auto-refresh buffer of the master station. The offset address is the start address of the Initial setting area, which is counted from the start address of the auto-refresh buffer for the target station. •0H: Initial setting area not used  •Setting range: 0H to 19FH (Default: 0H)

2) Refresh timing

Table 4.31 Refresh timing

Transfer direction	Refresh timing
AJ65BT-R2N→Master module	Updated immediately following a refresh occurred immediately after Initial data read request signal (RY(n+1)9) is turned ON.
Master module→AJ65BT-R2N	Updated immediately following a refresh occurred immediately after Initialization request signal (RYn4) is turned ON.

(b) Send area 1) and Monitoring-based transmission area 1)

These areas are used for transferring settings of Send start frame No. (R2N 118H) through System area (R2N 19FH) in the Send-frame-1 area from the master module to the AJ65BT-R2N.

1) Assignment settings

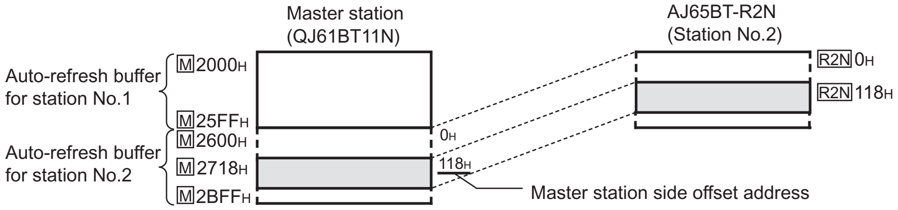
Assignment settings in Send area 1) and Monitoring-based transmission area 1) can be changed.

When reducing the transfer size, remove any unnecessary buffer memory from the assignments.

If the entire area is not used, it can be set as unused.

- Send area 1)

Table 4.32 Assignment settings

R2N Address	Name	Description
14H	Transfer size	Specify the size of the Send area 1). •0H: Send area 1) not used •Setting range: 0H to 88H (Unit: Word, Default: 88H)
15H	AJ65BT-R2N side start address	Specify the start address of the Send area 1) that is assigned to the AJ65BT-R2N buffer memory. •0H: Send area 1) not used •Setting range: 0H, 118H to 19FH (Default: 118H)
16H	Fixed value	4004H (Fixed)
17H	Master station side offset address	Specify the offset address of the Send area 1) that is assigned to the auto-refresh buffer of the master station. The offset address is the start address of the Send area 1), which is counted from the start address of the auto-refresh buffer for the target station. •0H: Send area 1) not used  •Setting range: 0H, 118H to 19FH (Default: 118H)

- Monitoring-based transmission area 1)

Table 4.33 Assignment settings

R2N Address	Name	Description
2CH	Transfer size	Specify the size of the Monitoring-based transmission area 1). •0H: Monitoring-based transmission area 1) not used •Setting range: 0H to 88H (Unit: Word, Default: 88H)
2DH	AJ65BT-R2N side start address	Specify the start address of the Monitoring-based transmission area 1) that is assigned to the AJ65BT-R2N buffer memory. •0H: Monitoring-based transmission area 1) not used •Setting range: 0H, 118H to 19FH (Default: 118H)
2EH	Fixed value	4004H (Fixed)

(Continued to next page)

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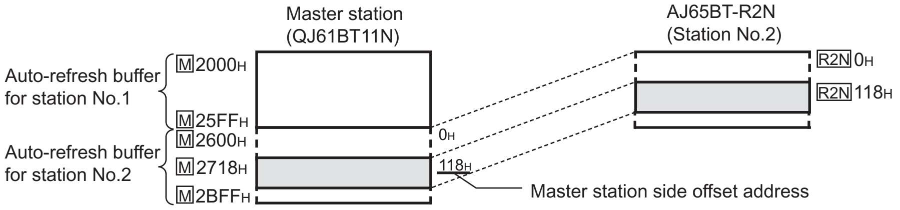
Table 4.33 Assignment settings (Continued)

R2N Address	Name	Description
2FH	Master station side offset address	Specify the offset address of the Monitoring-based transmission area 1) that is assigned to the auto-refresh buffer of the master station. The offset address is the start address of the Monitoring-based transmission area 1), which is counted from the start address of the auto-refresh buffer for the target station. •0H: Monitoring-based transmission area 1) not used  •Setting range: 0H, 118H to 19FH (Default: 118H)

2) Refresh timing

- Send area 1)

Table 4.34 Refresh timing

Transfer direction	Refresh timing
Master module→AJ65BT-R2N	Refreshed immediately after Send request signal (RYn0) is turned ON.

- Monitoring-based transmission area 1)

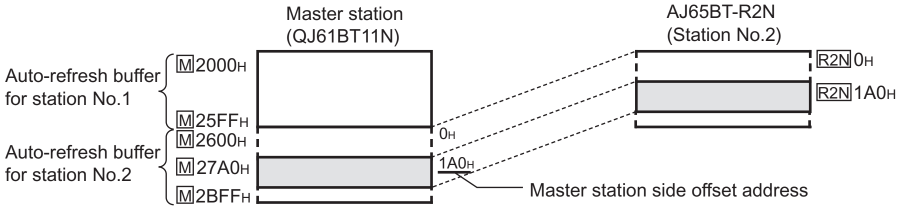
Table 4.35 Refresh timing

Transfer direction	Refresh timing
Master module→AJ65BT-R2N	Refreshed immediately after transmission trigger conditions for the monitoring-based transmission function are met.

(c) Status data storage area
The setting status or communication status of the AJ65BT-R2N are stored in this area.

1) Assignment settings
Assignment settings in the Initial setting area can be changed.
When reducing the transfer size, remove any unnecessary buffer memory from the assignments.
If the entire area is not used, it can be set as unused.

Table 4.36 Assignment settings

R2N Address	Name	Description
10_H	Transfer size	Specify the size of the Status data storage area. •0_H: Status data storage area not used •Setting range: 0_H to 20_H (Unit: Word, Default: 20_H)
11_H	AJ65BT-R2N side start address	Specify the start address of the Status data storage area that is assigned to the AJ65BT-R2N buffer memory. •0_H: Status data storage area not used •Setting range: 0_H, $1A0_H$ to $1BF_H$ (Default: $1A0_H$)
12_H	Fixed value	4004_H (Fixed)
13_H	Master station side offset address	Specify the offset address of the Status data storage area that is assigned to the auto-refresh buffer of the master station. The offset address is the start address of the Status data storage area, which is counted from the start address of the auto-refresh buffer for the target station. •0_H: Status data storage area not used  •Setting range: 0_H, $1A0_H$ to $1BF_H$ (Default: $1A0_H$)

2) Refresh timing

Table 4.37 Refresh timing

Transfer direction	Refresh timing
AJ65BT-R2N→Master module	Refreshed immediately before Initial data read completion signal (RX(n+1)9) turns ON.
	Refreshed immediately before Initialization complete signal (RXn4) or Initialization failed signal (RXn5) turns ON.
	Refreshed immediately before Send complete signal (RXn0) or Send failed signal (RXn1) turns ON.
	Refreshed immediately before Normal receive data read request signal (RXn2) or Error receive data read request signal (RXn3) turns ON.
	Updated immediately following a refresh occurred immediately after Error reset request signal (RY(n+1)A) is turned ON.
	Refreshed immediately after an error occurrence in transmission by the monitoring-based transmission function.
	Refreshed immediately before E^2PROM function complete signal (RXn7) or E^2PROM function failed signal (RXn8) turns ON.

(d) E^2PROM function area

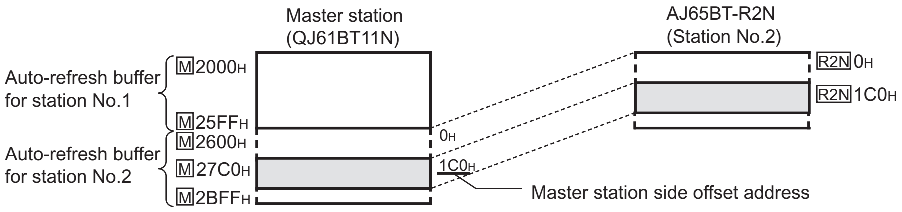
This area is provided for the following processing that is performed using the E^2PROM.

- E^2PROM function setting
- Registration of user registration frames
- Reading of user registration frames
- Deletion of user registration frames

1) Assignment settings

Assignment settings in the E^2PROM function area can be changed.
When reducing the transfer size, remove any unnecessary buffer memory from the assignments.
If the entire area is not used, it can be set as unused.

Table 4.38 Assignment settings

R2N Address	Name	Description
24H	Transfer size	Specify the size of the E^2PROM function area. •0H: E^2PROM function area not used •Setting range: 0H to 30H (Unit: Word, Default: 30H)
25H	AJ65BT-R2N side start address	Specify the start address of the E^2PROM function area that is assigned to the AJ65BT-R2N buffer memory. •0H: E^2PROM function area not used •Setting range: 0H, 1C0H to 1EFH (Default: 1C0H)
26H	Fixed value	4004H (Fixed)
27H	Master station side offset address	Specify the offset address of the E^2PROM function area that is assigned to the auto-refresh buffer of the master station. The offset address is the start address of the E^2PROM function area, which is counted from the start address of the auto-refresh buffer for the target station. •0H: E^2PROM function area not used  •Setting range: 0H, 1C0H to 1EFH (Default: 1C0H)

2) Refresh timing

Table 4.39 Refresh timing

Transfer direction	Refresh timing
Master module→AJ65BT-R2N	Updated immediately following a refresh occurred immediately after E^2PROM function request signal (RYn7) is turned ON.

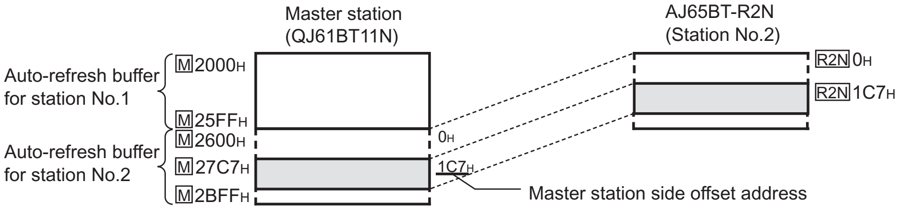
(e) User registration frame area

This area is provided for registration and reading of user registration frames.

1) Assignment settings

Assignment settings in the User registration frame area can be changed.
When reducing the transfer size, remove any unnecessary buffer memory from the assignments.
If the entire area is not used, it can be set as unused.

Table 4.40 Assignment settings

R2N Address	Name	Description
28_H	Transfer size	Specify the size of the User registration frame area. •0_H: User registration frame area not used •Setting range: 0_H to 29_H (Unit: Word, Default: 29_H)
29_H	AJ65BT-R2N side start address	Specify the start address of the User registration frame area that is assigned to the AJ65BT-R2N buffer memory. •0_H: User registration frame area not used •Setting range: 0_H, $1C7_H$ to $1EF_H$ (Default: $1C7_H$)
$2A_H$	Fixed value	4004_H (Fixed)
$2B_H$	Master station side offset address	Specify the offset address of the User registration frame area that is assigned to the auto-refresh buffer of the master station. The offset address is the start address of the User registration frame area, which is counted from the start address of the auto-refresh buffer for the target station. •0_H: User registration frame area not used  •Setting range: 0_H, $1C7_H$ to $1EF_H$ (Default: $1C7_H$)

2) Refresh timing

Table 4.41 Refresh timing

Transfer direction	Refresh timing
AJ65BT-R2N→Master module	Refreshed immediately before E^2PROM function complete signal (RXn7) or E^2PROM function failed signal (RXn8) turns ON.

(f) Send area 2) and Monitoring-based transmission area 2)

These area are provided for transferring data, which are addressed to the external device, from the master module to the send area of the AJ65BT-R2N.

1) Assignment settings

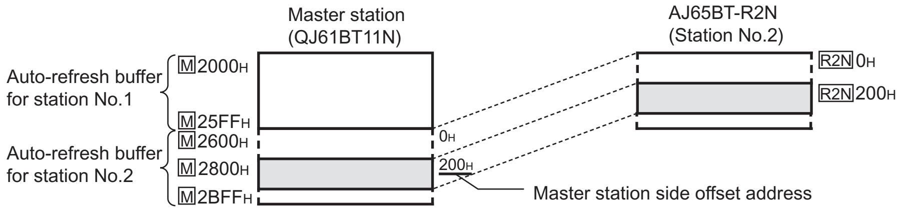
Assignment settings in Send area 2) and Monitoring-based transmission area 2) can be changed.

When reducing the transfer size, remove any unnecessary buffer memory from the assignments.

If the entire area is not used, it can be set as unused.

- Send area 2)

Table 4.42 Assignment settings

R2N Address	Name	Description
18_H	Transfer size	Specify the size of the Send area 2). •0_H: Send area 2) not used •Setting range: 0_H, 2_H to $5FE_H$ (Unit: Word, Default: 200_H)
19_H	AJ65BT-R2N side start address	Specify the start address of the Send area 2) that is assigned to the AJ65BT-R2N buffer memory. •0_H: Send area 2) not used •Setting range: 0_H, 200_H to $7FE_H$ (Default: 200_H)
$1A_H$	Fixed value	4004_H (Fixed)
$1B_H$	Master station side offset address	Specify the offset address of the Send area 2) that is assigned to the auto-refresh buffer of the master station. The offset address is the start address of the Send area 2), which is counted from the start address of the auto-refresh buffer for the target station. •0_H: Send area 2) not used  •Setting range: 0_H, 200_H to $7FE_H$ (Default: 200_H)

- Monitoring-based transmission area 2)

Table 4.43 Assignment settings

R2N Address	Name	Description
30_H	Transfer size	Specify the size of the Monitoring-based transmission area 2). •0_H: Monitoring-based transmission area 2) not used •Setting range: 0_H, 2_H to $5FE_H$ (Unit: Word, Default: 200_H)
31_H	AJ65BT-R2N side start address	Specify the start address of the Monitoring-based transmission area 2) that is assigned to the AJ65BT-R2N buffer memory. •0_H: Monitoring-based transmission area 2) not used •Setting range: 0_H, 200_H to $7FE_H$ (Default: 200_H)
32_H	Fixed value	4004_H (Fixed)

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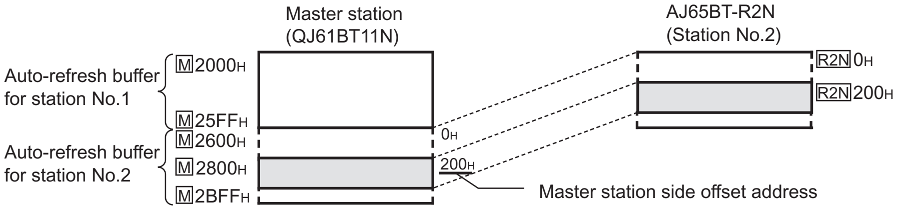
Table 4.43 Assignment settings (Continued)

R2N Address	Name	Description
33_H	Master station side offset address	Specify the offset address of the Monitoring-based transmission area 2) that is assigned to the auto-refresh buffer of the master station. The offset address is the start address of the Monitoring-based transmission area 2), which is counted from the start address of the auto-refresh buffer for the target station. •0_H: Monitoring-based transmission area 2) not used  •Setting range: 0_H, 200_H to $7FE_H$ (Default: 200_H)

2) Refresh timing

- Send area 2)

Table 4.44 Refresh timing

Transfer direction	Refresh timing
Master module→AJ65BT-R2N	Refreshed immediately after Send request signal (RYn0) is turned ON.

- Monitoring-based transmission area 2)

Table 4.45 Refresh timing

Transfer direction	Refresh timing
Master module→AJ65BT-R2N	Refreshed immediately after transmission trigger conditions for the monitoring-based transmission function are met.

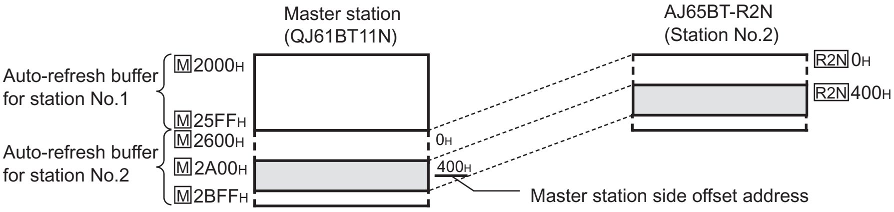
(g) Receive area

This area is provided for data received from the external device to be transferred from the receive area of the AJ65BT-R2N to the master module.

1) Assignment settings

Assignment settings in the Receive area can be changed.
When reducing the transfer size, remove any unnecessary buffer memory from the assignments.
If the entire area is not used, it can be set as unused.

Table 4.46 Assignment settings

R2N Address	Name	Description
1C$_H$	Transfer size	Specify the size of the Receive area. •0$_H$: Receive area not used •Setting range: 0$_H$, 2$_H$ to 5FE$_H$ (Unit: Word, Default: 200$_H$)
1D$_H$	AJ65BT-R2N side start address	Specify the start address of the Receive area that is assigned to the AJ65BT-R2N buffer memory. •0$_H$: Receive area not used •Setting range: 0$_H$, 200$_H$ to 7FE$_H$ (Default: 400$_H$)
1E$_H$	Fixed value	4004$_H$ (Fixed)
1F$_H$	Master station side offset address	Specify the offset address of the Receive area that is assigned to the auto-refresh buffer of the master station. The offset address is the start address of the Receive area, which is counted from the start address of the auto-refresh buffer for the target station. •0$_H$: Receive area not used  •Setting range: 0$_H$, 200$_H$ to 7FE$_H$ (Default: 400$_H$)

2) Refresh timing

Table 4.47 Refresh timing

Transfer direction	Refresh timing
AJ65BT-R2N→Master module	Refreshed immediately before Normal receive data read request signal (RXn2) or Error receive data read request signal (RXn3) turns ON.

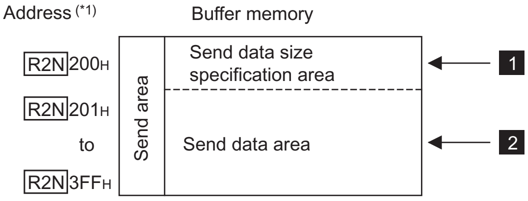
4.3.2 Send processing

(1) Send area

Data to be sent to the external device are stored in the send area.

(a) Composition of the send area

The send area is composed of Send data size specification area and Send data area.



*1 When Send area, start address specification (R2N 0H) is 200H

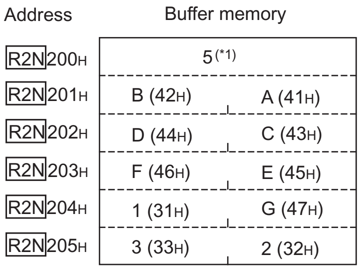
Figure 4.24 Composition of the send area

Table 4.48 Composition of the send area

No.	Name	Description
1	Send data size specification area	Number of send data is stored. The value changes depending on the setting of Word/byte specification (R2N 102H).
2	Send data area	Send data are stored in order starting from the lower byte of the lowest address.

(b) A storage example of the send area

The following shows an example of storing "ABCDEFG123" in the send area when sending it to the external device. (In the case of: Send area, start address specification (R2N 0H): 200H, and Word/byte specification (R2N 102H): 0H (In word units))



R2N 200H	5 (*1)	
R2N 201H	B (42H)	A (41H)
R2N 202H	D (44H)	C (43H)
R2N 203H	F (46H)	E (45H)
R2N 204H	1 (31H)	G (47H)
R2N 205H	3 (33H)	2 (32H)

*1 When Word/byte specification (R2N 102H) is 1H (Bytes), AH (10) is stored.

Figure 4.25 A storage example of the send area

(2) Transmission procedures

When the buffer memory auto-refresh function is used, the following send processing is performed.

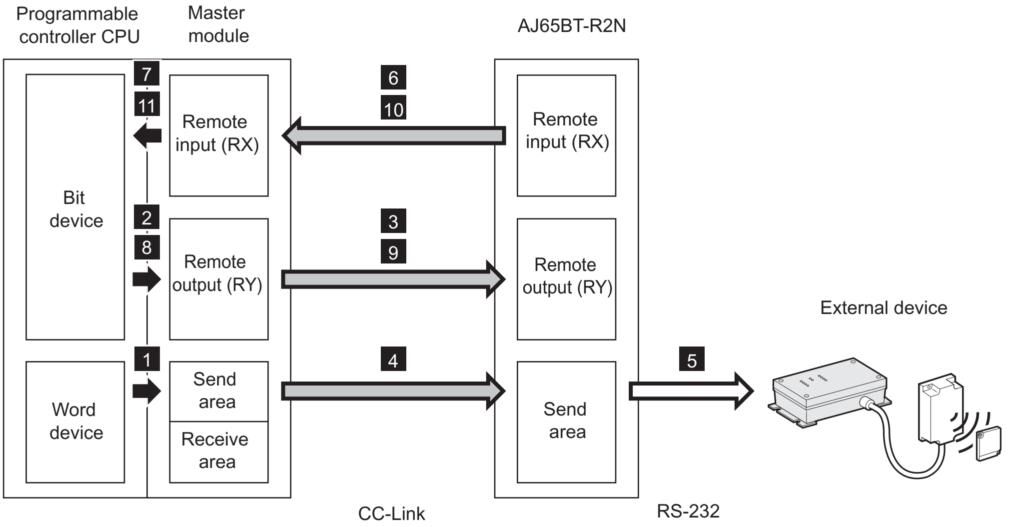


Figure 4.26 Send processing when using the buffer memory auto-refresh function

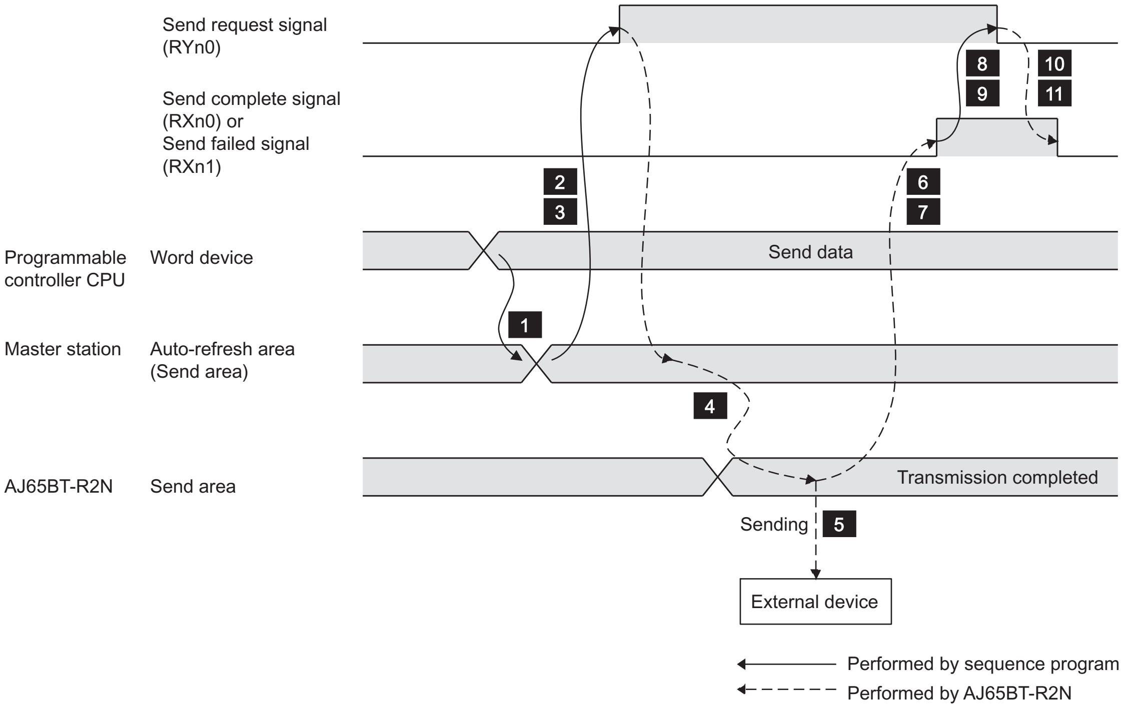


Figure 4.27 Timing chart when using the buffer memory auto-refresh function

Table 4.49 Transmission procedures when using the buffer memory auto-refresh function

No.	Processing
1	With the RITO instruction, the send data are written from word devices of the programmable controller CPU to the send area of the master module.
2, 3	Send request signal (RYn0) is turned ON.
4	The send data are written from the send area of the master module to the send area of the AJ65BT-R2N.
5	The send data are sent from the send area of the AJ65BT-R2N to the external device.
6, 7	When transmission is normally completed, Send complete signal (RXn0) turns ON. When failed, Send failed signal (RXn1) turns ON.
8, 9	Send request signal (RYn0) is turned OFF.
10, 11	Send complete signal (RXn0) and Send failed signal (RXn1) are turned OFF.

Remark

If the programmable controller CPU does not support dedicated instructions, the FROM/TO instruction can be used for communication.
For a sample program using the FROM/TO instruction, refer to the following.
☞ CHAPTER 8 PROGRAMMING WHEN USING FROM/TO INSTRUCTION IN ACPU/QCPU (A MODE)

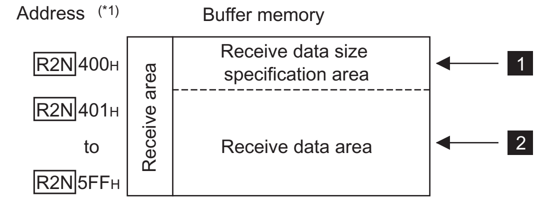
4.3.3 Receive processing

(1) Receive area

Data received from the external device are stored in the receive area.
Read the received data from the receive area to the programmable controller CPU .

(a) Composition of the receive area

The receive area is composed of Receive data size specification area and Receive data area.



*1 When Receive area, start address specification (R2N 2H) is 400H

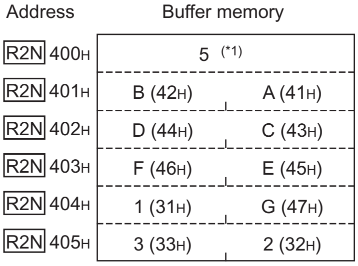
Figure 4.28 Composition of the receive area

Table 4.50 Composition of the receive area

No.	Name	Description
1	Receive data size specification area	Number of receive data is stored. The value changes depending on the setting of Word/byte specification (R2N 102H).
2	Receive data area	Receive data are stored in order starting from the lower byte of the lowest address.

(b) A storage example of the receive area

The following shows an example of storing "ABCDEFG123" in the receive area when receiving it from the external device. (In the case of: Receive area, start address specification (R2N 2H): 400H, and Word/byte specification (R2N 102H): 0H)



Address	Buffer memory	
R2N 400H	5 (*1)	
R2N 401H	B (42H)	A (41H)
R2N 402H	D (44H)	C (43H)
R2N 403H	F (46H)	E (45H)
R2N 404H	1 (31H)	G (47H)
R2N 405H	3 (33H)	2 (32H)

*1 When Word/byte specification (R2N 102H) is 1H (Bytes), AH (10) is stored.

Figure 4.29 A storage example of the receive area

(2) Reception procedures

When the buffer memory auto-refresh function is used, the following receive processing is performed.

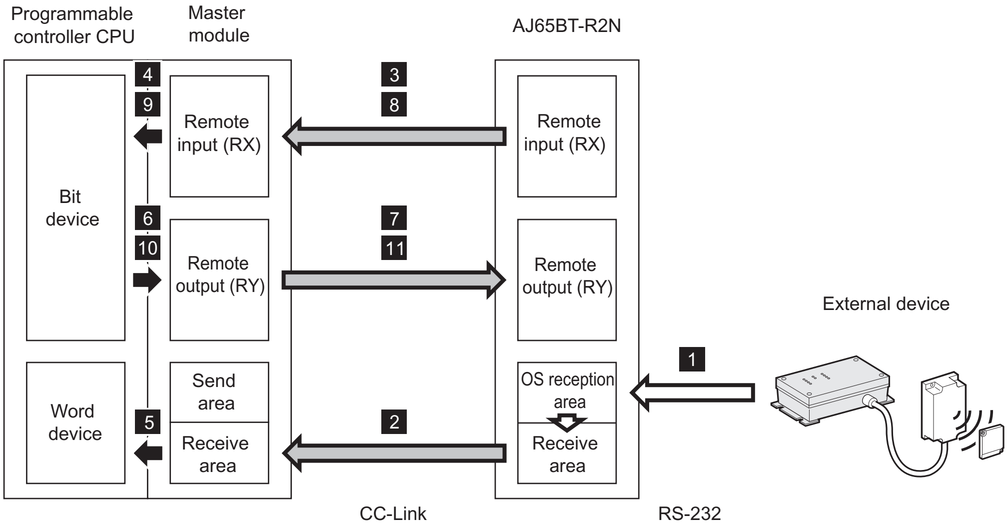


Figure 4.30 Receive processing when using the buffer memory auto-refresh function

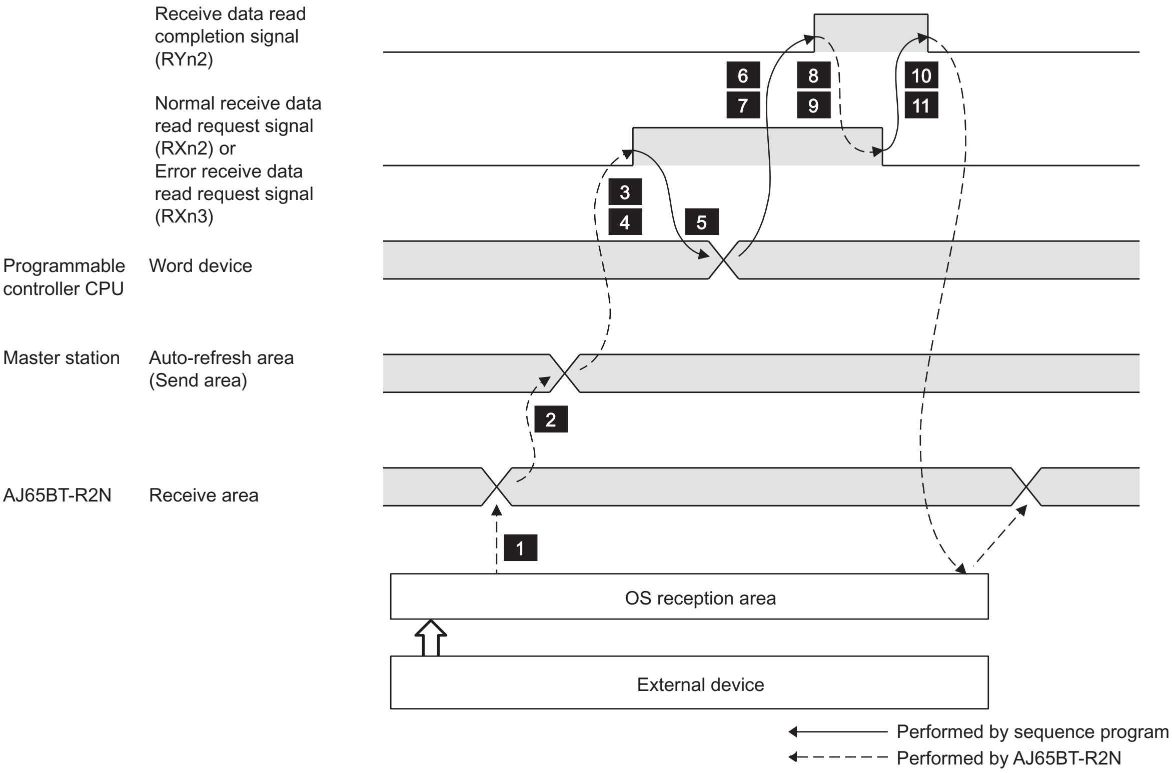


Figure 4.31 Timing chart when using the buffer memory auto-refresh function

Table 4.51 Reception procedures when using the buffer memory auto-refresh function

No.	Processing
1	Data are received from the external device through the OS reception area, and stored in the receive area.
2	The receive data are written from the receive area of the AJ65BT-R2N to the receive area of the master module.
3, 4	When reception is normally completed, Normal receive data read request signal (RXn2) turns ON. When failed, Error receive data read request signal (RXn3) turns ON.
5	With the RIFR instruction, the receive data are read from the receive area of the master module to the programmable controller CPU devices.
6, 7	Receive data read completion signal (RYn2) is turned ON.
8, 9	Normal receive data read request signal (RXn2) and Error receive data read request signal (RXn3) turn OFF.
10, 11	Receive data read completion signal (RYn2) is turned OFF.

Remark

If the programmable controller CPU does not support dedicated instructions, the FROM/TO instruction can be used for communication.

For a sample program using the FROM/TO instruction, refer to the following.

☞ CHAPTER 8 PROGRAMMING WHEN USING FROM/TO INSTRUCTION IN ACPU/QCPU (A MODE)

4.4 AJ65BT-R2N Initialization Function

The AJ65BT-R2N initialization function performs the following processing.

- Stopping the processing in execution
- Initializing the AJ65BT-R2N
- Enabling the setting written to a buffer memory

(1) Processing

(a) Stopping the following processing that is in execution

1) Send/receive processing
2) OS reception area clear function processing
3) Send cancel function processing
4) Forced receive completion function processing

(b) Initializing the AJ65BT-R2N

1) Initializing the DTR/DSR (ER/DR) control and DC code control of the flow control function.
2) Initializing the send/receive processing of the frame function.
3) Resetting the RS (RTS) signal status of the RS-232 control signals.
4) Clearing the OS reception area (☞ Section 4.5.8 OS reception area clear function)
5) Turning OFF the ERR. LED and clearing the Error code storage area (R2N 1A8H to 1B2H)

(c) Enabling the setting written to the buffer memory
The setting written to the following buffer memory is enabled.

1) Send area, start address specification (R2N 0H) to RS (RTS) signal status specification (R2N 101H)
2) ASCII-binary conversion specification (R2N 103H) to Receive timeout time specification (R2N 112H)

(2) Processing method

The AJ65BT-R2N initialization function is executed by turning ON the Initialization request signal (RYn4).

For a sample program for initialization, refer to the following.

☞ Section 6.3 Initial Setting for AJ65BT-R2N

(3) Precautions

For initialization of the AJ65BT-R2N, confirm that the following remote outputs (RY) are OFF before turning ON Initialization request signal (RYn4).

If Initialization request signal (RYn4) is turned ON while any of the following remote output signals (RY) is ON, the processing started by the signal (RY) may be stopped.

Table 4.52 Remote outputs (RY) to be turned OFF

Device No.	Signal name	Device No.	Signal name
RYn0	Send request signal	RYn6	OS reception area clear request signal
RYn1	Send cancel request signal	RYn7	E^{2}PROM function request signal
RYn2	Receive data read completion signal	RY(n+1)9	Initial data read request signal
RYn3	Forced receive completion request signal	RY(n+1)A	Error reset request signal

Example) Interlock circuit for confirming remote outputs (RY) are OFF

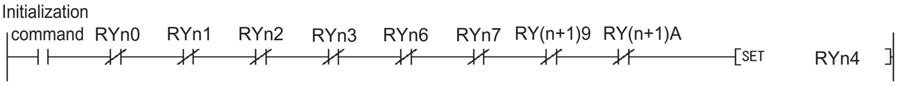


Figure 4.32 Example of an interlock circuit for confirming remote outputs (RY) are OFF

4.5 Functions Used for Data Communication

4.5.1 Frame function

The frame function is used to add specific data to original data to send them to the external device or to receive data containing specific data from the external device.
In the frame function, specific data are set up with a registration frame, which can be added or deleted.
Using this frame function makes processing of specific data easy when they are to be added to send/receive data of the external device.

The following methods are available for data communication using the frame function.

Table 4.53 Communication methods using the frame function

Send/receive	Method	Reference
Send	Adds one registration frame to the start and/or end of the send data that is stored in the send area.	(1) in this section
	Sends up to 100 registration frames that are specified in Transmission table specification (R2N 122H to 185H).	(2) in this section
Receive	Identifies necessary data with registration frame(s) from the data received from the external device.	(3) in this section

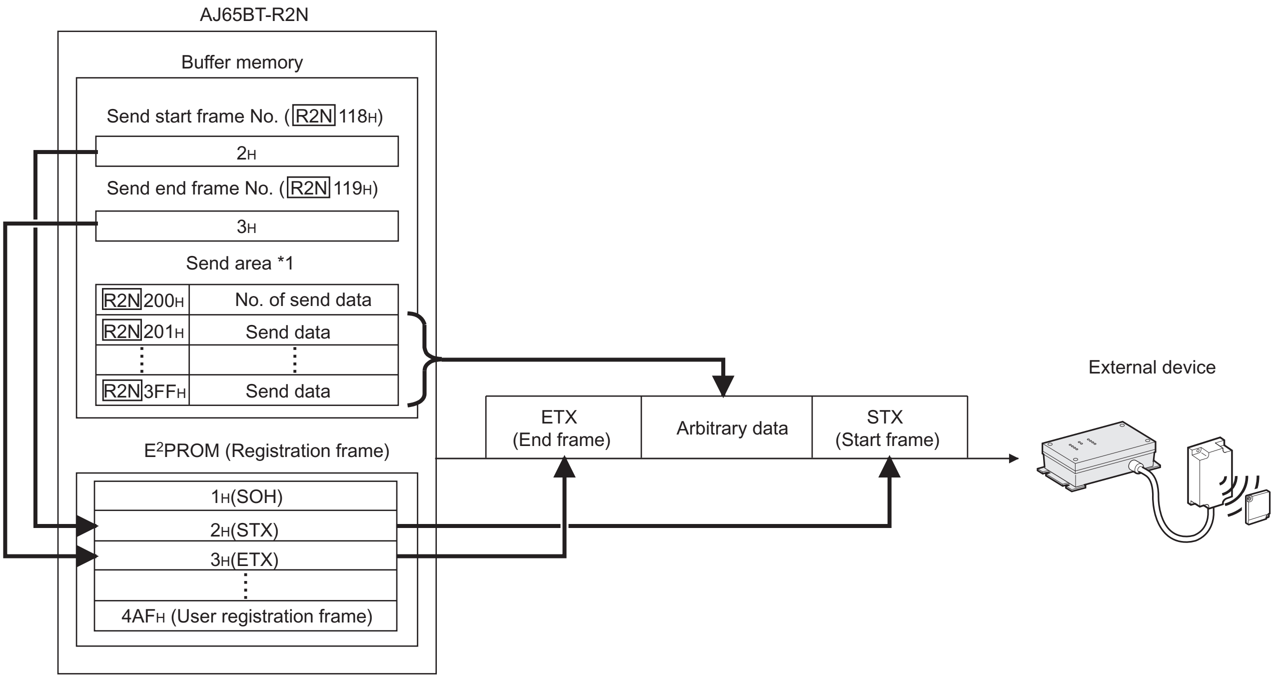
There are the following kinds of registration frames.

Table 4.54 Registration frame

Name	Description	Reference
Default registration frame	Frames that have been registered in the AJ65BT-R2N by default. These frames cannot be changed.	(4) in this section
User registration frame	Frames that the user is required to register to the E^2PROM of the AJ65BT-R2N. The user can specify any frame data.	(5) in this section

(1) Frame transmission (Send-frame-1 area)

One registration frame can be added to the start and/or end of the send data that is stored in the send area.



*1 When Send area, start address specification (R2N 0H) and Send area size specification (R2N 1H) are defaulted

Figure 4.33 Schematic diagram of transmission

(a) Setting

Table 4.55 Setting for frame transmission (Send-frame-1 area)

R2N Address	Name		Description
118H	Send-frame-1 area	Send start frame No.	Specify a registration frame that is to be added to the head of send data. •0H: No registration frame added to the head. •1H to 161H: Specify default registration frame. (☞ (4) in this section) •3E8H to 4AFH: Specify user registration frame. (☞ (5) in this section) •Setting range: 0H, 1H to 161H, 3E8H to 4AFH (Default: 0H)
119H		Send end frame No.	Specify a registration frame that is to be added to the end of send data. •0H: No registration frame added to the end. •1H to 161H: Specify default registration frame. (☞ (4) in this section) •3E8H to 4AFH: Specify user registration frame. (☞ (5) in this section) •Setting range: 0H, 1H to 161H, 3E8H to 4AFH (Default: 0H)

(b) Transmission method

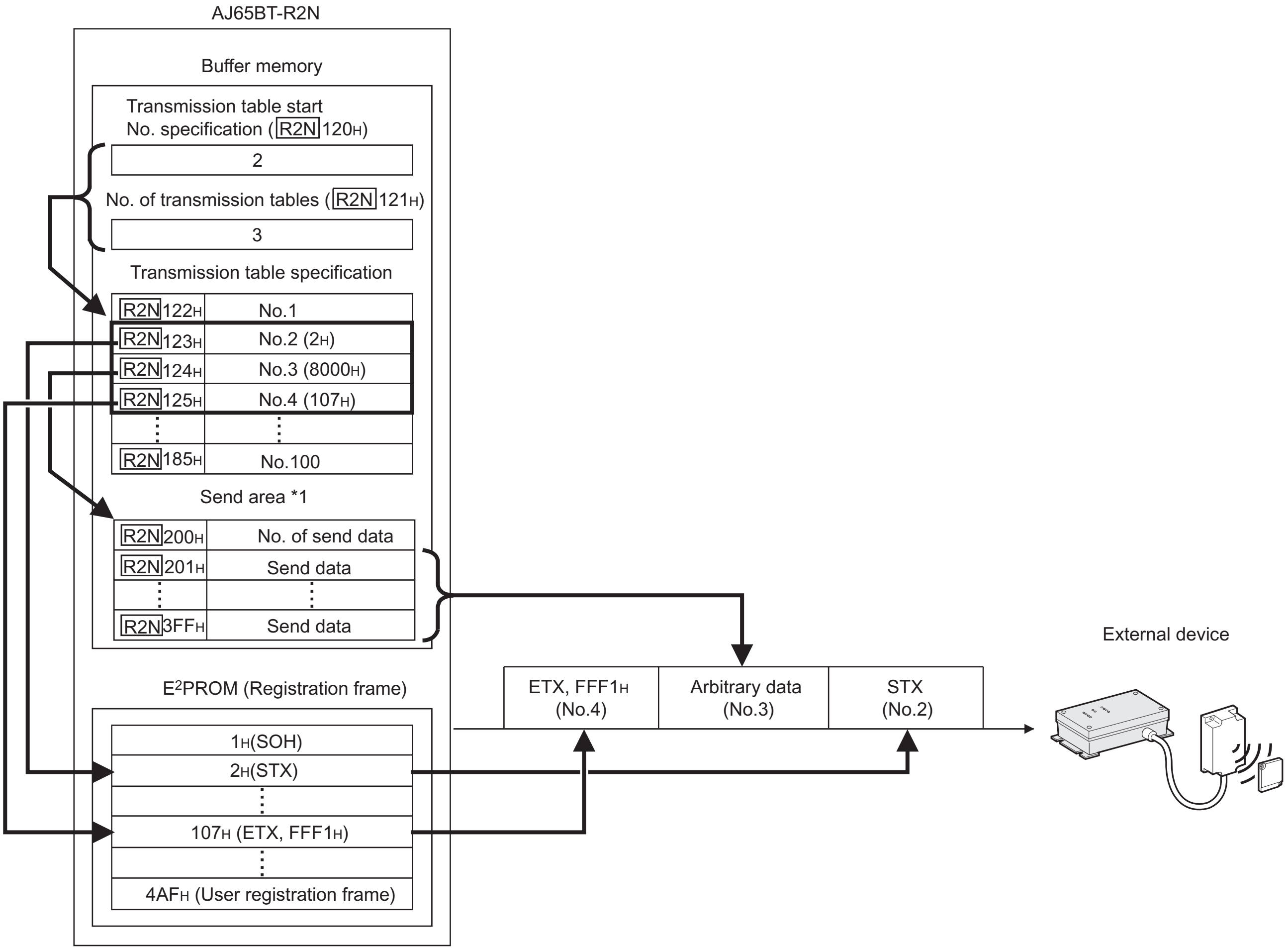
If a registration frame has been specified in the Send-frame-1 area (R2N 118_H to 119_H), the frame is automatically added to data when they are sent to the external device.

(c) Precautions

Do not include the same data as the start or end frame in send data (R2N 201_H to $3FF_H$ (at default)).
Doing so may cause the external device to recognize the received data as a start or end frame.

(2) Frame transmission (Send-frame-2 area)

Up to 100 registration frames, which are specified in Transmission table specification (R2N 122_H to 185_H), are sent as concatenated data.



*1 When Send area, start address specification (R2N 0_H) and Send area size specification (R2N 1_H) are defaulted

Figure 4.34 Schematic diagram of transmission

(a) Setting

Table 4.56 Setting for frame transmission (Send-frame-2 area)

R2N Address	Name		Description
120H	Send-frame-2 area	Transmission table start No. specification	Specify the start No. of the registration frame to be sent. Specify a start No. corresponding to Transmission table specification (R2N 122H to 185H). •0: No registration frame sent •Setting range: 0, 1 to 100 (Default: 0)
121H		No. of transmission tables	Specify the number of registration frames to be sent. •0: No registration frame sent •Setting range: 0, 1 to 100 (Default: 0)
122H to 185H		Transmission table specification (No.1 to No.100)	Specify a registration frame to be sent. One frame is specified for one number in Transmission table specification. •1H to 161H: Specify default registration frame. (☞ (4) in this section) •3E8H to 4AFH: Specify user registration frame. (☞ (5) in this section) •8000H: Specify send data stored in the send area (R2N 200H (at default)) •Setting range: 0H, 1H to 161H, 3E8H to 4AFH, 8000H (Default: 0H)

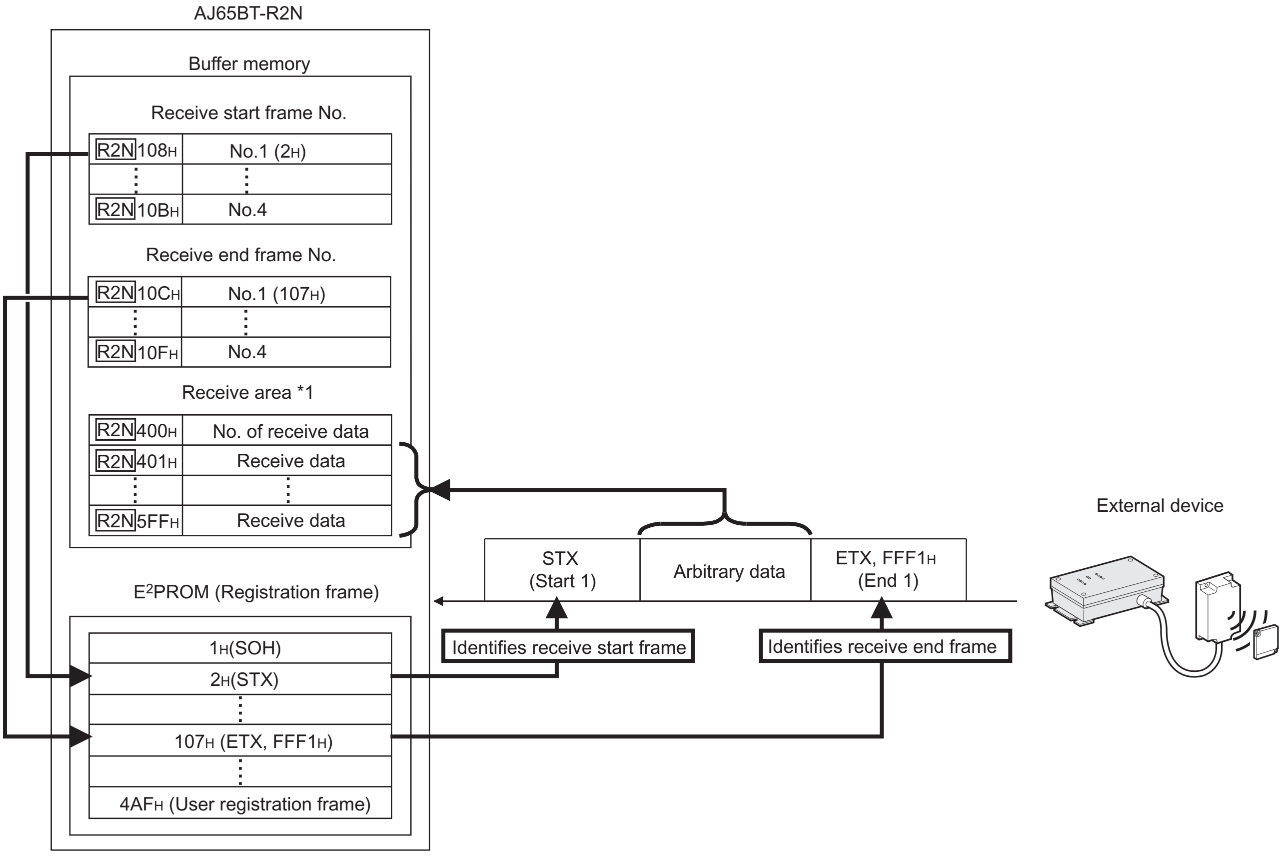
(b) Transmission method

If any registration frames have been specified in the Send-frame-2 area (R2N 120H to 185H), the frames are sent at the time of transmission to the external device.

The frames to be sent are concatenated data in the range specified by Transmission table start No. specification (R2N 120H) and No. of transmission tables (R2N 121H) in Transmission table specification (R2N 122H to 185H).

(3) Frame reception

Necessary data with registration frame(s) are identified from the data received from the external device.

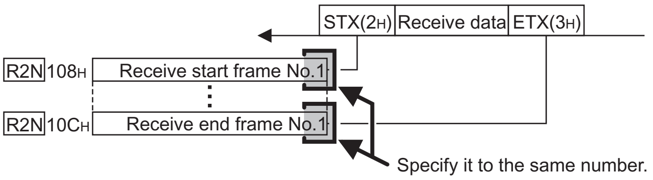


*1 When Send area, start address specification (R2N 0H) and Send area size specification (R2N 1H) are defaulted

Figure 4.35 Schematic diagram of reception

(a) Setting

Table 4.57 Setting for frame reception

R2N Address	Name	Description
108_H to $10B_H$	Receive start frame No.1 to 4	Specify a registration frame, which is to be identified as the data head, in Receive start frame No. (R2N 108_H to $10B_H$) Specify a registration frame, which is to be identified as the data end, in Receive end frame No. (R2N $10C_H$ to $10F_H$) When both of the start and end of the data are to be identified, specify the registration frames to the same number.  Specify it to the same number. When the data head need not be identified with a registration frame, specify 0_H in Receive start frame No. (R2N 108_H to $10B_H$). When the data end need not be identified with a registration frame, specify 0_H in Receive end frame No. (R2N $10C_H$ to $10F_H$). •1_H to 161_H: Specify default registration frame. (☞ (4) in this section) •$3E8_H$ to $4AF_H$: Specify user registration frame. (☞ (5) in this section) •Setting range: 0_H, 1_H to 161_H, $3E8_H$ to $4AF_H$ (Default: 0_H) Depending on the specification in this buffer memory, specification of No. of receive end data (R2N 111_H) may be required. For details, refer to the following. ☞ (3)(c) in this section Some precautions must be taken for this buffer memory. For details, refer to the following. ☞ (3)(d) in this section ☞ (3)(e) in this section
$10C_H$ to $10F_H$	Receive end frame No.1 to 4	
110_H	Receive start/end frame elimination	Specify whether or not to remove the receive start frame and the receive end frame from the receive data before storing the data in the receive area. •0_H: Not remove from receive data •1_H: Remove from receive data •Setting range: 0_H, 1_H (Default: 1_H)
$1B5_H$	Receive frame index No. storage	The number of the receive start frame or receive end frame, which is identified in data reception, is stored. If no receive start or end frame is identified in data reception, 0_H is stored.

(b) Reception method

When a registration frame has been specified in Receive start frame No.1 to 4 (R2N 108H to 10BH) or Receive end frame No.1 to 4 (R2N 10CH to 10FH), data are received with the registration frame identified.

(c) No. of receive end data (R2N 111H) setting

Whether specification of No. of receive end data (R2N 111H) is required or not is determined by whether the receive start frame and receive end frame are specified or not.

Table 4.58 Need for setting of No. of receive end data (R2N 111H)

Receive start frame	Receive end frame	Need for specification of No. of receive end data (R2N 111H)
○	○	Specify a value to complete reception for the case of no receive end frame detection.
○	×	Required
×	○	Specify a value to complete reception for the case of no receive end frame detection.

○: Specified, × : Not specified

Remark

For receiving variable length data, specify a receive end frame and set 0 in No. of receive end data (R2N 111H).

(d) Timing of reception

1) Comparisons of receive start or end timing between using and not using the frame function

Table 4.59 Timing comparisons between using and not using the frame function

Receive start/end	Using the frame function	Not using the frame function
Receive start	•When a receive start frame is specified At a time of receiving the receive start frame from the external device •When no receive start frame is specified At a time of receiving any data from the external device	At a time of receiving any data
Receive end	•When the number of received data reaches the value specified in No. of receive end data (R2N 111H) •At a time of receiving a receive end frame •When a receive error occurred (e.g. receive timeout)[*1]	•When the number of received data reaches the value specified in No. of receive end data (R2N 111H) •When a receive error occurred (e.g. receive timeout)[*1]

[*1] If a receive error occurred, data received before the error occurrence will be stored in Receive data area just like the case where no receive error occurred.

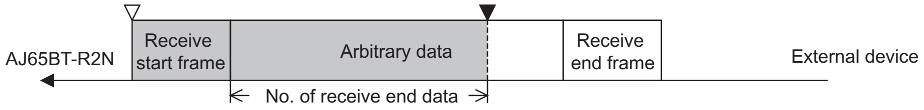
2) Timing at which Normal receive data read request signal (RXn2) or Error receive data read request signal (RXn3) turns ON according to the frame setting combination and the relation of the following values:

- 1: Value specified in No. of receive end data (R2N 111H)
- 2: No. of received data

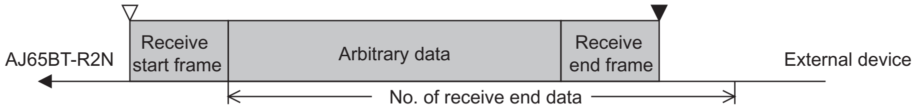
Table 4.60 Timing at which Normal receive data read request signal (RXn2) or Error receive data read request signal (RXn3) turns ON

<table>
<tr><th>Setting</th><th>Timing at which RXn2 or RXn3 turns ON</th></tr>
<tr><td>When receive start frame and receive end frame are set</td><td>

•When 1 < 2

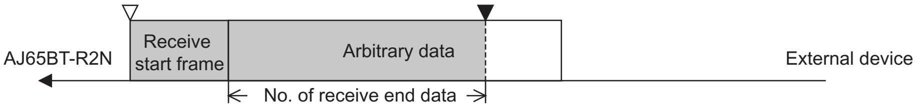


•When 1 ≧ 2, or 1 = 0

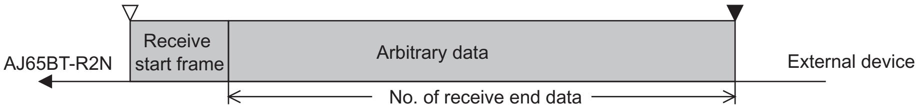


</td></tr>
<tr><td>When receive start frame only is set</td><td>

•When 1 < 2



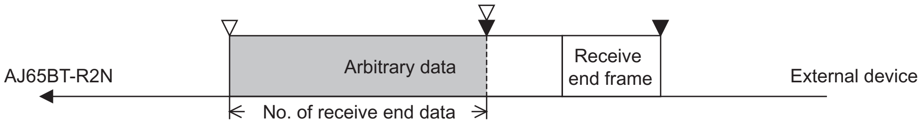
•When 1 ≧ 2



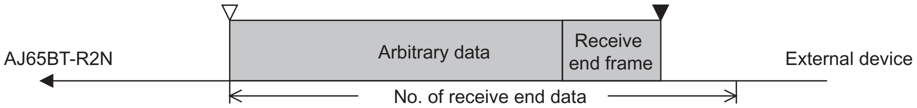
•When 1 = 0

</td></tr>
<tr><td>When receive end frame only is set</td><td>

•When 1 < 2



•When 1 ≧ 2, or 1 = 0



•When receive end frame only is received

</td></tr>
</table>

▽ : Receive start timing, ▼ : Timing at which reception is completed and RXn2 or RXn3 turns ON, ▨ : Data received

(e) Precautions on receive start frames and receive end frames

1) Specify a receive start frame and/or a receive end frame only in the following combinations 1 to 4, or 5 to 7.
A mixed setting of combinations 1 to 4 and 5 to 7 may result in abnormal data reception.

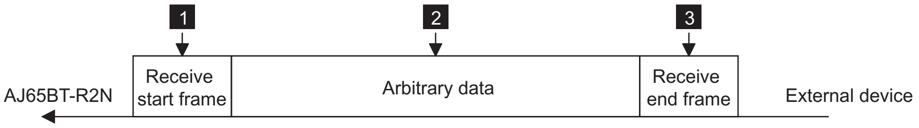


Figure 4.36 Receive data

- Combinations 1 to 4

Table 4.61 Combinations of receive start frame and receive end frame (Receive start frame specified)

Combination	Receive start frame 1	Arbitrary data 2	Receive end frame 3
1	○	○	○
2	○	○	—
3	○	—	○
4	○	—	—

○: Specified, × : Not specified

- Combinations 5 to 7

Table 4.62 Combinations of receive start frame and receive end frame (Receive start frame not specified)

Combination	Receive start frame 1	Arbitrary data 2	Receive end frame 3
5	—	○	○
6	—	○	—
7	—	—	○

○: Specified, × : Not specified

2) When a receive start frame is specified and no receive end frame is specified, set a number of receive data that does not include the receive start frame, in No. of receive end data (R2N 111_H).
If 0_H is specified in No. of receive end data (R2N 111_H), only the receive start frame will be received.

3) If a receive start frame has been specified, data received before receive start frame reception will not be received.

4) If a receive start frame has been specified, data after the receive end frame or data exceeding the No. of receive end data will not be received.

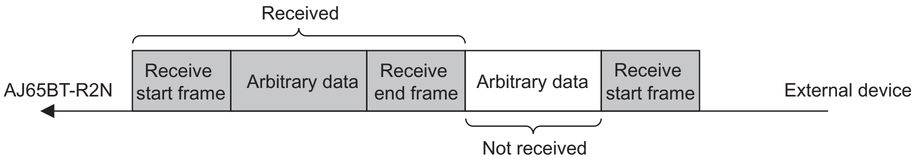


Figure 4.37 Data that are not received

5) Do not include the same data as the receive start frame or receive end frame in receive data.
   Doing so may cause the data to be incorrectly recognized as the frame.
6) When using the frame function, specify the size of the entire receive data including frame(s) in Receive area size specification ($\boxed{\text{R2N}}$ 3H).
7) When 0H is specified in Receive start/end frame elimination ($\boxed{\text{R2N}}$ 110H), a value in Receive data size specification area ($\boxed{\text{R2N}}$ 400H (at default)) is not equal to a value in No. of receive end data ($\boxed{\text{R2N}}$ 111H). The following relational expression is used.

   No. of receive data = No. of receive end data + (No. of received frame data)

(4) Default registration frames

The following send/receive data have been pre-registered as default registration frames.

These data cannot be changed.

To create any registration frame, use a user registration frame (☞ (5) in this section).

Table 4.63 Default registration frames

Frame No.		No. of bytes	Description		Remarks
HEX.	DEC.				
0H	0	—	Use prohibited		—
1H to FEH	1 to 254	1	Data that is the same as the frame No. (1H to FEH) Example: When 2H is specified, STX(02H) is sent/received.		—
FFH	255	—	Use prohibited		—
100H	256	1	NUL (00H)		—
101H	257	2	Special character (FFH + FFH)		—
102H	258	2	CR (0DH), LF (0AH)		—
103H	259	2	DLE (10H), STX (02H)		—
104H	260	2	DLE (10H), ETX (03H)		—
105H	261	2	NUL (00H), FEH		—
106H	262	3	NUL (00H), NUL (00H), FEH		—
107H	263	3	ETX (03H), special character (FFH + F1H)		—
108H	264	5	ETX (03H), special character (FFH + F1H), CR (0DH), LF (0AH)		—
109H to 12BH	265 to 299	—	Use prohibited		—
12CH	300	4	STX (02H), '0', '0', 'G'	2600 series (DENSEI-LAMBDA)	Start frame of In-zone ON command
12DH	301	5	STX (02H), '0', '0', 'S', ETX (03H)		In-zone OFF command
12EH	302	4	STX (02H), '0', '0', 'D'		Start frame of barcode data
12FH	303	4	STX (02H), '0', '0', 'E'		Start frame when barcode reader is faulty
130H	304	4	STX (02H), 'B', 'R', ETX (03H)	TLMS-3500RV (TOHKEN)	Frame at no read
131H	305	3	STX (02H), 'E', 'R'		Start frame in the case of an error
132H	306	4	ESC (1BH), 'A', '0', CR (0DH)		SYNC ON command
133H	307	4	ESC (1BH), 'A', '0', ','		Start frame of SYNC ON command at edge input
134H	308	4	ESC (1BH), 'A', '1', CR (0DH)		SYNC OFF command
135H	309	4	STX (02H), CAN (18H), CR (0DH), LF (0AH)	DS50AF (IDEC DATALOGIC)	Frame at no read
136H	310	4	STX (02H), BEL (18H), CR (0DH), LF (0AH)		Frame at error
137H	311	2	'*', CR (0DH)	V620 (OMRON)	End frame
138H	312	2	'RD'		Start frame of each command
139H	313	2	'WT'		
13AH	314	2	'AR'		
13BH	315	2	'AW'		
13CH	316	2	'PR'		
13DH	317	2	'PW'		
13EH	318	2	ÅeTS'		

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Table 4.63 Default registration frames (Continued)

Frame No.		No. of bytes	Description		Remarks
HEX.	1DEC.				
13F$_H$	319	4	'AA *', CR (0D$_H$)	V620 (OMRON)	Each command frame
140$_H$	320	4	'XZ *', CR (0D$_H$)		
141$_H$	321	3	Special character (FF$_H$ + FA$_H$), CR (0D$_H$)	ID/R/X (SUNX)	End frame
142$_H$ to 14C$_H$	322 to 332	—	Use prohibited		—
14D$_H$	333	2	'ST'	ID/R/X (SUNX)	Start frame of each command
14E$_H$	334	2	'WR'		
14F$_H$	335	2	'CT'		
150$_H$	336	2	'RD'		
151$_H$	337	2	'RA'		
152$_H$	338	2	'RP'		
153$_H$	339	2	'WA'		
154$_H$	340	2	'WP'		
155$_H$	341	2	'CL'		
156$_H$	342	2	'WI'		
157$_H$	343	2	'SP'		
158$_H$	344	5	'RD6A', CR (0D$_H$)		Each command frame
159$_H$	345	5	'RP5E', CR (0D$_H$)		
15A$_H$	346	5	'EQ6A', CR (0D$_H$)		
15B$_H$	347	5	'NC6F', CR (0D$_H$)		
15C$_H$	348	5	'RI9B', CR (0D$_H$)		
15D$_H$	349	5	'CP93', CR (0D$_H$)		
15E$_H$	350	5	'EQ96', CR (0D$_H$)		
15F$_H$	351	7	'SM0000', CR (0D$_H$)		
160$_H$	352	7	'SM0101', CR (0D$_H$)		
161$_H$	353	7	'SM0202', CR (0D$_H$)		
162$_H$ to 3E7$_H$	354 to 999	—	Use prohibited		—

(5) User registration frame

An arbitrary frame can be registered to the E^{2}PROM and used as a user registration frame.

(a) Setting

When E^{2}PROM function request signal (RYn7) is turned ON after setting of the following buffer memory, processing specified in E^{2}PROM function specification (R2N 1C0H) is performed.

For details of E^{2}PROM function request signal (RYn7), refer to the following.

☞ Section 3.7.2 (7) E2PROM function request signal (RYn7), E2PROM function complete signal (RXn7), and E2PROM function failed signal (RXn8)

Table 4.64 Setting for frame reception

<table>
<tr><th>R2N Address</th><th>Name</th><th>Description</th></tr>
<tr><td>1C0H</td><td>E²PROM function specification</td><td>Specify whether to register, read or delete a user registration frame to or from the E²PROM.
•1H: Register a user registration frame.
•2H: Read out a user registration frame.
•3H: Delete a user registration frame.
•Setting range: 0H to 4H (Default: 0H)
0H or 4H is used for registering settings of the AJ65BT-R2N to the E²PROM. (☞ Section 4.5.9)</td></tr>
<tr><td>1C1H</td><td>User registration frame No.</td><td>Specify a frame No. (3E8H to 4AFH) of the user registration frame to be registered, read out, or deleted.
•Setting range: 0H, 3E8H to 4AFH (Default: 0H)</td></tr>
<tr><td>1C7H</td><td>No. of user registration frame bytes</td><td>Specify the number of bytes of the user registration frame to be registered or read out.
•Setting range: 0H, 1H to 80H (Default: 0H)</td></tr>
<tr><td>1C8H to 1EFH</td><td>User registration frame</td><td>Specify characters to register them as a user registration frame. Or, characters read out from a user registration frame are stored.,
Characters are specified or stored in order starting from the lower byte of the lowest address.
Example: When registering ETX (03H) + FFH + F1H + CR (0DH) + LF (0AH)
<table>
<tr><th>Address</th><th colspan="2">Buffer memory</th></tr>
<tr><td>R2N 1C7H</td><td colspan="2">5</td></tr>
<tr><td>R2N 1C8H</td><td>FFH</td><td>ETX(03H)</td></tr>
<tr><td>R2N 1C9H</td><td>CR(0DH)</td><td>F1H</td></tr>
<tr><td>R2N 1CAH</td><td>00H</td><td>LF(0AH)</td></tr>
</table>
For registration of normal characters (☞ (5)(b) in this section), specify 00H to FEH.
For registration of special characters (☞ (5)(c) in this section), specify FFH + (character code, etc.)
•Setting range: 0H to FFH (Default: 0H)</td></tr>
</table>

(b) Normal character

Normal characters are the same data as characters (00H to FEH (00 to 254)).

Example: 2H is STX (2H).

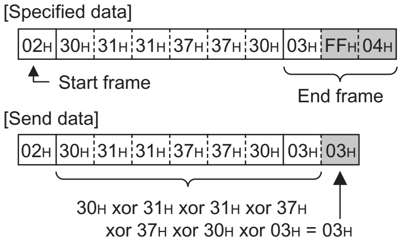
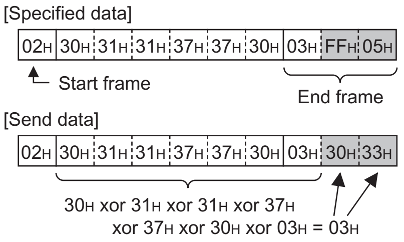
(c) Special character

A special character is sent or received by specifying character codes and necessary data following FFH.

Point

Sum check code or special characters for horizontal parity code only cannot be specified in the user registration frames. For specifying sum check codes or horizontal parity codes, add an arbitrary data. If no arbitrary data is added, a registration frame specification error (BB8BH) occurs.

Table 4.65 Special character

Character code	Function	Applicability					
		Send				Receive	
		Frame transmission (Send-frame-1 area)		Frame transmission (Send-frame-2 area)	Monitoring-based transmission	Frame reception	
		Start	End			Start	End
00H	When sending, 00H (NUL) is sent. When receiving, the part where 00H is specified (1 byte) is not checked. It is received as normal data. •Specification method: FFH + 00H	○	○	○	○	○	○
01H to 03H	Use prohibited	—					
04H	A horizontal parity code calculated from the send/receive data excluding the start frame is sent/received as a 1-byte binary code. •Specification method: FFH + 04H Example: When sending the following data 	×	○	×	×	×	○
05H	A horizontal parity code calculated from the send/receive data excluding the start frame is sent/received as a 2-byte ASCII code. •Specification method: FFH + 05H Example: When sending the following data 	×	○	×	×	×	○

○: Applicable, ×: N/A

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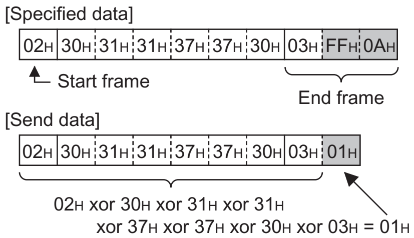
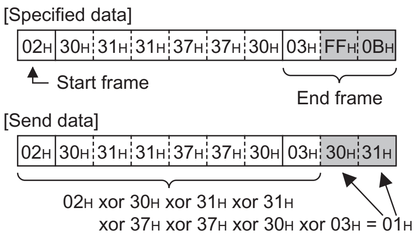
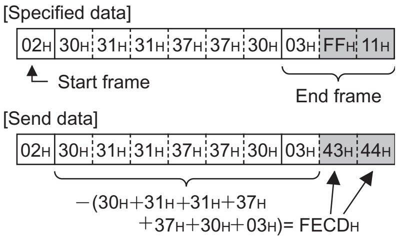
Table 4.65 Special character (Continued)

Character code	Function	Applicability					
		Send				Receive	
		Frame transmission (Send-frame-1 area)		Frame transmission (Send-frame-2 area)	Monitoring-based transmission	Frame reception	
		Start	End			Start	End
0AH	A horizontal parity code calculated from the send/receive data including each frame is sent/received as a 1-byte binary code. •Specification method: FFH + 0AH Example: When sending the following data 	×	○	×	×	×	○
0BH	A horizontal parity code calculated from the send/receive data including each frame is sent/received as a 2-byte ASCII code. •Specification method: FFH + 0BH Example: When sending the following data 	×	○	×	×	×	○
11H	A sum check code, which is calculated by excluding the start frame from the send/receive data and taking its 2's complement, is sent/received as a 2-byte ASCII code. •Specification method: FFH + 11H Example: When sending the following data 	×	○	×	×	×	○

○: Applicable, ×: N/A

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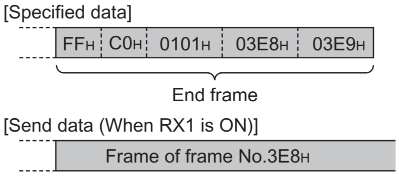
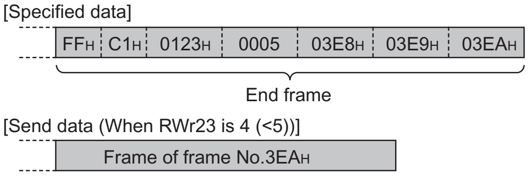
Table 4.65 Special character (Continued)

Character code	Function	Applicability					
		Send				Receive	
		Frame transmission (Send-frame-1 area)		Frame transmission (Send-frame-2 area)	Monitoring-based transmission	Frame reception	
		Start	End			Start	End
C0$_\mathrm{H}$	A specified frame is sent depending on the ON/OFF status of the remote input (RX) or remote output (RY). •Specification method: FF$_\mathrm{H}$ + C0$_\mathrm{H}$ + (RX/RY specification[*1]) + (Registration frame No. at ON) + (Registration frame No. at OFF) Example: When sending data differently depending on the ON/OFF status of RX1  	○	○	○	○	×	×
C1$_\mathrm{H}$	According to the result of comparison between the remote register (RW) and a comparison value, a specified frame is sent. •Specification method: FF$_\mathrm{H}$ + C1$_\mathrm{H}$ + (RW specification [*2]) + (Comparison value) + (Registration frame No. (RW = Comparison value)) + (Registration frame No. (RW>Comparison value)) + (Registration frame No. (RW<Comparison value)) Example: When sending data comparing RWr23 with 5  	○	○	○	○	×	×
C2$_\mathrm{H}$ to CF$_\mathrm{H}$	Use prohibited	—					

○: Applicable, × : N/A

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Table 4.65 Special character (Continued)

Character code	Function	Applicability					
		Send				Receive	
		Frame transmission (Send-frame-1 area)		Frame transmission (Send-frame-2 area)	Monitoring-based transmission	Frame reception	
		Start	End			Start	End
D0$_{H}$	A frame or send area data are sent depending on the remote register (RW) value. To send a default registration frame (☞ (4) in this section), specify 1$_{H}$ to 161$_{H}$ in the remote register (RW). To send a user registration frame (☞ (5) in this section), specify 3E8$_{H}$ to 4AF$_{H}$ in the remote register (RW). To send data stored in the send area (R2N 200$_{H}$(at default)), specify 8000$_{H}$ in the remote register (RW). •Specification method: FF$_{H}$ + D0$_{H}$ + (RW specification [*2]) Example: When sending a registration frame of RWr21 [Specified data] FF$_{H}$ | D0$_{H}$ | 0121$_{H}$ End frame [Send data (When RWr21 is 102$_{H}$)] 0D$_{H}$ | 0A$_{H}$	○	○	○	○	×	×
D1$_{H}$ to D7$_{H}$	Use prohibited	—					
D8$_{H}$	When sending, a remote register (RW) value is regarded as an unsigned decimal number (0 to 65535) and sent as a 5-digit ASCII code. If a remote register (RW) value has four digits or less, (Space (20$_{H}$)) + (RW value) is sent. •Specification method: FF$_{H}$ + D8$_{H}$ + (RW specification [*2]) Example: When sending a RWr22 value [Specified data] FF$_{H}$ | D8$_{H}$ | 0022$_{H}$ End frame [Send data (When RWw22 is 1234)] 20$_{H}$ | 31$_{H}$ | 32$_{H}$ | 33$_{H}$ | 34$_{H}$	○	○	○	○	×	×

○: Applicable, × : N/A

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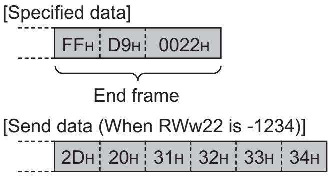
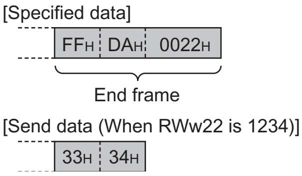
Table 4.65 Special character (Continued)

Character code	Function	Applicability					
		Send				Receive	
		Frame transmission (Send-frame-1 area)		Frame transmission (Send-frame-2 area)	Monitoring-based transmission	Frame reception	
		Start	End			Start	End
D9H	When sending, a remote register (RW) value is regarded as a signed decimal number (-32768 to 32767) and sent as a 6-digit ASCII code. If a remote register (RW) value has five digits or less, (Space (20H)) + (RW value) is sent. If the value is negative and has four digits or less, (- (2DH)) + (Space (20H)) + (RW value) is sent. •Specification method: FFH + D9H + (RW specification [*2]) Example: When sending a RWr22 value 	○	○	○	○	×	×
DAH	When sending, a remote register (RW) value is regarded as an unsigned decimal number (0 to 65535) and the last two digits are sent as an ASCII code. If a remote register (RW) value is one digit, (0(30H)) + (RW value) is sent. •Specification method: FFH + DAH + (RW specification [*2]) Example: When sending a RWr22 value 	○	○	○	○	×	×

○: Applicable, ×: N/A

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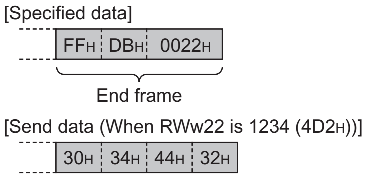
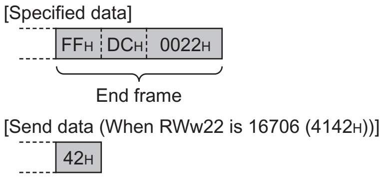
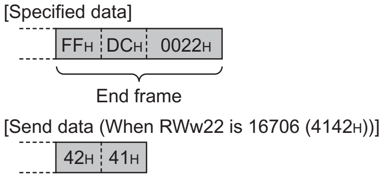
Table 4.65 Special character (Continued)

Character code	Function	Applicability					
		Send				Receive	
		Frame transmission (Send-frame-1 area)		Frame transmission (Send-frame-2 area)	Monitoring-based transmission	Frame reception	
		Start	End			Start	End
DBH	When sending, a remote register (RW) value is regarded as a hexadecimal number (0000H to FFFFH) and sent as a 4-digit ASCII code. If a remote register (RW) value has three digits or less, (0(30H)) + (RW value) is sent. •Specification method: FFH + DBH + (RW specification *2) Example: When sending a RWr22 value 	○	○	○	○	×	×
DCH	The lower one byte of the remote register (RW) is sent. •Specification method: FFH + DCH + (RW specification *2) Example: When sending a RWr22 value 	○	○	○	○	×	×
DDH	A remote register (RW) value is sent in order, the lower one byte first and then the upper one byte. •Specification method: FFH + DDH + (RW specification *2) Example: When sending a RWr22 value 	○	○	○	○	×	×
DEH to E4H	Use prohibited	—					

○: Applicable, × : N/A

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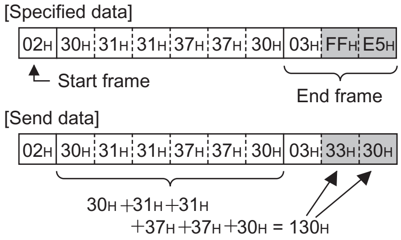
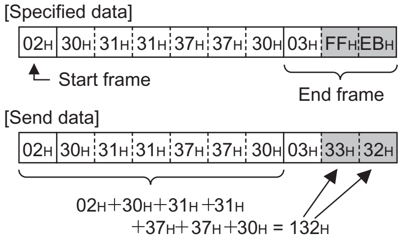
Table 4.65 Special character (Continued)

Character code	Function	Applicability					
		Send				Receive	
		Frame transmission (Send-frame-1 area)		Frame transmission (Send-frame-2 area)	Monitoring-based transmission	Frame reception	
		Start	End			Start	End
E5H	A sum check code calculated from the send/receive data excluding the start and end frames is sent/received as a 2-byte ASCII code. •Specification method: FFH + E5H Example: When sending the following data 	×	○	×	×	×	○
E6H to EAH	Use prohibited	—					
EBH	A sum check code calculated from the send/receive data excluding the end frame is sent/received as a 2-byte ASCII code. •Specification method: FFH + EBH Example: When sending the following data 	×	○	×	×	×	○
ECH, EDH	Use prohibited	—					

○: Applicable, × : N/A

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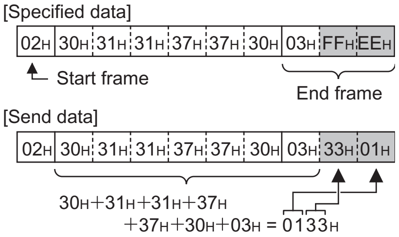
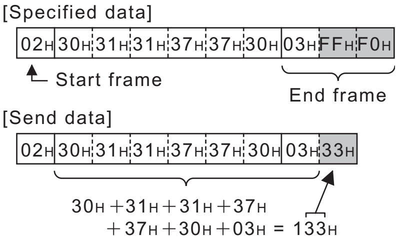
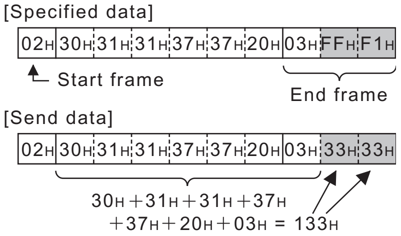
Table 4.65 Special character (Continued)

Character code	Function	Applicability					
		Send				Receive	
		Frame transmission (Send-frame-1 area)		Frame transmission (Send-frame-2 area)	Monitoring-based transmission	Frame reception	
		Start	End			Start	End
EEH	The lower two bytes of a sum check code, which is calculated from send/receive data excluding the start frame, are sent or received in order from the lowest byte . •Specification method: FFH + EEH Example: When sending the following data  	×	○	×	×	×	○
EFH	Use prohibited	—					
F0H	The lower one byte of a sum check code, which is calculated from the send/receive data excluding the start frame, is sent or received. •Specification method: FFH + F0H Example: When sending the following data  	×	○	×	×	×	○
F1H	The lower one byte of a sum check code, which is calculated from the send/receive data excluding the start frame, is sent or received as a 2-byte ASCII code. •Specification method: FFH + F1H Example: When sending the following data  	×	○	×	×	×	○

○: Applicable, ×: N/A

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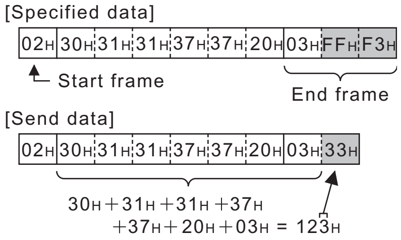
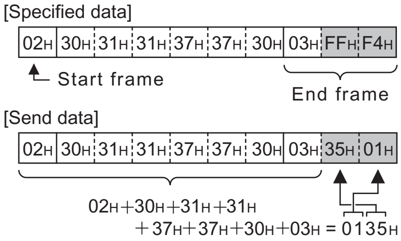
Table 4.65 Special character (Continued)

Character code	Function	Applicability					
		Send				Receive	
		Frame transmission (Send-frame-1 area)		Frame transmission (Send-frame-2 area)	Monitoring-based transmission	Frame reception	
		Start	End			Start	End
F2H	Use prohibited	—					
F3H	The lower 4 bits of a sum check code, which is calculated from the send/receive data excluding the start frame, are sent or received as a 1-byte ASCII code. •Specification method: FFH + F3H Example: When sending the following data 	×	○	×	×	×	○
F4H	The lowest 2 bytes of a sum check code, which is calculated from the send/receive data including each frame, are sent or received in order from the lowest byte. •Specification method: FFH + F4H Example: When sending the following data 	×	○	×	×	×	○
F5H	Use prohibited	—					

○: Applicable, ×: N/A

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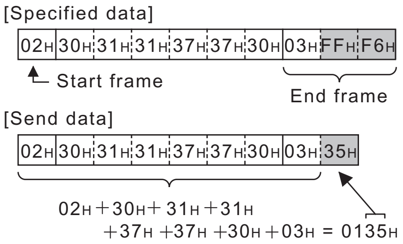
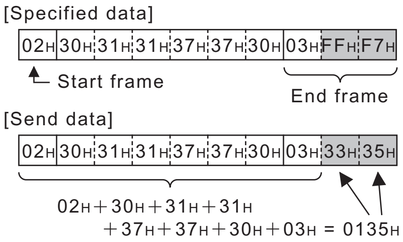
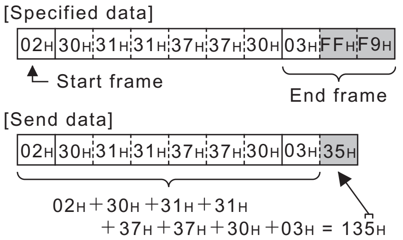
Table 4.65 Special character (Continued)

<table>
<tr><th rowspan="4">Character code</th><th rowspan="4">Function</th><th colspan="6">Applicability</th></tr>
<tr><th colspan="4">Send</th><th colspan="2">Receive</th></tr>
<tr><th colspan="2">Frame transmission (Send-frame-1 area)</th><th rowspan="2">Frame transmission (Send-frame-2 area)</th><th rowspan="2">Monitoring-based transmission</th><th colspan="2">Frame reception</th></tr>
<tr><th>Start</th><th>End</th><th>Start</th><th>End</th></tr>
<tr><td>F6H</td><td>The lower one byte of a sum check code, which is calculated from the send/receive data including each frame, is sent or received.
•Specification method: FFH + F6H
Example: When sending the following data
 </td><td>×</td><td>○</td><td>×</td><td>×</td><td>×</td><td>○</td></tr>
<tr><td>F7H</td><td>The lower one byte of a sum check code, which is calculated from the send/receive data including each frame, is sent or received as a 2-byte ASCII code.
•Specification method: FFH + F7H
Example: When sending the following data
 </td><td>×</td><td>○</td><td>×</td><td>×</td><td>×</td><td>○</td></tr>
<tr><td>F8H</td><td>Use prohibited</td><td colspan="6">—</td></tr>
<tr><td>F9H</td><td>The lowest 4 bits of a sum check code, which is calculated from the send/receive data including each frame, are sent or received as a 1-byte ASCII code.
•Specification method: FFH + F9H
Example: When sending the following data
 </td><td>×</td><td>○</td><td>×</td><td>×</td><td>×</td><td>○</td></tr>
</table>

○: Applicable, ×: N/A

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Table 4.65 Special character (Continued)

Character code	Function	Applicability					
		Send				Receive	
		Frame transmission (Send-frame-1 area)		Frame transmission (Send-frame-2 area)	Monitoring-based transmission	Frame reception	
		Start	End			Start	End
FAH	A 2's-complement sum check code, which is calculated from the send/receive data including each frame, is sent or received as a 2-byte ASCII code. •Specification method: FFH + FAH Example: When sending the following data [Specified data] 02H 30H 31H 31H 37H 37H 30H 03H FFH FAH Start frame (02H) / End frame (03H FFH FAH) [Send data] 02H 30H 31H 31H 37H 37H 30H 03H 43H 42H −(02H +30H +31H +31H +37H +37H +30H + 03H)= FECBH	×	○	×	×	×	○
FBH to FEH	Use prohibited	—					
FFH	FFH is sent or received. •Specification method: FFH + FFH	○	○	○	○	○	○

○: Applicable, × : N/A

* 1 RX/RY is specified as follows:

b15 to b13	b12	b11 to b0
0	1)	device No.

1) Device type
0: RY
1: RX

Figure 4.38 RX/RY specification

* 2 RW is specified as follows:

b15 to b13	b12	b11 to b0
0	1)	device No.

1) Device type
0: RWw
1: RWr

Figure 4.39 RW specification

4.5.2 Monitoring-based transmission function

This function allows data specified in the transmission table to be sent when the transmission condition specified by the user is met.

(1) Monitoring-based transmission function overview

Change of the monitoring target (device or status) can be specified as a transmission condition. (Transmission trigger)

(a) Device monitoring

The AJ65BT-R2N monitors the remote I/O (RX, RY) or remote register (RW) of the master module on the CC-Link system, and sends data when a transmission trigger occurs.

(b) Status monitoring

The AJ65BT-R2N monitors the status of the master module on the CC-Link system or that of the programmable controller CPU on the master-module-mounted station, and sends data when a transmission trigger occurs.

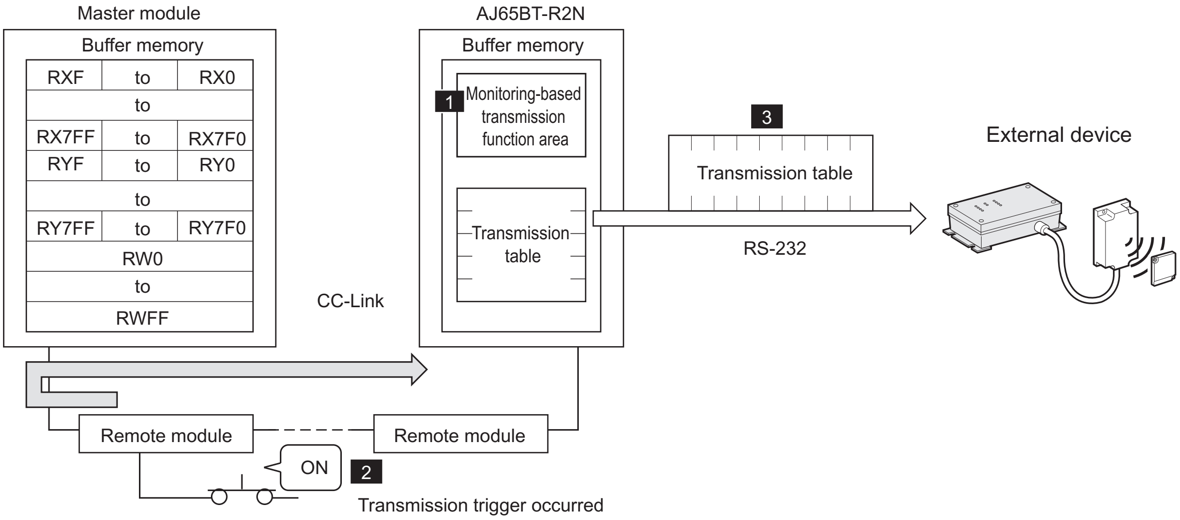


Figure 4.40 Monitoring-based transmission function overview

Table 4.66 Monitoring-based transmission function overview

No.	Processing
1	A transmission condition is set.
2	The monitoring target device or status value changes, and a transmission trigger occurs.
3	The AJ65BT-R2N sends data to the external device, according to the contents of the transmission table.

(2) Send processing

The settings of the buffer memory used for the monitoring-based transmission function are explained.

(a) Buffer memory used for the monitoring-based transmission function

Configure the monitoring-based transmission function settings in the following buffer memory.

Also, in Transmission table specification (R2N 122H to 185H), specify a registration frame(s) to be sent.

☞Section 4.5.1 (2) Frame transmission (Send-frame-2 area)

Table 4.67 Buffer memory used for the monitoring-based transmission function

R2N Address	Name		Description
70H	Monitoring interval specification		Specify a monitoring interval used when the AJ65BT-R2N monitors the device or status specified for transmission trigger detection. If no monitoring-based transmission is to be performed, specify 0. •Setting range: 0, 1 to 32767 (Unit: ×100ms, Default: 0)
71H	No. of monitoring settings		Specify the number of settings that are set in Monitoring setting - 1 to - 64 (R2N 78H to F7H). If no monitoring-based transmission is to be performed, specify 0. •Setting range: 0, 1 to 64 (Default: 0)
78H	Monitoring setting - 1	Monitoring target	Specify a device or status for transmission trigger detection. •When specifying a device, refer to (2)(b) in this section. •When specifying a status, refer to (2)(c) in this section.
79H		Send data specification	Specify which data are to be sent by the AJ65BT-R2N when a transmission trigger occurs. •Refer to (2)(d) in this section.
7AH to F7H	Monitoring setting - 2 to - 64		Same as Monitoring setting - 1

☒Point

Initialize the AJ65BT-R2N if a set value in R2N 0H to 101H and 103H to 112H is changed.

☞ Section 4.4 AJ65BT-R2N Initialization Function

(b) Monitoring target (When specifying a device)

Set a device used for transmission trigger detection.

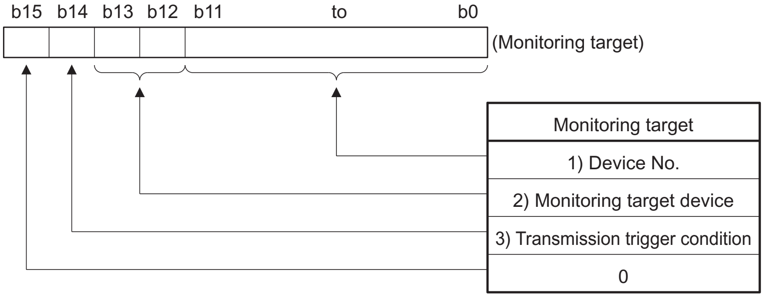


Figure 4.41 Monitoring target (When specifying a device)

1) Device No.

Specify the device No. of the monitoring target device.

(Example)

When specifying RX5 of the first remote module: 5H

When specifying RX5 (RX25) of the second remote module: 25H

Master station address

		b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
1st station	E0H	RXF	RXE	RXD	RXC	RXB	RXA	RX9	RX8	RX7	RX6	RX5	RX4	RX3	RX2	RX1	RX0
	E1H	RX1F	RX1E	RX1D	RX1C	RX1B	RX1A	RX19	RX18	RX17	RX16	RX15	RX14	RX13	RX12	RX11	RX10
2nd station	E2H	RX2F	RX2E	RX2D	RX2C	RX2B	RX2A	RX29	RX28	RX27	RX26	RX25	RX24	RX23	RX22	RX21	RX20
	E3H	RX3F	RX3E	RX3D	RX3C	RX3B	RX3A	RX39	RX38	RX37	RX36	RX35	RX34	RX33	RX32	RX31	RX30

Figure 4.42 Device No.

2) Monitoring target device

Specify a monitoring target device.

Table 4.68 Monitoring target device

Bit position		Monitoring target device
b13	b12	
0	0	RY
0	1	RX
1	0	RWw
1	1	RWr

3) Transmission trigger condition

Specify a condition for a transmission trigger.

Table 4.69 Transmission trigger condition

Monitoring target device	Transmission trigger condition setting		Transmission trigger timing
	b14=0	b14=1	
RX, RY	Rising edge detection	Falling edge detection	When the AJ65BT-R2N detects a change at the rising/falling edge
RWw, RWr	(Status of b14 is invalid.)		When the specified remote register (RW) value is other than "0"

(c) Monitoring target (When specifying a status)
Set a status used for transmission trigger detection.

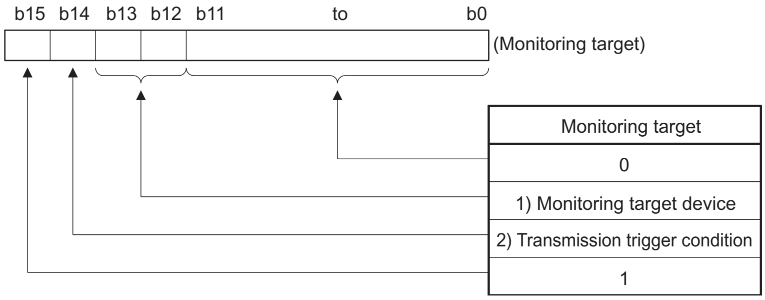


Figure 4.43 Monitoring target (When specifying a status)

1) Monitoring target status
Specify a monitoring target status.

Table 4.70 Monitoring target status

Bit position		Monitoring target status
b13	b12	
0	0	(Setting prohibited)
0	1	CC-Link data link status
1	0	Operating status of programmable controller CPU
1	1	Programmable controller CPU status

2) Transmission trigger condition
Specify a condition for a transmission trigger.

Table 4.71 Transmission trigger condition

Monitoring target status	Transmission trigger condition setting		Transmission trigger timing
	b14=0	b14=1	
CC-Link data link status	Data link stopped	Data link running	When the AJ65BT-R2N detects a change of each status
Operating status of programmable controller CPU [*1]	RUN	STOP	
Programmable controller CPU status	Abnormal [*2]	Normal	

[*1] When parameters have been set with GX Developer, GX Works2, GX Works3, or the RLPA instruction, RLPASET instruction, RUN/STOP of the programmable controller CPU on the master station is a condition for trigger occurrence.
When parameters have been set by a sequence program, ON/OFF of Refresh instruction (Yn0) of the master module is a condition for trigger occurrence.
ON: Operating status of programmable controller CPU: RUN
OFF: Operating status of programmable controller CPU: STOP

[*2] A stop error in the programmable controller CPU is a condition for trigger occurrence.
For details, refer to the user's manual for the programmable controller CPU used.

(d) Send data specification

Data to be sent in the event of a transmission trigger are specified with the transmission table start No. and No. of transmission tables.

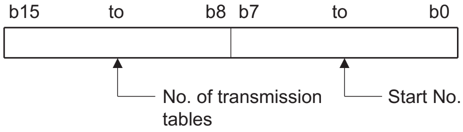


Figure 4.44 Send data specification

1) Start No.
   Specify the transmission table start No. within the range from 1 to 100.
2) No. of transmission tables
   Specify the number of transmission tables within the range from 1 to 100.

(Example)

When a transmission trigger occurs, data specified with transmission tables No.2 to No.4 are sent as shown below.

In this case, in Send data specification (R2N 79H), "0302H" is set.

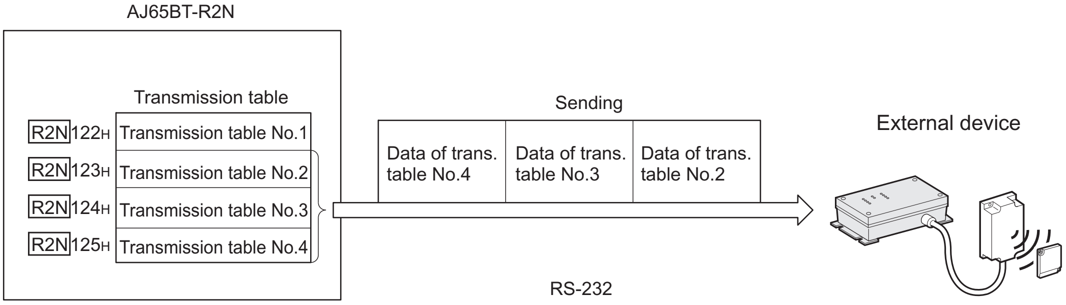


Figure 4.45 Send data setting example

(3) Precautions for using the monitoring-based transmission function

(a) Device or status monitoring for transmission trigger detection is performed at intervals set in Monitoring interval specification (R2N 70H) of the buffer memory.
The ON/OFF state, value or status causing a transmission trigger must be held for the length of the time set in Monitoring interval specification (R2N 70H) or longer (Set time＋100ms or more).
If it is not held for the length of the time set in Monitoring interval specification (R2N 70H) or longer, the AJ65BT-R2N may not be able to detect a transmission trigger.

(b) When a monitoring-based transmission and any other transmission (nonprocedural or frame transmission) are generated concurrently, the AJ65BT-R2N sends data in order of the occurrence of the send processing.

(c) If two or more transmission triggers occur at the same time, data are sent in order of transmission trigger detection.

4.5.3 Send cancel function

The send cancel function cancels the send processing which has already been requested to the AJ65BT-R2N from the master module.

(1) Processing method

Turning ON Send cancel request signal (RYn1) after turn-ON of Send request signal (RYn0) stops data transmission to the external device.
For Send cancel request signal (RYn1), refer to the following.

☞Section 3.7.2 (2) Send cancel request signal (RYn1)

(2) Processing procedures

The following shows an example of using the buffer memory auto-refresh function.

(a) Processing flow

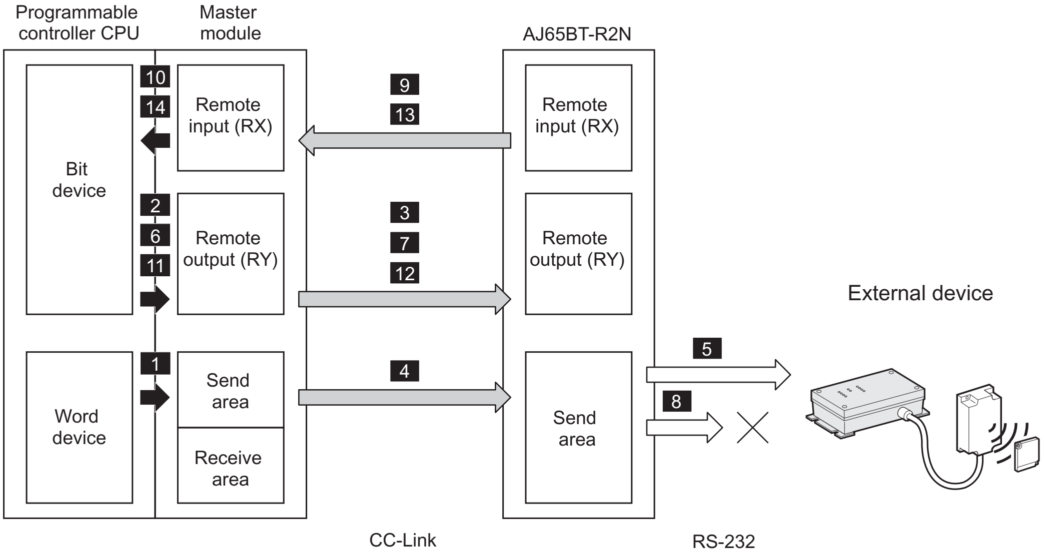


Figure 4.46 Canceling transmission when using the buffer memory auto-refresh function

(b) Timing chart

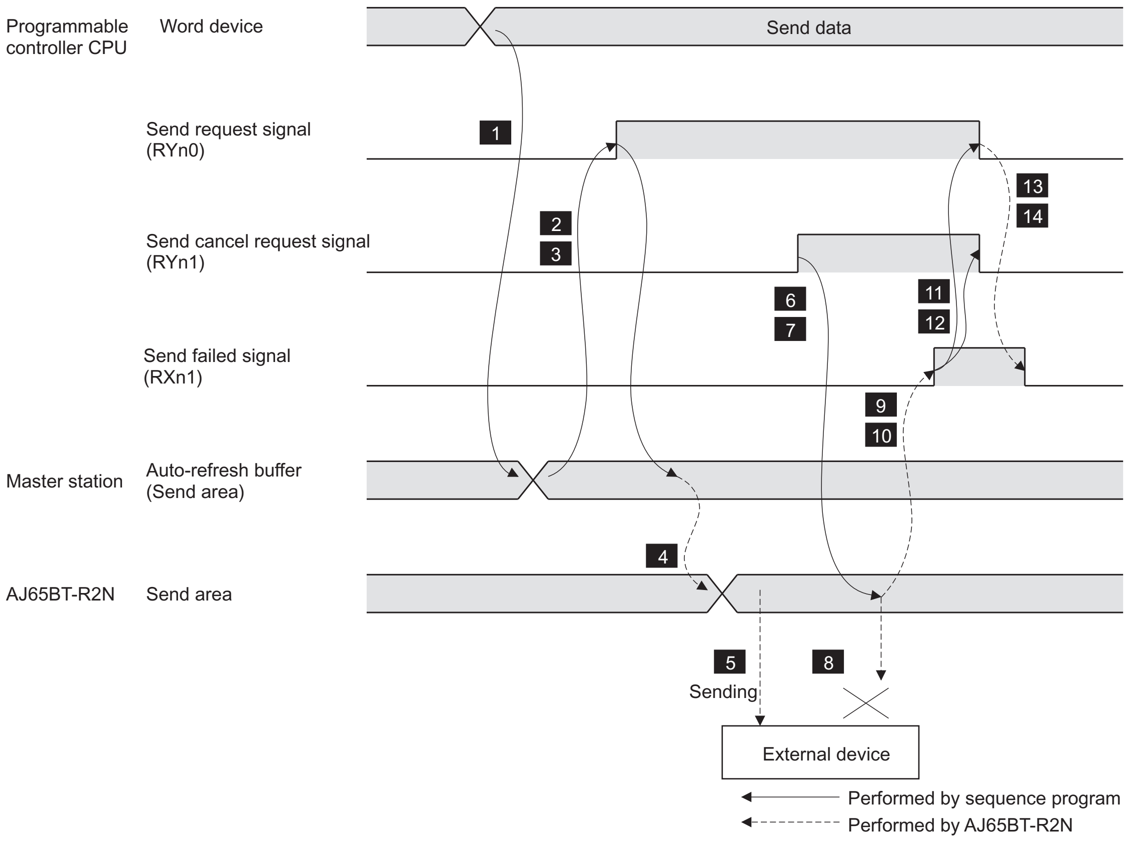


Figure 4.47 Canceling transmission when using the buffer memory auto-refresh function

(c) Processing procedures

Table 4.72 Send cancel procedures when using the buffer memory auto-refresh function

No.	Processing
1	With the RITO instruction, the send data are written from word devices of the programmable controller CPU to the Send area 2) of the master module.
2, 3	Send request signal (RYn0) is turned ON.
4	The send data are written from the send area of the master module to the send area of the AJ65BT-R2N.
5	The send data are sent from the send area of the AJ65BT-R2N to the external device.
6, 7	Send cancel request signal (RYn1) is turned ON.
8	Transmission from the send area of the AJ65BT-R2N to the external device is stopped.
9, 10	When the transmission is stopped, Send failed signal (RXn1) turns ON.
11, 12	Send request signal (RYn0) and Send cancel request signal (RYn1) are turned OFF.
13, 14	Send failed signal (RXn1) turns OFF.

Remark

If the programmable controller CPU does not support dedicated instructions, the FROM/TO instruction can be used for communication.
For a sample program using the FROM/TO instruction, refer to the following.

☞CHAPTER 8 PROGRAMMING WHEN USING FROM/TO INSTRUCTION IN ACPU/QCPU (A MODE)

☒Point

(1) Transmissions generated by the monitoring-based transmission function cannot be canceled with the send cancel function.
(2) When resending data whose transmission was canceled with the send cancel function, perform the send processing again.

(3) Precautions

(a) When Send cancel request signal (RYn1) is turned ON, Send complete signal (RXn0) may turn ON.

(b) Create an interlock circuit as shown below so that Send cancel request signal (RYn1) will not turn ON unless a send request is made.
(Example)
Interlock circuit by which Send cancel request signal (RYn1) does not turn ON unless a send request is made

Table 4.73 Devices used in the interlock circuit example

Device No.	Signal name	Device No.	Signal name
RXn0	Send complete signal	RYn0	Send request signal
RXn1	Send failed signal	RYn1	Send cancel request signal

Figure 4.48 Interlock circuit example

4.5.4 Forced receive completion function

The forced receive completion function allows forced completion of data reception from the external device to read the received data, when the data reception is not completed.
This function is used in the following cases:

- Data as many as the No. of receive end data cannot be received.
- The start or end frame cannot be identified in the data received.

(1) Processing method

When Forced receive completion request signal (RYn3) is turned ON, data reception from the external device is forcibly terminated.
For Forced receive completion request signal (RYn3), refer to the following.

☞Section 3.7.2 (4) Forced receive completion request signal (RYn3)

(2) Processing procedures

The following shows an example of using the buffer memory auto-refresh function.

(a) Processing flow

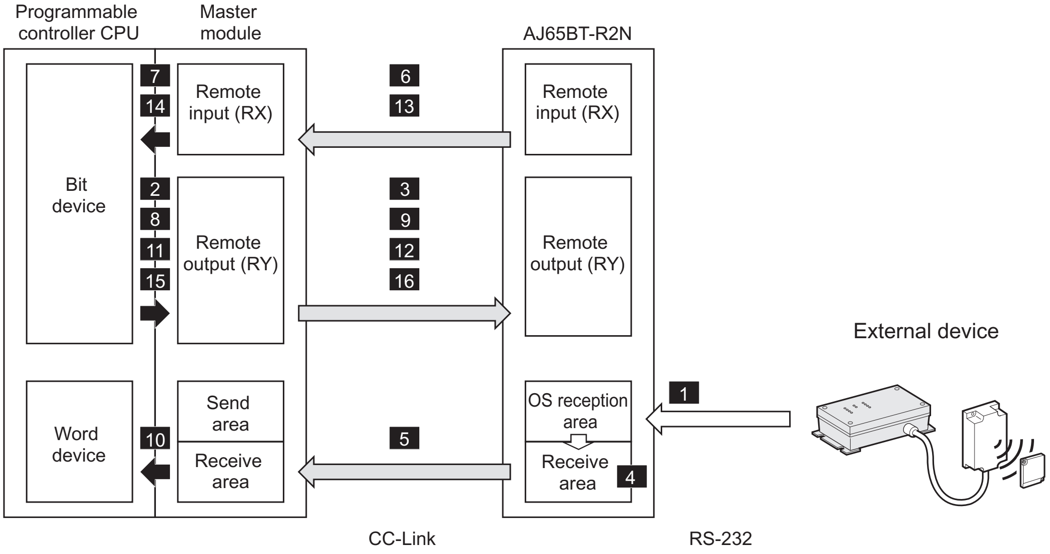


Figure 4.49 Forced receive completion when using the buffer memory auto-refresh function

(b) Timing chart

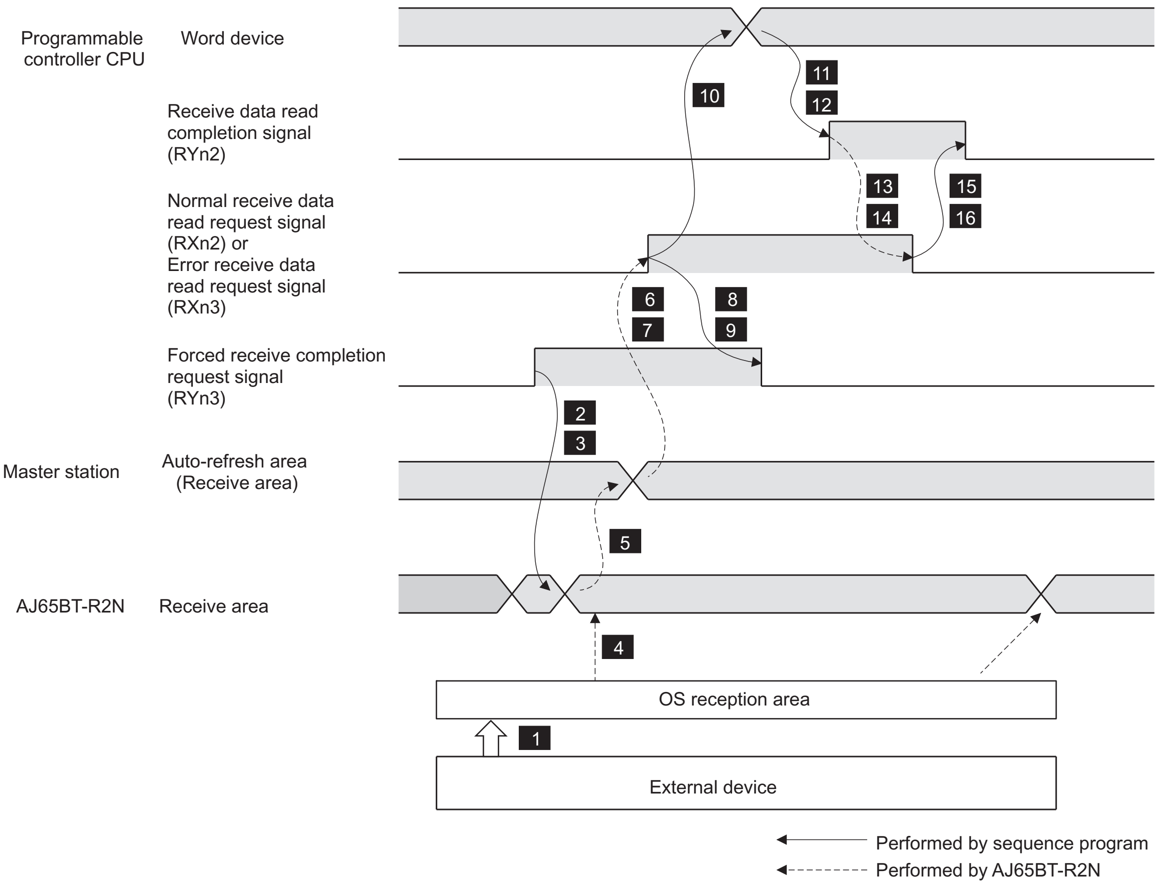


Figure 4.50 Forced receive completion when using the buffer memory auto-refresh function

(c) Processing procedures

Table 4.74 Forced receive completion procedures when using the buffer memory auto-refresh function

No.	Processing
1	Data received from the external device are stored in the OS reception area.
2, 3	Forced receive completion request signal (RYn3) is turned ON.
4	The data stored in the OS reception area are written to the receive area.
5	The receive data are written from the receive area of the AJ65BT-R2N to the receive area of the master module.
6, 7	When reception is normally completed, Normal receive data read request signal (RXn2) turns ON. When failed, Error receive data read request signal (RXn3) turns ON.
8, 9	Forced receive completion request signal (RYn3) is turned OFF.
10	With the RIRD instruction, the receive data are read from the receive area of the master module to the programmable controller CPU devices.
11, 12	Receive data read completion signal (RYn2) is turned ON.
13, 14	Normal receive data read request signal (RXn2) or Error receive data read request signal (RXn3) turns OFF.
15, 16	Receive data read completion signal (RYn2) is turned OFF.

☒Point

(1) Forced receive completion is enabled only when no receive start frame No. is specified.
If any receive start frame No. is specified, Forced receive completion request signal (RYn3) is ignored.

(2) If data exceeding the receive area size are stored in the OS reception area when forced receive completion is activated, data as much as the receive area size are stored in the receive area and the reception is terminated.

(3) Precautions for using the forced receive completion function

If Forced receive completion request signal (RYn3) is turned ON with Normal receive data read request signal (RXn2) or Error receive data read request signal (RYn3) set to ON, an error will occur.
To prevent this, create an interlock circuit as shown in the following example so that Forced receive completion request signal does not turn ON unless reading of received data is requested.
(Example)
Interlock circuit by which Forced receive completion request signal (RYn3) does not turn ON unless reading of received data is requested

Table 4.75 Devices used in the interlock circuit example

Device No.	Signal name	Device No.	Signal name
RXn2	Normal receive data read request signal	RYn3	Forced receive completion request signal
RXn3	Error receive data read request signal	—	

Figure 4.51 Interlock circuit example

4.5.5 Flow control function

The flow control function discontinues or restarts data transmission depending on the status of the OS reception area of the AJ65BT-R2N or a request from the external device.

Discontinuation or restart is notified by the following control methods.

Table 4.76 Flow control

Name	Description	Reference section
DTR/DSR (ER/DR) control	The AJ65BT-R2N informs the external device with the DTR (ER) signal of whether it can receive data or not, and checks whether the external device can receive data or not with the DSR (DR) signal.	(1) in this section
DC code control	The AJ65BT-R2N informs the external device of whether it can receive data or not by sending DC1 or DC3, and confirms whether the external device can receive data or not by receiving DC1 or DC3.	(2) in this section

(1) DTR/DSR (ER/DR) control

(a) DTR (ER) control
When the size of free OS reception area space is reduced to 64 bytes or less, the AJ65BT-R2N turns OFF the DTR (ER) signal to stop transmission from the external device to the AJ65BT-R2N.
After reading of data received from the programmable controller CPU, when the size of free OS reception area space is increased to 263 bytes or more, the AJ65BT-R2N turns ON the DTR (ER) signal to restart transmission from the external device to the AJ65BT-R2N.

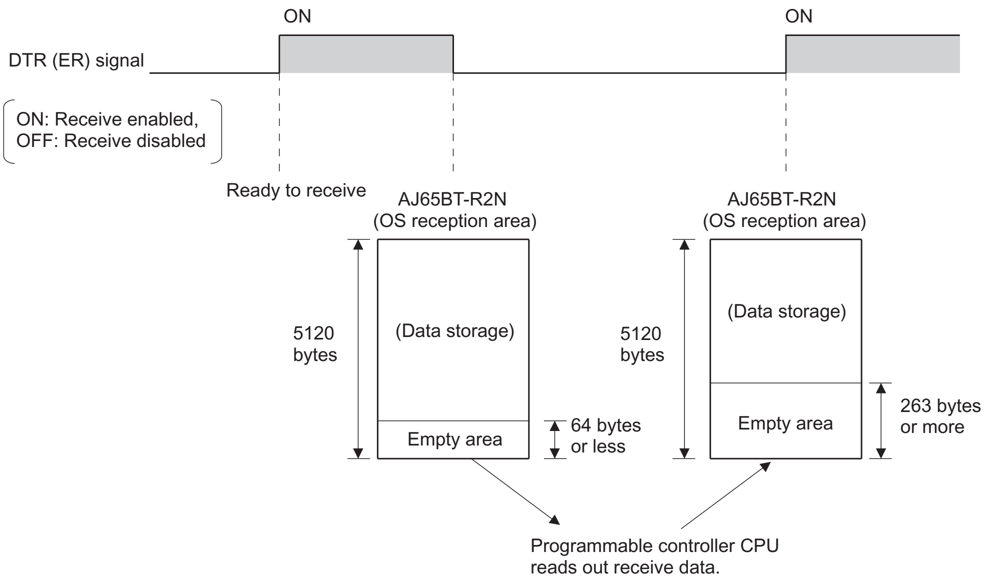


Figure 4.52 DTR (ER) control

(b) DSR (DR) control
When the DSR (DR) signal turns ON, the AJ65BT-R2N restarts transmission to the external device.
When the DSR (DR) signal turns OFF, transmission to the external device is stopped.

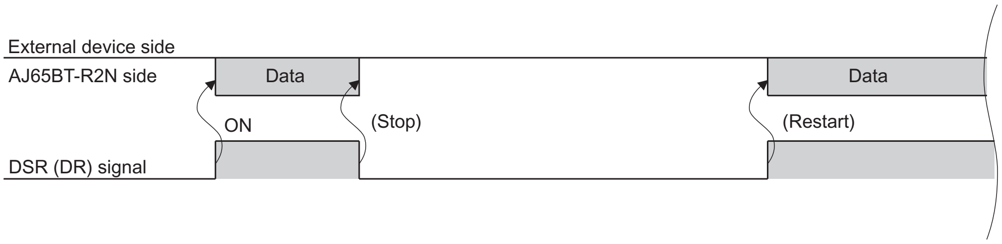


Figure 4.53 DSR (DR) control

(2) DC code control

(a) DC1/DC3 (XON/XOFF) transmission control
When the size of free OS reception area space is reduced to 64 bytes or less, the AJ65BT-R2N sends DC3 to the external device to stop data transmission from the external device to the AJ65BT-R2N.
After reading of data received from the programmable controller CPU, when the size of free OS reception area space is increased to 263 bytes or more, the AJ65BT-R2N sends DC1 to the external device to restart data transmission from the external device to the AJ65BT-R2N.

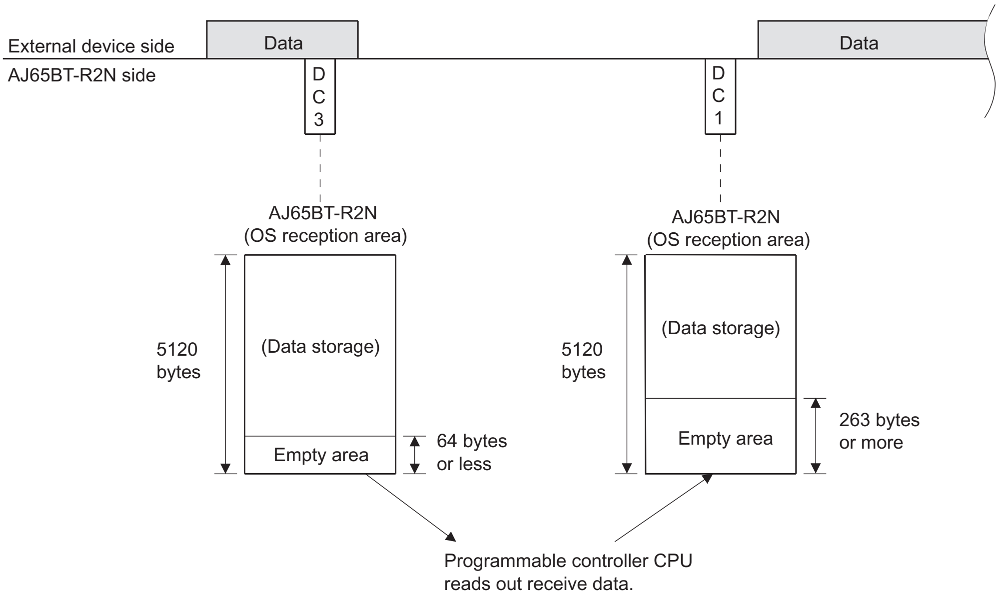


Figure 4.54 DC1/DC3 (XON/XOFF) transmission control

(b) DC1/DC3 (XON/XOFF) reception control
Upon reception of the DC3 code, the AJ65BT-R2N stops transmission to the external device.
Transmission to the external device is restarted upon reception of the DC1 code.

Figure 4.55 DC1/DC3 reception control

(c) Precautions for using the DC code control

1) At the time of power ON or in the initialized state, the AJ65BT-R2N is in the DC1 send and DC1 receive status.
Note that it does not send DC1 to the external device, and does not wait for reception of DC1.

2) The DC1 and DC3 codes are shown below.
   - DC1: 11H
   - DC3: 13H

3) Use the ASCII-binary conversion function to utilize the DC control function.
In the DC code control, the DC1 or DC3 code received from the external device is not stored in the receive area of the AJ65BT-R2N.

(3) Buffer memory used for the flow control function

Configure the flow control function setting in the following buffer memory.

Table 4.77 Buffer memory used for the flow control function

R2N Address	Name	Description
100H	Flow control specification	Specify DTR/DSR (ER/DR) control or DC code control, for data communication between the AJ65BT-R2N and external device. •0H : Flow control not performed •1H : Perform flow control by DTR/DSR (ER/DR) control (The ON/OFF status of the DTR (ER) signal (RYnA) is invalid.) •2H : Perform flow control by DC code control •Setting range: 0H to 2H (Default: 1H)

☒Point

Initialize the AJ65BT-R2N if the value set in Flow control specification (R2N 100H) was changed.

☞Section 4.4 AJ65BT-R2N Initialization Function

4.5.6 ASCII-binary conversion function

The ASCII-binary conversion function allows the AJ65BT-R2N to exchange data with the external device using ASCII codes.

(1) ASCII-binary conversion function overview

The AJ65BT-R2N converts ASCII/binary data as shown below.

Table 4.78 ASCII-binary conversion function overview

Status	Description
When sending	Regards the send area data as binary data, and converts them to ASCII code data before sending.
When receiving	Regards received data as ASCII code data, converts them to binary code data, and stores them in the receive area.

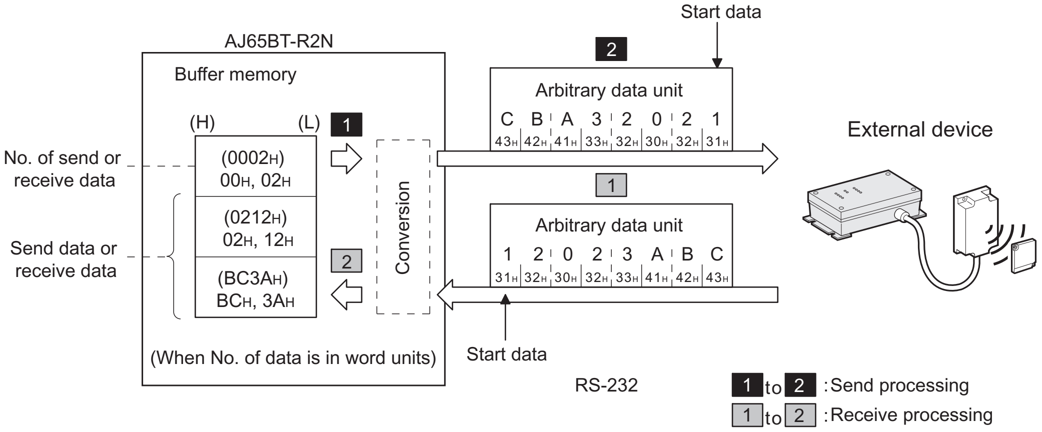
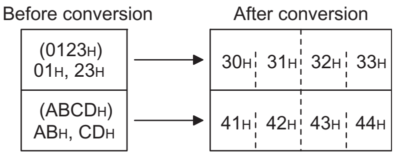
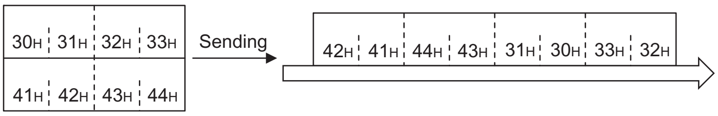


Figure 4.56 ASCII-binary conversion function overview

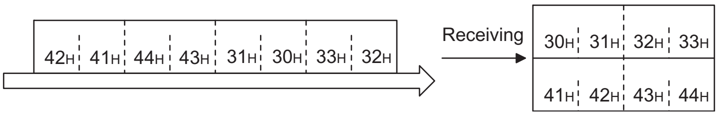
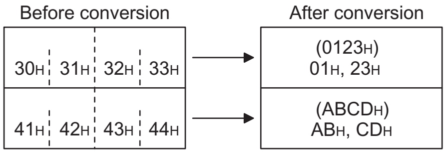
(a) Send processing

Table 4.79 ASCII-binary conversion function overview (Send processing)

No.	Processing
1	Data written to the send area are converted from binary codes to ASCII codes. 
2	Data converted to ASCII codes are sent to the external device in the order shown below. 

(b) Receive processing

Table 4.80 ASCII-binary conversion function overview (Receive processing)

No.	Processing
1	The AJ65BT-R2N receives data from the external device. 
2	Data received from the external device are converted from ASCII codes to binary codes, and they are written to the receive area. 

(2) Buffer memory used for the ASCII-binary conversion function

Configure the ASCII-binary conversion function setting in the following buffer memory.

Table 4.81 Buffer memory used for the ASCII-binary conversion function

R2N Address	Name	Description
103H	ASCII-binary conversion specification	Specify whether or not to enable ASCII-binary conversion for data communication with the external device. •0H: Disable ASCII-binary conversion •1H: Enable ASCII-binary conversion •Setting range: 0H, 1H (Default: 0H)

☒Point

Initialize the AJ65BT-R2N if the value set in ASCII-binary conversion specification (R2N 103H) was changed.
☞Section 4.4 AJ65BT-R2N Initialization Function

(3) Precautions for using the ASCII-binary conversion function

(a) The target of conversion is 30H to 39H (0 to 9) and 41H to 46H (A to F).

(b) Pay attention to the following when ASCII-binary conversion is specified in the frame function.

1) Only the receive data (the data to be stored in the receive area) are converted to a binary code.
Receive start and end frames are not converted to binary codes regardless of the setting in Receive start/end frame elimination (R2N 110H).
Receive data are compared with the registered data with the receive start and end frames unchanged.

2) Only the send data (the data in the send area) are converted to an ASCII code.
Registration frames are not converted to ASCII codes.

3) The number of bytes of the total data including send data, receive data, and start and end frames after ASCII-binary conversion must be 4096 bytes or less.
Either of the following errors occurs when the number of bytes exceeds 4096.
- When sending: Send data size exceeded error (BB93H)
- When receiving: Receive data size exceeded error (BBA2H)

(c) Pay attention to the following when ASCII-binary conversion is specified in the monitoring-based transmission function.

1) Only the send data (the data in the send area) are converted to an ASCII code.
Registration frames are not converted to ASCII codes.

2) The number of bytes of binary data before conversion must be 4096 or less.
When the number of bytes exceeds 4096, a send data size exceeded error (BB93H) occurs.

4.5.7 RW refresh function

The RW refresh function enables monitoring of the buffer memory by assigning a part of the AJ65BT-R2N buffer memory to the remote register (RW).

(1) RW refresh function overview

By assigning the constantly changing AJ65BT-R2N buffer memory to the remote register, the following can be done.

- When assigned to the remote register (RWr), the master station can detect a change of the AJ65BT-R2N buffer memory.
- When assigned to the remote register (RWw), a part of the AJ65BT-R2N buffer memory can be changed easily.

(2) Refresh timing of the RW refresh function

Data refresh between the remote register (RW) of the master module and the AJ65BT-R2N buffer memory is performed at the following timing.

(a) At intervals of the time set in RW refresh interval specification (R2N 40H)

(b) At the same timing as refresh of the auto-refresh buffer

☞Section 4.3.1 (1) Configuration of the auto-refresh buffer

☒Point

When the RW refresh function and the buffer memory auto-refresh function are activated at the same time, RW refresh function data are overwritten with the buffer memory auto-refresh function.
Make the setting carefully so that the refresh areas will not be overlapped.

(3) Buffer memory used for the RW refresh function

Configure the RW refresh function settings in the following buffer memory.

Table 4.82 Buffer memory used for the RW refresh function

R2N Address	Name		Description
40H	RW refresh interval specification		Specify a time interval at which data are refreshed between the remote register (RW) of the master station and the AJ65BT-R2N buffer memory. If no refresh of remote register (RW) is to be performed, specify 0. •Setting range: 0, 1 to 32767 (Unit: × 100ms, Default: 1)
41H	RWw refresh enable/disable setting		Specify whether to enable or disable the RWw refresh. •0H: Disable refresh of RWw •1H: Enable refresh of RWw •Setting range: 0H, 1H (Default: 0H)
42H	RWr refresh enable/disable setting		Specify whether to enable or disable the RWr refresh. •0H: Disable refresh of RWr •1H: Enable refresh of RWr •Setting range: 0H, 1H (Default: 1H)
43H	RW refresh target address specification	Master station→AJ65BT-R2N (RWwm)	Specify a buffer memory address of the AJ65BT-R2N, which is assigned to the remote register (RW) on the master station side. For details, refer to Table 4.83.
44H		AJ65BT-R2N→Master station (RWrm)	
45H		Master station→AJ65BT-R2N (RWw(m+1))	
46H		AJ65BT-R2N→Master station (RWr(m+1))	
47H		Master station→AJ65BT-R2N (RWw(m+2))	
48H		AJ65BT-R2N→Master station (RWr(m+2))	
49H		Master station→AJ65BT-R2N (RWw(m+3))	
4AH		AJ65BT-R2N→Master station (RWr(m+3))	

In RW refresh target address specification (R2N 43H to 4AH), the following buffer memory data are set as defaults.
If necessary, specify a buffer memory address of the AJ65BT-R2N, which is assigned to the remote register (RW).

Table 4.83 RW refresh target address specification

Transfer direction	R2N Address	Remote register (RW)	Default	AJ65BT-R2N buffer memory indicated by default	
Master station→AJ65BT-R2N	43H	RWwm	118H	Send-frame-1 area	Send start frame No.
	45H	RWw(m+1)	119H		Send end frame No.
	47H	RWw(m+2)	120H	Send-frame-2 area	Transmission table start No. specification
	49H	RWw(m+3)	121H		No. of transmission tables
AJ65BT-R2N→Master station	44H	RWrm	1B0H	Error code storage area	General error codes
	46H	RWr(m+1)	1B1H		Error codes generated when sending
	48H	RWr(m+2)	1B2H		Error codes generated when receiving
	4AH	RWr(m+3)	1B6H	No. of data stored in OS reception area	

☒Point

Initialize the AJ65BT-R2N if a set value in the AJ65BT-R2N buffer memory used for the RW refresh function was changed.

☞Section 4.4 AJ65BT-R2N Initialization Function

4.5.8 OS reception area clear function

The OS reception area clear function clears data in the OS reception area of the AJ65BT-R2N.

(1) OS reception area
The OS reception area is explained.

(a) The OS reception area is an OS area where the AJ65BT-R2N temporarily stores the following receive data.
- Data received before a request for reading out receive data to the programmable controller CPU is generated by the user-set "No. of receive end data" and "Receive end frame"
- Data received from the external device while receive data stored in the receive area of the buffer memory are requested to be read out to the programmable controller CPU

(b) Data stored in the OS reception area are transferred to the receive area in the following cases:
- When a request for reading out receive data to the programmable controller CPU is generated by the user-set "No. of receive end data" and "Receive end frame"
- When the forced receive completion function is used

(c) The number of receive data stored in the OS reception area can be checked in No. of data stored in OS reception area (R2N 1B6H).
When the buffer memory auto-refresh function is used, however, an accurate number of receive data cannot be read depending on the time of receive completion since it is updated at the auto-refresh timing.

☒Point

To check the number of receive data stored in the OS reception area, use the RW refresh function to read No. of data stored in OS reception area (R2N 1B6H).
Note that the OS reception area data cannot be read out directly from the programmable controller CPU.

(2) Processing method
The OS reception area of the AJ65BT-R2N is cleared when OS reception area clear request signal (RYn6) is turned ON.
For OS reception area clear request signal (RYn6), refer to the following.
☞Section 3.7.2 (6) OS reception area clear request signal (RYn6) and OS reception area cleared signal (RXn6)

(3) Processing procedures

(a) Processing flow

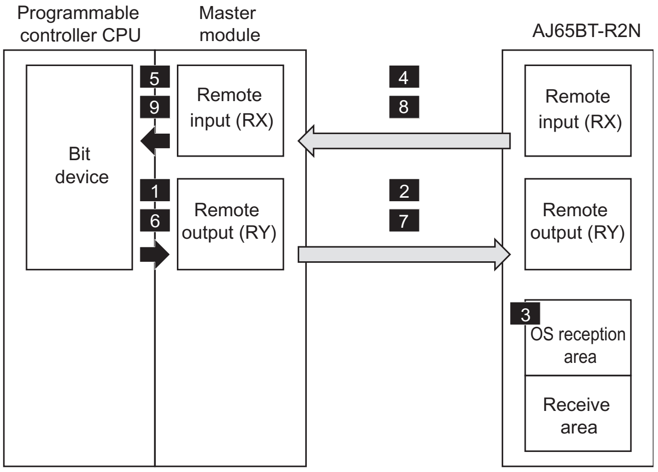


Figure 4.57 Operating procedures of the OS reception area clear function

(b) Timing chart

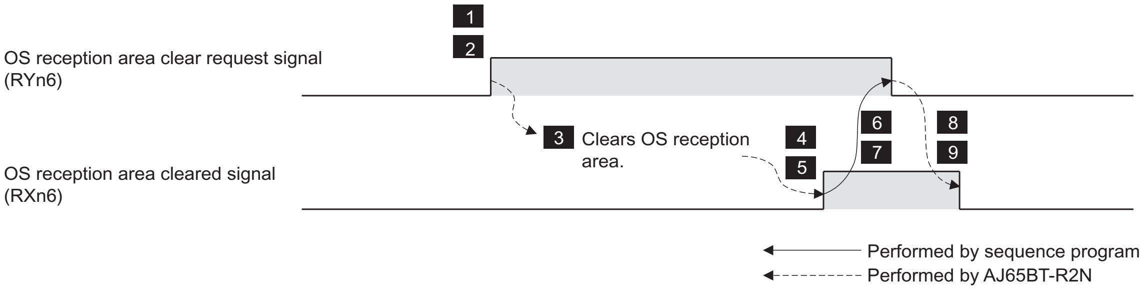


Figure 4.58 Operating procedures of the OS reception area clear function

(c) Processing procedures

Table 4.84 Operating procedures of the OS reception area clear function

No.	Processing
1, 2	OS reception area clear request signal (RYn6) is turned ON.
3	Clearing the OS reception area is started.
4, 5	OS reception area cleared signal (RXn6) turns ON when clearing of the OS reception area is completed.
6, 7	OS reception area clear request signal (RYn6) is turned OFF.
8, 9	OS reception area cleared signal (RXn6) turns OFF.

☒Point

(1) The OS reception area clear function clears only the OS reception area. The receive area in the buffer memory of the AJ65BT-R2N is not cleared.

(2) If the OS reception area clear function is performed in frame reception, all of the receive data stored in the OS reception area are cleared.

(4) Buffer memory used for the OS reception area clear function

Configure the OS reception area clear function setting in the following buffer memory.

Table 4.85 Buffer memory used for the OS reception area clear function

R2N Address	Name	Description
1B6H	No. of data stored in OS reception area	Number of the data stored in the OS reception area is stored. The information stored is updated every 100ms. The value changes depending on the setting of Word/byte specification (R2N 102H).

4.5.9 E^{2}PROM function

The E^{2}PROM function allows the user to register values set in the AJ65BT-R2N buffer memory to the E^{2}PROM to use them as initial values at the time of the AJ65BT-R2N startup.

☒Point

(1) After registration to the E^{2}PROM, there is no need to create a sequence program for changing defaults of the AJ65BT-R2N buffer memory.

(2) Do not execute registration to the E^{2}PROM every time the AJ65BT-R2N is started up.

Doing so may cause the maximum number of writes to E^{2}PROM (service life) to be reached earlier.

(1) Processing method

The E^{2}PROM function is enabled when E^{2}PROM function request signal (RYn7) is turned ON after data is written to E^{2}PROM function specification (R2N 1C0H).

For E^{2}PROM function request signal (RYn7), refer to the following.

☞Section 3.7.2 (7) E2PROM function request signal (RYn7), E2PROM function complete signal (RXn7), and E2PROM function failed signal (RXn8)

(2) Processing procedures

The following shows an example of using the buffer memory auto-refresh function.

(a) Processing flow

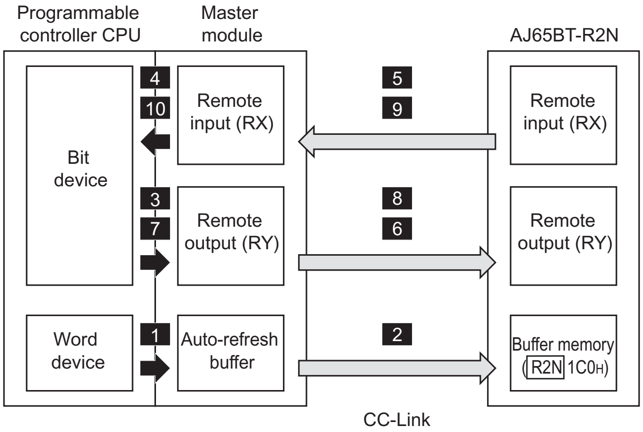


Figure 4.59 E^{2}PROM function processing procedures

(b) Timing chart

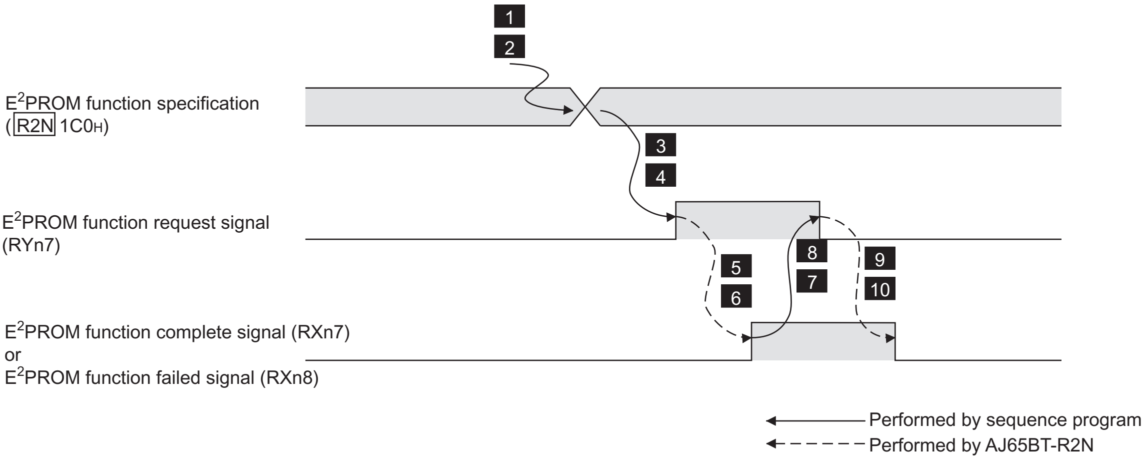


Figure 4.60 E^{2}PROM function processing procedures

(c) Processing procedures

Table 4.86 E^{2}PROM function processing procedures

No.	Processing
1, 2	In E^{2}PROM function specification (R2N 1C0H), the E^{2}PROM function is specified.
3, 4	E^{2}PROM function request signal (RYn7) is turned ON.
5, 6	E^{2}PROM function complete signal (RXn7) turns ON when the E^{2}PROM function is completed normally. E^{2}PROM function failed signal (RXn8) turns ON when the E^{2}PROM function failed.
7, 8	E^{2}PROM function request signal (RYn7) is turned OFF.
9, 10	E^{2}PROM function complete signal (RXn7) or E^{2}PROM function failed signal (RXn8) turns OFF.

(3) Buffer memory used for the E^{2}PROM function

Configure the E^{2}PROM function settings in the following buffer memory.

Table 4.87 Buffer memory used for the E^{2}PROM function

R2N Address	Name	Description
1C0H	E^{2}PROM function specification	Specify the function. Specify registration of the values set in the buffer memory to the E^{2}PROM, or initialization of them. •0H: Register values set in the buffer memory •4H: Initialize the buffer memory back to defaults •Setting range: 0H to 4H (Default: 0H) 1H to 3H are used when a user registration frame is set. ☞ Section 4.5.1 (5) User registration frame
1A7H	Buffer memory default setting status storage	The default buffer memory status at startup of the AJ65BT-R2N is stored. •0H: Defaults of AJ65BT-R2N are stored. •1H: Initial values registered to E^{2}PROM are stored.

4.5.10 RS-232 signal control function

With the RS-232 signal control function, the RS-232 interface signal status data stored in the AJ65BT-R2N buffer memory can be read and outputs can be controlled.
The RS-232 signals are controlled by remote I/O signals (RX/RY).

(1) Relation between the RS-232 control signals and remote I/O signals (RX, RY)
The RS-232 interface control signals and remote I/O signals (RX, RY) are shown below.

Table 4.88 Relation between the RS-232 control signals and remote I/O signals (RX, RY)

Remote I/O signal (RX, RY)		Control signal	Description
Remote input signal (RX)	RXn9	CS (CTS) signal	The ON/OFF status of the control signal is reflected to the corresponding remote input signal (RXn9 to RXnB).
	RXnA	DSR (DR) signal	
	RXnB	CD signal	
Remote output signal (RY)	RYn9	RS (RTS) signal	The ON/OFF status of the remote output signal (RYn9, RYnA) is reflected to the corresponding control signal.
	RYnA	DTR (ER) signal	

Refreshes between the RS-232 control signals and I/O signals are performed at intervals of 100ms.
For each RS-232 signal, refer to the following.

☞Section 3.5.1 RS-232 connector specifications

(2) Buffer memory used for the RS-232 signal control function
Configure the RS-232 signal control function settings in the following buffer memory.

Table 4.89 Buffer memory setting

R2N Address	Name	Description
100H	Flow control specification	Specify DTR/DSR (ER/DR) control or DC code control, for data communication between the AJ65BT-R2N and external device. •0H : Flow control not performed •1H : Perform flow control by DTR/DSR (ER/DR) control (The ON/OFF status of the DTR (ER) signal (RYnA) is invalid.) •2H : Perform flow control by DC code control •Setting range: 0H to 2H (Default: 1H)
101H	RS (RTS) signal status specification	Specify whether to set the RS (RTS) signal status constantly to ON or to change it according to ON/OFF of RS (RTS) signal (RYn9). •0H: Always ON(The ON/OFF status of the RS (RTS) signal (RYn9) is invalid.) •1H: Change according to ON/OFF of RS (RTS) signal (RYn9) •Setting range: 0H, 1H (Default: 0H)

☒Point

Initialize the AJ65BT-R2N if a set value in the AJ65BT-R2N buffer memory used for the RS-232 signal control function was changed.

☞Section 4.4 AJ65BT-R2N Initialization Function

CHAPTER 5 SET-UP AND PROCEDURE BEFORE OPERATION

5.1 Implementation and Installation

5.1.1 Handling precautions

The following describes precautions for handling the AJ65BT-R2N.

⚠WARNING

- Do not touch terminals or connectors while the power is ON.
  Doing so may cause electric shock or malfunctions.
- Do not touch any connector under the cover on the front of the module.
  Doing so may result in a failure or malfunction of the module.

⚠CAUTION

- Take care to prevent foreign matter such as dust or wire chips from entering the module.
  Failure to do so may cause a fire, failure or malfunctions.
- Do not disassemble or remodel the module.
  Doing so may cause a failure, malfunctions, personal injuries and/or a fire.
- Do not drop or apply a strong shock to the module since the case is made of resin.
  Doing so will damage the module.
- Tighten terminal screws within the specified torque range.
  A loose screw may cause a short circuit or malfunction.
  Overtightening a terminal screw may damage the screw, resulting in a short circuit or malfunction.
- When disposing of this product, treat it as industrial waste.
- Use the module in an environment that meets the general specifications given in this manual.
  Operating it in any other environment may cause an electric shock, fire, malfunction, product damage or deterioration.
- Securely fix the module with the DIN rail or installation screws. Installation screws must be tightened within the specified torque range.
  A loose screw may cause a drop of the module, short circuit or malfunction.
  Overtightening may damage the screw, resulting in a drop of the module or a short circuit.
- Be sure to shut off all phases of the external power supply before mounting or removing the module to/from the panel.
  Failure to do so may result in a failure or malfunction of the module.

(1) Tighten the module mounting screws within the following ranges.

Table 5.1 Screw tightening torque

Screw	Tightening torque range	Remarks
Module mounting screw (M4)	0.78 to 1.18N·m	—
Terminal block terminal screw (M3.5)	0.59 to 0.88N·m	—
Terminal block mounting screw (M4)	0.98 to 1.37N·m	—
RS-232 cable connector screw (M2.6)	0.20 to 0.39N·m	Screw hole depth: L=3.2mm or less (Internal dimension from end face)

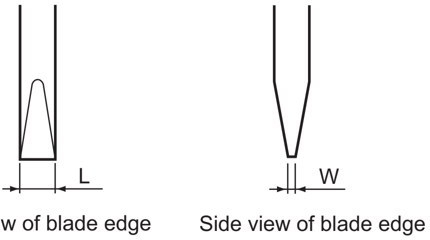
(2) When using the DIN rail adapter, pay attention to the following.

(a) Applicable DIN rail type (Compliant with IEC 60715)
- TH35-7.5Fe
- TH35-7.5Al
- TH35-15Fe

(b) DIN rail mounting screw pitch
When installing a DIN rail, tighten the screws at a pitch of 200mm or less.

(3) Use drivers, which match the following recommended driver dimensions, for the operation of Station No. setting switches and Data link transmission speed setting switch. Using drivers with unsuitable edge width or thickness may damage the switches.

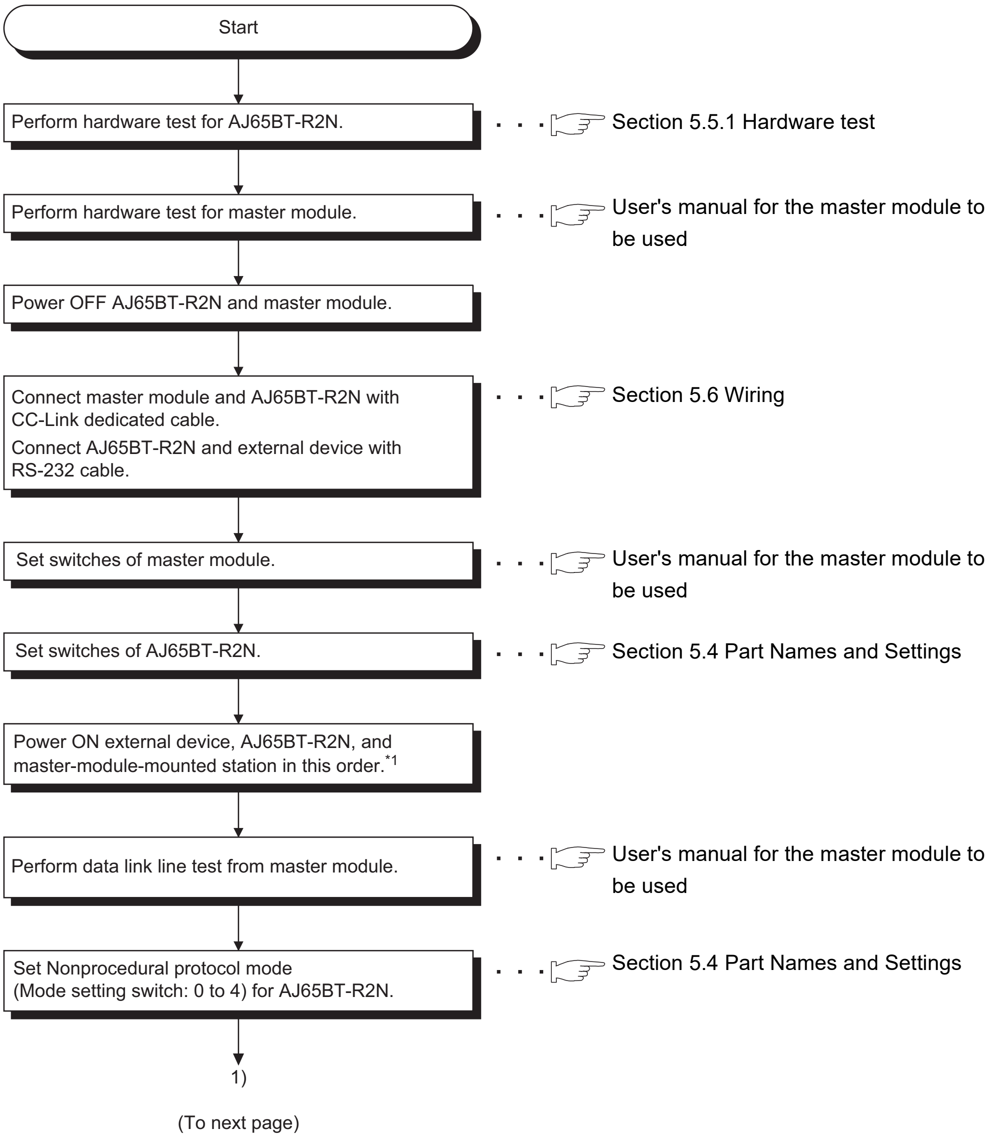
Recommended driver dimensions	
Edge width (L)	2.0 to 2.4mm
Edge thickness (W)	0.5 to 0.6mm



Front view of blade edge   Side view of blade edge

5.2 Set-up and Procedure Before Operation

This section describes the preparatory procedures of the AJ65BT-R2N.



Start

Perform hardware test for AJ65BT-R2N. · · · Section 5.5.1 Hardware test

Perform hardware test for master module. · · · User's manual for the master module to be used

Power OFF AJ65BT-R2N and master module.

Connect master module and AJ65BT-R2N with CC-Link dedicated cable.
Connect AJ65BT-R2N and external device with RS-232 cable. · · · Section 5.6 Wiring

Set switches of master module. · · · User's manual for the master module to be used

Set switches of AJ65BT-R2N. · · · Section 5.4 Part Names and Settings

Power ON external device, AJ65BT-R2N, and master-module-mounted station in this order.*1

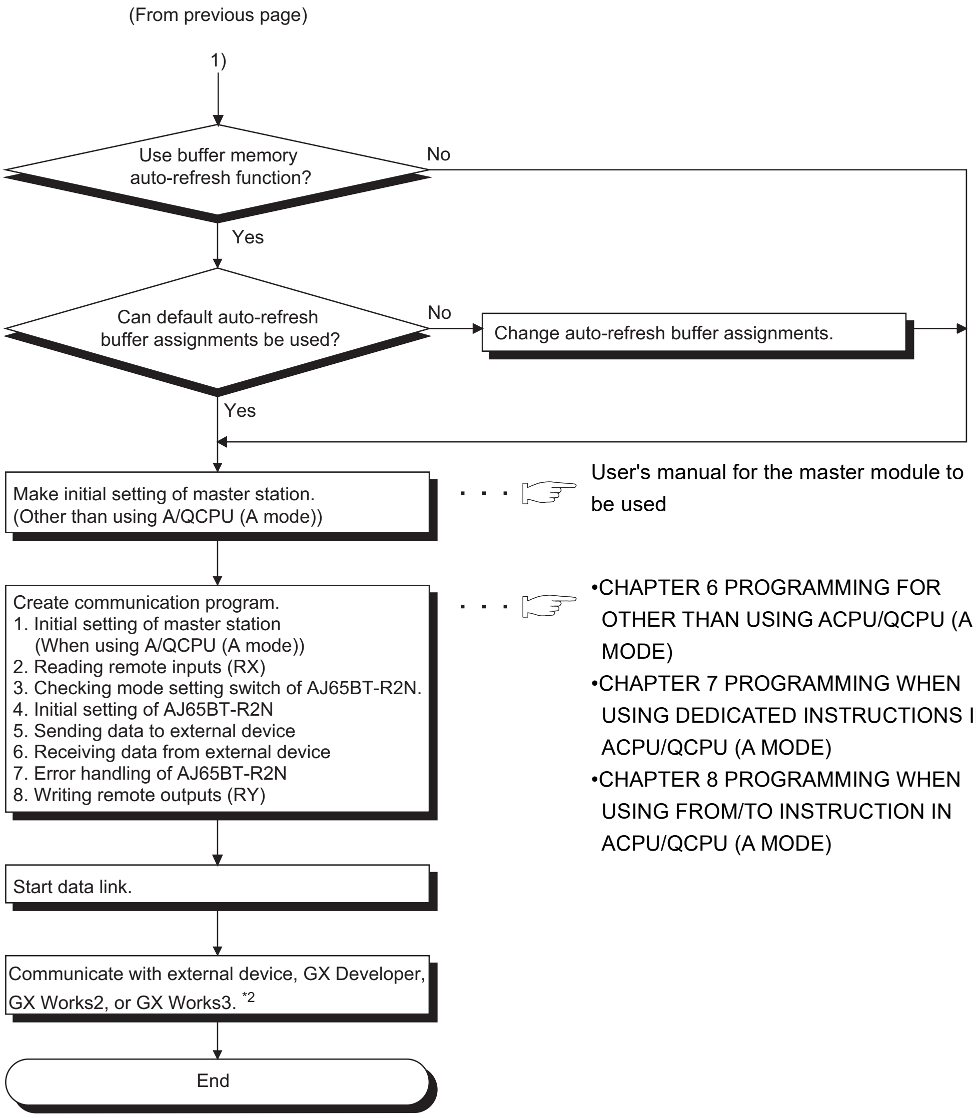
Perform data link line test from master module. · · · User's manual for the master module to be used

Set Nonprocedural protocol mode (Mode setting switch: 0 to 4) for AJ65BT-R2N. · · · Section 5.4 Part Names and Settings

1)

(To next page)

Figure 5.1 Preparatory procedures and setting



User's manual for the master module to be used

- CHAPTER 6 PROGRAMMING FOR OTHER THAN USING ACPU/QCPU (A MODE)
- CHAPTER 7 PROGRAMMING WHEN USING DEDICATED INSTRUCTIONS IN ACPU/QCPU (A MODE)
- CHAPTER 8 PROGRAMMING WHEN USING FROM/TO INSTRUCTION IN ACPU/QCPU (A MODE)

Figure 5.1 Preparatory procedures and setting (Continued)

* 1 When an external device detects a communication error at powering on the AJ65BT-R2N, power on the order of the master-module mounted station, AJ65BT-R2N, and external device.

* 2 To use a general-purpose output on a module of hardware version A, the +24V input terminal must be wired on the general-purpose I/O terminal block.

5.3 Installation Environment

(1) AJ65BT-R2N

For the AJ65BT-R2N installation environment, refer to the following.

☞Section 3.1 General Specifications

(2) CC-Link

For the installation environment of the CC-Link system, refer to the following.

☞User's manual for the master module to be used

5.4 Part Names and Settings

This section describes the part names, description of LEDs, and each switch of the AJ65BT-R2N.

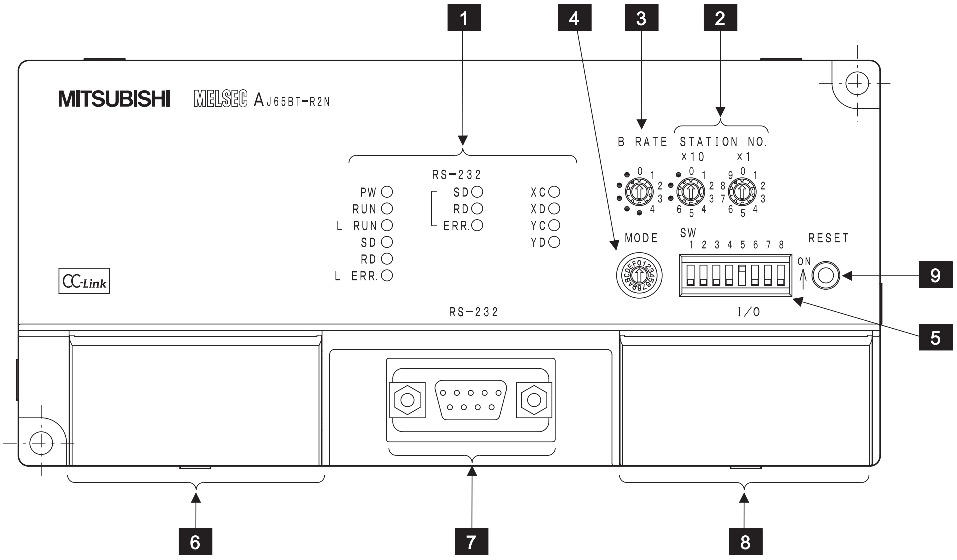
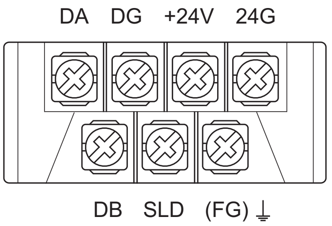


Figure 5.2 AJ65BT-R2N outline view

Table 5.2 Part names

No.	Name	Description
1	Indicator LEDs	Indicate the operating status of the AJ65BT-R2N. For details, refer to (1) in this section.
2	Station No. setting switch	Set a station No. for the AJ65BT-R2N. (Factory default: 0) Setting range: 1 to 64 Set the tens place of the station No. with "×10", and the ones place with "× 1".
3	Data link transmission speed setting switch	Set the transmission speed of the AJ65BT-R2N. For details, refer to (2) in this section.
4	Mode setting switch	Set the operation status of the AJ65BT-R2N. For details, refer to (3) in this section.
5	RS-232 transmission setting switches	Set the RS-232 transmission specifications. For details, refer to (4) in this section.
6	Data link terminal block	Connect a CC-Link dedicated cable for power supply and data link. (Detachable terminal block) 
7	RS-232 interface	Connect an RS-232 cable for connection to an external device.
8	General-purpose I/O terminal block	Connect input/output wires. (Detachable terminal block)
9	Reset switch	Used to return to the power-up status.

(1) Indicator LEDs

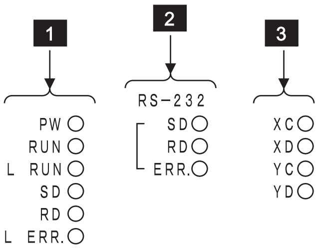


Figure 5.3 Indicator LEDs

Table 5.3 Indicator LEDs

LED		Status	Description
1	PW	ON	Power is ON
		OFF	Power is OFF
	RUN	ON	Operating normally
		OFF	•24V DC power failure or watchdog timer error occurred •In MELSOFT connection mode, any of the RS-232 transmission setting switches SW1 to SW8 is ON •Incorrect switch setting
	L RUN	ON	Communicating normally
		OFF	•Communication failure or timeout error occurred •Incorrect switch setting
	SD	ON	Data being sent by data link
		Flashing	Data being sent by data link
		OFF	Data not sent by data link
	RD	ON	Data being received by data link
		Flashing	Data being received by data link
		OFF	Data not received by data link
	L ERR.	ON	Invalid transmission speed or station No. setting
		Flashing regularly	Transmission speed or station No. setting changed after power-ON
		Flashing irregularly	•Terminating resistor not connected •AJ65BT-R2N or CC-Link dedicated cable affected by noise
		OFF	Communicating normally
2	SD	ON	RS-232 data being sent
		Flashing	RS-232 data being sent
		OFF	RS-232 data not sent
	RD	ON	RS-232 data being received
		Flashing	RS-232 data being received
		OFF	RS-232 data not received
	ERR.	ON	When Nonprocedural protocol mode is active, RS-232 transmission error
		OFF	•In Nonprocedural protocol mode, normal communication •In MELSOFT connection mode, always OFF
3	XC, XD	ON	General-purpose input (XC, XD) is ON
		OFF	General-purpose input (XC, XD) is OFF
	YC, YD	ON	General-purpose output (YC, YD) is ON
		OFF	General-purpose output (YC, YD) is OFF

(2) Data link transmission speed setting switch

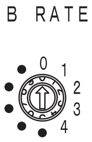


Figure 5.4 Data link transmission speed setting switch

Table 5.4 Data link transmission speed setting switch

Setting	Transmission speed
0[*1]	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps
·	Use prohibited

* 1 Data link transmission speed setting switch at factory default setting is 0 (156kbps).

(3) Mode setting switch

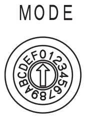


Figure 5.5 Mode setting switch

Table 5.5 Mode setting switch

Setting	Name			Description
0[*1]	Nonprocedural protocol mode	For send/receive buffer communication function	Mode 0	Communications are performed in Nonprocedural protocol mode. Set this when using the send/receive buffer communication function.
1		For buffer memory auto-refresh function	Mode 1	Communications are performed in Nonprocedural protocol mode. Set this when using the buffer memory auto-refresh function.
2			Mode 2	
3			Mode 3	
4			Mode 4	
5	MELSOFT connection mode			Used for communications with the engineering tool.
6	Use prohibited			Setting error (RUN LED OFF)
7				
8				
9				
A				
B				Use prohibited
C				
D	Hardware test mode			Set this when conducting a hardware test.
E	Use prohibited			Setting error (RUN LED OFF)
F				

* 1 Mode setting switch at factory default setting is 0 (Nonprocedural protocol mode).

(4) RS-232 transmission setting switches

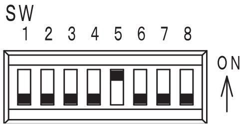


Figure 5.6 RS-232 transmission setting switches

Table 5.6 RS-2332 transmission setting switches

Switch No.	Setting item	Switch status		Factory default setting
		ON	OFF	
SW1	Transmission speed	For details, refer to Table 5.7		OFF
SW2				
SW3				
SW4				
SW5	Data bit length	8	7	ON
SW6	Parity bit	Present	None	OFF
SW7		Even	Odd	
SW8	Stop bit length	2	1	

Table 5.7 RS-232 transmission setting switches (SW1 to SW4)

Setting item		Switch No.			
		SW1	SW2	SW3	SW4
Transmission speed	300bps	OFF	OFF	OFF	OFF
	600bps	ON	OFF	OFF	OFF
	1200bps	OFF	ON	OFF	OFF
	2400bps	ON	ON	OFF	OFF
	4800bps	OFF	OFF	ON	OFF
	9600bps	ON	OFF	ON	OFF
	19200bps	OFF	ON	ON	OFF
	38400bps	ON	ON	ON	OFF
	57600bps	OFF	OFF	OFF	ON
	115200bps	ON	OFF	OFF	ON

☒Point

(1) When MELSOFT connection mode is used, turn OFF SW1 to SW8.
If any of SW1 to SW8 is ON, the setting error (RUN LED is OFF) may occur.

(2) Unless data are sent concurrently from the AJ65BT-R2N and external-device sides in Nonprocedural protocol mode, communication at 57600bps or 115200bps is available.
If data is communicated simultaneously, the RS-232 receive overrun error (BB23H) may occur.

(5) How to check the switch status of the AJ65BT-R2N

The switch status of the AJ65BT-R2N can be checked with R2N addresses 1A0H to 1A6H.

Table 5.8 Checking switch status with buffer memory

R2N Address	Name	Description
1A0H	Station No. setting switch	Station No. setting switch status of the AJ65BT-R2N is stored. •Storage range: 1 to 64 (Default: 0)
1A1H	Data link transmission speed setting switch	Data link transmission speed setting switch status of the AJ65BT-R2N is stored. •156 :156kbps (Default) •625 :625kbps •2500 :2.5Mbps •5000 :5Mbps •10000 :10Mbps
1A2H	Mode setting switch	Mode setting switch status of the AJ65BT-R2N is stored. •0H :When send/receive buffer communication function is used •1H to 4H :When buffer memory auto-refresh function is used •5H :In MELSOFT connection mode •6H to CH :Area that cannot be set •DH :In hardware test •EH, FH :Area that cannot be set •Storage range :0H to FH (Default: 0H)
1A3H	RS-232 transmission speed	Transmission speed set in the AJ65BT-R2N is stored. •300 :300bps (Default) •600 :600bps •1200 :1200bps •2400 :2400bps •4800 :4800bps •9600 :9600bps •19200 :19200bps •384 :38400bps •576 :57600bps •1152 :115200bps
1A4H	RS-232 data bit length	Data bit length set in the AJ65BT-R2N is stored. •7 :7 bits •8 :8 bits •Storage range :7, 8 (Default: 8)
1A5H	RS-232 parity bit	Parity bit set in the AJ65BT-R2N is stored. •0 :Bit is absent •1 :Bit is present (Odd) •2 :Bit is present (Even) •Storage range :0 to 2 (Default: 0)
1A6H	RS-232 stop bit length	Stop bit length set in the AJ65BT-R2N is stored. •1 :1 bit •2 :2 bits •Storage range :1, 2 (Default: 1)

5.5 AJ65BT-R2N Single Unit Test

Check if the single unit of the AJ65BT-R2N operates normally.
Always perform a test before configuring the system.

5.5.1 Hardware test

The following describes a hardware test of the AJ65BT-R2N.
Perform a test according to the following procedures.

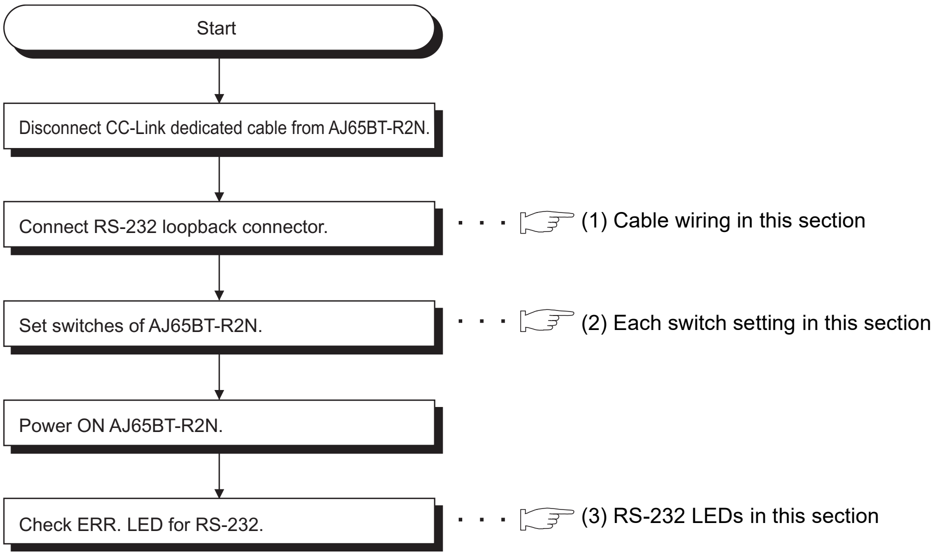
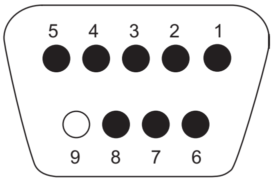
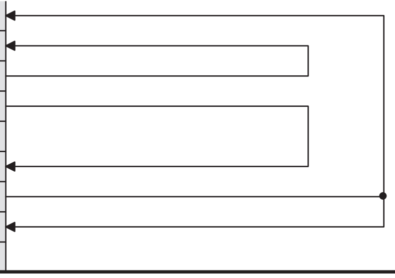


Figure 5.7 Hardware test procedure

(1) Cable wiring

The following shows specifications of the RS-232 loopback connector.
Create the RS-232 loopback connector in accordance with the RS-232 loopback connector wire connection shown below.

Table 5.9 RS-232 loopback connector wire connection

RS-232 connector	AJ65BT-R2N side (DTE)		Loopback connector wire connection
	Signal mnemonic	Pin No.	
	CD	1	
	RD (RXD)	2	
	SD (TXD)	3	
	DTR (ER)	4	
	SG	5	
	DSR (DR)	6	
	RS (RTS)	7	
	CS (CTS)	8	
	-	9	

☒Point

In Hardware test mode, the data for check is sent to the CC-Link at the time of CC-Link loopback check.
Disconnect a wiring of the CC-Link before performing a hardware test.

(2) Each switch setting
Set each switch of the AJ65BT-R2N as shown below.

Table 5.10 Each switch setting

Item		Description	Set value
Station No. setting switch		Station No.1	" × 10":0 " × 1":1
Data link transmission speed setting switch		10Mbps	4
Mode setting switch		Hardware test mode	D
RS-232 transmission setting switches	SW1 to SW4	Transmission speed: 300bps	OFF
	SW5	Data bit length: 8	ON
	SW6, SW7	Parity bit: None	OFF
	SW8	Stop bit length: 1	OFF

(3) RS-232 LEDs

(a) At normal status
ERR. LED of the RS-232 is flashing.
If LED flashes 30 seconds or more, the RS-232 is normal.

(b) At error status
ERR. LED of the RS-232 is turned ON.
Errors are indicated depending on the YC LED/YD LED status as shown below.

Table 5.11 YC LED/YD LED status

LED status	Test name	Description	Corrective action
RS-232 SD ○ XC ○ RD ○ XD ○ ERR. ● YC ○ YD ○	ROM test	ROM check error	The hardware has an error. Please consult your local Mitsubishi representative, explaining a detailed description of the problem.
RS-232 SD ○ XC ○ RD ○ XD ○ ERR. ● YC ● YD ○	RAM test	RAM check error	
RS-232 SD ○ XC ○ RD ○ XD ○ ERR. ● YC ○ YD ●	Data link loopback test	The hardware has an error or the CC-Link dedicated cable is still connected.	Disconnect the CC-Link dedicated cable. If the ERR. LED will not flash even after disconnecting a cable, please consult your local Mitsubishi representative, explaining a detailed description of the problem.
RS-232 SD ○ XC ○ RD ○ XD ○ ERR. ● YC ● YD ●	RS-232 loopback test	The hardware has an error or the RS-232 loopback connector is not mounted.	Mount a loopback connector. If the ERR. LED will not flash even after mounting a connector, please consult your local Mitsubishi representative, explaining a detailed description of the problem.

○: OFF, ●: ON

5.6 Wiring

5.6.1 CC-Link dedicated cable connection method

The following describes the connection method of a CC-Link dedicated cable.

⚠CAUTION

- Be sure to shut off all phases of the external power supply used by the system before installation or wiring.
  Failure to do so may cause an electric shock or damage to the product.
- Attach the terminal cover to the product before energizing and operating the system after installation or wiring.
  Failure to do so may cause an electric shock.
- Be sure to shut off all phases of the external power supply used by the system before cleaning or retightening the terminal screw.
  Failure to do so may result in a failure or malfunction of the module.
  A loose screw may cause a drop of the module, short circuit or malfunction.
  Overtightening may damage the screw, resulting in a drop of the module, short circuit or malfunction.
- Do not install the control or communication cable(s) together with the main circuit or power cables.
  Keep a distance of 100mm or more between them.
  Failure to do so may cause malfunctions due to noise.
- Always ground the FG terminal to the protective ground conductor.
  Failure to do so may result in electric shock or malfunctions.
- Check the rated voltage and terminal layout and then wire the module correctly.
  Connecting a power supply of a different voltage rating or incorrect wiring may cause a fire or failure.
- Completely connect each cable connector to each receptacle.
  Failure to do so may cause malfunctions due to poor contact.
- Place the connection wires and cables in a duct or clamp them.
  If not, dangling cables may swing or inadvertently be pulled, resulting in damage to the module and/ or cables or malfunctions due to poor cable connection.
- Do not install the control cable(s) together with the communication cable(s).
  Doing so may cause malfunctions due to noise.
- Always use the data link terminal block for connection of a CC-Link dedicated cable to a master module.
  Care must be taken because, if the cable is incorrectly inserted into the general-purpose I/O terminal block instead of the data link terminal block, the module will break down.

The following shows how to connect the AJ65BT-R2N to a master module and a remote module with CC-Link dedicated cables.

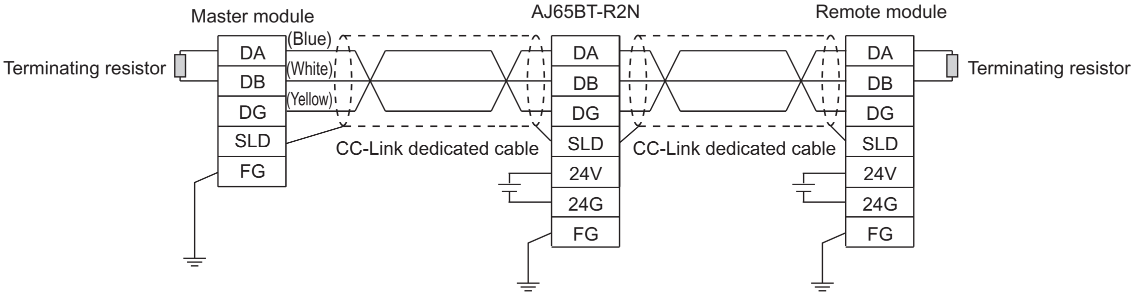


Figure 5.8 Connection between AJ65BT-R2N and master module

☒Point

Be sure to connect terminating resistors, which are supplied with the master module, to modules on both ends of the data link network. (Connect it between DA and DB.)

5.6.2 External device connection method

The following shows how to connect the AJ65BT-R2N and the external device of the RS-232.

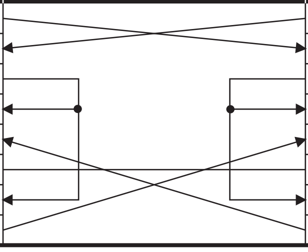
(1) Connection example

The AJ65BT-R2N cannot use the CD signal as the control signal for sending/receiving data to/from the external device.

Wire the CD signal line of the AJ65BT-R2N and external device as shown in Table 5.12.

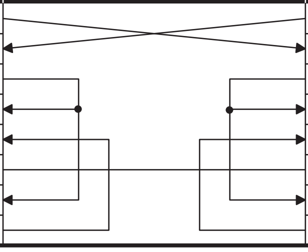
(a) Connection example where DC code control and DTR/DSR(ER/DR) control are executable

Table 5.12 DC code control and DTR/DSR (ER/DR) control

AJ65BT-R2N side (DTE)		Cable connection and signaling	External device (DTE)
Signal mnemonic	Pin No.		Signal mnemonic
SD	3		SD
RD	2		RD
RS	7		RS
CS	8		CS
DR	6		DR
SG	5		SG
CD	1		CD
ER	4		ER

(b) Connection example only DC code control is executable

Table 5.13 Connection example only DC code control is executable

AJ65BT-R2N side (DTE)		Cable connection and signaling	External device (DTE)
Signal mnemonic	Pin No.		Signal mnemonic
SD	3		SD
RD	2		RD
RS	7		RS
CS	8		CS
DR	6		DR
SG	5		SG
CD	1		CD
ER	4		ER

(2) Precautions for connection

(a) Connect the FG signal line and shield of the RS-232 cable as follows:

Table 5.14 Precautions for connection

RS-232 cable	Connection method	Remarks
FG signal	Connected to the screw clamp of the AJ65BT-R2N side connector.	•Do not short-circuit the FG and SG signal lines of the RS-232 cable. •If the FG and SG signal lines are connected inside the external-device side, do not connect the FG signal line on the AJ65BT-R2N side to the external device.
Shield	Connected to the screw clamp of the AJ65BT-R2N side connector. (Not connected to external device)	

(b) When data communication cannot be performed normally due to external noise, connect the wires as follows:

1) Connect the FG terminals of both stations with the shield of the RS-232 cable. For the external device side, refer to the handling instructions for the external device.

2) Each signal line (except for SG) must be twisted with the SG signal line.

3) FG of the AJ65BT-R2N is connected to the screw clamp of the connector, acting as FG of the module.

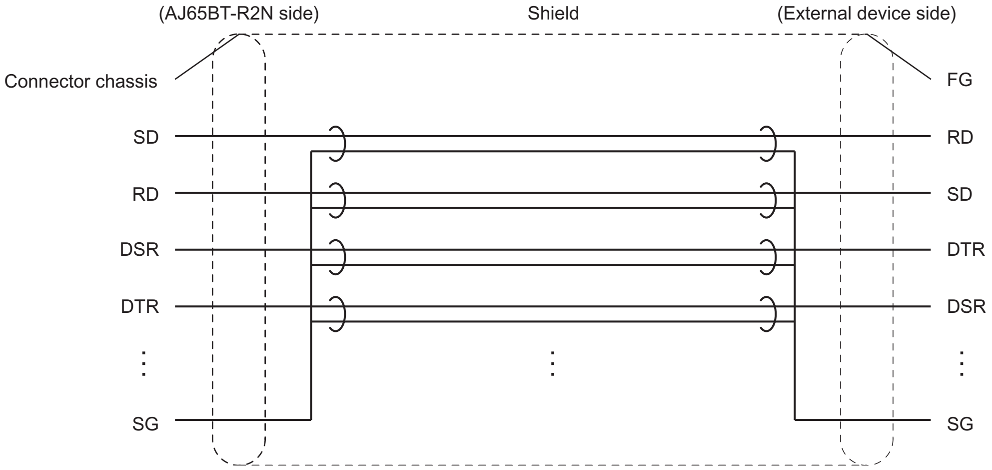


Figure 5.9 Precautions for connection

(c) Do not connect an RS-422 device to the RS-232 interface.
Doing so will damage the RS-422 interface of the connected device, resulting in communication failure.

CHAPTER 6 PROGRAMMING FOR OTHER THAN USING ACPU/QCPU (A MODE)

(1) How to read this chapter

The configuration of this chapter is as follows.

- For RCPU, refer to the MELSEC iQ-R Programming Manual (Module Dedicated Instructions).
- For QCPU (Q mode), refer to the MELSEC-Q CC-Link System Master/Local Module User's Manual.
- For LCPU, refer to the MELSEC-L CC-Link System Master/Local Module User's Manual.
- For QnACPU, refer to the QnACPU Programming Manual (Special Function Module).

(a) System configuration

This explains the system where the programs described in this chapter are executed.

☞ CHAPTER 6 (2) System configuration for program

(b) Setting of each station

This explains the setting of the master station, remote I/O station and AJ65BT-R2N.

☞ Section 6.1 Setting of Each Station

(c) Executable programs

Various programs are shown, which can be operated when the settings and system configuration are the same as those given in this chapter.

- Send/Receive program

  ☞ Section 6.2 Entire Send/Receive Program Structure
- Program for changing the auto-refresh buffer assignments and registering the assignment settings to E^{2}PROM.

  ☞ Section 6.9.1 Program example for changing auto-refresh buffer assignments
- Program for sending or receiving data with GP.RISEND and GP.RIRCV instructions

  ☞ Section 6.9.2 Program example for sending/receiving data with GP.RISEND/GP.RIRCV instruction
- Program for receiving data when a receive timeout occurs

  ☞ Section 6.9.3 Program example for receiving data when a receive timeout occurs

(d) Each program processing

Each processing in a program is explained.

☞ Section 6.3 Initial Setting for AJ65BT-R2N to Section 6.6 Error Handling of AJ65BT-R2N

(e) Programs used according to function

Programs used according to function are described.

Table 6.1 Programs added according to function

Function	Reference section
Initial setting for the frame function	Section 6.7
Initial setting for the monitoring-based transmission function	
Initial setting for the flow control function	
Initial setting for the ASCII-binary conversion function	
Initial setting for the RW refresh function	
Send cancel function	Section 6.8
Forced receive completion function	
OS reception area clear function	
E^2PROM function setting	

(2) System configuration for program

The following shows the system configuration for the program described in this chapter.

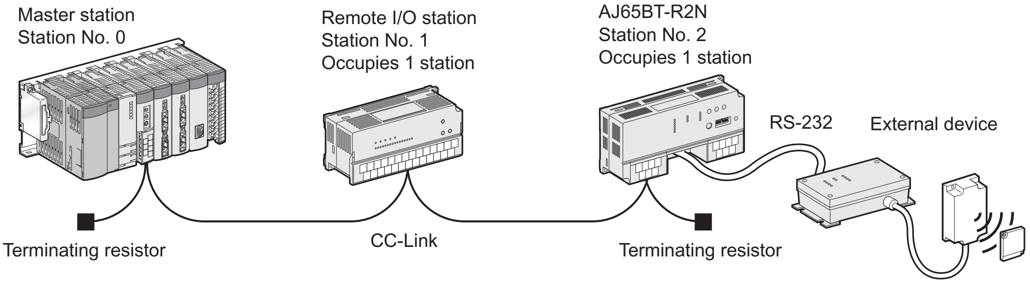


Figure 6.1 System configuration for program

(a) Master station

Table 6.2 Master station information

Item		Description
Station No.		0
Data link transmission speed		156kbps
CC-Link version		Ver.1
Start I/O No.		0000H (Mounting position of master module)
All connect count		2
Auto refresh target device	RX	X100 to X13F
	RY	Y100 to Y13F
	RWr	RCPU, QCPU, LCPU: W0 to W7 QnACPU: D500 to D507
	RWw	RCPU, QCPU, LCPU: W100 to W107 QnACPU: D600 to D607
	SB	RCPU, QCPU, LCPU: SB0 to SB1F QnACPU: D704 to D735
	SW	RCPU, QCPU, LCPU: SW0 to SW1FF QnACPU: D700 to D1211

(b) Remote I/O station

Table 6.3 Remote I/O station information

Item	Description
Station No.	1
Data link transmission speed	156kbps
CC-Link version	Ver.1
No. of occupied stations	Occupies 1 station

(c) AJ65BT-R2N

Table 6.4 AJ65BT-R2N information

Item		Description
Station No.		2
Data link transmission speed		156kbps
RS-232 transmission speed		300bps
CC-Link version		Ver.1
No. of occupied stations		Occupies 1 station
Mode setting switch	Using send/receive buffer communication function	0 (Mode 0)
	Using buffer memory auto-refresh function	1 (Mode1)
Send buffer size	Using send/receive buffer communication function	64 words[*1]
	Using buffer memory auto-refresh function	0 word
Receive buffer size	Using send/receive buffer communication function	64 words[*1]
	Using buffer memory auto-refresh function	0 word
Auto-refresh buffer size	Using send/receive buffer communication function	0 word
	Using buffer memory auto-refresh function	1536 words[*2]

* 1 When sending/receiving data of 59 words or more, change each buffer size in [Station information setting] (☞ Section 6.1.2 (2)(b)).

* 2 When sending/receiving data of 512 words or more, change the auto-refresh buffer size in [Station information setting] (☞ Section 6.1.2 (2)(b)) and change the auto-refresh buffer assignment.

(d) Sendable transmission

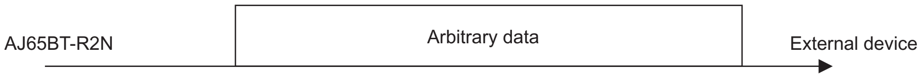


Figure 6.2 Sendable message

Table 6.5 Information of sendable message

Item		Description
Start frame		None[*1]
End frame		None[*1]
Data size (including above frames)	Using send/receive buffer communication function	58 words or less[*2]
	Using buffer memory auto-refresh function	511 words or less[*3]

* 1 If required by the external device, each of the frames can be sent.

* 2 When sending/receiving data of 59 words or more, change each buffer size in [Station information setting] (☞ Section 6.1.2 (2)(b)).

* 3 When sending/receiving data of 512 words or more, change the auto-refresh buffer size in [Station information setting] (☞ Section 6.1.2 (2)(b)) and change the auto-refresh buffer assignment.

(e) Receivable message

Figure 6.3 Receivable message

Table 6.6 Information of receivable message

Item		Description
Start frame		None
End frame		CR(0DH)＋LF(0AH)
Data size (including above frames)	Using send/receive buffer communication function	58 words or less[*1]
	Using buffer memory auto-refresh function	509 words or less[*2]

[*1] When sending/receiving data of 59 words or more, change each buffer size in [Station information setting] (☞ Section 6.1.2 (2)(b)).

[*2] When sending/receiving data of 510 words or more, change the auto-refresh buffer size in [Station information setting] (☞ Section 6.1.2 (2)(b)) and change the auto-refresh buffer assignment.

Remark

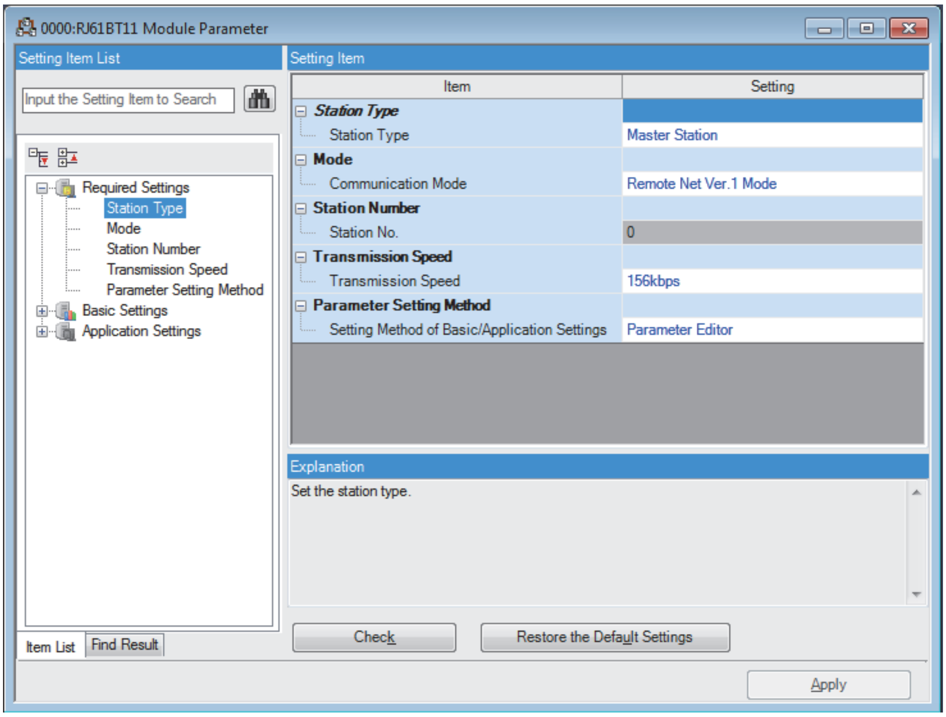
Receive data must not contain CR(0DH)＋LF(0AH).
If CR(0DH)＋LF(0AH) is included, the CR(0DH)＋LF(0AH) is regarded as the end frame, resulting in termination of the reception.

6.1 Setting of Each Station

6.1.1 Setting RJ61BT11

When using the RJ61BT11, the parameters must be set.
Set the following using GX Works3

(1) Required settings



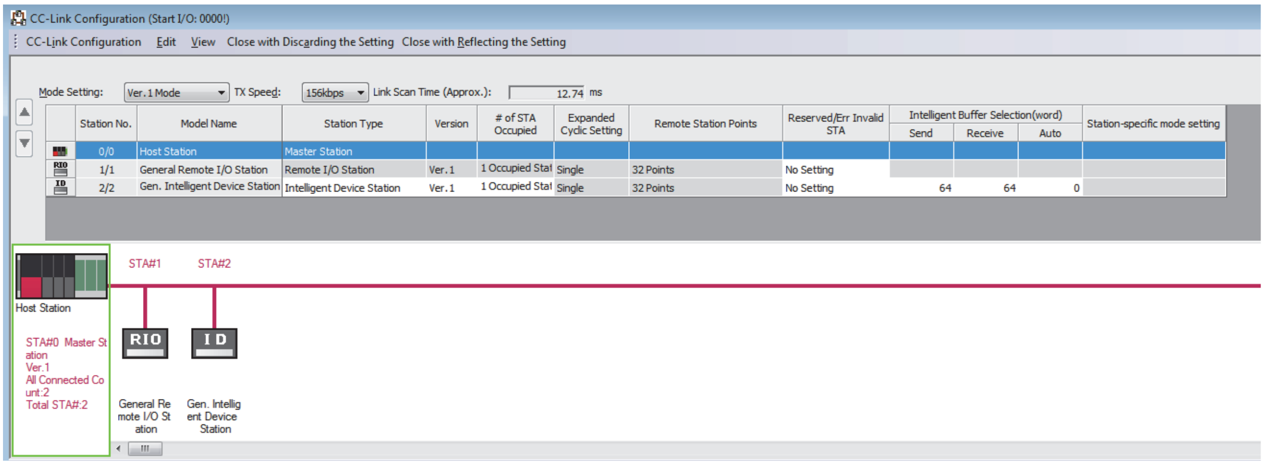
Item	Setting
Station Type	
Station Type	Master Station
Mode	
Communication Mode	Remote Net Ver.1 Mode
Station Number	
Station No.	0
Transmission Speed	
Transmission Speed	156kbps
Parameter Setting Method	
Setting Method of Basic/Application Settings	Parameter Editor

Set the station type.

Figure 6.4 [Required Settings] dialog box

(2) Basic settings

(a) Network configuration setting



CC-Link Configuration (Start I/O: 0000!)

Mode Setting: Ver.1 Mode TX Speed: 156kbps Link Scan Time (Approx.): 12.74 ms

Station No.	Model Name	Station Type	Version	# of STA Occupied	Expanded Cyclic Setting	Remote Station Points	Reserved/Err Invalid STA	Intelligent Buffer Selection(word)			Station-specific mode setting
								Send	Receive	Auto	
0/0	Host Station	Master Station									
1/1	General Remote I/O Station	Remote I/O Station	Ver.1	1 Occupied Stat	Single	32 Points	No Setting				
2/2	Gen. Intelligent Device Station	Intelligent Device Station	Ver.1	1 Occupied Stat	Single	32 Points	No Setting	64	64	0	

Figure 6.5 [CC-Link Configuration] dialog box

For the intelligent buffer select (word), set the following.

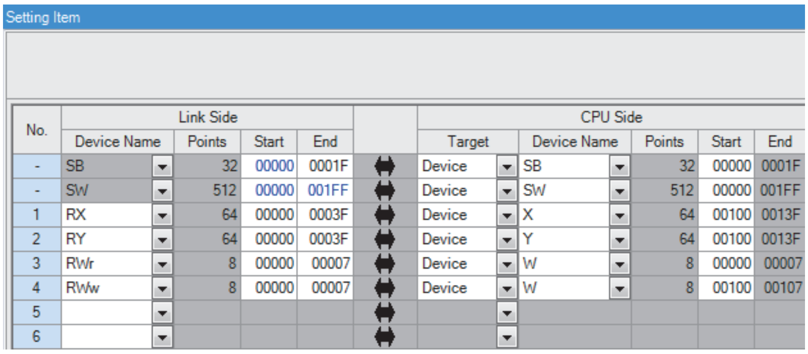
Table 6.7 CC-Link configuration setting example

<table>
<tr><th rowspan="2">Item</th><th colspan="2">Set value</th></tr>
<tr><th>Station No. 1</th><th>Station No. 2</th></tr>
<tr><td>Intelligent buffer select (word)</td><td>—</td><td>•Using send/receive buffer communication function
<table>
<tr><th>Send</th><th>Receive</th><th>Automatic</th></tr>
<tr><td>64*1</td><td>64*1</td><td>0</td></tr>
</table>
•Using buffer memory auto-refresh function
<table>
<tr><th>Send</th><th>Receive</th><th>Automatic</th></tr>
<tr><td>0</td><td>0</td><td>1536*2</td></tr>
</table></td></tr>
</table>

* 1 When sending/receiving data of 59 words or more, change the value to "(Send/receive data size) + 6 words".

* 2 When sending/receiving data of 512 words or more, change the auto-refresh buffer size and the auto-refresh buffer assignments.

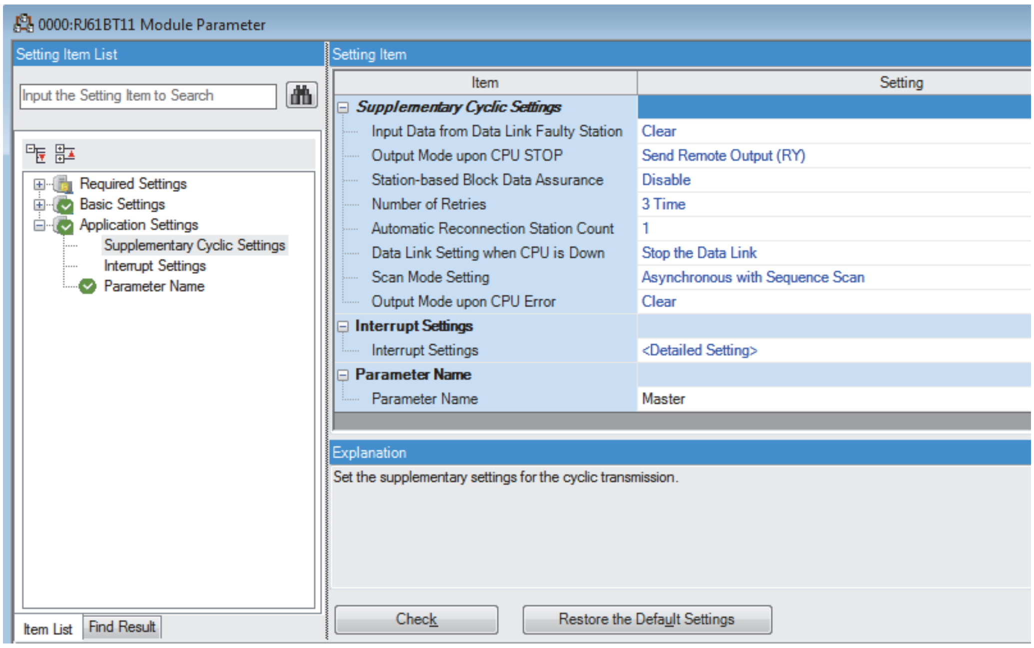
(b) Refresh setting



No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
-	SB	32	00000	0001F	↔	Device	SB	32	00000	0001F
-	SW	512	00000	001FF	↔	Device	SW	512	00000	001FF
1	RX	64	00000	0003F	↔	Device	X	64	00100	0013F
2	RY	64	00000	0003F	↔	Device	Y	64	00100	0013F
3	RWr	8	00000	00007	↔	Device	W	8	00000	00007
4	RWw	8	00000	00007	↔	Device	W	8	00100	00107
5					↔					
6					↔					

Figure 6.6 [Refresh Setting] dialog box

(3) Application settings



Item	Setting
Supplementary Cyclic Settings	
Input Data from Data Link Faulty Station	Clear
Output Mode upon CPU STOP	Send Remote Output (RY)
Station-based Block Data Assurance	Disable
Number of Retries	3 Time
Automatic Reconnection Station Count	1
Data Link Setting when CPU is Down	Stop the Data Link
Scan Mode Setting	Asynchronous with Sequence Scan
Output Mode upon CPU Error	Clear
Interrupt Settings	
Interrupt Settings	<Detailed Setting>
Parameter Name	
Parameter Name	Master

Explanation

Set the supplementary settings for the cyclic transmission.

Figure 6.7 [Application Settings] dialog box

6.1.2 Setting QJ61BT11N or QJ61BT11

When using the QJ61BT11N or QJ61BT11, the switches and parameters must be set.

(1) Switch setting

Switch setting for the master station is performed with the switches on the master module.

Table 6.8 Setting example for each switch

Item	Description	Set value
Station No. setting switch	Master station	0
Transmission speed/mode setting switch	156kbps	0

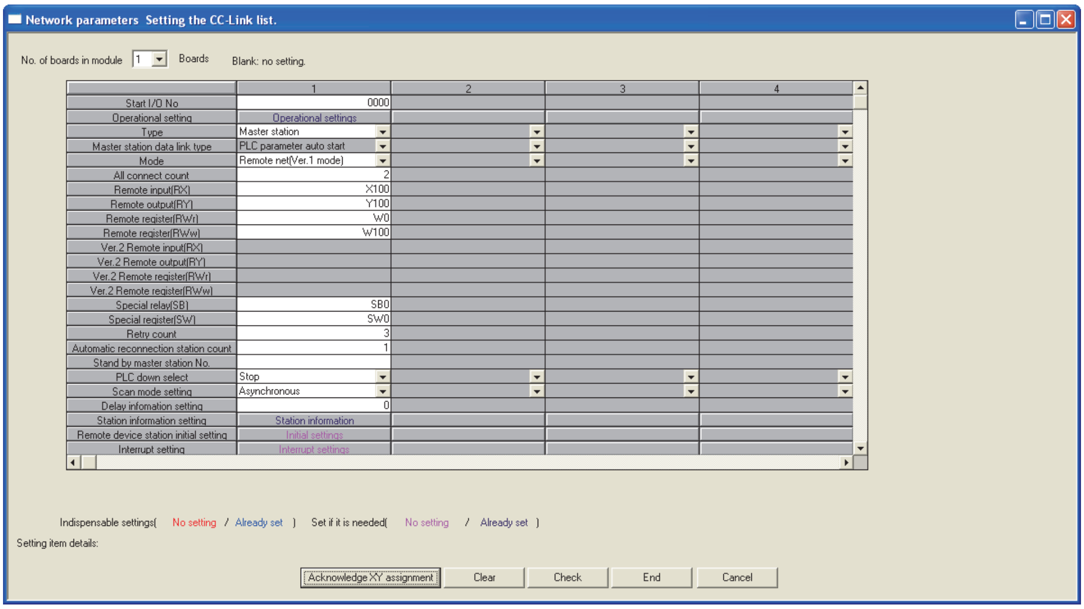
(2) Parameter setting

Set the following using the engineering tool.

This section describes the parameter setting of when GX Developer is used.

When GX Works2 is used, refer to the following.

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



Network parameters Setting the CC-Link list.

No. of boards in module: 1 Boards

Blank: no setting.

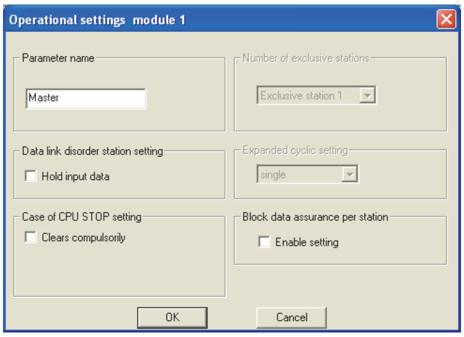
	1	2	3	4
Start I/O No	0000			
Operational setting	Operational settings			
Type	Master station			
Master station data link type	PLC parameter auto start			
Mode	Remote net(Ver.1 mode)			
All connect count	2			
Remote input(RX)	X100			
Remote output(RY)	Y100			
Remote register(RWr)	W0			
Remote register(RWw)	W100			
Ver.2 Remote input(RX)				
Ver.2 Remote output(RY)				
Ver.2 Remote register(RWr)				
Ver.2 Remote register(RWw)				
Special relay(SB)	SB0			
Special register(SW)	SW0			
Retry count	3			
Automatic reconnection station count	1			
Stand by master station No.				
PLC down select	Stop			
Scan mode setting	Asynchronous			
Delay infomation setting	0			
Station information setting	Station information			
Remote device station initial setting	Initial settings			
Interrupt setting	Interrupt settings			

Indispensable settings(No setting / Already set) Set if it is needed(No setting / Already set)

Setting item details:

Figure 6.8 [Setting the CC-Link list] dialog box

(a) Operational setting



Operational settings module 1

Parameter name: Master

Number of exclusive stations: Exclusive station 1

Data link disorder station setting: ☐ Hold input data

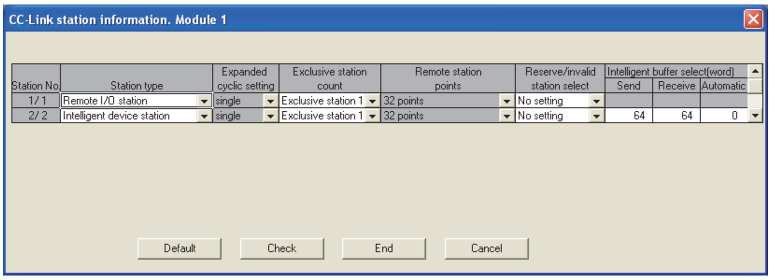
Expanded cyclic setting: single

Case of CPU STOP setting: ☐ Clears compulsorily

Block data assurance per station: ☐ Enable setting

Figure 6.9 [Operational settings module 1] dialog box

(b) Station information setting



CC-Link station information. Module 1

Station No.	Station type	Expanded cyclic setting	Exclusive station count	Remote station points	Reserve/invalid station select	Intelligent buffer select(word) Send	Intelligent buffer select(word) Receive	Intelligent buffer select(word) Automatic
1/ 1	Remote I/O station	single	Exclusive station 1	32 points	No setting			
2/ 2	Intelligent device station	single	Exclusive station 1	32 points	No setting	64	64	0

Figure 6.10 [Station information Module 1] dialog box

For the intelligent buffer select (word), set the following.

Table 6.9 Station information setting example

<table>
<tr><th rowspan="2">Item</th><th colspan="2">Set value</th></tr>
<tr><th>Station No. 1</th><th>Station No. 2</th></tr>
<tr><td>Intelligent buffer select (word)</td><td>—</td><td>•Using send/receive buffer communication function
<table>
<tr><th>Send</th><th>Receive</th><th>Automatic</th></tr>
<tr><td>64*1</td><td>64*1</td><td>0</td></tr>
</table>
•Using buffer memory auto-refresh function
<table>
<tr><th>Send</th><th>Receive</th><th>Automatic</th></tr>
<tr><td>0</td><td>0</td><td>1536*2</td></tr>
</table>
</td></tr>
</table>

* 1 When sending/receiving data of 59 words or more, change the value to "(Send/receive data size) ＋6 words".

* 2 When sending/receiving data of 512 words or more, change the auto-refresh buffer size and the auto-refresh buffer assignments.

6.1.3 Setting L26CPU-BT, L26CPU-PBT, or LJ61BT11

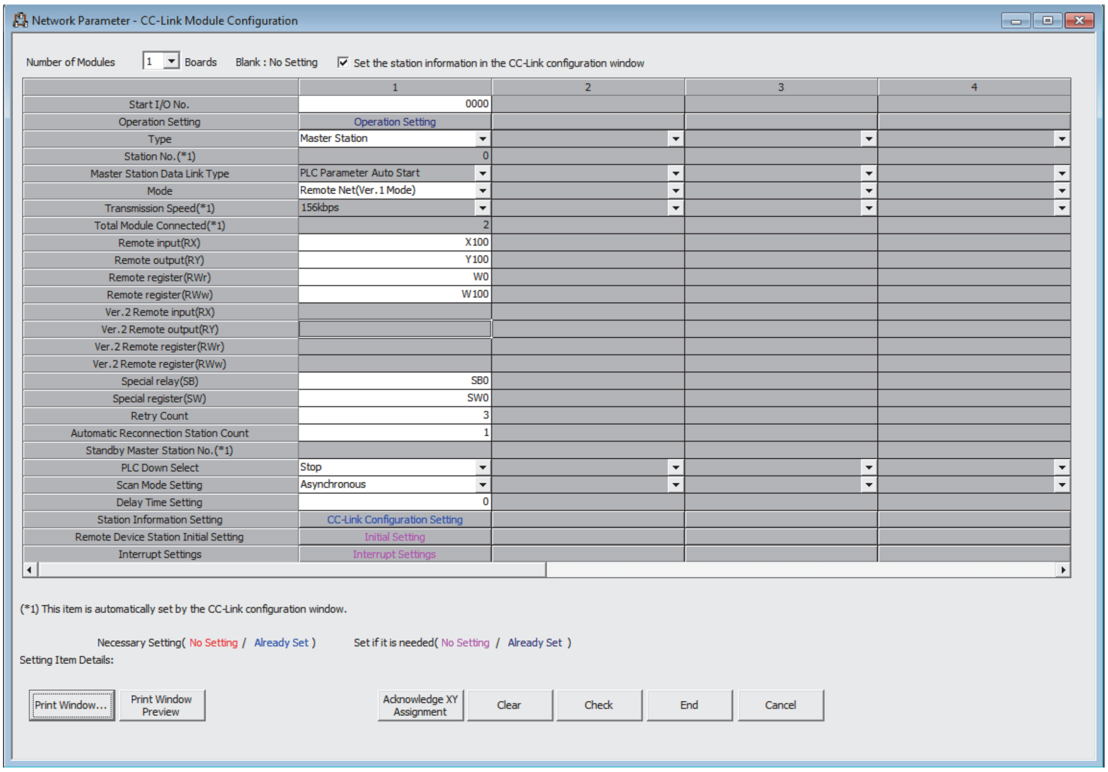
When using the L26CPU-BT, L26CPU-PBT, or LJ61BT11, the parameters must be set.

Remark

This manual describes the program examples in which the I/O numbers of X/Y00 to X/Y1F are assigned for a master module. I/O numbers must be assigned to apply the program examples introduced in this manual to an actual system.
For I/O number assignment, refer to the following.
☞MELSEC-L CPU Module User's Manual (Function Explanation, Program Fundamentals)

(1) Parameter setting

Set the following using GX Works2.



Network Parameter - CC-Link Module Configuration

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

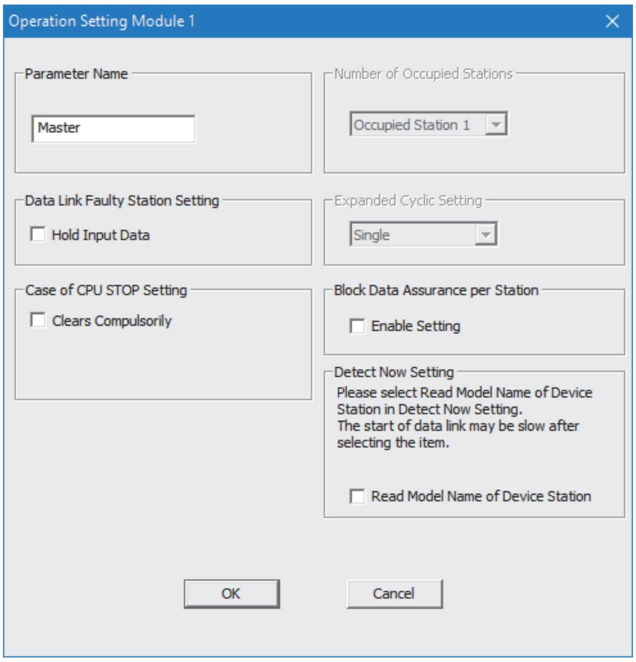
	1	2	3	4
Start I/O No.	0000			
Operation Setting	Operation Setting			
Type	Master Station			
Station No.(*1)	0			
Master Station Data Link Type	PLC Parameter Auto Start			
Mode	Remote Net(Ver.1 Mode)			
Transmission Speed(*1)	156kbps			
Total Module Connected(*1)	2			
Remote input(RX)	X100			
Remote output(RY)	Y100			
Remote register(RWr)	W0			
Remote register(RWw)	W100			
Ver.2 Remote input(RX)				
Ver.2 Remote output(RY)				
Ver.2 Remote register(RWr)				
Ver.2 Remote register(RWw)				
Special relay(SB)	SB0			
Special register(SW)	SW0			
Retry Count	3			
Automatic Reconnection Station Count	1			
Standby Master Station No.(*1)				
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			

(*1) This item is automatically set by the CC-Link configuration window.

Necessary Setting(No Setting / Already Set) Set if it is needed(No Setting / Already Set)
Setting Item Details:

Figure 6.11 [Setting the CC-Link list] dialog box

(a) Operational setting



Operation Setting Module 1

Parameter Name: Master

Number of Occupied Stations: Occupied Station 1

Data Link Faulty Station Setting

☐ Hold Input Data

Expanded Cyclic Setting: Single

Case of CPU STOP Setting

☐ Clears Compulsorily

Block Data Assurance per Station

☐ Enable Setting

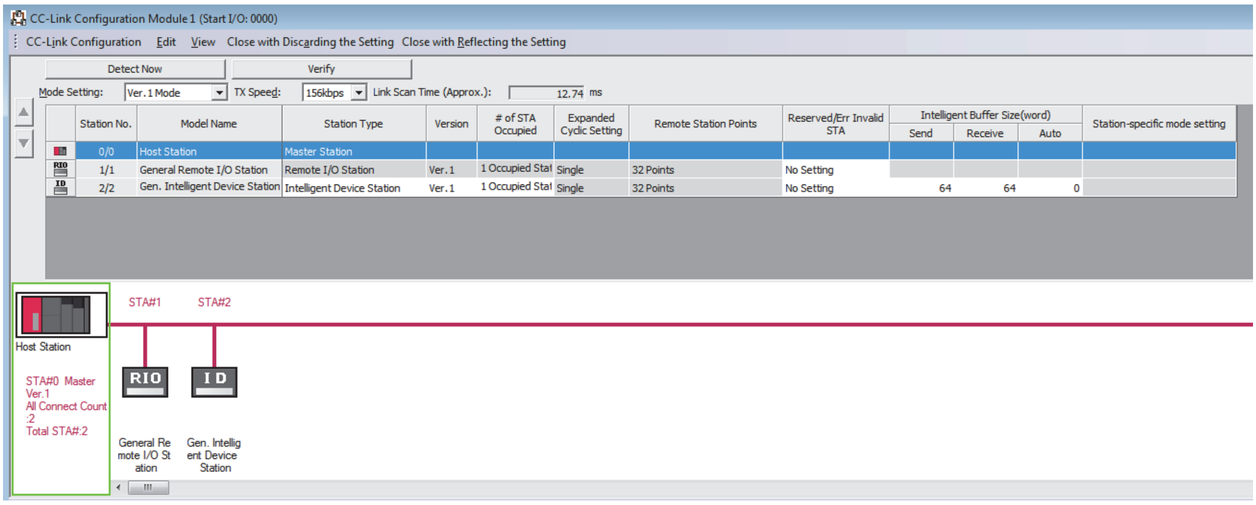
Detect Now Setting

Please select Read Model Name of Device Station in Detect Now Setting.
The start of data link may be slow after selecting the item.

☐ Read Model Name of Device Station

Figure 6.12 [Operational settings module 1] dialog box

(b) CC-Link configuration setting



CC-Link Configuration Module 1 (Start I/O: 0000)

Mode Setting: Ver.1 Mode TX Speed: 156kbps Link Scan Time (Approx.): 12.74 ms

	Station No.	Model Name	Station Type	Version	# of STA Occupied	Expanded Cyclic Setting	Remote Station Points	Reserved/Err Invalid STA	Intelligent Buffer Size(word)			Station-specific mode setting
									Send	Receive	Auto	
	0/0	Host Station	Master Station									
RIO	1/1	General Remote I/O Station	Remote I/O Station	Ver.1	1 Occupied Stat	Single	32 Points	No Setting				
ID	2/2	Gen. Intelligent Device Station	Intelligent Device Station	Ver.1	1 Occupied Stat	Single	32 Points	No Setting	64	64	0	

Figure 6.13 [CC-Link Configuration Module 1] dialog box

For the intelligent buffer select (word), set the following.

Table 6.10 CC-Link configuration setting example

<table>
<tr><th rowspan="2">Item</th><th colspan="2">Set value</th></tr>
<tr><th>Station No. 1</th><th>Station No. 2</th></tr>
<tr><td>Intelligent buffer select (word)</td><td>—</td><td>•Using send/receive buffer communication function
<table>
<tr><th>Send</th><th>Receive</th><th>Automatic</th></tr>
<tr><td>64*1</td><td>64*1</td><td>0</td></tr>
</table>
•Using buffer memory auto-refresh function
<table>
<tr><th>Send</th><th>Receive</th><th>Automatic</th></tr>
<tr><td>0</td><td>0</td><td>1536*2</td></tr>
</table></td></tr>
</table>

* 1 When sending/receiving data of 59 words or more, change the value to "(Send/receive data size)＋6 words".

* 2 When sending/receiving data of 512 words or more, change the auto-refresh buffer size and the auto-refresh buffer assignments.

6.1.4 Setting AJ61QBT11 or A1SJ61QBT11

When using the AJ61QBT11 or A1SJ61QBT11, the switches and parameters must be set.

(1) Switch setting

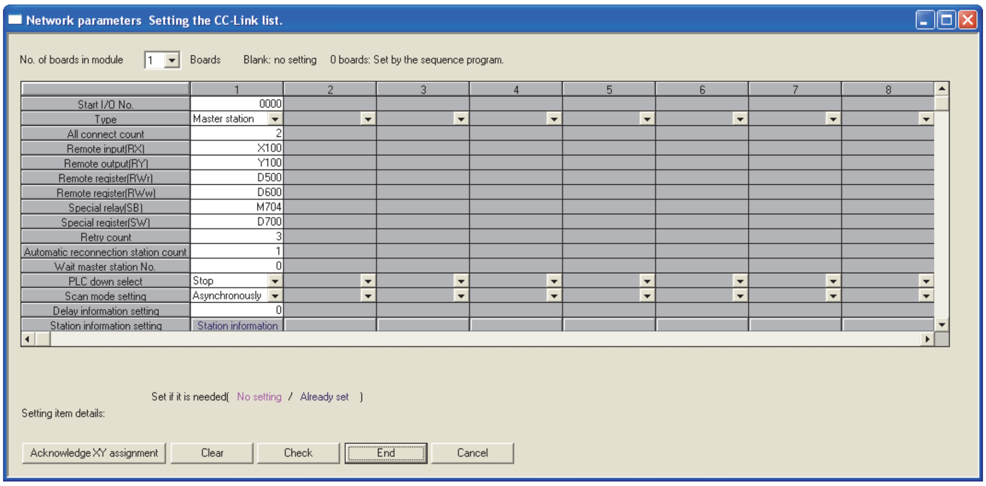
Switch setting for the master station is performed with the switches on the master module.

Table 6.11 Setting for the AJ61QBT11 or A1SJ61QBT11

Item		Description	Set value
Station No. setting switch		Master station	0
Mode setting switch		Online (Remote net mode)	0
Transmission speed setting switch		156kbps	0
Condition setting switch	SW1	Station type: Master station/local station	OFF
	SW2, SW3	Use prohibited	OFF
	SW4	Input data status of data link error station: Cleared	OFF
	SW5, SW6	No. of occupied stations: Invalid	OFF
	SW7, SW8	Use prohibited	OFF

(2) Parameter setting

Set parameters for the master station in GX Developer.



Network parameters Setting the CC-Link list.

No. of boards in module 1 Boards Blank: no setting 0 boards: Set by the sequence program.

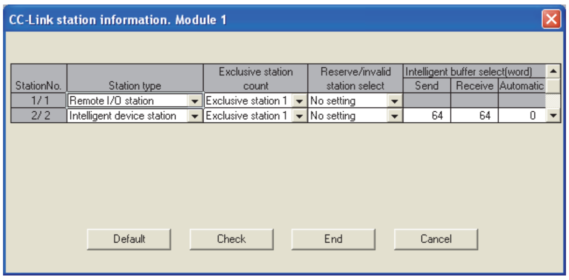
	1	2	3	4	5	6	7	8
Start I/O No.	0000							
Type	Master station							
All connect count	2							
Remote input(RX)	X100							
Remote output(RY)	Y100							
Remote register(RWr)	D500							
Remote register(RWw)	D600							
Special relay(SB)	M704							
Special register(SW)	D700							
Retry count	3							
Automatic reconnection station count	1							
Wait master station No.	0							
PLC down select	Stop							
Scan mode setting	Asynchronously							
Delay information setting	0							
Station information setting	Station information							

Set if it is needed(No setting / Already set)

Setting item details:

Figure 6.14 [Setting the CC-Link list] dialog box

(a) Station information setting



CC-Link station information. Module 1

StationNo.	Station type	Exclusive station count	Reserve/invalid station select	Intelligent buffer select(word) Send	Receive	Automatic
1/ 1	Remote I/O station	Exclusive station 1	No setting			
2/ 2	Intelligent device station	Exclusive station 1	No setting	64	64	0

Figure 6.15 [Station information Module 1] dialog box

For the intelligent buffer select (word), set the following.

Table 6.12 Station information setting example

<table>
<tr><th rowspan="2">Item</th><th colspan="2">Set value</th></tr>
<tr><th>Station No. 1</th><th>Station No. 2</th></tr>
<tr><td>Intelligent buffer select (word)</td><td>—</td><td>•Using send/receive buffer communication function
<table>
<tr><th>Send</th><th>Receive</th><th>Automatic</th></tr>
<tr><td>64*1</td><td>64*1</td><td>Arbitrary</td></tr>
</table>
•Using buffer memory auto-refresh function
<table>
<tr><th>Send</th><th>Receive</th><th>Automatic</th></tr>
<tr><td>Arbitrary</td><td>Arbitrary</td><td>1536*2</td></tr>
</table>
</td></tr>
</table>

* 1 When sending/receiving data of 59 words or more, change the value to "(Send/receive data size) ＋6 words".

* 2 When sending/receiving data of 512 words or more, change the auto-refresh buffer size and the auto-refresh buffer assignments.

6.1.5 Remote I/O station setting

For the setting method, refer to the manual for the remote I/O station.

Table 6.13 Remote I/O station setting example

Item	Set value
Station No.	1
Transmission speed	156kbps

6.1.6 AJ65BT-R2N setting

Perform the AJ65BT-R2N settings with each switch of AJ65BT-R2N.

Table 6.14 AJ65BT-R2N setting example

Item		Description	Set value
Station No. setting switch		Station No. 2	× 10: 0 × 1: 2
Data link transmission speed setting switch		156kbps	0
Mode setting switch		•Using send/receive buffer communication function (Mode 0)	0
		•Using buffer memory auto-refresh function (Mode 1)	1
RS-232 transmission setting switches	SW1 to SW4	Transmission speed: 300bps	OFF
	SW5	Data bit length: 8	ON
	SW6, SW7	Parity bit: None	OFF
	SW8	Stop bit length: 1	OFF

6.2 Entire Send/Receive Program Structure

The programs in this section can be executed when the following system configuration and settings have been set.

☞ CHAPTER 6 (2) System configuration for program

☞ Section 6.1 Setting of Each Station

6.2.1 For the send/receive buffer communication function

(1) Overview of program examples

(a) Mode setting switch check program ((3) in this section - 1)
Whether the mode setting switch is set correctly or not is checked.

(b) AJ65BT-R2N initial setting program ((3) in this section - 2)

1) When AJ65BT-R2N initial setting start flag (M20) is turned ON, settings are configured so that data reception is completed by the frame function upon receipt of CR(0DH)＋LF(0AH).

2) The AJ65BT-R2N is initialized.

☞ Section 6.3.1 For the send/receive buffer communication function

(c) Program for sending data to external device ((3) in this section - 3)
If Send execute flag (X22) is turned ON, the character string "ABCDEF" is sent from the master station to the external device.

☞ Section 6.4.1 For the send/receive buffer communication function

(d) Program for receiving data from external device ((3) in this section - 4)
When data are received from the external device, the received data are read out from the AJ65BT-R2N to the master station.

☞ Section 6.5.1 For the send/receive buffer communication function

(e) Error handling program ((3) in this section - 5)

1) When an error occurs during initialization setting or data transfer, an error code will be read out from the AJ65BT-R2N to the master module if Error code read flag (X23) is turned ON.

2) The error is canceled when Error clear flag (X24) is turned ON after the cause of the error has been eliminated.

☞ Section 6.6.1 For the send/receive buffer communication function

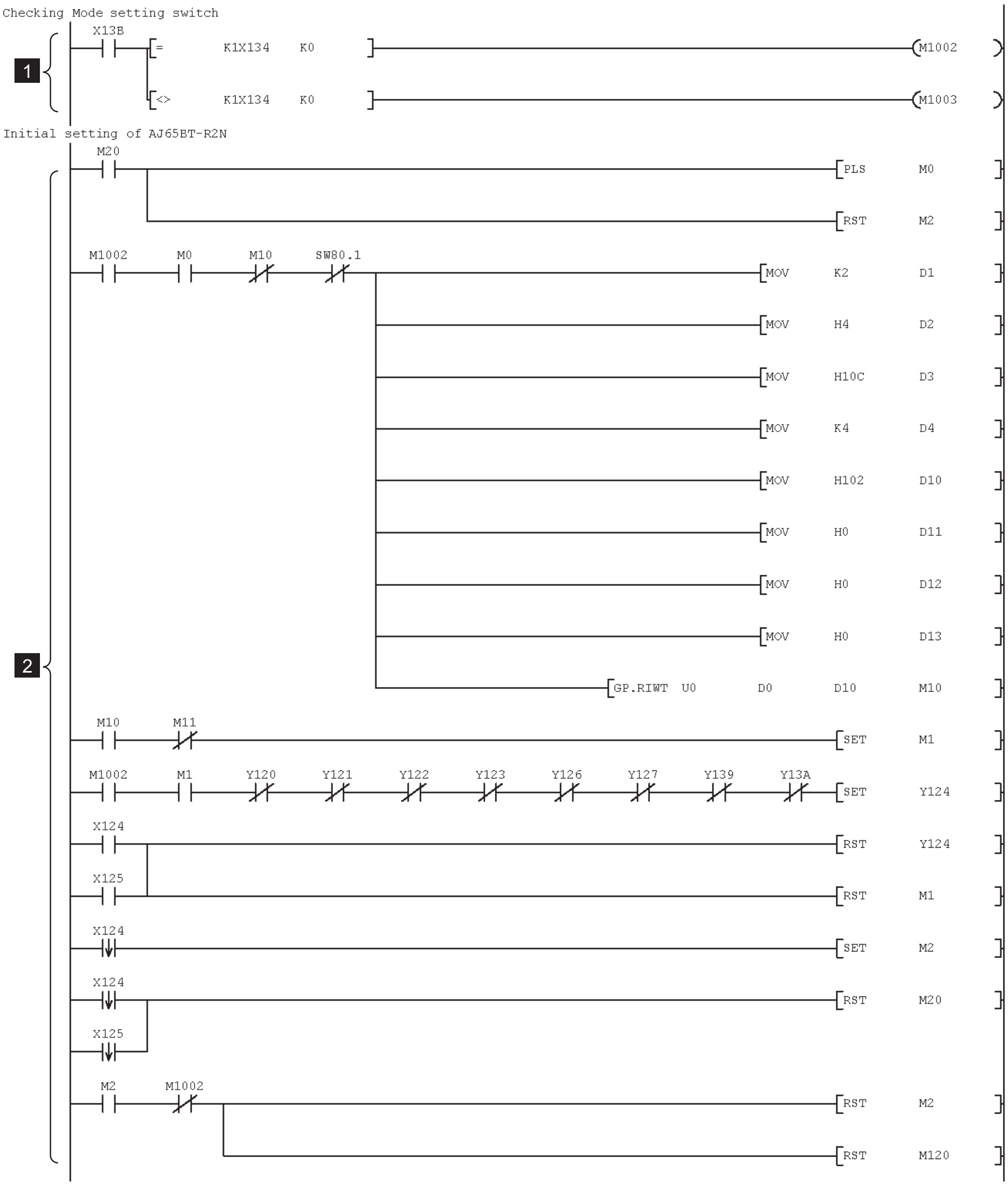
(f) Supplementary program for QnA dedicated instructions ((3) in this section to 6)
When using the RIRD, RIWT, RIRCV or RISEND instruction in the QnACPU, execute this program immediately before the END instruction in order to prevent malfunctions.
If this program is not executed, a target-related error (4B00H) may occur in the CPU module.
When using the QCPU, this program is unnecessary.

(2) Devices used in the program example

Table 6.15 Devices used in the program example

Device	Description	Device	Description
X0	Module error (Master station)	M2	Operation complete flag
X1	Own station data link status (Master station)	M3	Operation failed flag
X0F	Module ready (Master station)	M10	Device that is turned ON for one scan after completion of GP.RIWT
X22	Send execute flag	M11	Device that is turned ON for one scan after failure of writing by GP.RIWT
X23	Error code read flag	M20	AJ65BT-R2N initial setting start flag
X24	Error clear flag	M120	Buffer memory access exclusion check flag
X120	Send complete signal	M125	Sending flag
X121	Send failed signal	M130	Receiving flag
X122	Normal receive data read request signal	M135	Error handling flag
X123	Error receive data read request signal	M155	Device that is turned ON for one scan after completion of GP.RIRD
X124	Initialization complete signal	M156	Device that is turned ON for one scan after failure of reading by GP.RIRD
X125	Initialization failed signal	M160	Device that is turned ON for one scan after completion of GP.RIRD
X128	E^{2}PROM function failed signal	M161	Device that is turned ON for one scan after failure of reading by GP.RIRD
K1X134	Mode setting switch status signal (X134 to X137)	M180	Device that is turned ON for one scan after completion of GP.RIWT
X13A	Error status signal	M181	Device that is turned ON for one scan after failure of writing by GP.RIWT
X13B	Remote station ready signal	M190	Device that is turned ON for one scan after completion of GP.RIRD
K8Y120	Remote output (Y120 to Y13F)	M191	Device that is turned ON for one scan after failure of reading by GP.RIRD
Y120	Send request signal	M1002	AJ65BT-R2N mode normal flag
Y121	Send cancel request signal	M1003	AJ65BT-R2N mode error flag
Y122	Receive data read completion signal	D0 to D4	Control data of GP.RIWT instruction
Y123	Forced receive completion request signal	D10 to D13	Initial setting data or No. of send data and send data
Y124	Initialization request signal	D30 to D34	Control data of GP.RIRD instruction
Y126	OS reception area clear request signal	D35 to D39	
Y127	E^{2}PROM function request signal	D200	No. of receive data
Y139	Initial data read request signal	From D201	Receive data
Y13A	Error reset request signal	D400 to D402	AJ65BT-R2N error code
M0	Operation start request flag	D900	Master module RY(n+1)E, RY(n+1)F
M1	Initial setting write completion flag	SW80.1	Other station data link status (Station No.2)

(3) Program example



Turns ON AJ65BT-R2N mode normal flag

Turns ON AJ65BT-R2N mode error flag

Turns ON Operation start request flag

Resets Operation complete flag

Station No. of AJ65BT-R2N

Access code and attribute code

Receive end frame No. address

No. of write points

Specifies default registration frame 102H (CR(0DH)+LF(0AH) for receive end frame No. 1

No frame specification

No frame specification

No frame specification

Writes to AJ65BT-R2N buffer memory

Turns ON Initial setting write completion flag

Turns ON Initialization request signal

Resets Initialization request signal

Resets Initial setting write completion flag

Turns ON Operation complete flag

Resets AJ65BT-R2N initial setting start flag

Resets Operation complete flag

Resets Buffer memory access exclusion check flag

Figure 6.16 Program example

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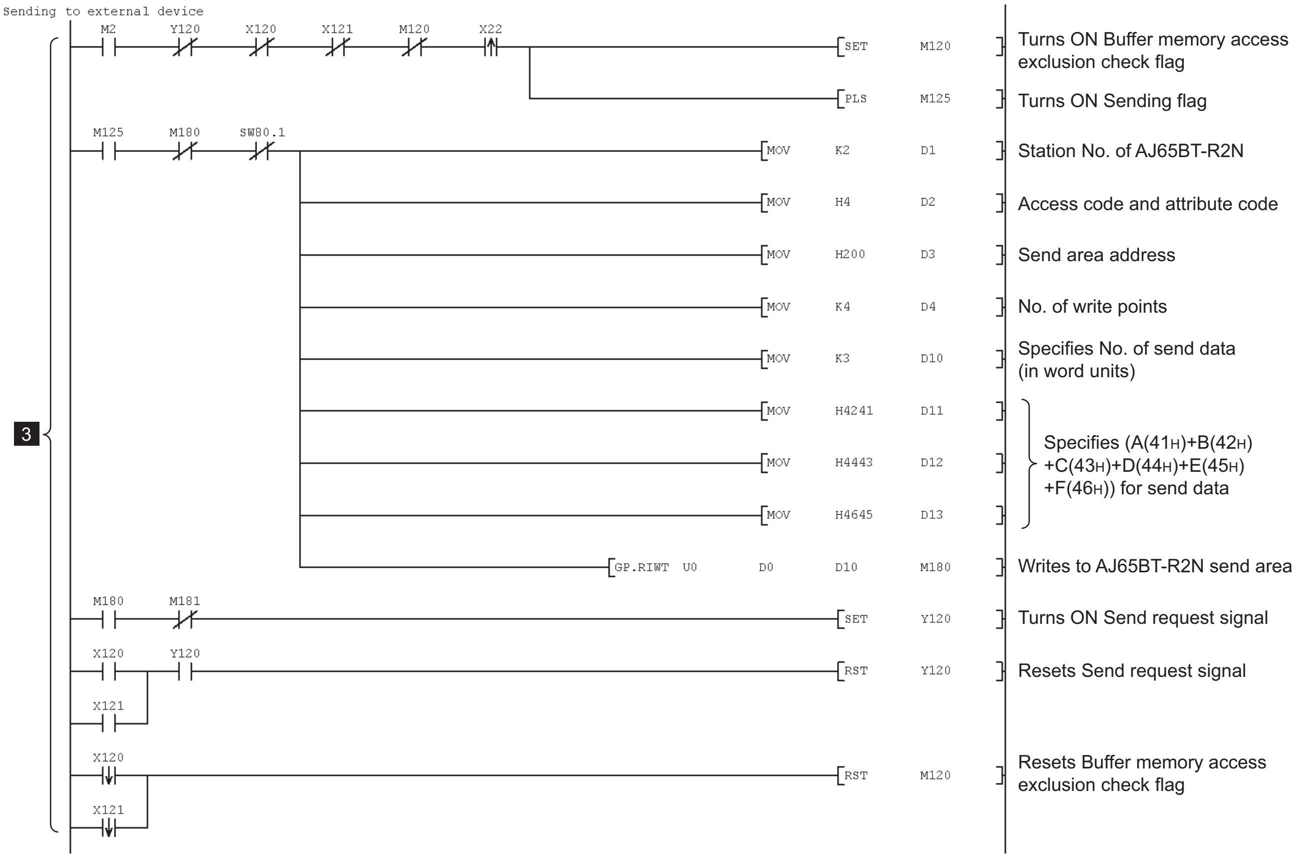

Figure 6.16 Program example (Continued)

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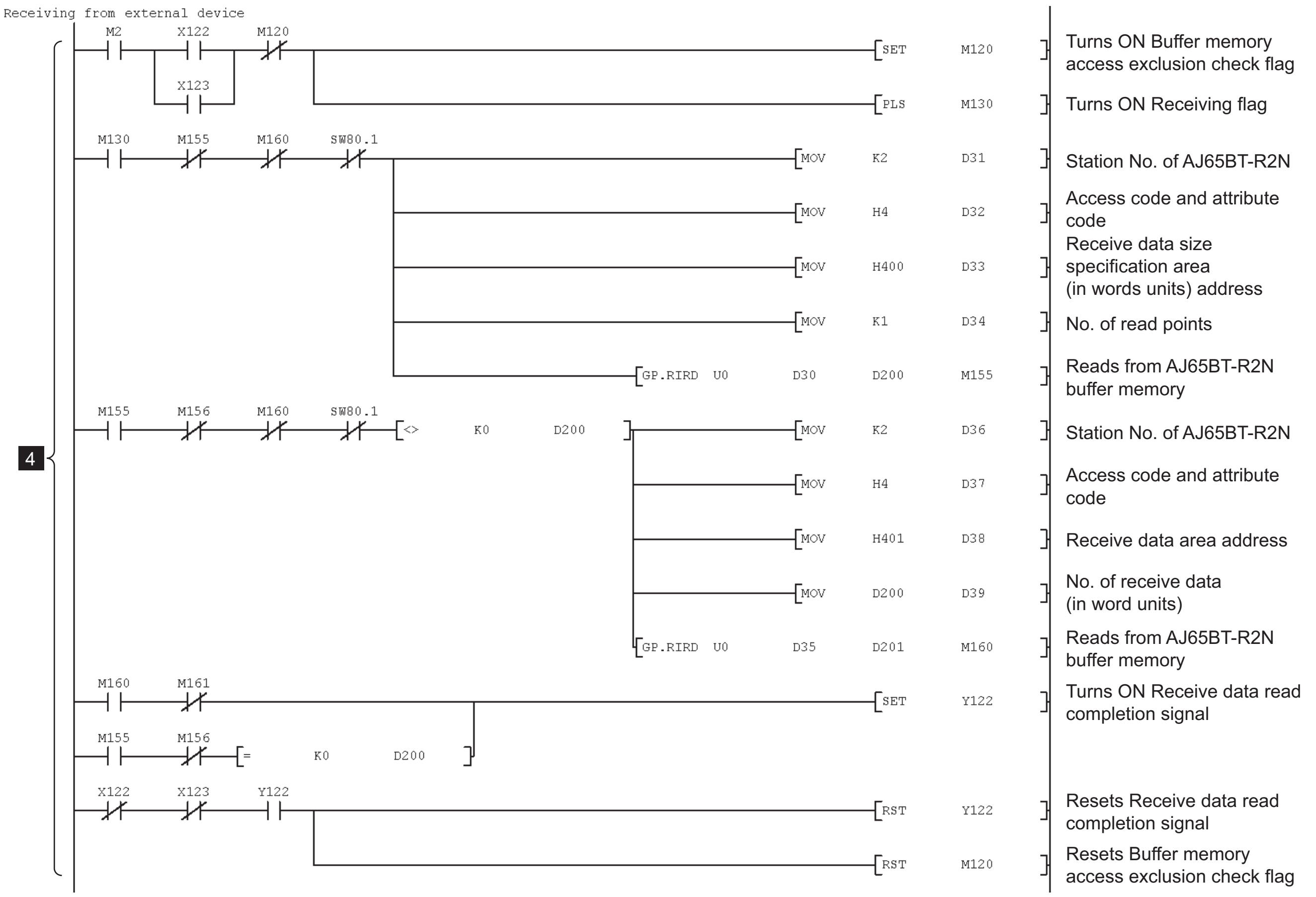

Figure 6.16 Program example (Continued)

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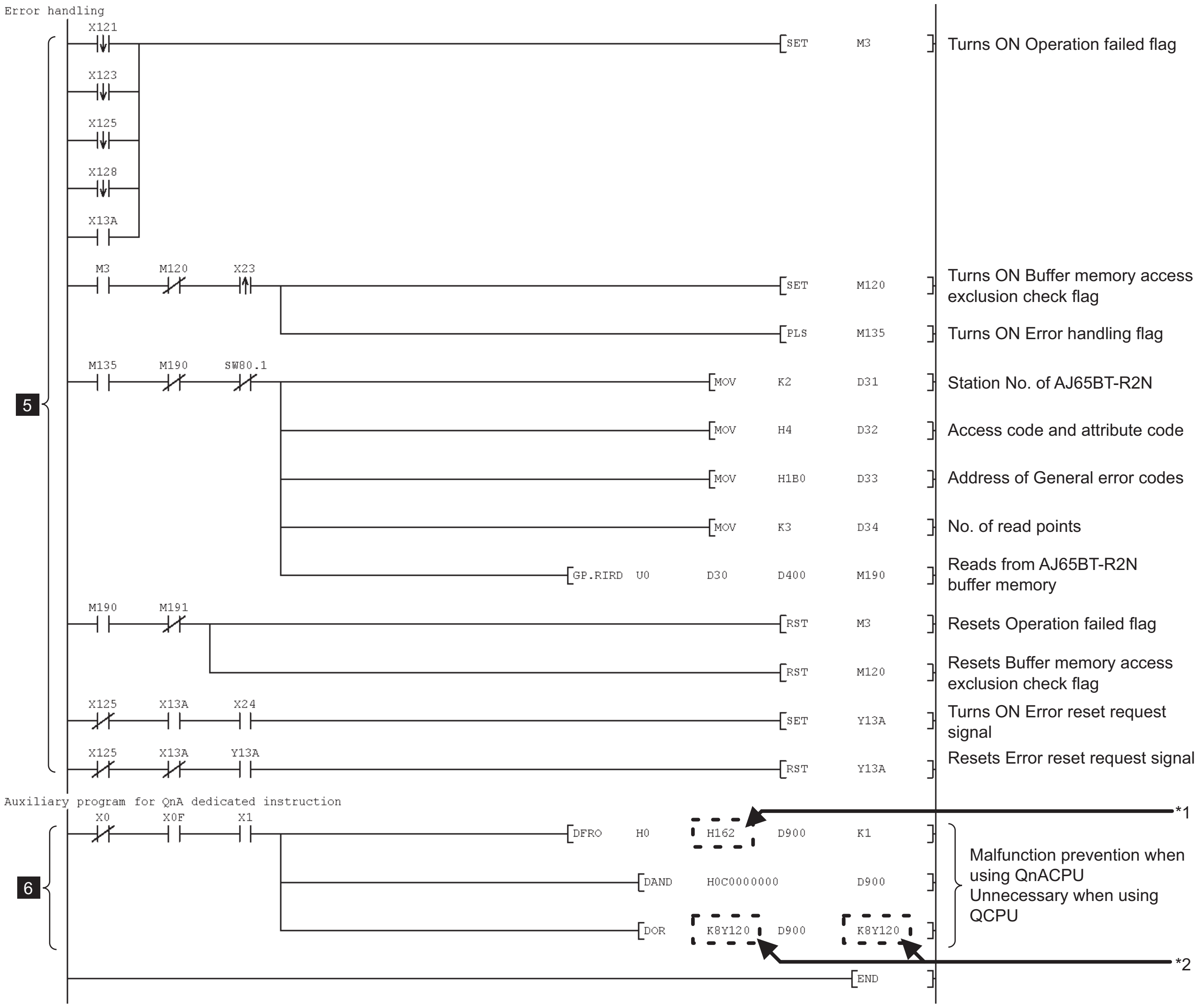


*1 Master module buffer memory address to which the AJ65BT-R2N remote output (RY) was assigned.
Correct the remote output (RY) assignment if it is different from that of the program example.

*2 Auto-refresh target device of AJ65BT-R2N
Correct the auto-refresh target device if it is different from that of the program example.

Figure 6.16 Program example (Continued)

6.2.2 For the buffer memory auto-refresh function

(1) Overview of program examples

(a) Mode setting switch check program ((3) in this section - **1**)
Whether the mode setting switch is set correctly or not is checked.

(b) AJ65BT-R2N initial setting program ((3) in this section - **2**)

1) Initial data are read from the AJ65BT-R2N to the master module.
2) By the frame function, reception is completed when CR($0D_H$)+LF($0A_H$) is received.
3) The AJ65BT-R2N is initialized.

☞ Section 6.3.2 For the buffer memory auto-refresh function

(c) Program for sending data to external device ((3) in this section - **3**)
If Send execute flag (X22) is turned ON, the character string "ABCDEF" is sent from the master station to the external device.

☞ Section 6.4.2 For the buffer memory auto-refresh function

(d) Program for receiving data from external device ((3) in this section - **4**)
When data are received from the external device, the received data are read out from the AJ65BT-R2N to the master station.

☞ Section 6.5.2 For the buffer memory auto-refresh function

(e) Error handling program ((3) in this section - **5**)

1) When an error occurs during initialization setting or data transfer, an error code will be read out from the AJ65BT-R2N to the master module if Error code read flag (X23) is turned ON.
2) The error is canceled when Error clear flag (X24) is turned ON after the cause of the error has been eliminated.

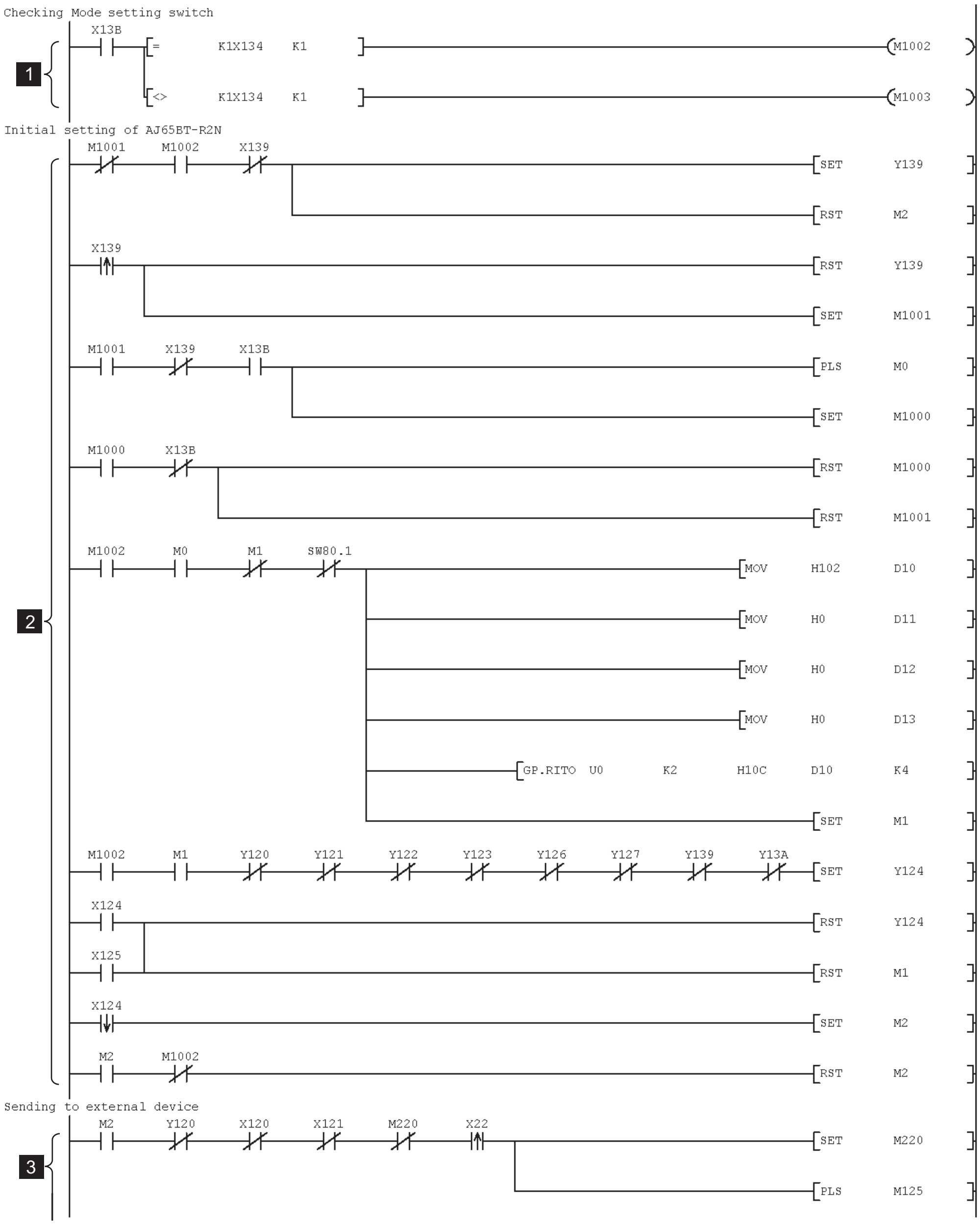
☞ Section 6.6.2 For the buffer memory auto-refresh function

(2) Devices used in the program example

Table 6.16 Devices used in the program example

Device	Description	Device	Description
X22	Send execute flag	Y127	E^2PROM function request signal
X23	Error code read flag	Y139	Initial data read request signal
X24	Error clear flag	Y13A	Error reset request signal
X120	Send complete signal	M0	Operation start request flag
X121	Send failed signal	M1	Initial setting write completion flag
X122	Normal receive data read request signal	M2	Operation complete flag
X123	Error receive data read request signal	M3	Operation failed flag
X124	Initialization complete signal	M125	Sending flag
X125	Initialization failed signal	M130	Receiving flag
X128	E^2PROM function failed signal	M135	Error handling flag
K1X134	Mode setting switch status signal (X134 to X137)	M220	Send-in-execution flag
X139	Initial data read completion signal	M1000	AJ65BT-R2N initial data read complete flag
X13A	Error status signal	M1001	AJ65BT-R2N initial data reading flag
X13B	Remote station ready signal	M1002	AJ65BT-R2N mode normal flag
Y120	Send request signal	M1003	AJ65BT-R2N mode error flag
Y121	Send cancel request signal	D10 to D13	Initial setting data or No. of send data and send data
Y122	Receive data read completion signal	D200	No. of receive data
Y123	Forced receive completion request signal	From D201	Receive data
Y124	Initialization request signal	D400 to D402	AJ65BT-R2N error code
Y126	OS reception area clear request signal	SW80.1	Other station data link status (Station No.2)

(3) Program example



Turns ON AJ65BT-R2N mode normal flag

Turns ON AJ65BT-R2N mode error flag

Turns ON Initial data read request signal

Resets Operation complete flag

Resets Initial data read request signal

Turns ON AJ65BT-R2N initial data reading flag

Turns ON Operation start request flag

Turns ON AJ65BT-R2N initial data read complete flag

Resets AJ65BT-R2N initial data read complete flag

Resets AJ65BT-R2N initial data reading flag

Specifies default registration frame 102H (CR(0DH)+LF(0AH)) for receive end frame No.1

No frame specification

No frame specification

No frame specification

Writes to AJ65BT-R2N buffer memory

Turns ON Initial setting write completion flag

Turns ON Initialization request signal

Resets Initialization request signal

Resets Initial setting write completion flag

Turns ON Operation complete flag

Resets Operation complete flag

Turns ON Send-in-execution flag

Turns ON Sending flag

Figure 6.17 Program example

(Continued to next page)

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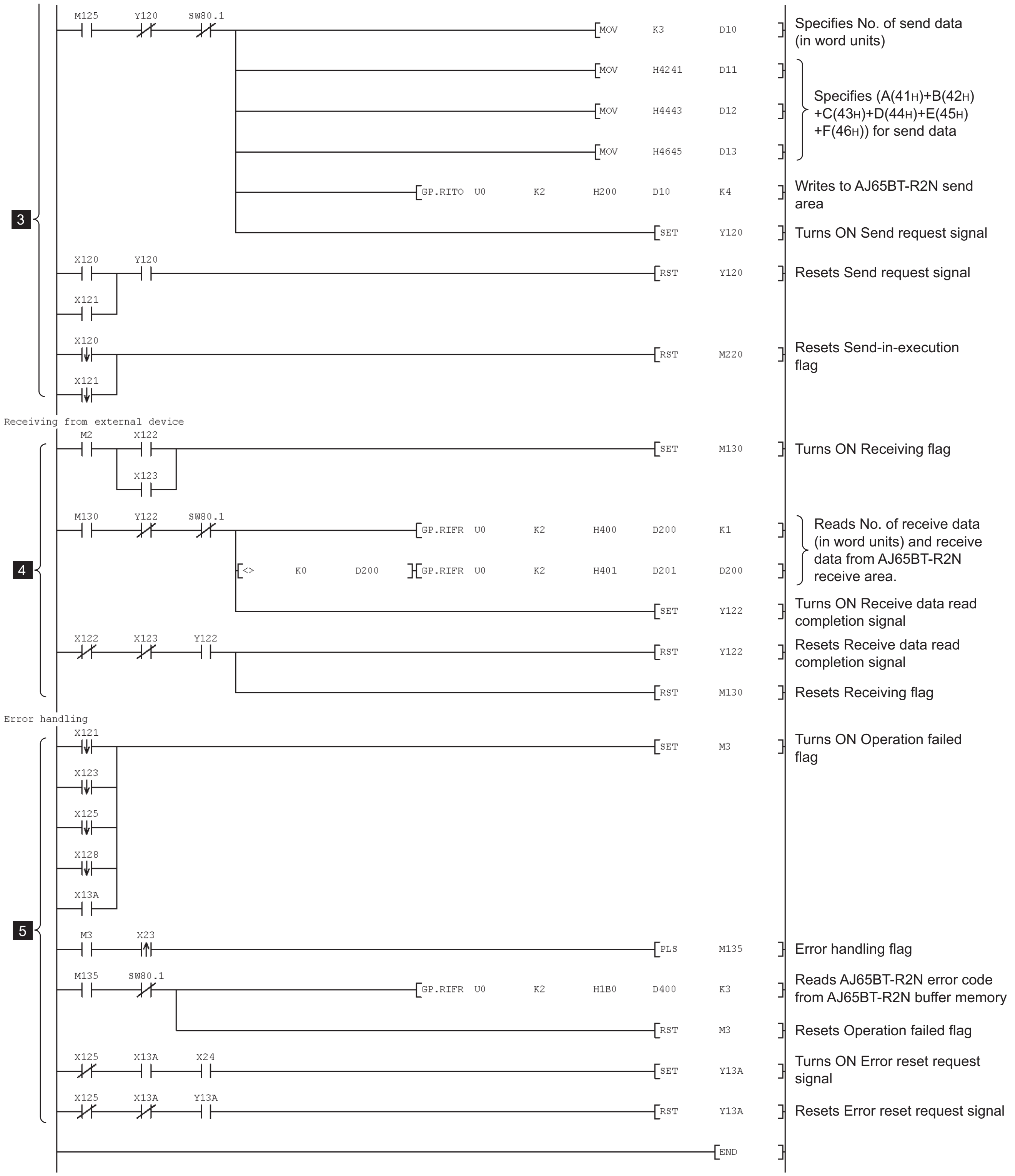


Figure 6.17 Program example (Continued)

6.3 Initial Setting for AJ65BT-R2N

6.3.1 For the send/receive buffer communication function

(1) Overview of program examples

1) When AJ65BT-R2N initial setting start flag (M20) is turned ON, settings are configured so that data reception is completed by the frame function upon receipt of CR(0D$_H$)+LF(0A$_H$).

2) The AJ65BT-R2N is initialized.

(2) Processing in the program example

1) Default registration frame 102$_H$ (CR(0D$_H$)+LF(0A$_H$)) is written to Receive start frame No. 1 (R2N 10C$_H$).

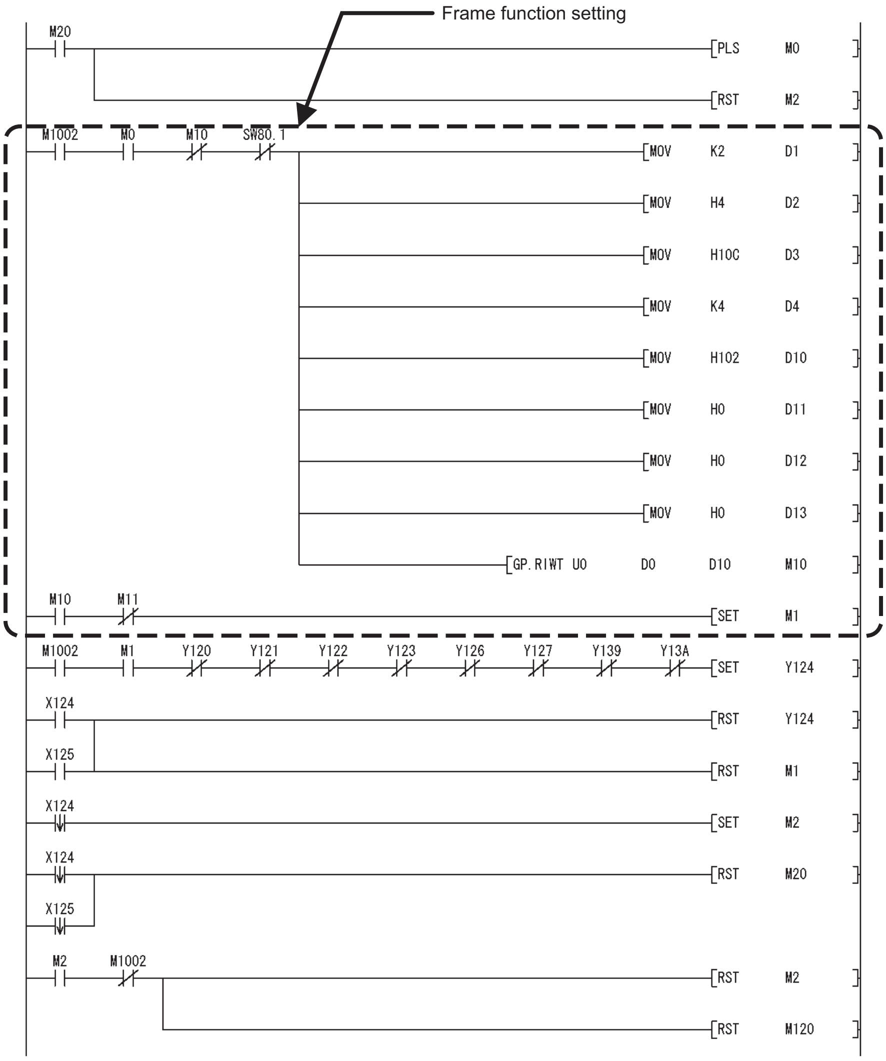
2) After writing is normally completed, Initialization request signal (Y124) is turned ON to complete the initial setting.

(3) Devices used in the program example

Table 6.17 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X124	Initialization complete signal	Section 6.3.1	—
X125	Initialization failed signal	Section 6.3.1	—
X13B	Remote station ready signal	Section 6.3.1	—
Y120	Send request signal	—	Section 6.4.1
Y121	Send cancel request signal	—	—
Y122	Receive data read completion signal	—	Section 6.5.1
Y123	Forced receive completion request signal	—	—
Y124	Initialization request signal	Section 6.3.1	—
Y126	OS reception area clear request signal	—	—
Y127	E^{2}PROM function request signal	—	—
Y139	Initial data read request signal	—	—
Y13A	Error reset request signal	—	Section 6.6.1
M0	Operation start request flag	Section 6.3.1	—
M1	Initial setting write completion flag	Section 6.3.1	—
M2	Operation complete flag	Section 6.3.1	—
M10	Device that is turned ON for one scan after completion of GP.RIWT	Section 6.3.1	—
M11	Device that is turned ON for one scan after failure of writing by GP.RIWT	Section 6.3.1	—
M20	AJ65BT-R2N initial setting start flag	—	—
M1002	AJ65BT-R2N mode normal flag	—	Section 6.2.1 (3) 1
D0 to D4	Control data of GP.RIWT instruction	—	—
D10 to D13	Initial setting data	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(4) Program example



Turns ON Operation start request flag

Resets Operation complete flag

Station No. of AJ65BT-R2N

Access code and attribute code

Receive end frame No. address

No. of write points

Specifies default registration frame 102H (CR(0DH)+LF(0AH)) for receive end frame No. 1

No frame specification

No frame specification

No frame specification

Writes to AJ65BT-R2N buffer memory

Turns ON Initial setting write completion flag

Turns ON Initialization request signal

Resets Initialization request signal

Resets Initial setting write completion flag

Turns ON Operation complete flag

Resets AJ65BT-R2N initial setting start flag

Resets Operation complete flag

Resets Buffer memory access exclusion check flag

Figure 6.18 Program example

(a) Setting of any other function

When changing the frame function setting to other than the above or when using any other function, refer to the section below and modify the area enclosed by the dotted line.

☞ Section 6.7 Initial Settings for Other Functions

6.3.2 For the buffer memory auto-refresh function

(1) Overview of program example

1) Initial data are read from the AJ65BT-R2N to the master module.
2) By the frame function, reception is completed when CR(0DH)+LF(0AH) is received.
3) The AJ65BT-R2N is initialized.

Point

Be sure to perform reading of initial data before making initial settings.

(2) Processing in the program example

1) The initial data are read out.
2) Default registration frame 102H (CR(0DH)+LF(0AH)) is written to Receive start frame No.1 (R2N 10CH).
3) After writing is normally completed, Initialization request signal (Y124) is turned ON to complete the initial setting.

(3) Devices used in the program example

Table 6.18 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X124	Initialization complete signal	Section 6.3.2	—
X125	Initialization failed signal	Section 6.3.2	—
X139	Initial data read completion signal	Section 6.3.2	—
X13B	Remote station ready signal	Section 6.3.2	—
Y120	Send request signal	—	Section 6.4.2
Y121	Send cancel request signal	—	—
Y122	Receive data read completion signal	—	Section 6.5.2
Y123	Forced receive completion request signal	—	—
Y124	Initialization request signal	Section 6.3.2	—
Y126	OS reception area clear request signal	—	—
Y127	E^2PROM function request signal	—	—
Y139	Initial data read request signal	Section 6.3.2	—
Y13A	Error reset request signal	—	Section 6.6.2
M0	Operation start request flag	Section 6.3.2	—
M1	Initial setting write completion flag	Section 6.3.2	—
M2	Operation complete flag	Section 6.3.2	—
M1000	AJ65BT-R2N initial data read complete flag	Section 6.3.2	—
M1001	Internal processing flag for AJ65BT-R2N initial data read	Section 6.3.2	—
M1002	AJ65BT-R2N mode normal flag	—	Section 6.2.2 (3) 1
D10 to D13	Initial setting data	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(4) Program example

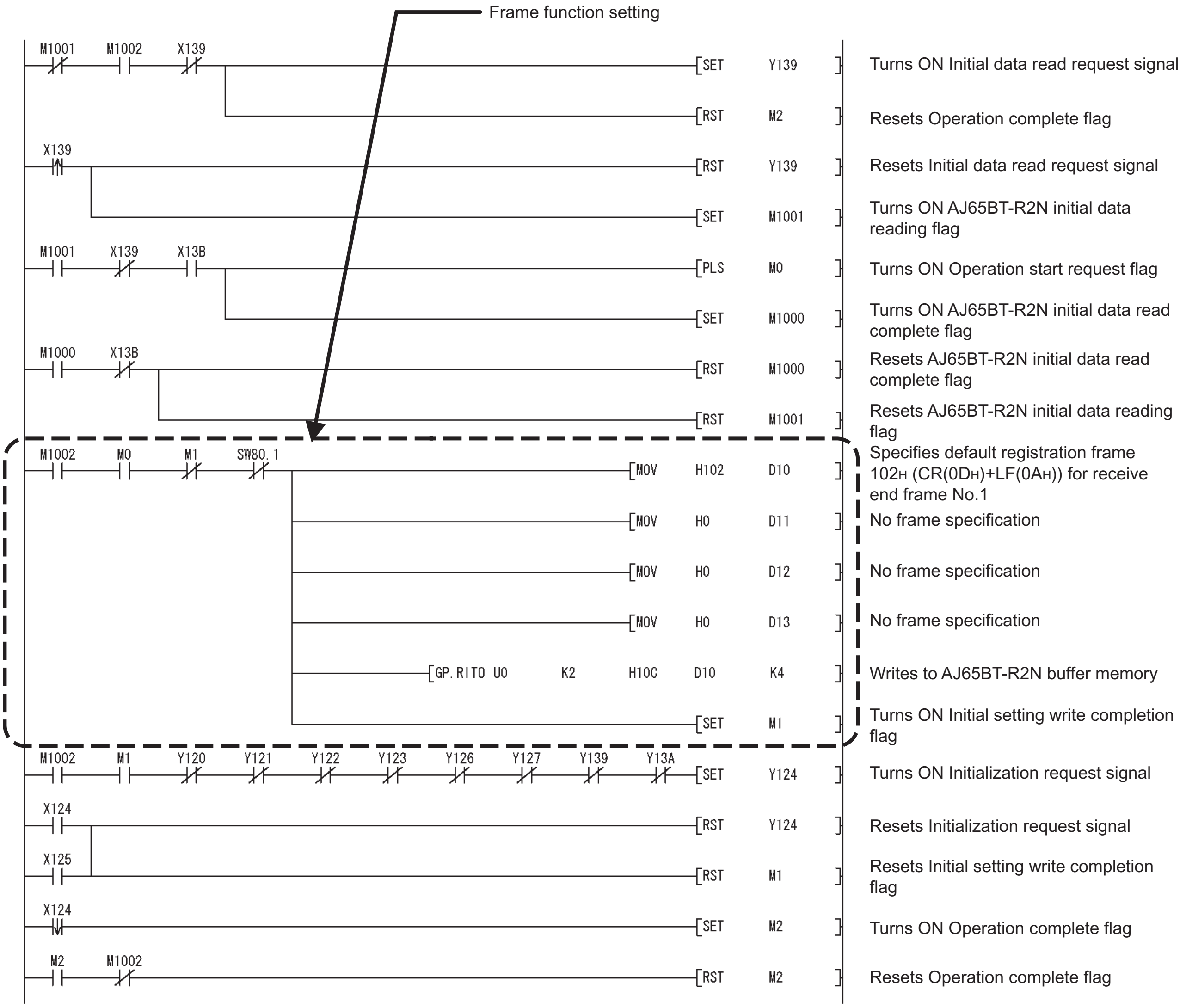


Figure 6.19 Program example

(a) Setting of any other function

When changing the frame function setting to other than the above or when using any other function, refer to the section below and modify the area enclosed by the dotted line.

☞ Section 6.7 Initial Settings for Other Functions

6.4 Sending to External Device

6.4.1 For the send/receive buffer communication function

(1) Overview of program example
If Send execute flag (X22) is turned ON, the character string "ABCDEF" is sent from the master station to the external device.

(2) Processing in the program example

1) No. of send data (3) is written to Send data size specification area (R2N 200H) and the send data ("ABCDEF") is written to Send data area (R2N 201H).
2) Send request signal (Y120) is turned ON to send data to the external device.
3) Send request signal (Y120) is turned OFF to complete the transmission.

(3) Devices used in the program example

Table 6.19 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X22	Send execute flag	—	—
X120	Send complete signal	Section 6.4.1	—
X121	Send failed signal	Section 6.4.1	—
Y120	Send request signal	Section 6.4.1	—
M2	Operation complete flag	—	Section 6.3.1
M120	Buffer memory access exclusion check flag	Section 6.4.1	Section 6.5.1, Section 6.6.1
M125	Sending flag	Section 6.4.1	—
M180	Device that is turned ON for one scan after completion of GP.RIWT	Section 6.4.1	—
M181	Device that is turned ON for one scan after failure of writing by GP.RIWT	Section 6.4.1	—
D0 to D4	Control data of GP.RIWT instruction	—	—
D10 to D13	No. of send data, send data	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(4) Program example

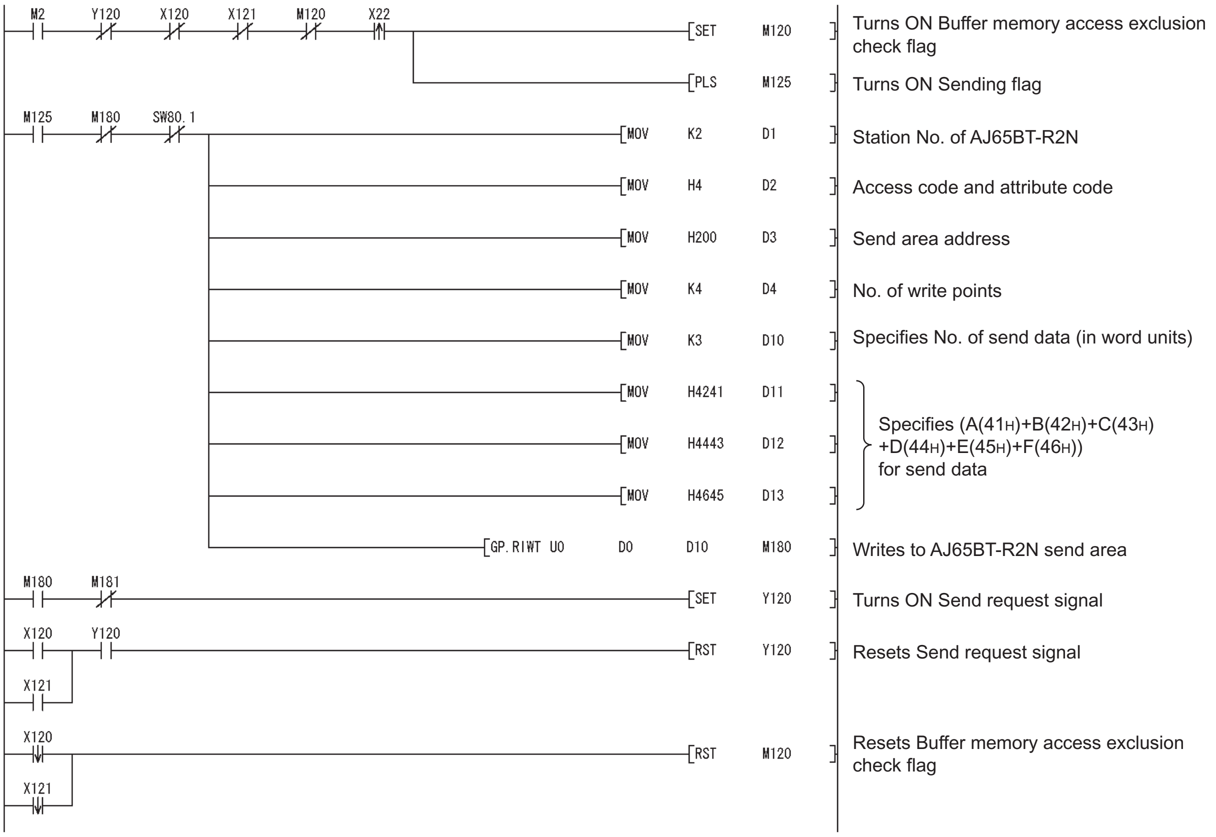


Figure 6.20 Program example

☒Point

When sending data of 481 words or more to the external device using the GP.RIWT instruction, divide the send data into parts with 480 words or less and write them to the AJ65BT-R2N.
With the GP.RIWT instructions, data with 481 words or more cannot be written to the AJ65BT-R2N at one time.

6.4.2 For the buffer memory auto-refresh function

(1) Overview of program example

If Send execute flag (X22) is turned ON, the character string "ABCDEF" is sent to the external device.

(2) Processing in the program example

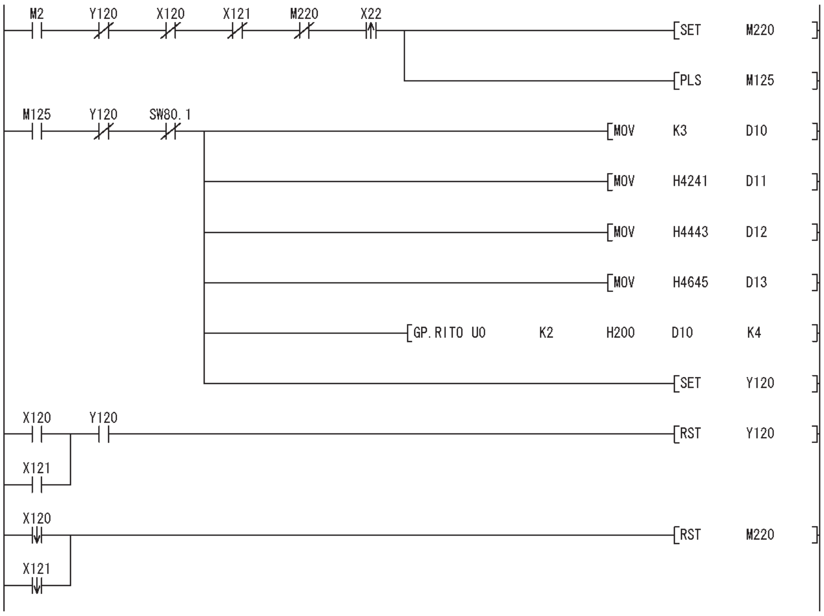
1) No. of send data (3) is written to Send data size specification area (R2N 200H) and the send data ("ABCDEF") is written to Send data area (R2N 201H).
2) Send request signal (Y120) is turned ON to send data to the external device.
3) Send request signal (Y120) is turned OFF to complete the transmission.

(3) Devices used in the program example

Table 6.20 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X22	Send execute flag	—	—
X120	Send complete signal	Section 6.4.2	—
X121	Send failed signal	Section 6.4.2	—
Y120	Send request signal	Section 6.4.2	—
M2	Operation complete flag	—	Section 6.3.2
M125	Sending flag	Section 6.4.2	—
M220	Send-in-execution flag	Section 6.4.2	—
D10 to D13	No. of send data, send data	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(4) Program example



Turns ON Send-in-execution flag

Turns ON Sending flag

Specifies No. of send data (in word units)

Specifies (A(41H)+B(42H)+C(43H)+D(44H)+E(45H)+F(46H)) for send data

Writes to AJ65BT-R2N send area

Turns ON Send request signal

Resets Send request signal

Resets Send-in-execution flag

Figure 6.21 Program example

☒Point

When sending data of 4097 words or more to the external device using the GP.RITO instruction, divide the send data into parts with 4096 words or less and write them to the AJ65BT-R2N.

With the GP.RITO instructions, data with 4097 words or more cannot be written to the AJ65BT-R2N at one time.

6.5 Receiving from External Device

6.5.1 For the send/receive buffer communication function

(1) Overview of program example

When data is received to the AJ65BT-R2N from the external device, the received data is read to the master station word device (D200).

(2) Processing in the program example

1) No. of receive data is read from Receive data size specification area (R2N 400H) to the master station word device (D200).
2) The receive data is read from Receive data area(R2N 401H) to the master station word device (D201 or later).
3) Receive data read completion signal (Y122) is turned ON → OFF to terminate the reception.

(3) Devices used in the program example

Table 6.21 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X122	Normal receive data read request signal	—	—
X123	Error receive data read request signal	—	—
Y122	Receive data read completion signal	Section 6.5.1	—
M2	Operation complete flag	—	Section 6.3.1
M120	Buffer memory access exclusion check flag	Section 6.5.1	Section 6.4.1, Section 6.6.1
M130	Receiving flag	Section 6.5.1	—
M155	Device that is turned ON for one scan after completion of GP.RIRD	Section 6.5.1	—
M156	Device that is turned ON for one scan after failure of reading by GP.RIRD	Section 6.5.1	—
M160	Device that is turned ON for one scan after completion of GP.RIRD	Section 6.5.1	—
M161	Device that is turned ON for one scan after failure of reading by GP.RIRD	Section 6.5.1	—
D30 to D34	Control data of GP.RIRD instruction	—	—
D35 to D39		—	—
D200	No. of receive data	—	—
D201 or later	Receive data	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(4) Program example

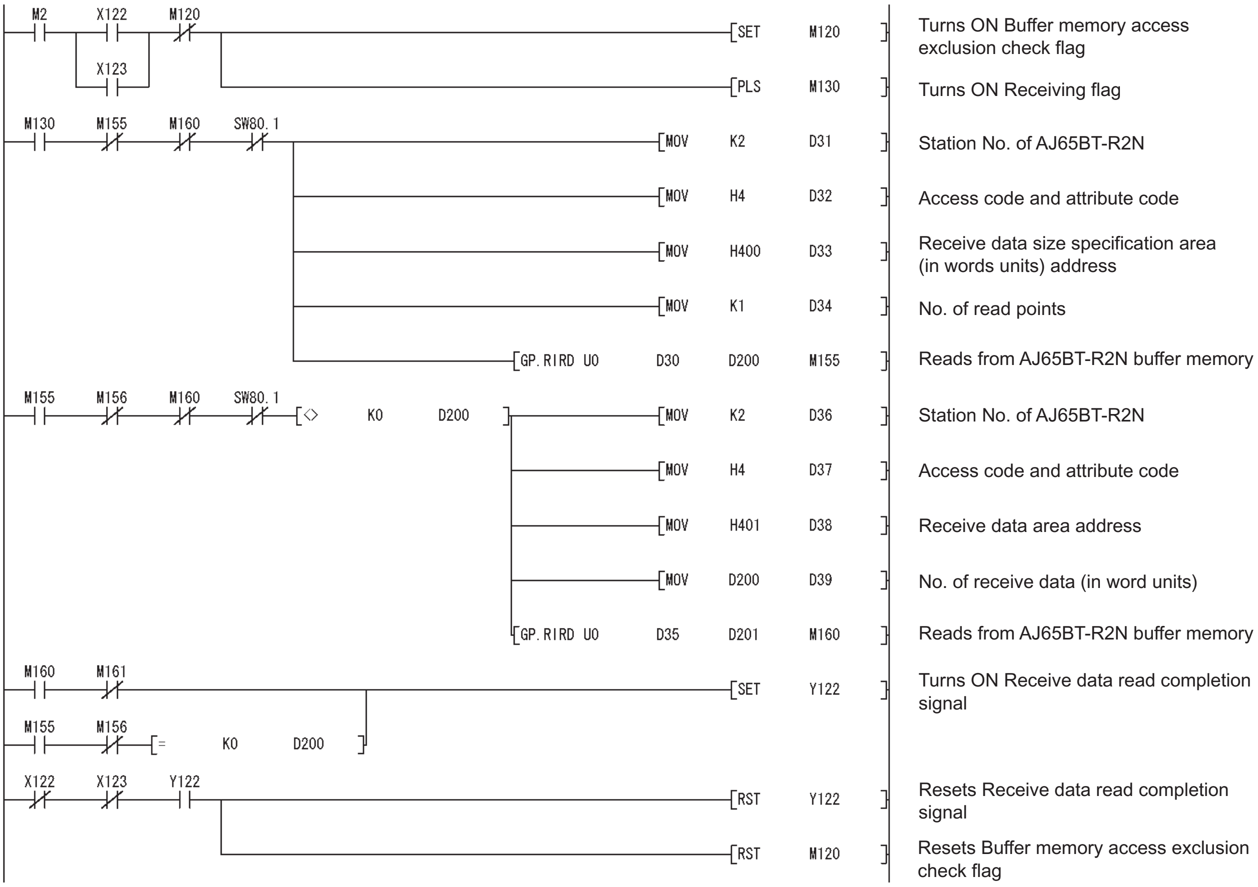


Figure 6.22 Program example

☒Point

When receiving data of 481 words or more from the external device using the GP.RIRD instruction, divide the receive data into parts with 480 words or less and read them to the AJ65BT-R2N.
With the GP.RIRD instructions, data with 481 words or more cannot be read from the AJ65BT-R2N at one time.

6.5.2 For the buffer memory auto-refresh function

(1) Overview of program example

When the AJ65BT-R2N receives data from the external device, the received data are read out to the master station word device (D200).

(2) Processing in the program example

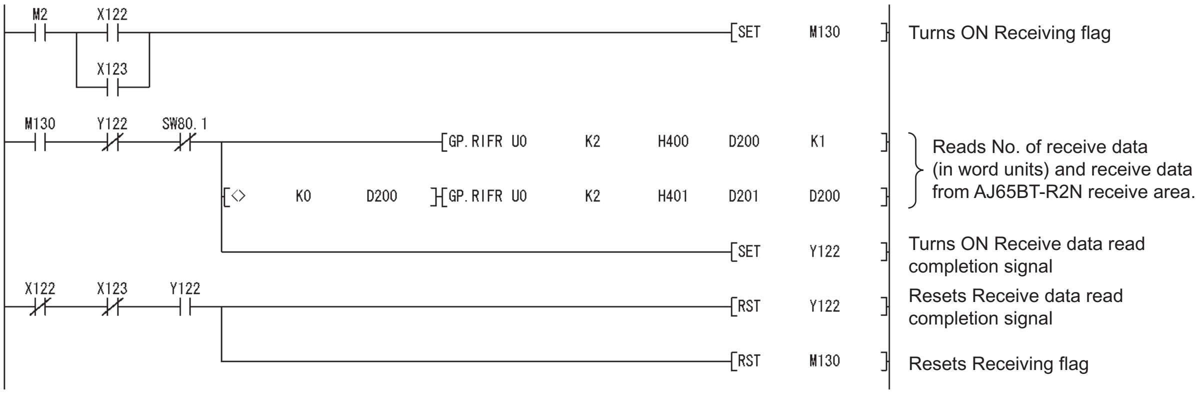
1) No. of receive data is read from Receive data size specification area (R2N 400H) to the master station word device (D200).
2) The receive data is read from Receive data area(R2N 401H) to the master station word device (D201 or later).
3) Receive data read completion signal (Y122) is turned ON → OFF to terminate the reception.

(3) Devices used in the program example

Table 6.22 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X122	Normal receive data read request signal	—	—
X123	Error receive data read request signal	—	—
Y122	Receive data read completion signal	Section 6.5.2	—
M2	Operation complete flag	—	Section 6.3.2
M130	Receiving flag	Section 6.5.2	—
D200 or later	No. of receive data, receive data	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(4) Program example



Turns ON Receiving flag

Reads No. of receive data (in word units) and receive data from AJ65BT-R2N receive area.

Turns ON Receive data read completion signal

Resets Receive data read completion signal

Resets Receiving flag

Figure 6.23 Program example

☒Point

When receiving data of 4097 words or more from the external device using the GP.RIFR instruction, divide the receive data into parts with 4096 words or less and read them to the AJ65BT-R2N.

With the GP.RIFR instructions, data with 4097 words or more cannot be read from the AJ65BT-R2N at one time.

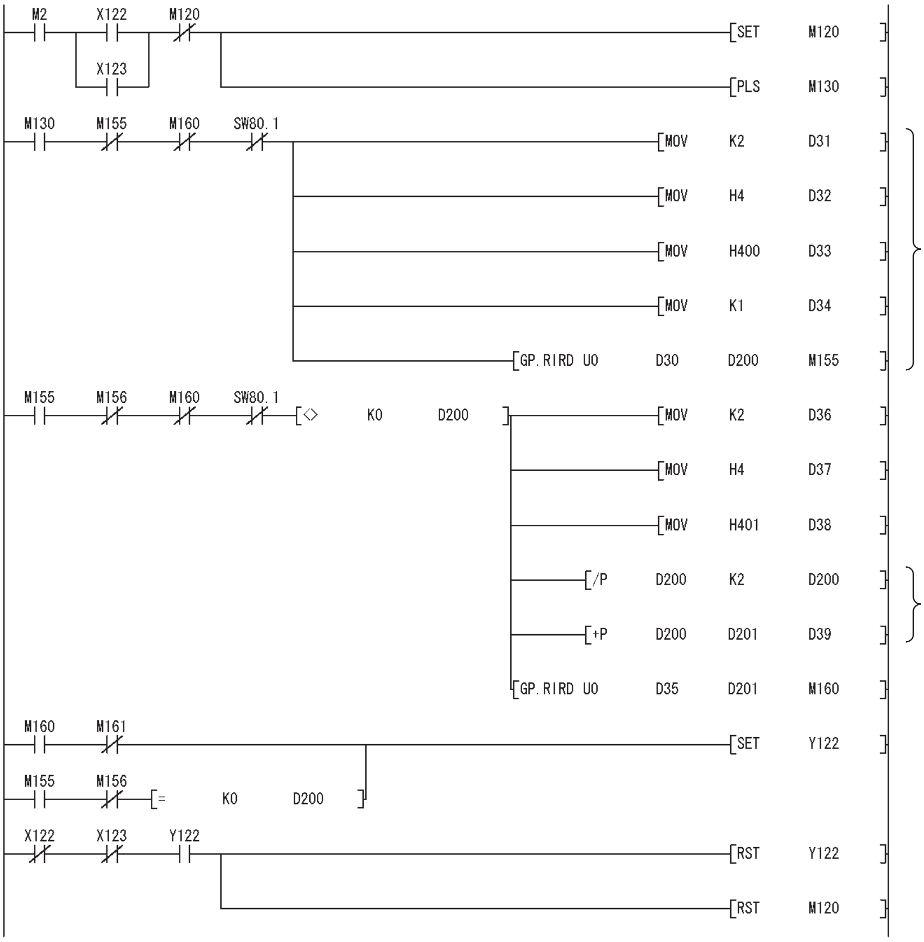
6.5.3 Precautions when receiving from external device

(1) Precautions for specification in byte units

The setting in Word/byte specification (R2N 102H) influences the number of the data handled by the following buffer memory areas.

- No. of receive end data (R2N 111H)
- No. of actual send data (R2N 1B4H)
- No. of data stored in OS reception area (R2N 1B6H)
- Send data size specification area (R2N 200H (at default))
- Receive data size specification area (R2N 400H (at default))

In the case of byte specification, to use any of the above memory values as set data of a dedicated instruction, the byte data must be changed to word data as shown below.



Reads No. of receive data (in byte units)

Changes No. of receive data (in byte units) to No. of words (fractions rounded up) and specifies it as No. of read points in GP.RIRD instruction

Figure 6.24 Program example of receiving when specified in byte units

6.6 Error Handling of AJ65BT-R2N

6.6.1 For the send/receive buffer communication function

(1) Overview of program example

1) When an error occurs during initialization setting or data transfer, an error code will be read out from the AJ65BT-R2N to the master module if Error code read flag (X23) is turned ON.

2) The error is canceled when Error clear flag (X24) is turned ON after the cause of the error has been eliminated.

(2) Processing in the program example

1) If any of the signals below are turned ON and Error code read flag (X23) is turned ON, an error code will be read out from the AJ65BT-R2N to the master module.
   - Send failed signal (X121)
   - Error receive data read request signal (X123)
   - Initialization failed signal (X125)
   - E^{2}PROM function failed signal (X128)

2) If Error clear flag (X24) is turned ON after the cause of the error has been eliminated, Error reset request signal (RY(n+1)A) will be turned ON and the error will be cleared.

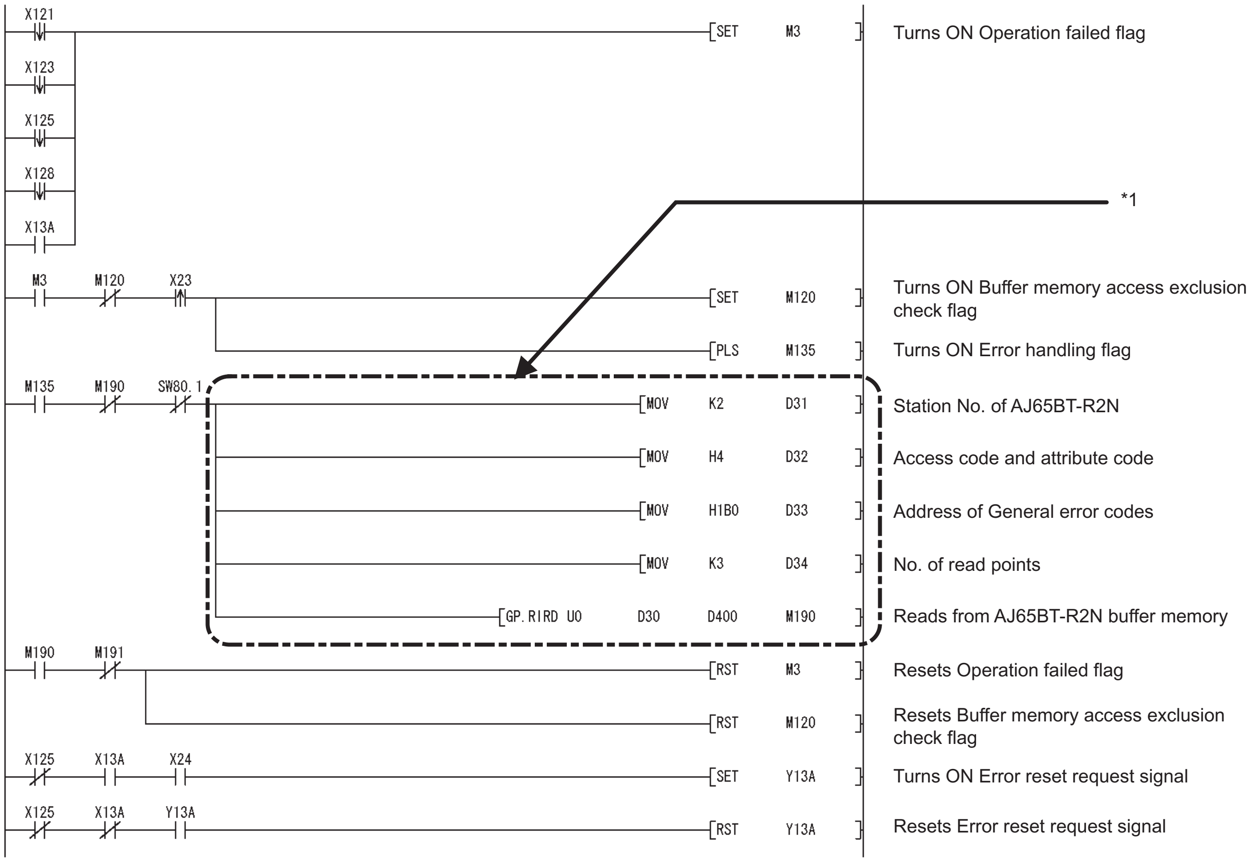
3) This turns off the ERR.LED, and error handling is complete when Error code storage area (R2N 1A8$_H$ to 1B2$_H$) is cleared.

(3) Devices used in the program example

Table 6.23 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X23	Error code read flag	—	—
X24	Error clear flag	—	—
X121	Send failed signal	—	Section 6.4.1
X123	Error receive data read request signal	—	—
X125	Initialization failed signal	—	Section 6.3.1
X128	E^{2}PPROM function failed signal	—	—
X13A	Error status signal	Section 6.6.1	—
Y13A	Error reset request signal	Section 6.6.1	—
M3	Operation failed flag	Section 6.6.1	—
M120	Buffer memory access exclusion check flag	Section 6.6.1	Section 6.4.1, Section 6.5.1
M135	Error handling flag	Section 6.6.1	—
M190	Device that is turned ON for one scan after completion of GP.RIRD	Section 6.6.1	—
M191	Device that is turned ON for one scan after failure of reading by GP.RIRD	Section 6.6.1	—
D30 to D34	Control data of GP.RIRD instruction	—	—
D400 to D402	AJ65BT-R2N error code	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(4) Program example



*1 Modify this according to the system being used and processing executed, etc.

Figure 6.25 Program example

6.6.2 For the buffer memory auto-refresh function

(1) Overview of program example

1) When an error occurs during initialization setting or data transfer, an error code will be read out from the AJ65BT-R2N to the master module if Error code read flag (X23) is turned ON.

2) The error is canceled when Error clear flag (X24) is turned ON after the cause of the error has been eliminated.

(2) Processing in the program example

1) If any of the signals below are turned ON and Error code read flag (X23) is turned ON, an error code will be read out from the AJ65BT-R2N to the master module.
   - Send failed signal (X121)
   - Error receive data read request signal (X123)
   - Initialization failed signal (X125)
   - E^{2}PROM function failed signal (X128)

2) If Error clear flag (X24) is turned ON after the cause of the error has been eliminated, Error reset request signal (RY(n+1)A) will be turned ON and the error will be cleared.

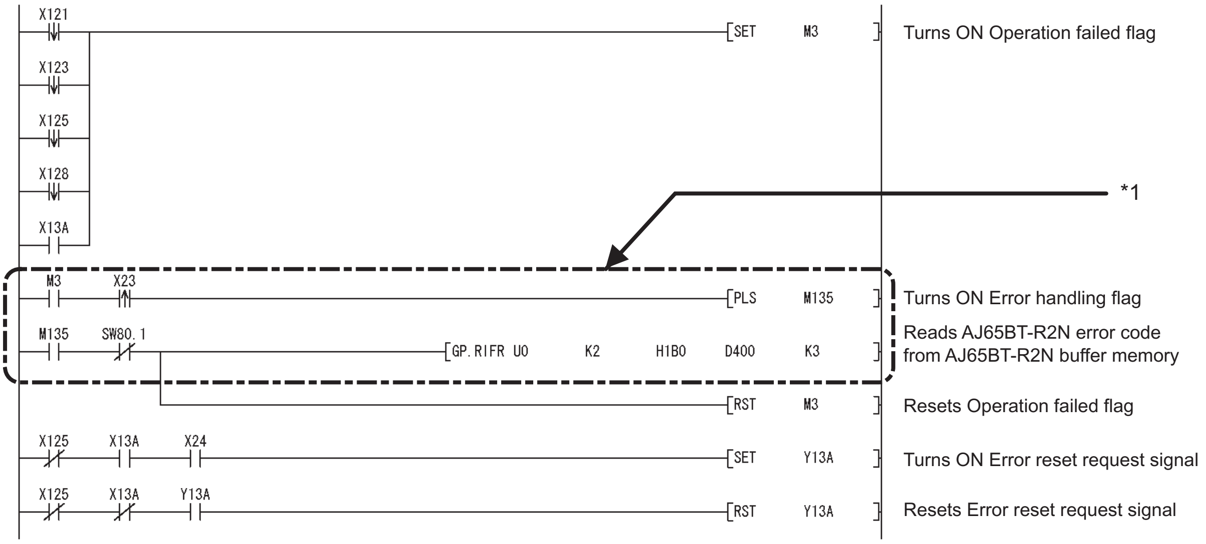
3) This turns off the ERR.LED, and error handling is complete when Error code storage area (R2N 1A8H to 1B2H) is cleared.

(3) Devices used in the program example

Table 6.24 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X23	Error code read flag	—	—
X24	Error clear flag	—	—
X121	Send failed signal	—	Section 6.4.2
X123	Error receive data read request signal	—	—
X125	Initialization failed signal	—	Section 6.3.2
X128	E^{2}PROM function failed signal	—	—
X13A	Error status signal	Section 6.6.2	—
Y13A	Error reset request signal	Section 6.6.2	—
M3	Operation failed flag	Section 6.6.2	—
M135	Error handling flag	Section 6.6.2	—
D400 to D402	AJ65BT-R2N error code	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(4) Program example



Turns ON Operation failed flag

Turns ON Error handling flag

Reads AJ65BT-R2N error code from AJ65BT-R2N buffer memory

Resets Operation failed flag

Turns ON Error reset request signal

Resets Error reset request signal

*1 Modify this according to the system being used and processing executed, etc.

Figure 6.26 Program example

6.7 Initial Settings for Other Functions

This section explains programs for the initial setting of the functions listed below.

Table 6.25 List of other functions

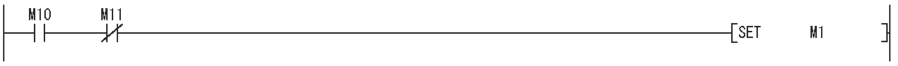
Function	Reference section
Initial setting for the frame function	Section 6.7.1
Initial setting for the monitoring-based transmission function	Section 6.7.2
Initial setting for the flow control function	Section 6.7.3
Initial setting for the ASCII-binary conversion function	Section 6.7.4
Initial setting for the RW refresh function	Section 6.7.5

Only the initial setting program is extracted for each function.
When using each function, apply the extracted program to the program given in the following section.

☞ Section 6.3 Initial Setting for AJ65BT-R2N

Remark

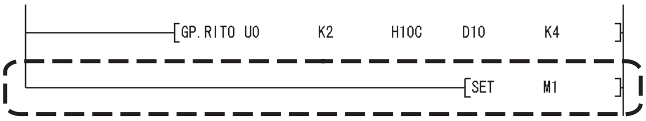
(1) When using more than one of the above functions during use of the send/receive buffer communication function, modify the program as follows:
- Avoid any duplicate settings with the devices (M10 to M17) that turn ON after completion of the GP.RIWT instruction.
- For the GP.RIWT instruction used at the end of initial setting, specify M10 as the device that turns ON after completion of the instruction.
- Have the following program, which is included in each program, executed one time at the end of all initial setting procedures.



Turns ON Initial setting write completion flag

Figure 6.27 Program executed only at the end of initial setting

(2) When using more than one of the above functions during use of the buffer memory auto-refresh function, modify the program as follows:
- Have the program part enclosed as shown below, which is included in each program, executed one time at the end of all initial setting procedures.



Turns ON Initial setting write completion flag

Figure 6.28 Program executed only at the end of initial setting

6.7.1 Initial setting for the frame function

(1) For the send/receive buffer communication function

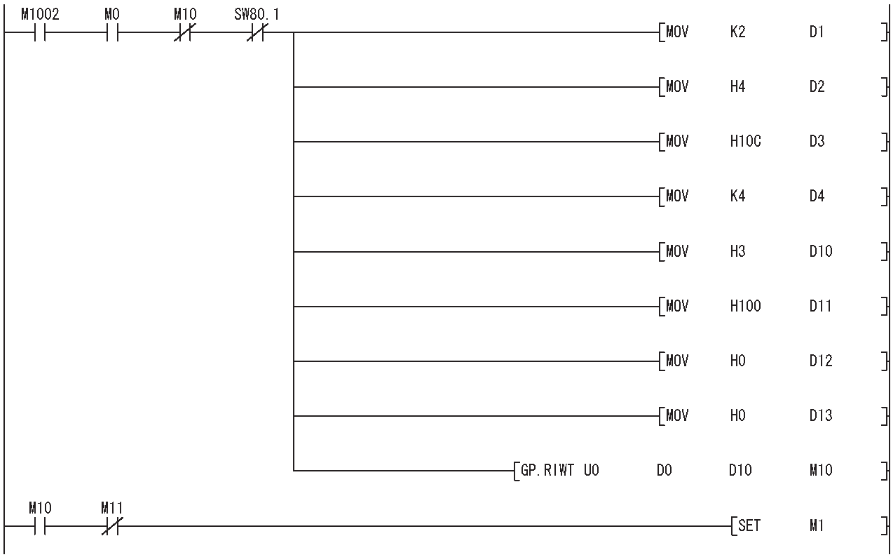
(a) Overview of program example
Reception is completed when ETX(03_H) or NUL(00_H) is received.

(b) Devices used in the program example

Table 6.26 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 6.3.1
M1	Initial setting write completion flag	Section 6.7.1	Section 6.3.1
M10	Device that is turned ON for one scan after completion of GP.RIWT	Section 6.7.1	Section 6.3.1
M11	Device that is turned ON for one scan after failure of writing by GP.RIWT	Section 6.7.1	Section 6.3.1
M1002	AJ65BT-R2N mode normal flag	—	Section 6.2.1 (3) 1
D0 to D4	Control data of GP.RIWT instruction	—	—
D10 to D13	Receive end frame No. 1 to 4	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(c) Program example



Station No. of AJ65BT-R2N

Access code and attribute code

Receive end frame No. address

No. of write points

Specifies default registration frame 03_H(ETX)

Specifies default registration frame 100_H (NUL(00_H))

No frame specification

No frame specification

Writes to AJ65BT-R2N buffer memory

Turns ON Initial setting write completion flag

Figure 6.29 Program example

(2) For the buffer memory auto-refresh function

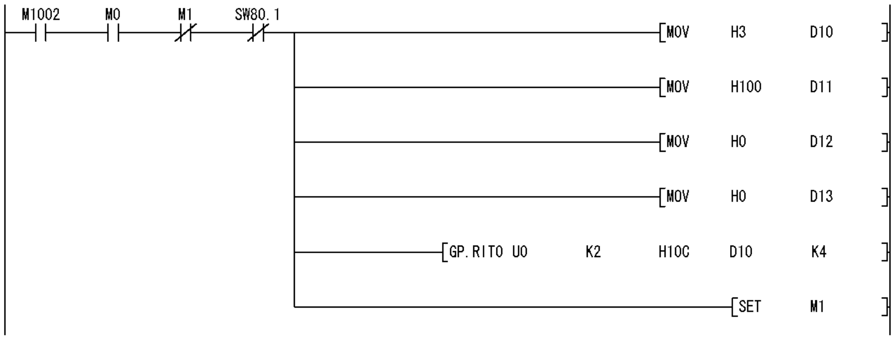
(a) Overview of program example
Reception is completed when ETX(03H) or NUL(00H) is received.

(b) Devices used in the program example

Table 6.27 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 6.3.2
M1	Initial setting write completion flag	Section 6.7.1	Section 6.3.2
M1002	AJ65BT-R2N mode normal flag	—	Section 6.2.2 (3) 1
D10 to D13	Receive end frame No. 1 to 4	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(c) Program example



Specifies default registration frame 03H (ETX)

Specifies default registration frame 100H (NUL(00H))

No frame specification

No frame specification

Writes to AJ65BT-R2N buffer memory

Turns ON Initial setting write completion flag

Figure 6.30 Program example

6.7.2 Initial setting for the monitoring-based transmission function

(1) For the send/receive buffer communication function

(a) Overview of program example

- The monitoring interval is set to 200ms and the send timeout time is set to 500ms.
- Data are sent when RX5 of the module on station No.1 turns ON.
- STX(02H)＋User registration frame (3E8H)＋ETX(03H) is set as the send data.

(b) Devices used in the program example

Table 6.28 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 6.3.1
M1	Initial setting write completion flag	Section 6.7.2	Section 6.3.1
M10	Device that is turned ON for one scan after completion of GP.RIWT	Section 6.7.2	Section 6.3.1
M11	Device that is turned ON for one scan after failure of writing by GP.RIWT	Section 6.7.2	Section 6.3.1
M12	Device that is turned ON for one scan after completion of GP.RIWT	Section 6.7.2	—
M13	Device that is turned ON for one scan after failure of writing by GP.RIWT	Section 6.7.2	—
M14	Device that is turned ON for one scan after completion of GP.RIWT	Section 6.7.2	—
M15	Device that is turned ON for one scan after failure of writing by GP.RIWT	Section 6.7.2	—
M16	Device that is turned ON for one scan after completion of GP.RIWT	Section 6.7.2	—
M17	Device that is turned ON for one scan after failure of writing by GP.RIWT	Section 6.7.2	—
M1002	AJ65BT-R2N mode normal flag	—	Section 6.2.1 (3) 1
D0 to D4	Control data of GP.RIWT instruction	—	—
D10 to D14	Monitoring-based transmission function set values	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(c) Program example

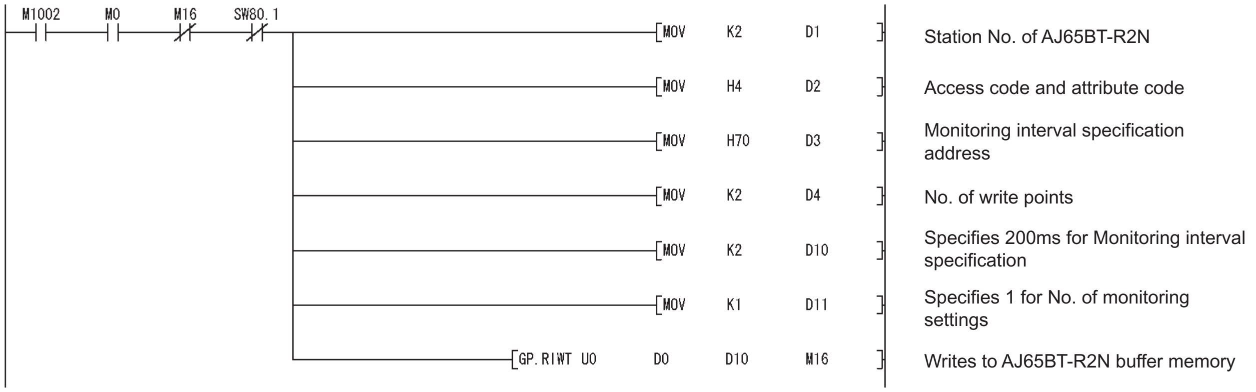


Figure 6.31 Program example

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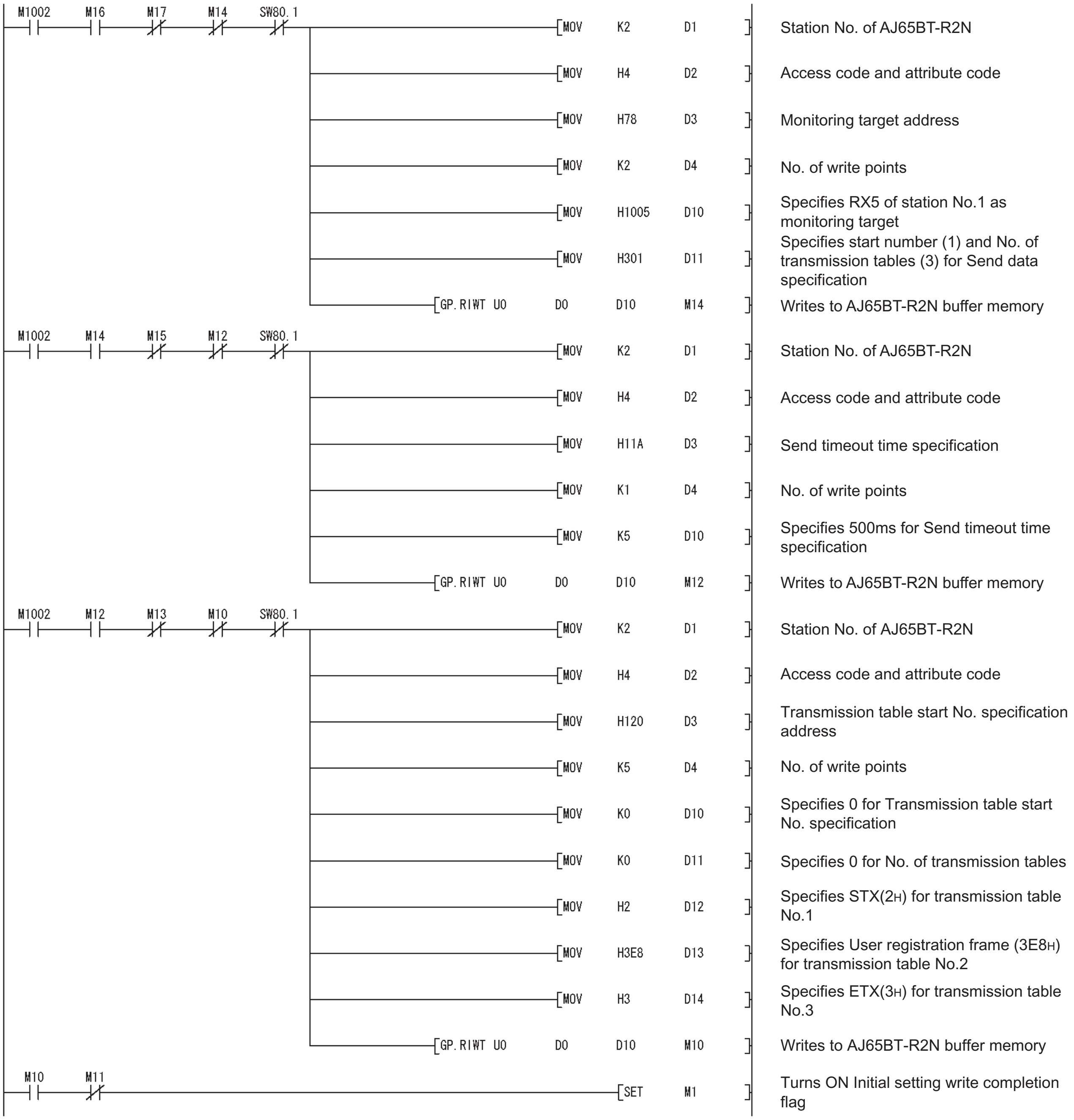


```
M1002  M16  M17  M14  SW80.1
─┤├────┤├───┤/├──┤/├──┤/├──┬──[MOV   K2     D1   ]   Station No. of AJ65BT-R2N
                           ├──[MOV   H4     D2   ]   Access code and attribute code
                           ├──[MOV   H78    D3   ]   Monitoring target address
                           ├──[MOV   K2     D4   ]   No. of write points
                           ├──[MOV   H1005  D10  ]   Specifies RX5 of station No.1 as monitoring target
                           ├──[MOV   H301   D11  ]   Specifies start number (1) and No. of transmission tables (3) for Send data specification
                           └──[GP.RIWT U0  D0  D10  M14]   Writes to AJ65BT-R2N buffer memory
M1002  M14  M15  M12  SW80.1
─┤├────┤├───┤/├──┤/├──┤/├──┬──[MOV   K2     D1   ]   Station No. of AJ65BT-R2N
                           ├──[MOV   H4     D2   ]   Access code and attribute code
                           ├──[MOV   H11A   D3   ]   Send timeout time specification
                           ├──[MOV   K1     D4   ]   No. of write points
                           ├──[MOV   K5     D10  ]   Specifies 500ms for Send timeout time specification
                           └──[GP.RIWT U0  D0  D10  M12]   Writes to AJ65BT-R2N buffer memory
M1002  M12  M13  M10  SW80.1
─┤├────┤├───┤/├──┤/├──┤/├──┬──[MOV   K2     D1   ]   Station No. of AJ65BT-R2N
                           ├──[MOV   H4     D2   ]   Access code and attribute code
                           ├──[MOV   H120   D3   ]   Transmission table start No. specification address
                           ├──[MOV   K5     D4   ]   No. of write points
                           ├──[MOV   K0     D10  ]   Specifies 0 for Transmission table start No. specification
                           ├──[MOV   K0     D11  ]   Specifies 0 for No. of transmission tables
                           ├──[MOV   H2     D12  ]   Specifies STX(2H) for transmission table No.1
                           ├──[MOV   H3E8   D13  ]   Specifies User registration frame (3E8H) for transmission table No.2
                           ├──[MOV   H3     D14  ]   Specifies ETX(3H) for transmission table No.3
                           └──[GP.RIWT U0  D0  D10  M10]   Writes to AJ65BT-R2N buffer memory
M10  M11
─┤├───┤/├─────────────────────[SET   M1   ]   Turns ON Initial setting write completion flag
```

Figure 6.31 Program example (Continued)

(2) For the buffer memory auto-refresh function

(a) Overview of program example

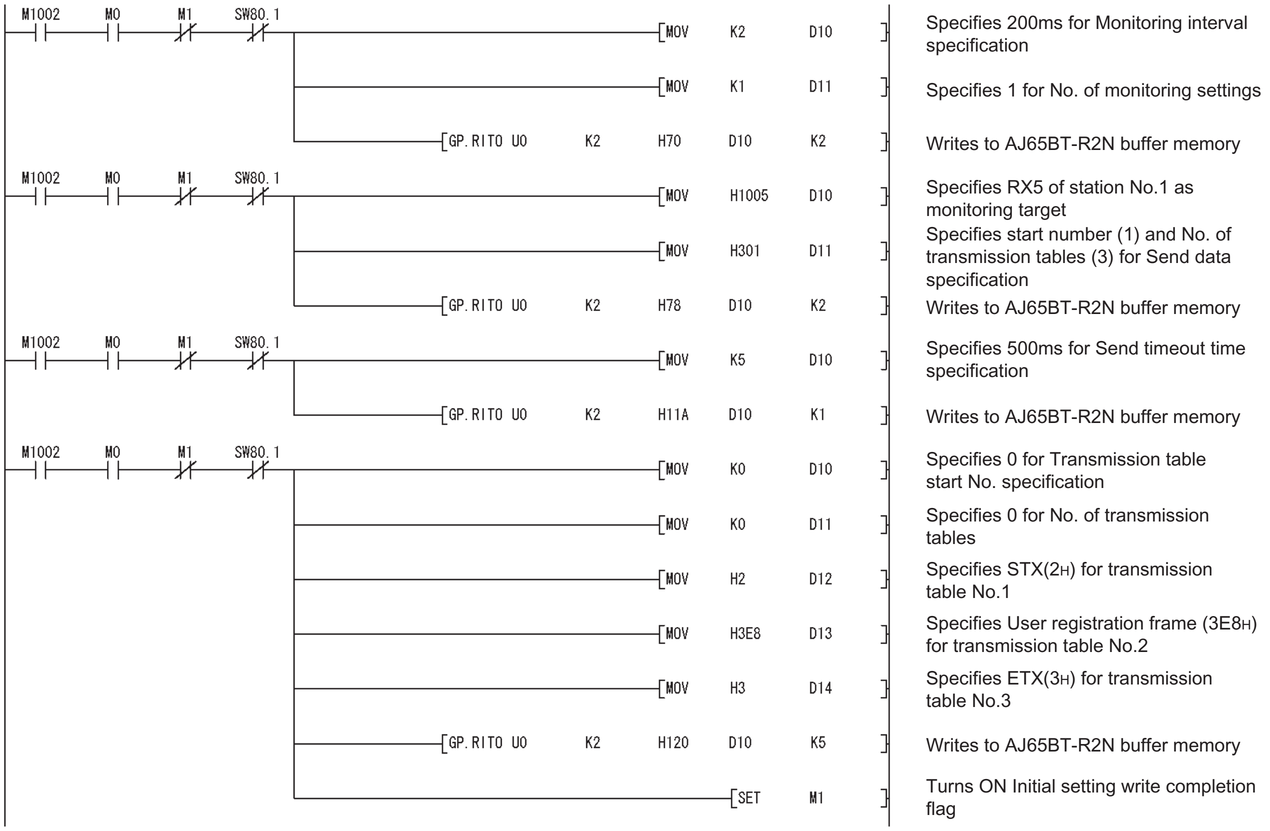
- The monitoring interval is set to 200ms and the send timeout time is set to 500ms.
- Data are sent when RX5 of the module on station No.1 turns ON.
- STX(02H)＋User registration frame (3E8H)＋ETX(03H) is set as the send data.

(b) Devices used in the program example

Table 6.29 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 6.3.2
M1	Initial setting write completion flag	Section 6.7.2	Section 6.3.2
M1002	AJ65BT-R2N mode normal flag	—	Section 6.2.2 (3) 1
D10 to D14	Monitoring-based transmission function set values	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(c) Program example



Specifies 200ms for Monitoring interval specification

Specifies 1 for No. of monitoring settings

Writes to AJ65BT-R2N buffer memory

Specifies RX5 of station No.1 as monitoring target

Specifies start number (1) and No. of transmission tables (3) for Send data specification

Writes to AJ65BT-R2N buffer memory

Specifies 500ms for Send timeout time specification

Writes to AJ65BT-R2N buffer memory

Specifies 0 for Transmission table start No. specification

Specifies 0 for No. of transmission tables

Specifies STX(2H) for transmission table No.1

Specifies User registration frame (3E8H) for transmission table No.2

Specifies ETX(3H) for transmission table No.3

Writes to AJ65BT-R2N buffer memory

Turns ON Initial setting write completion flag

Figure 6.32 Program example

6.7.3 Initial setting for the flow control function

(1) For the send/receive buffer communication function

(a) Overview of program example
The flow control is performed by the DC code control.

(b) Devices used in the program example

Table 6.30 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 6.3.1
M1	Initial setting write completion flag	Section 6.7.3	Section 6.3.1
M10	Device that is turned ON for one scan after completion of GP.RIWT	Section 6.7.3	Section 6.3.1
M11	Device that is turned ON for one scan after failure of writing by GP.RIWT	Section 6.7.3	Section 6.3.1
M1002	AJ65BT-R2N mode normal flag	—	Section 6.2.1 (3) 1
D0 to D4	Control data of GP.RIWT instruction	—	—
D10	Flow control function set value	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(c) Program example

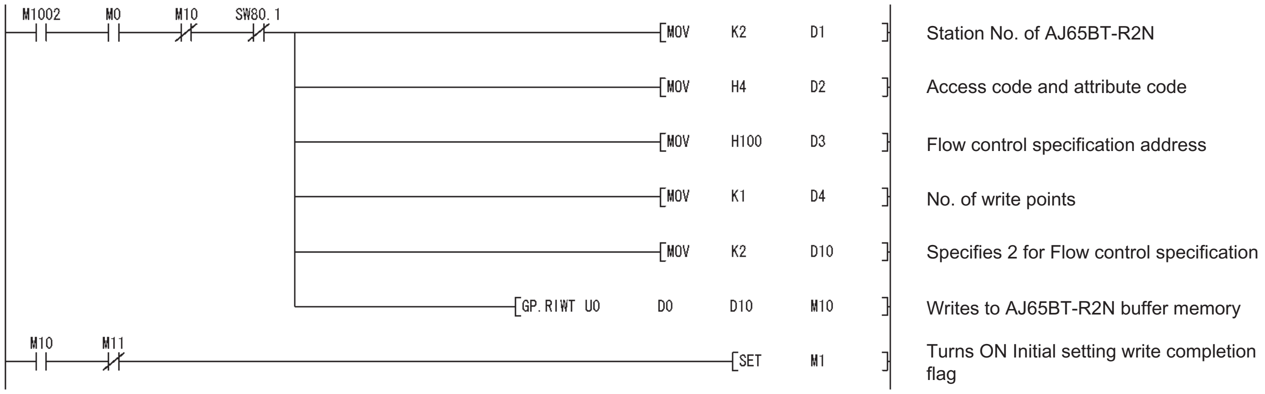


Figure 6.33 Program example

(2) For the buffer memory auto-refresh function

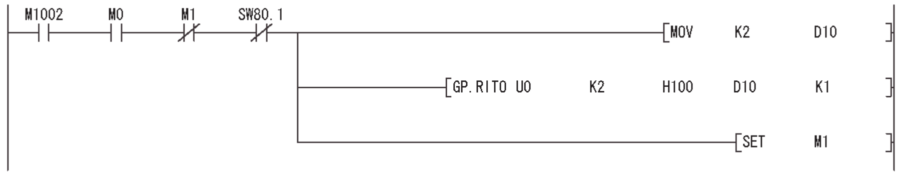
(a) Overview of program example
The flow control is performed by the DC code control.

(b) Devices used in the program example

Table 6.31 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 6.3.2
M1	Initial setting write completion flag	Section 6.7.3	Section 6.3.2
M1002	AJ65BT-R2N mode normal flag	—	Section 6.2.2 (3) 1
D10	Flow control function set value	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(c) Program example



Specifies 2 for Flow control specification

Writes to AJ65BT-R2N buffer memory

Turns ON Initial setting write completion flag

Figure 6.34 Program example

6.7.4 Initial setting for the ASCII-binary conversion function

(1) For the send/receive buffer communication function

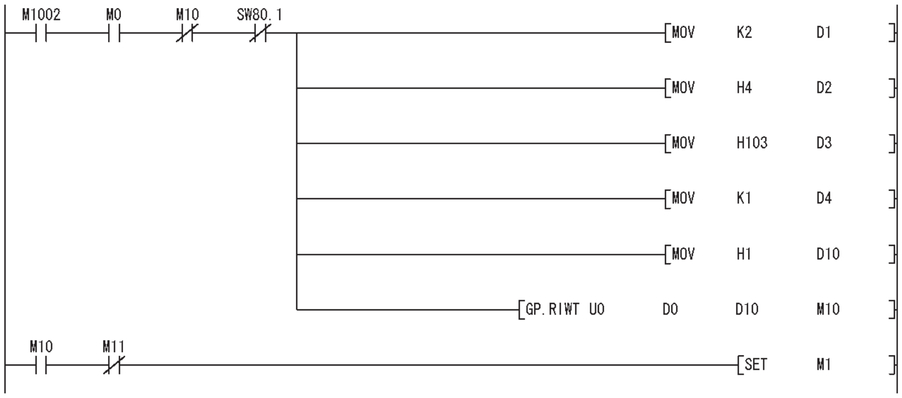
(a) Overview of program example
The ASCII-binary conversion function is used.

(b) Devices used in the program example

Table 6.32 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 6.3.1
M1	Initial setting write completion flag	Section 6.7.4	Section 6.3.1
M10	Device that is turned ON for one scan after completion of GP.RIWT	Section 6.7.4	Section 6.3.1
M11	Device that is turned ON for one scan after failure of writing by GP.RIWT	Section 6.7.4	Section 6.3.1
M1002	AJ65BT-R2N mode normal flag	—	Section 6.2.1 (3) 1
D0 to D4	Control data of GP.RIWT instruction	—	—
D10	ASCII-binary conversion function set value	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(c) Program example



Station No. of AJ65BT-R2N

Access code and attribute code

ASCII-binary conversion specification address

No. of write points

Specifies 1 for ASCII-binary conversion specification

Writes to AJ65BT-R2N buffer memory

Turns ON Initial setting write completion flag

Figure 6.35 Program example

(2) For the buffer memory auto-refresh function

(a) Overview of program example
The ASCII-binary conversion function is used.

(b) Devices used in the program example

Table 6.33 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 6.3.2
M1	Initial setting write completion flag	Section 6.7.4	Section 6.3.2
M1002	AJ65BT-R2N mode normal flag	—	Section 6.2.2 (3) 1
D10	ASCII-binary conversion function set value	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(c) Program example

Specifies 1 for ASCII-binary conversion specification

Writes to AJ65BT-R2N buffer memory

Turns ON Initial setting write completion flag

Figure 6.36 Program example

6.7.5 Initial setting for the RW refresh function

(1) For the send/receive buffer communication function

(a) Overview of program example

- The remote register (RW) assignments are changed to those listed below so that the assigned buffer memories can be monitored.

Table 6.34 Devices used in the program example

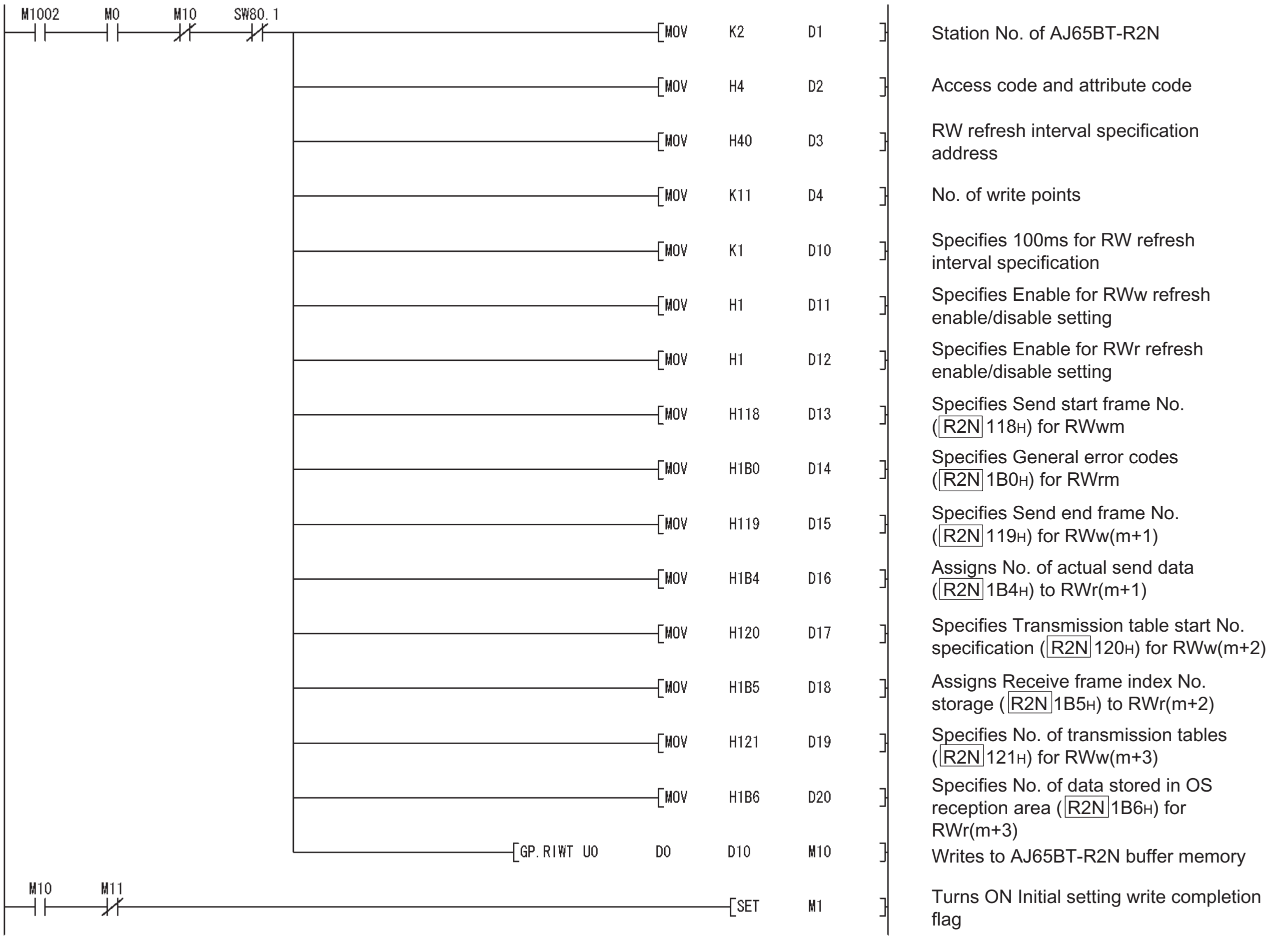
Device	Buffer memory	Device	Buffer memory
RWrm	General error codes (R2N 1B0H)	RWwm	Send start frame No. (R2N 118H)
RWr(m+1)	No. of actual send data (R2N 1B4H)	RWw(m+1)	Send end frame No. (R2N 119H)
RWr(m+2)	Receive frame index No. storage (R2N 1B5H)	RWw(m+2)	Transmission table start No. specification (R2N 120H)
RWr(m+3)	No. of data stored in OS reception area (R2N 1B6H)	RWw(m+3)	No. of transmission tables (R2N 121H)

(b) Devices used in the program example

Table 6.35 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 6.3.1
M1	Initial setting write completion flag	Section 6.7.5	Section 6.3.1
M10	Device that is turned ON for one scan after completion of GP.RIWT	Section 6.7.5	Section 6.3.1
M11	Device that is turned ON for one scan after failure of writing by GP.RIWT	Section 6.7.5	Section 6.3.1
M1002	AJ65BT-R2N mode normal flag	—	Section 6.2.1 (3) 1
D0 to D4	Control data of GP.RIWT instruction	—	—
D10 to D20	RW refresh function set values	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(c) Program example



```
MOV K2 D1                     Station No. of AJ65BT-R2N
MOV H4 D2                     Access code and attribute code
MOV H40 D3                    RW refresh interval specification address
MOV K11 D4                    No. of write points
MOV K1 D10                    Specifies 100ms for RW refresh interval specification
MOV H1 D11                    Specifies Enable for RWw refresh enable/disable setting
MOV H1 D12                    Specifies Enable for RWr refresh enable/disable setting
MOV H118 D13                  Specifies Send start frame No. (R2N 118H) for RWwm
MOV H1B0 D14                  Specifies General error codes (R2N 1B0H) for RWrm
MOV H119 D15                  Specifies Send end frame No. (R2N 119H) for RWw(m+1)
MOV H1B4 D16                  Assigns No. of actual send data (R2N 1B4H) to RWr(m+1)
MOV H120 D17                  Specifies Transmission table start No. specification (R2N 120H) for RWw(m+2)
MOV H1B5 D18                  Assigns Receive frame index No. storage (R2N 1B5H) to RWr(m+2)
MOV H121 D19                  Specifies No. of transmission tables (R2N 121H) for RWw(m+3)
MOV H1B6 D20                  Specifies No. of data stored in OS reception area (R2N 1B6H) for RWr(m+3)
GP.RIWT U0 D0 D10 M10         Writes to AJ65BT-R2N buffer memory
SET M1                        Turns ON Initial setting write completion flag
```

Figure 6.37 Program example

(2) For the buffer memory auto-refresh function

(a) Overview of program example

- The remote register (RW) assignments are changed to those listed below so that the assigned buffer memories can be monitored.

Table 6.36 Devices used in the program example

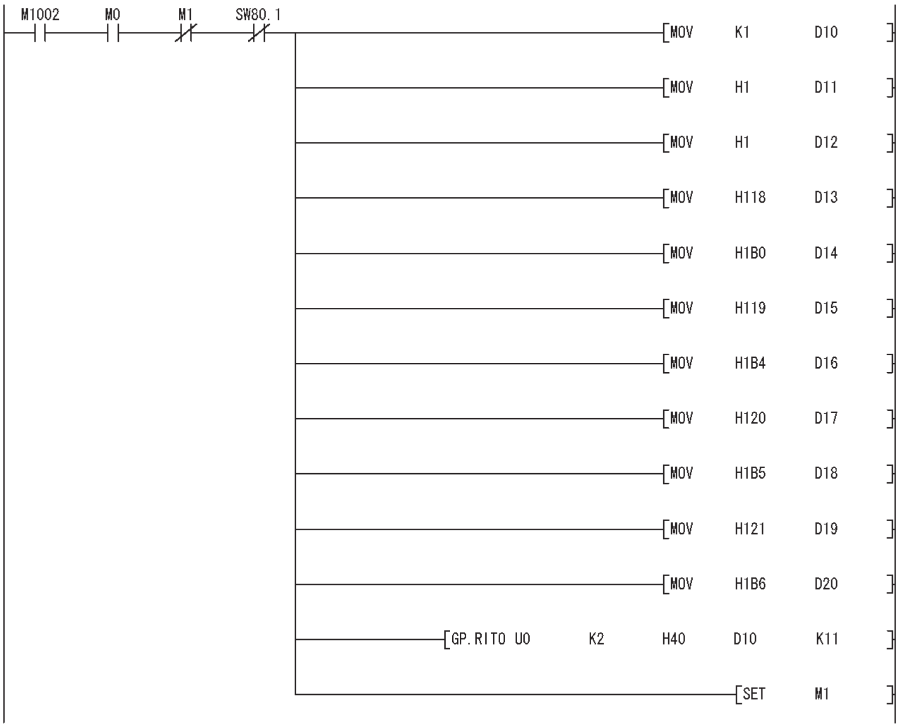
Device	Buffer memory	Device	Buffer memory
RWrm	General error codes (R2N 1B0$_H$)	RWwm	Send start frame No. (R2N 118$_H$)
RWr(m+1)	No. of actual send data (R2N 1B4$_H$)	RWw(m+1)	Send end frame No. (R2N 119$_H$)
RWr(m+2)	Receive frame index No. storage (R2N 1B5$_H$)	RWw(m+2)	Transmission table start No. specification (R2N 120$_H$)
RWr(m+3)	No. of data stored in OS reception area (R2N 1B6$_H$)	RWw(m+3)	No. of transmission tables (R2N 121$_H$)

(b) Devices used in the program example

Table 6.37 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 6.3.2
M1	Initial setting write completion flag	Section 6.7.5	Section 6.3.2
M1002	AJ65BT-R2N mode normal flag	—	Section 6.2.2 (3) 1
D10 to D20	RW refresh function set values	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(c) Program example



Specifies 100ms for RW refresh interval specification

Specifies Enable for RWw refresh enable/disable setting

Specifies Enable for RWr refresh enable/disable setting

Specifies Send start frame No. (R2N 118$_H$) for RWwm

Specifies General error codes (R2N 1B0$_H$) for RWrm

Specifies Send end frame No. (R2N 119$_H$) for RWw(m+1)

Assigns No. of actual send data (R2N 1B4$_H$) to RWr(m+1)

Specifies Transmission table start No. specification (R2N 120$_H$) for RWw(m+2)

Assigns Receive frame index No. storage (R2N 1B5$_H$) to RWr(m+2)

Specifies No. of transmission tables (R2N 121$_H$) for RWw(m+3)

Specifies No. of data stored in OS reception area (R2N 1B6$_H$) for RWr(m+3)

Writes to AJ65BT-R2N buffer memory

Turns ON Initial setting write completion flag

Figure 6.38 Program example

6.8 Other Functions

This section explains programs for executing the functions below.
Execute each program in this section after AJ65BT-R2N initialization.

Table 6.38 List of other functions

Function	Reference section
Send cancel function	Section 6.8.1
Forced receive completion function	Section 6.8.2
OS reception area clear function	Section 6.8.3
E^2PROM function setting	Section 6.8.4

6.8.1 Send cancel function

The same program example can be used for the send/receive buffer communication function and buffer memory auto-refresh function.

(1) Overview of program example

Transmission is canceled when Send cancel execute flag (X25) is turned ON after a send request and before send completion.

(2) Processing in the program example

1) After turn-ON of Send request signal (Y120), Send cancel request signal (Y121) is turned ON before Send complete signal (X120) or Send failed signal (X121) turns ON.
2) Send request signal (Y120) and Send cancel request signal (Y121) are turned OFF after turn-ON of Send complete signal (X120) or Send failed signal (X121).

(3) Devices used in the program example

Table 6.39 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X25	Send cancel execute flag	—	—
X120	Send complete signal	Section 6.8.1	Section 6.4.1
X121	Send failed signal	Section 6.8.1	Section 6.4.1
Y120	Send request signal	—	Section 6.4.1
Y121	Send cancel request signal	Section 6.8.1	—

(4) Program example

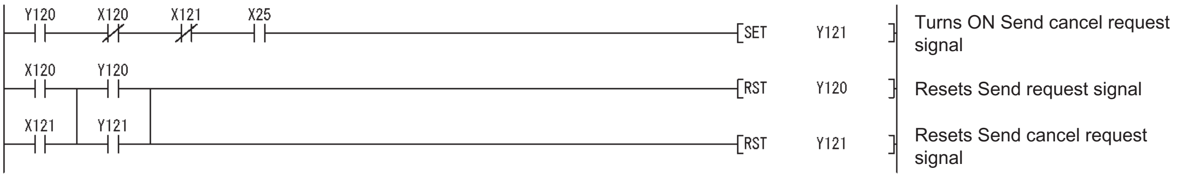


Figure 6.39 Program example

6.8.2 Forced receive completion function

(1) For the send/receive buffer communication function

(a) Overview of program example

When Forced receive completion execute flag (X26) turns ON before reception completion, the receive processing is forcibly completed at the point and data that have been received are read out.

(b) Processing in the program example

1) Forced receive completion request signal (Y123) is turned ON to forcibly terminate reception.

2) Received data are read from Receive data size specification area (R2N 400H) and Receive data area (R2N 401H) to the master station word device (D200).

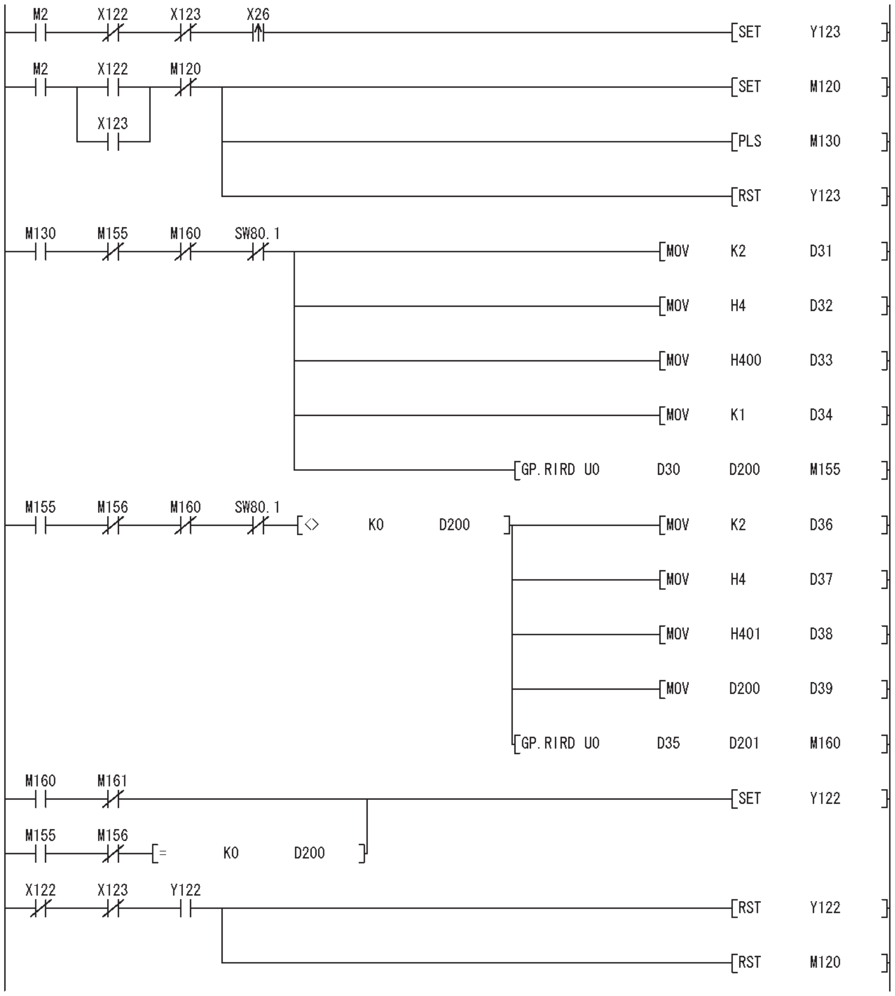
3) Receive data read completion signal (Y122) is turned OFF to terminate the reception.

(c) Devices used in the program example

Table 6.40 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X26	Forced receive completion execute flag	—	—
X122	Normal receive data read request signal	Section 6.8.2	—
X123	Error receive data read request signal	Section 6.8.2	—
Y122	Receive data read completion signal	Section 6.8.2	Section 6.5.1
Y123	Forced receive completion request signal	Section 6.8.2	—
M2	Operation complete flag	—	Section 6.3.1
M120	Buffer memory access exclusion check flag	Section 6.8.2	Section 6.4.1, Section 6.5.1, Section 6.6.1
M130	Receiving flag	Section 6.8.2	Section 6.5.1
M155	Device that is turned ON for one scan after completion of GP.RIRD	Section 6.8.2	Section 6.5.1
M156	Device that is turned ON for one scan after failure of reading by GP.RIRD	Section 6.8.2	Section 6.5.1
M160	Device that is turned ON for one scan after completion of GP.RIRD	Section 6.8.2	Section 6.5.1
M161	Device that is turned ON for one scan after failure of reading by GP.RIRD	Section 6.8.2	Section 6.5.1
D30 to D34	Control data of GP.RIRD instruction	—	—
D35 to D39		—	—
D200	No. of receive data	—	—
From D201	Receive data	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(d) Program example



Turns ON Forced receive completion request signal

Turns ON Buffer memory access exclusion check flag

Turns ON Receiving flag

Resets Forced receive completion request signal

Reads No. of receive data from AJ65BT-R2N receive data size specification area (in word units)

Reads receive data from AJ65BT-R2N receive data area

Turns ON Receive data read completion signal

Resets Receive data read completion signal

Resets Buffer memory access exclusion check flag

Figure 6.40 Program example

(2) For the buffer memory auto-refresh function

(a) Overview of program example
When Forced receive completion execute flag (X26) turns ON before reception completion, the receive processing is forcibly completed at the point and data that have been received are read out.

(b) Processing in the program example

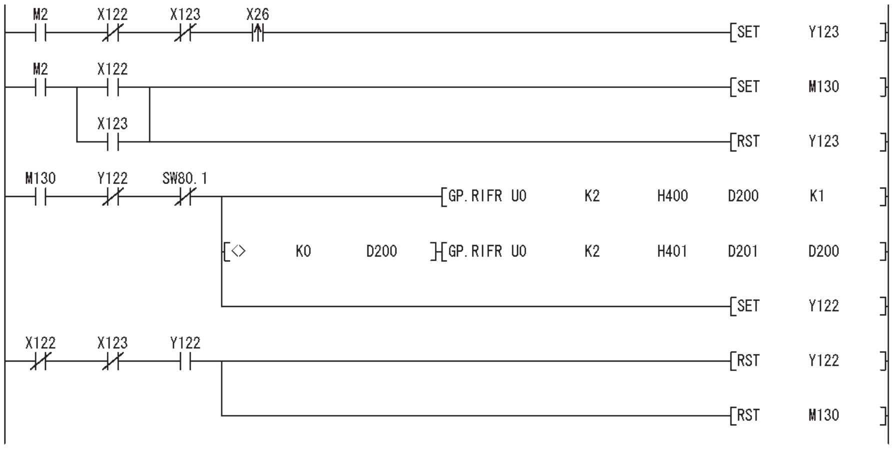
1) Forced receive completion request signal (Y123) is turned ON to forcibly terminate reception.
2) Received data are read from Receive data size specification area (R2N 400H) and Receive data area (R2N 401H) to the master station word device (D200).
3) Receive data read completion signal (Y122) is turned OFF to terminate the reception.

(c) Devices used in the program example

Table 6.41 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X26	Forced receive completion execute flag	—	—
X122	Normal receive data read request signal	Section 6.8.2	—
X123	Error receive data read request signal	Section 6.8.2	—
Y122	Receive data read completion signal	Section 6.8.2	Section 6.5.2
Y123	Forced receive completion request signal	Section 6.8.2	—
M2	Operation complete flag	—	Section 6.3.2
M130	Receiving flag	Section 6.8.2	Section 6.5.2
D200	No. of receive data	—	—
From D201	Receive data	—	—
SW80.1	Other station data link status (Station No.2)	—	—

(d) Program example



Turns ON Forced receive completion request signal

Turns ON Receiving flag

Resets Forced receive completion request signal

Reads No. of receive data (in word units) and receive data from AJ65BT-R2N receive area

Turns ON Receive data read completion signal

Resets Receive data read completion signal

Resets Receiving flag

Figure 6.41 Program example

6.8.3 OS reception area clear function

The same program example can be used for the send/receive buffer communication function and buffer memory auto-refresh function.

(1) Overview of program example

The OS reception area is cleared when the AJ65BT-R2N fails to receive data from the external device.

(2) Processing in the program example

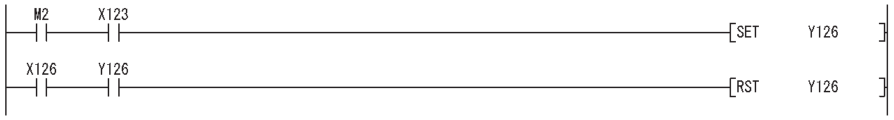
When Error receive data read request signal (X123) is ON, OS reception area clear request signal (Y126) is turned ON to clear the OS reception area.

(3) Devices used in the program example

Table 6.42 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X123	Error receive data read request signal	—	—
X126	OS reception area cleared signal	Section 6.8.3	—
Y126	OS reception area clear request signal	Section 6.8.3	—
M2	Operation complete flag	—	Section 6.3.2

(4) Program example



Turns ON OS reception area clear request signal

Resets OS reception area clear request signal

Figure 6.42 Program example

6.8.4 E^{2}PROM function setting

☒Point

(1) Do not execute registration to E^{2}PROM each time the AJ65BT-R2N is started up.

Doing so may cause the maximum number of writes to E^{2}PROM (service life) to be reached earlier.

(2) Execute the E^{2}PROM function after initialization of the AJ65BT-R2N is normally completed.

For E^{2}PROM function sample programs, refer to the following.

☞ Section 6.9.1 Program example for changing auto-refresh buffer assignments

6.9 Program Examples

This section gives program examples for the following processing.

Table 6.43 Program example

Description	Reference section
Program example for changing auto-refresh buffer assignments	Section 6.9.1
Program example for sending/receiving data with GP.RISEND/GP.RIRCV instruction	Section 6.9.2
Program example for receiving data when a receive timeout occurs	Section 6.9.3

6.9.1 Program example for changing auto-refresh buffer assignments

(1) Overview of program examples

- When Operation start request flag (M0) is turned ON, the assignments are changed so that the AJ65BT-R2N auto-refresh buffer size is 80H, and they are registered to the E^{2}PROM.
  When the auto-refresh buffer size changes to 80H, the buffer memory auto-refresh function can be used with up to 20 AJ65BT-R2Ns connected.
- The AJ65BT-R2N operates with the auto-refresh buffer size setting changed to 80H after restart.

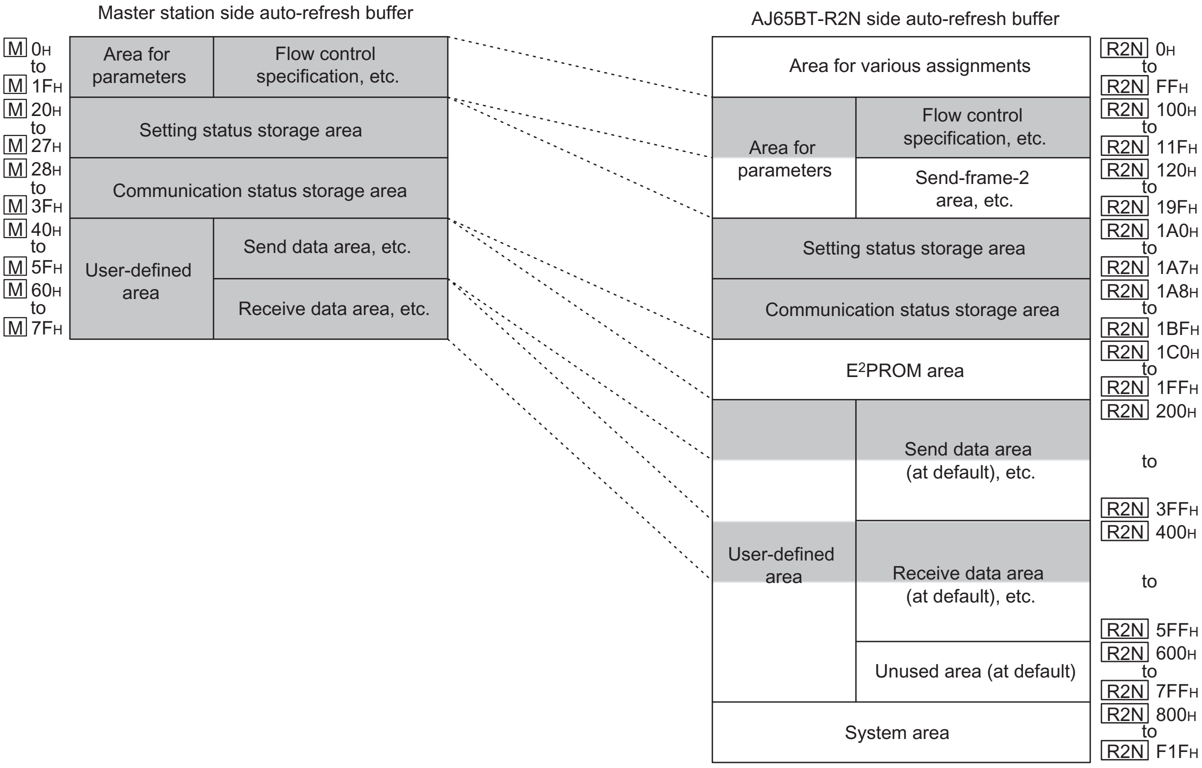


Figure 6.43 Auto-refresh buffer after assignment change

(2) For the send/receive buffer communication function

(a) Devices used in the program example

Table 6.44 Devices used in the program example

Device	Description	Device	Description
X0	Module error (Master station)	M1	Initial setting write completion flag
X0F	Module ready (Master station)	M2	Operation complete flag
X1	Own station data link status (Master station)	M3	Operation failed flag
X23	Error code read flag	M10	Device that is turned ON for one scan after completion of GP.RIWT
X24	Error clear flag	M11	Device that is turned ON for one scan after failure of writing by GP.RIWT
X27	E^2PROM function setting flag	M12	Device that is turned ON for one scan after completion of GP.RIWT
X124	Initialization complete signal	M13	Device that is turned ON for one scan after failure of writing by GP.RIWT
X125	Initialization failed signal	M14	Device that is turned ON for one scan after completion of GP.RIWT
X127	E^2PROM function complete signal	M15	Device that is turned ON for one scan after failure of writing by GP.RIWT
X128	E^2PROM function failed signal	M20	AJ65BT-R2N initial setting start flag
K1X134	Mode setting switch status signal (X134 to X137)	M120	Buffer memory access exclusion check flag
X13A	Error status signal	M135	Error handling flag
X13B	Remote station ready signal	M190	Device that is turned ON for one scan after completion of GP.RIRD
K8Y120	Remote output (Y120 to Y13F)	M191	Device that is turned ON for one scan after failure of reading by GP.RIRD
Y120	Send request signal	M1002	AJ65BT-R2N mode normal flag
Y121	Send cancel request signal	M1003	AJ65BT-R2N mode error flag
Y122	Receive data read completion signal	M1004	E^2PROM function setting pulse signal
Y123	Forced receive completion request signal	D0 to D4	Control data of GP.RIWT instruction
Y124	Initialization request signal	D10 to D45	Set values
Y126	OS reception area clear request signal	D30 to D34	Control data of GP.RIRD instruction
Y127	E^2PROM function request signal	D400 to D402	AJ65BT-R2N error code
Y139	Initial data read request signal	D900	Master module RY(n+1)E, RY(n+1)F
Y13A	Error reset request signal	SW80.1	Other station data link status (Station No.2)
M0	Operation start request flag	—	

(b) Program example

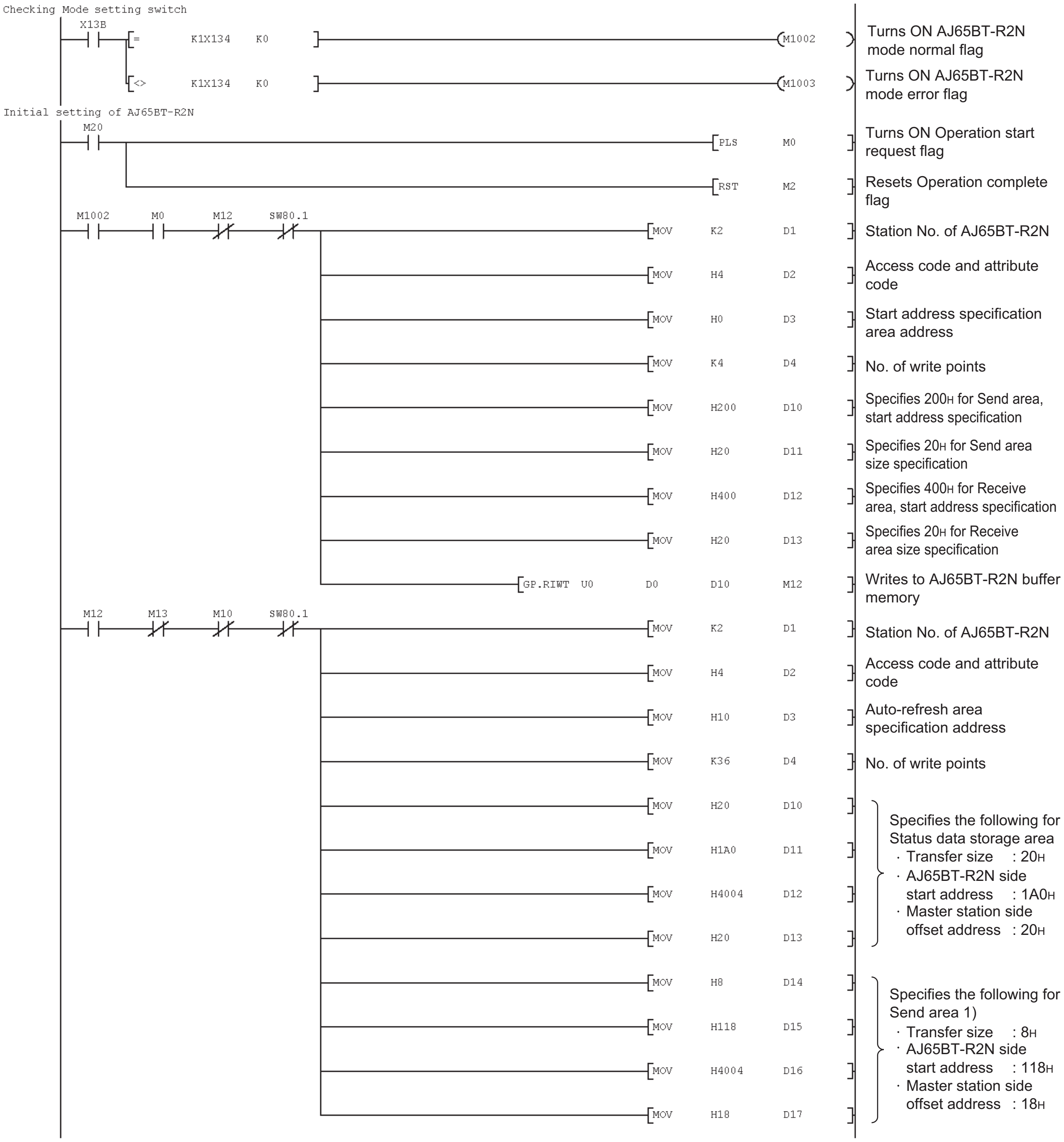


Figure 6.44 Program example for changing auto-refresh buffer assignments

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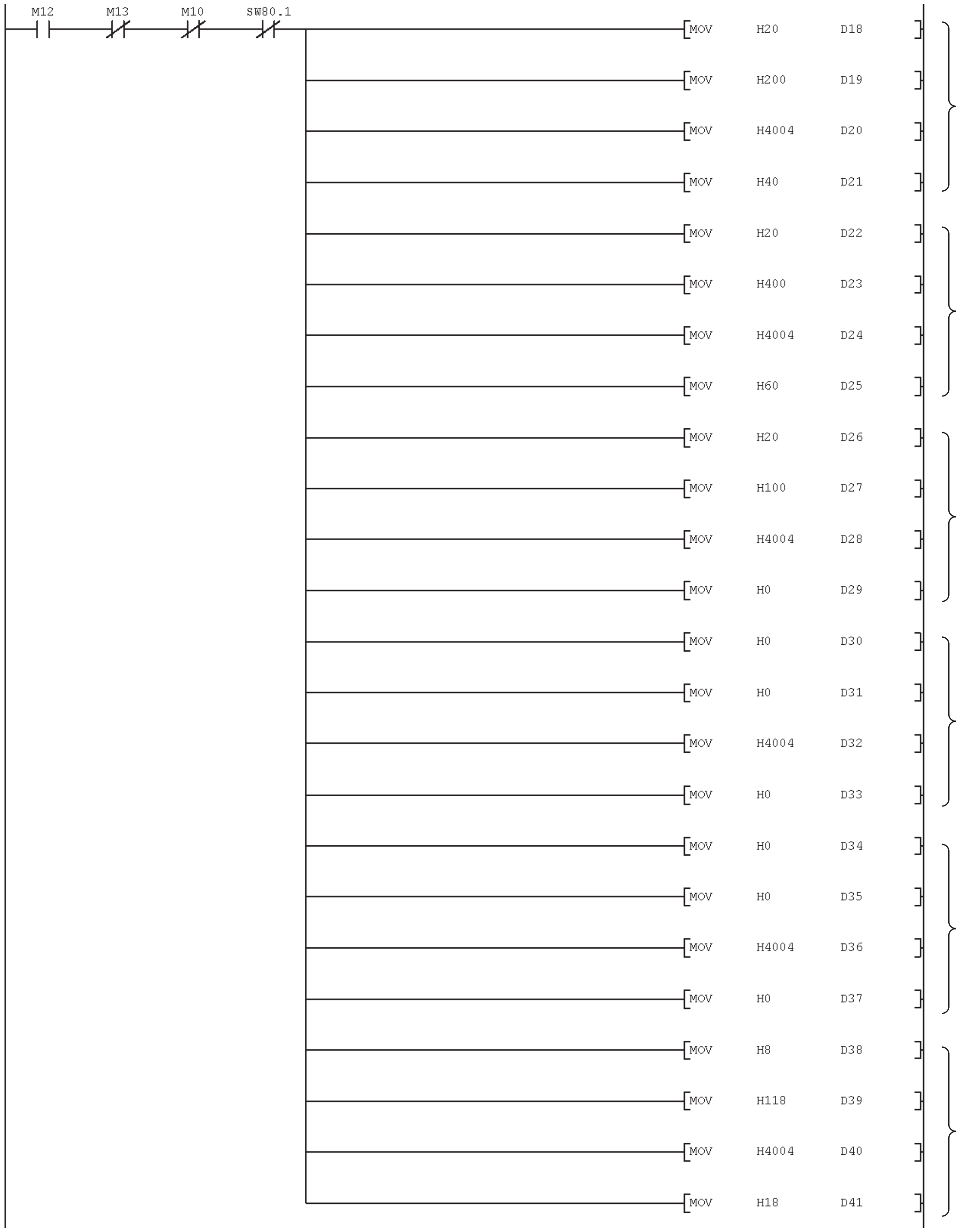

```
MOV  H20    D18
MOV  H200   D19
MOV  H4004  D20
MOV  H40    D21
MOV  H20    D22
MOV  H400   D23
MOV  H4004  D24
MOV  H60    D25
MOV  H20    D26
MOV  H100   D27
MOV  H4004  D28
MOV  H0     D29
MOV  H0     D30
MOV  H0     D31
MOV  H4004  D32
MOV  H0     D33
MOV  H0     D34
MOV  H0     D35
MOV  H4004  D36
MOV  H0     D37
MOV  H8     D38
MOV  H118   D39
MOV  H4004  D40
MOV  H18    D41
```

Specifies the following for Send area 2)
- Transfer size : 20_H
- AJ65BT-R2N side start address : 200_H
- Master station side offset address : 40_H

Specifies the following for Receive area
- Transfer size : 20_H
- AJ65BT-R2N side start address : 400_H
- Master station side offset address : 60_H

Specifies the following for Initial setting area
- Transfer size : 20_H
- AJ65BT-R2N side start address : 100_H
- Master station side offset address : 0_H

Specifies the following for E^{2}PROM function area
- Transfer size : 0_H
- AJ65BT-R2N side start address : 0_H
- Master station side offset address : 0_H

Specifies the following for User registration frame area
- Transfer size : 0_H
- AJ65BT-R2N side start address : 0_H
- Master station side offset address : 0_H

Specifies the following for Monitoring-based transmission area 1)
- Transfer size : 8_H
- AJ65BT-R2N side start address : 118_H
- Master station side offset address : 18_H

Figure 6.44 Program example for changing auto-refresh buffer assignments (Continued)

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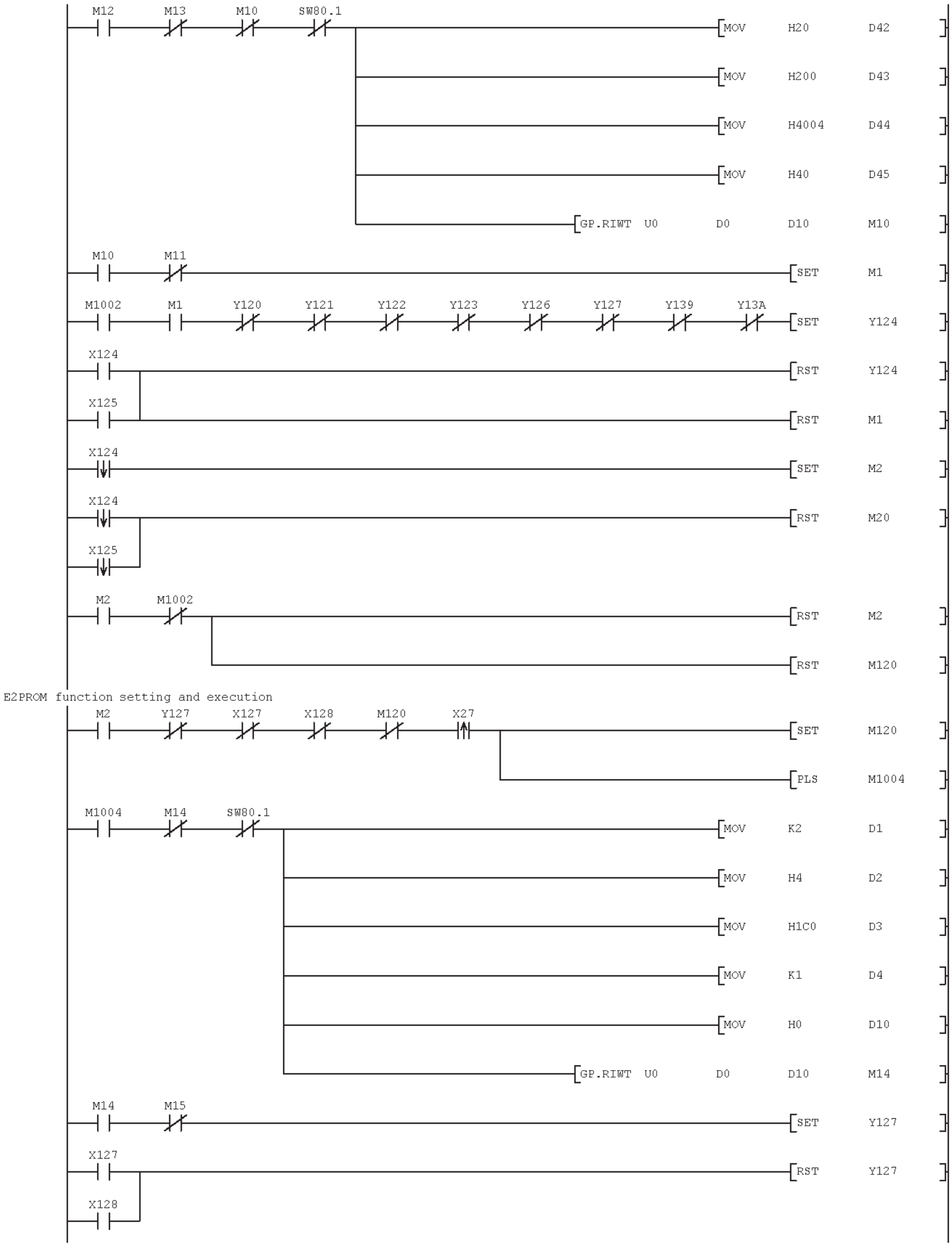

Specifies the following for Monitoring-based transmission area 2)
- Transfer size : 20H
- AJ65BT-R2N side start address : 200H
- Master station side offset address : 40H

Writes to AJ65BT-R2N buffer memory

Turns ON Initial setting write completion flag

Turns ON Initialization request signal

Resets Initialization request signal

Resets Initial setting write completion flag

Turns ON Operation complete flag

Resets AJ65BT-R2N initial setting start flag

Resets Operation complete flag

Resets Buffer memory access exclusion check flag

Turns ON Buffer memory access exclusion check flag

Turns ON E^{2}PROM function setting pulse signal

Station No. of AJ65BT-R2N

Access code and attribute code

E^{2}PROM function specification address

No. of write points

Sets 0 (registration of set buffer memory values) for E^{2}PROM function specification

Writes to AJ65BT-R2N buffer memory

Turns ON E^{2}PROM function request signal

Resets E^{2}PROM function request signal

Figure 6.44 Program example for changing auto-refresh buffer assignments (Continued)

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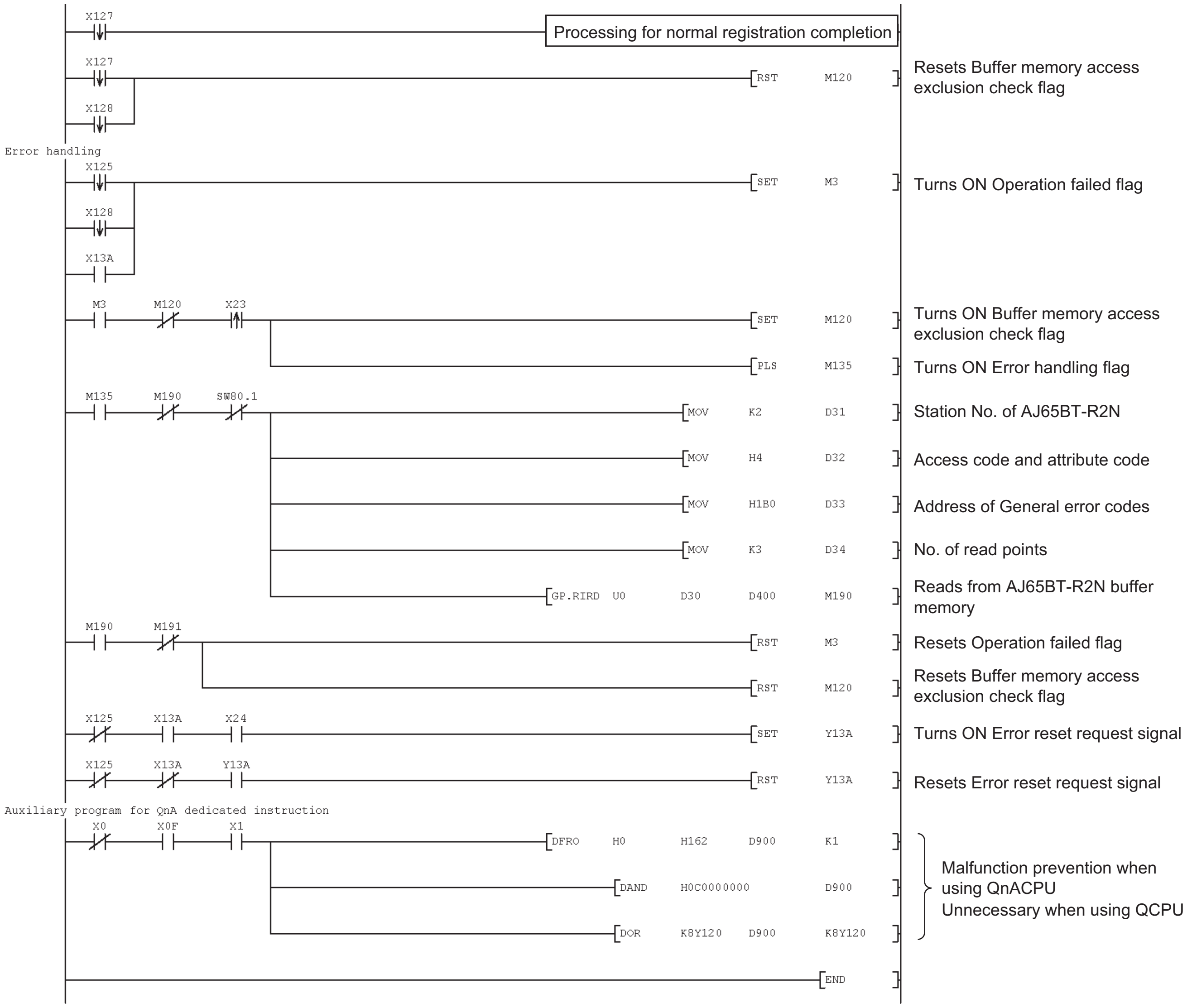

Figure 6.44 Program example for changing auto-refresh buffer assignments (Continued)

(3) For the buffer memory auto-refresh function

(a) Devices used in the program example

Table 6.45 Devices used in the program example

Device	Description	Device	Description
X23	Error code read flag	Y139	Initial data read request signal
X24	Error clear flag	Y13A	Error reset request signal
X27	E^2PROM function setting flag	M0	Operation start request flag
X124	Initialization complete signal	M1	Initial setting write completion flag
X125	Initialization failed signal	M2	Operation complete flag
X127	E^2PROM function complete signal	M3	Operation failed flag
X128	E^2PROM function failed signal	M135	Error handling flag
K1X134	Mode setting switch status signal (X134 to X137)	M270	E^2PROM function setting-in-process flag
X139	Initial data read completion signal	M1000	AJ65BT-R2N initial data read complete flag
X13A	Error status signal	M1001	AJ65BT-R2N initial data reading flag
X13B	Remote station ready signal	M1002	AJ65BT-R2N mode normal flag
Y120	Send request signal	M1003	AJ65BT-R2N mode error flag
Y121	Send cancel request signal	M1004	E^2PROM function setting pulse signal
Y122	Receive data read completion signal	D10 to D45	Set values
Y123	Forced receive completion request signal	D400 to D402	AJ65BT-R2N error code
Y124	Initialization request signal	W4 to W6	
Y126	OS reception area clear request signal	SW80.1	Other station data link status (Station No.2)
Y127	E^2PROM function request signal	—	

(b) Program example

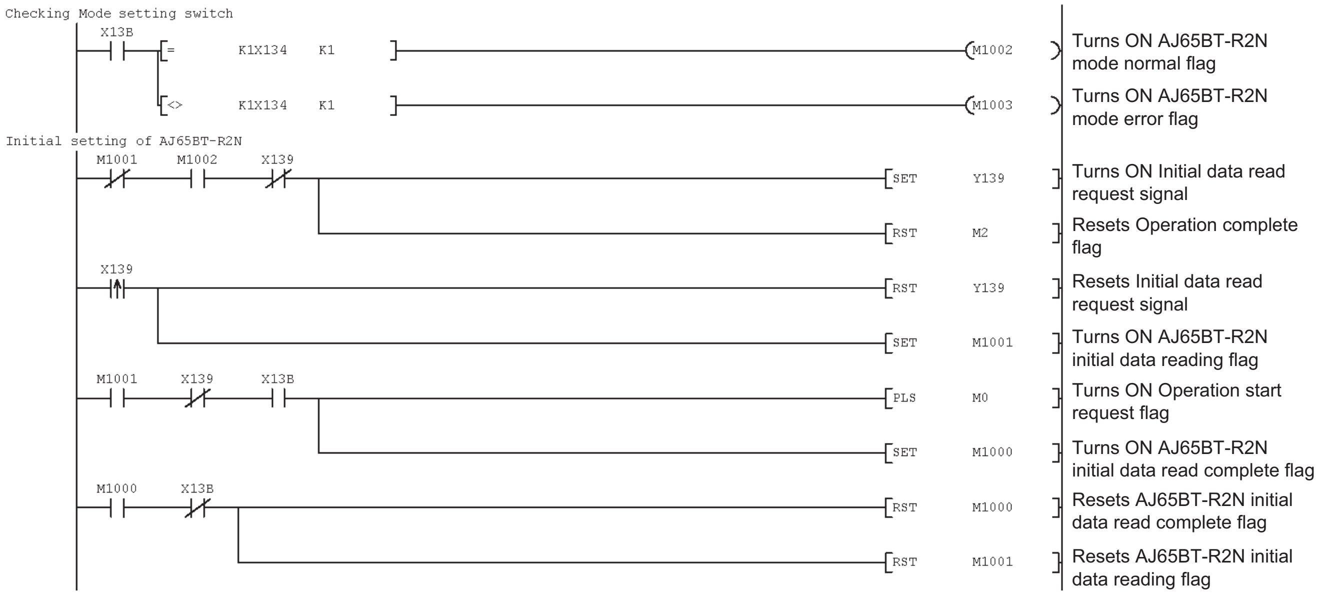

Figure 6.45 Program example for changing auto-refresh buffer assignments

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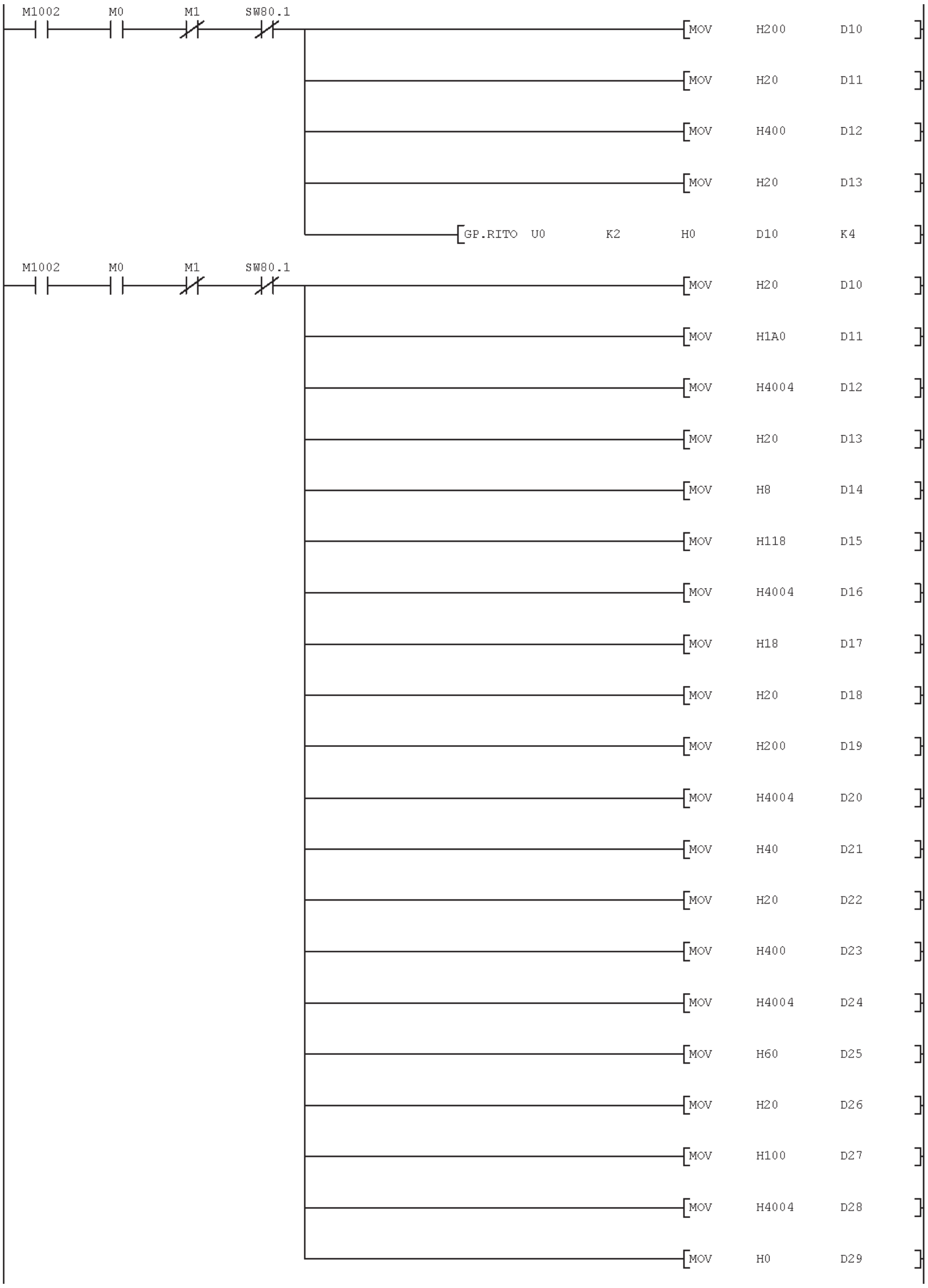

Specifies 200H for Send area, start address specification

Specifies 20H for Send area size specification

Specifies 400H for Receive area, start address specification

Specifies 20H for Receive area size specification

Writes to AJ65BT-R2N buffer memory

Specifies the following for Status data storage area
- Transfer size : 20H
- AJ65BT-R2N side start address : 1A0H
- Master station side offset address : 20H

Specifies the following for Send area 1)
- Transfer size : 8H
- AJ65BT-R2N side start address : 118H
- Master station side offset address : 18H

Specifies the following for Send area 2)
- Transfer size : 20H
- AJ65BT-R2N side start address : 200H
- Master station side offset address : 40H

Specifies the following for Receive area
- Transfer size : 20H
- AJ65BT-R2N side start address : 400H
- Master station side offset address : 60H

Specifies the following for Initial setting area
- Transfer size : 20H
- AJ65BT-R2N side start address : 100H
- Master station side offset address : 0H

Figure 6.45 Program example for changing auto-refresh buffer assignments (Continued)

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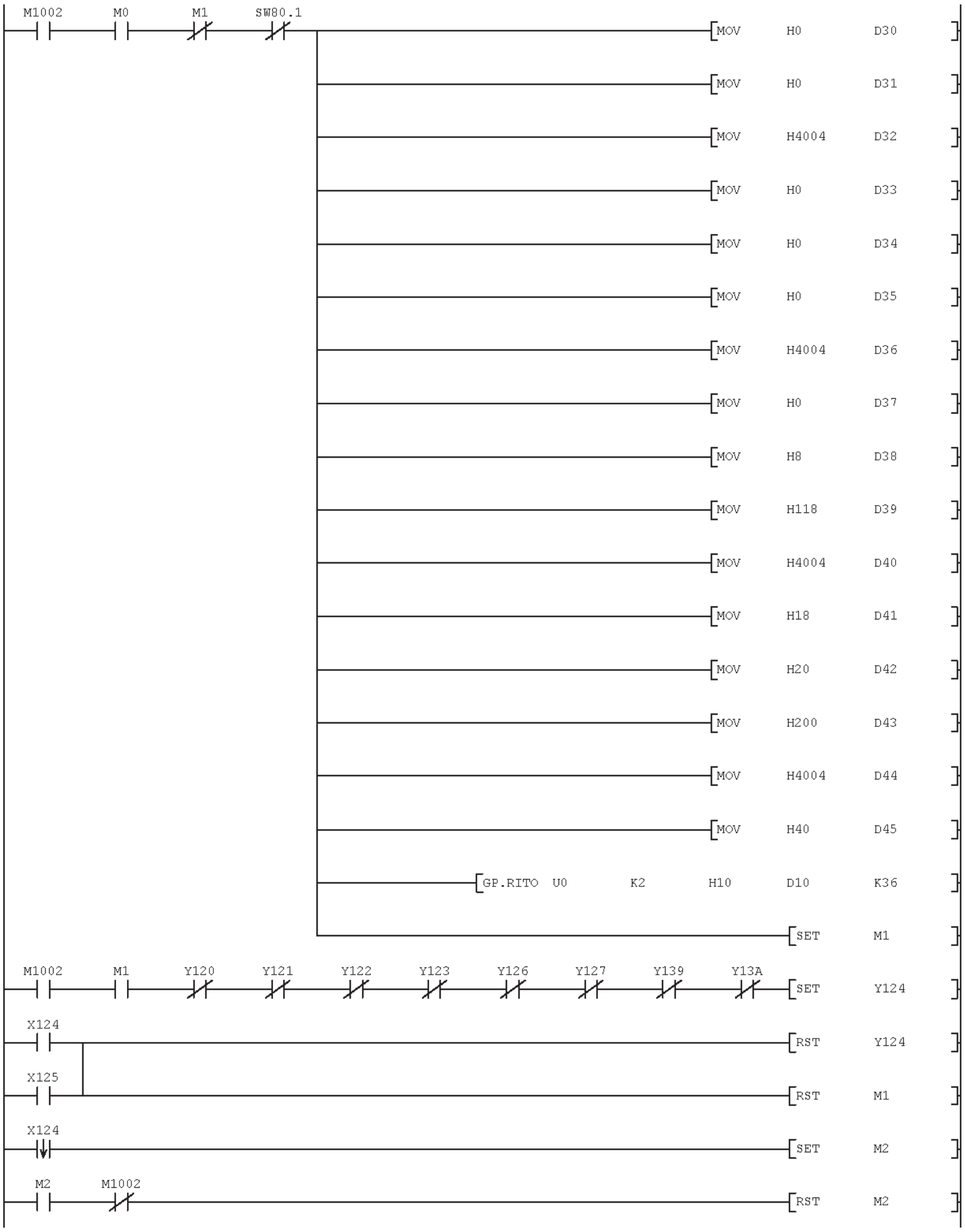

Specifies the following for E²PROM function area
- Transfer size: 0H
- AJ65BT-R2N side start address : 0H
- Master station side offset address : 0H

Specifies the following for User registration frame area
- Transfer size: 0H
- AJ65BT-R2N side start address : 0H
- Master station side offset address : 0H

Specifies the following for Monitoring-based transmission area 1)
- Transfer size: 8H
- AJ65BT-R2N side start address : 118H
- Master station side offset address : 18H

Specifies the following for Monitoring-based transmission area 2)
- Transfer size: 20H
- AJ65BT-R2N side start address : 200H
- Master station side offset address : 40H

Writes to AJ65BT-R2N buffer memory

Turns ON Initial setting write completion flag

Turns ON Initialization request signal

Resets Initialization request signal

Resets Initial setting write completion flag

Turns ON Operation complete flag

Resets Operation complete flag

Figure 6.45 Program example for changing auto-refresh buffer assignments (Continued)

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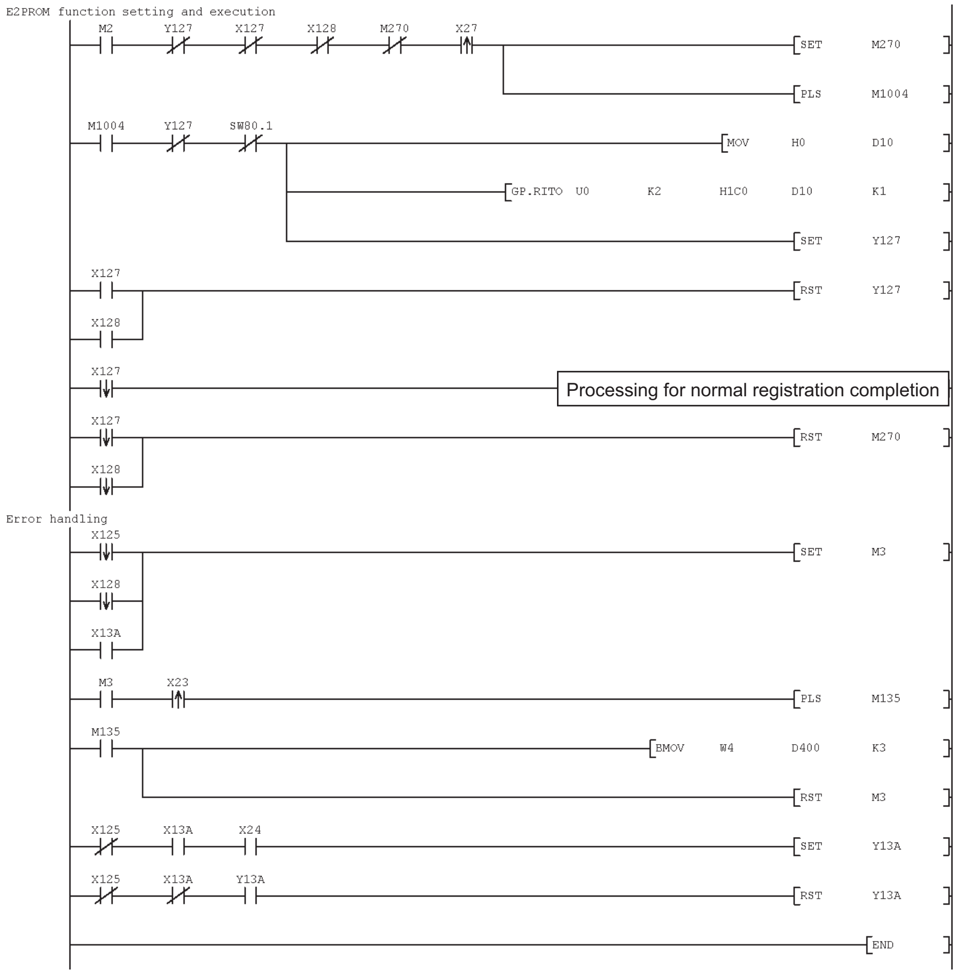

Turns ON E^{2}PROM function setting-in-process flag

Turns ON E^{2}PROM function setting pulse signal

Sets 0 (registration of set buffer memory values) for E^{2}PROM function specification

Writes to AJ65BT-R2N buffer memory

Turns ON E^{2}PROM function request signal

Resets E^{2}PROM function request signal

Resets E^{2}PROM function setting-in-process flag

Turns ON Operation failed flag

Turns ON Error handling flag

Reads error code

Resets Error handling flag

Turns ON Error reset request signal

Resets Error reset request signal

Figure 6.45 Program example for changing auto-refresh buffer assignments (Continued)

6.9.2 Program example for sending/receiving data with GP.RISEND/ GP.RIRCV instruction

The GP.RISEND and GP.RIRCV instructions are dedicated instructions for sending/receiving data using the send/receive buffer communication function.
For this reason, this program example can only be used when using the send/receive buffer communication function.

(1) Overview of program example

- When Operation send execute flag (X22) is turned ON, a character string "ABCDEFGHI"＋LF (0AH) is sent with the GP.RISEND instruction.
- When the AJ65BT-R2N receives data from the external device, six words of the received data are read out to the word device (D50) with the GP.RIRCV instruction.

(2) Devices used in the program example

Table 6.46 Devices used in the program example

Device	Description	Device	Description
X0	Module error (Master station)	M160	Device that is turned ON for one scan after completion of GP.RIRCV
X0F	Module ready (Master station)	M161	Device that is turned ON for one scan after failure of writing by GP.RIRCV
X1	Own station data link status (Master station)	M180	Device that is turned ON for one scan after completion of GP.RISEND
X22	Send execute flag	M181	Device that is turned ON for one scan after failure of writing by GP.RISEND
X23	Error code read flag	M190	Device that is turned ON for one scan after completion of GP.RIRD
X24	Error clear flag	M191	Device that is turned ON for one scan after failure of reading by GP.RIRD
X121	Send failed signal	M1002	AJ65BT-R2N mode normal flag
X122	Normal receive data read request signal	M1003	AJ65BT-R2N mode error flag
X123	Error receive data read request signal	C0	Normal send counter
X125	Initialization failed signal	C1	Abnormal send counter
X128	E^2PROM function failed signal	C2	Normal receive counter
K1X134	Mode setting switch status signal (X134 to X137)	C3	Abnormal receive counter
X13A	Error status signal	D0 to D4	Control data of GP.RISEND instruction
X13B	Remote station ready signal	D10 to D12	Interlock signal storage device for GP.RISEND
K8Y120	Remote output (Y120 to Y13F)	D20 to D25	No. of send data, send data
Y13A	Error reset request signal	D30 to D34	Control data of GP.RIRCV or GP.RIRD instruction
M3	Operation failed flag	D40 to D42	Interlock signal storage device for GP.RISEND
M120	Buffer memory access exclusion check flag	D50 to D55	No. of receive data, receive data
M125	Sending flag	D400 to D402	AJ65BT-R2N error code
M130	Receiving flag	D900	Master module RY(n+1)E, RY(n+1)F
M135	Error handling flag	SW80.1	Other station data link status (Station No.2)

(3) Program example

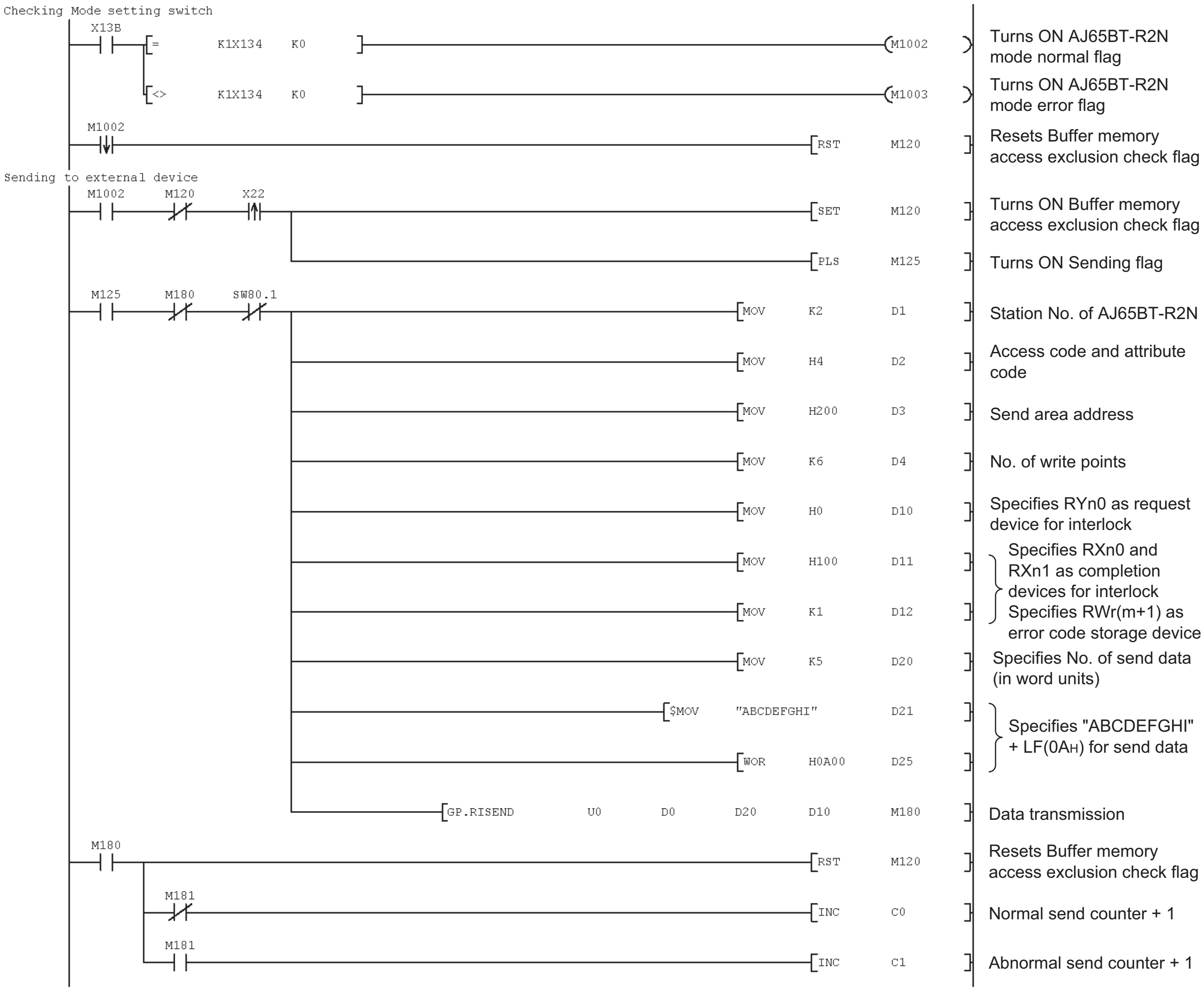

Figure 6.46 Program example for sending/receiving data with GP.RISEND/GP.RIRCV instruction

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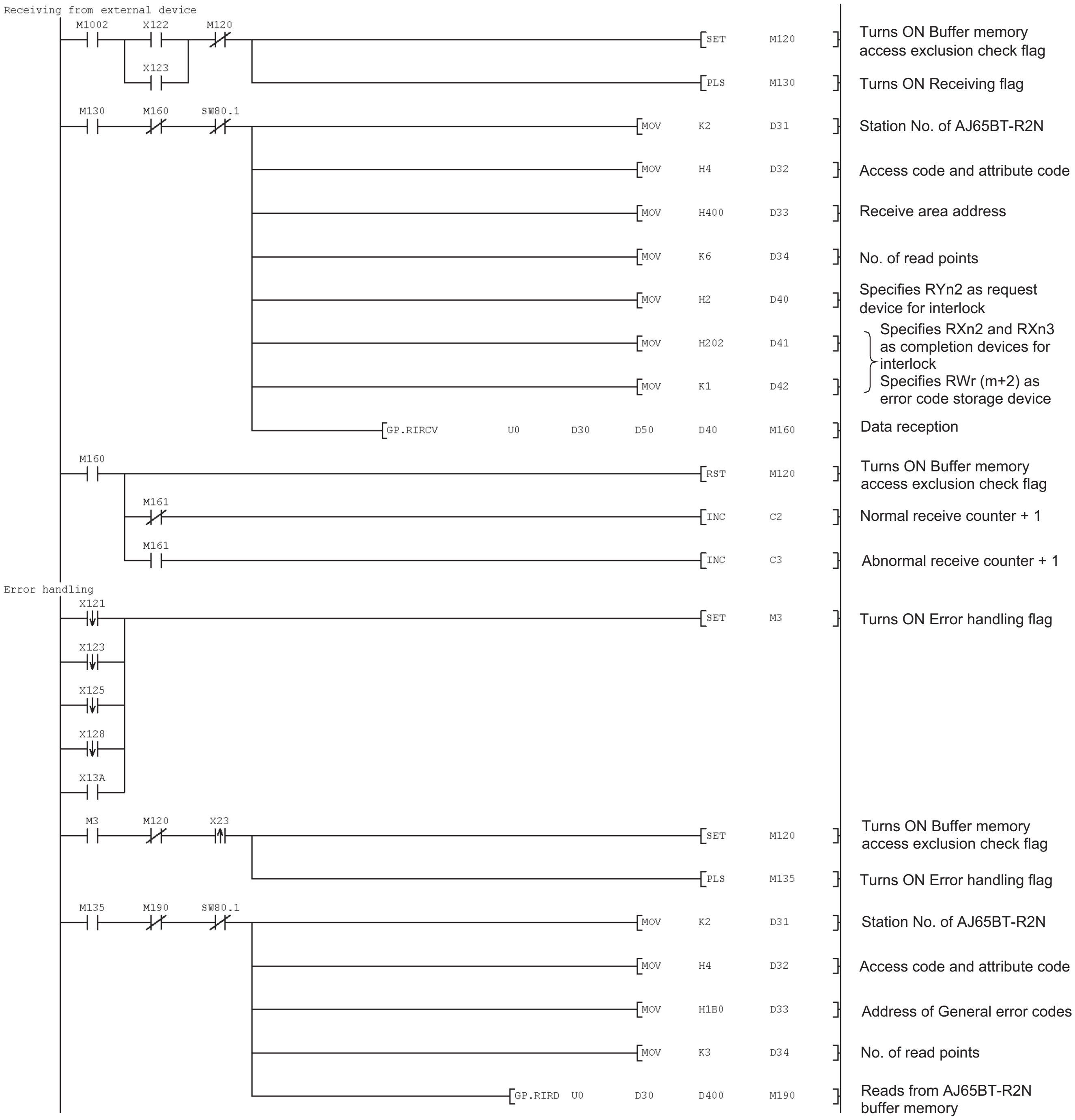

Figure 6.46 Program example for sending/receiving data with GP.RISEND/GP.RIRCV instruction (Continued)

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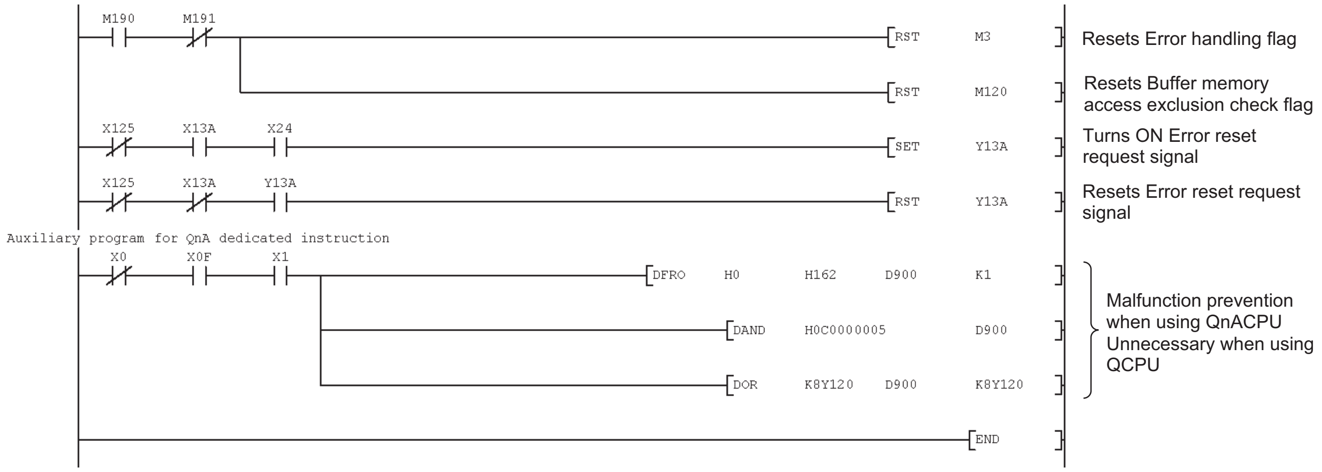


Resets Error handling flag

Resets Buffer memory access exclusion check flag

Turns ON Error reset request signal

Resets Error reset request signal

Malfunction prevention when using QnACPU Unnecessary when using QCPU

Figure 6.46 Program example for sending/receiving data with GP.RISEND/GP.RIRCV instruction (Continued)

☒Point

When sending/receiving data of 481 words or more to/from the external device using a GP.RISEND or GP.RIRCV instruction, divide the data into parts, each of which contains 480 words or less, to write and read to the AJ65BT-R2N.
With GP.RISEND and GP.RIRCV instructions, data of 481 words or more cannot be written or read out to the AJ65BT-R2N at one time.

6.9.3 Program example for receiving data when a receive timeout occurs

(1) Overview of program example

- The receive timeout time is set to 200ms.
- If a receive timeout error (BB21H) occurs, data received up to that point are read out from the AJ65BT-R2N buffer memory to word devices of the master station.
- After reading is completed, the error is cleared.

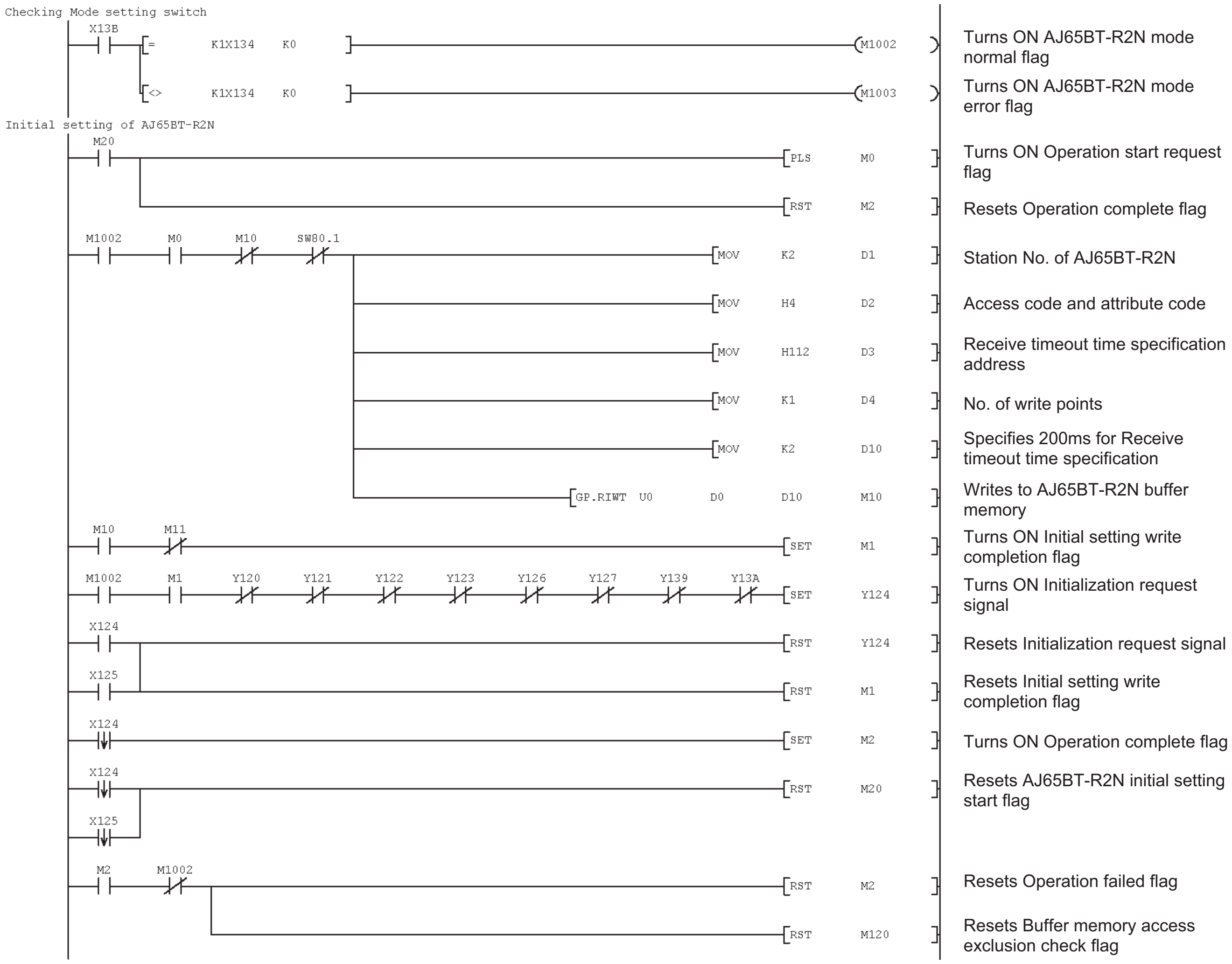
(2) For the send/receive buffer communication function

(a) Devices used in the program example

Table 6.47 Devices used in the program example

Device	Description	Device	Description
X0	Module error (Master station)	M10	Device that is turned ON for one scan after completion of GP.RIWT
X1	Own station data link status (Master station)	M11	Device that is turned ON for one scan after failure of writing by GP.RIWT
X0F	Module ready (Master station)	M20	AJ65BT-R2N initial setting start flag
X23	Error code read flag	M22	Error clear request
X24	Error clear flag	M120	Buffer memory access exclusion check flag
X122	Normal receive data read request signal	M130	Receiving flag
X123	Error receive data read request signal	M135	Error handling flag
X124	Initialization complete signal	M155	Device that is turned ON for one scan after completion of GP.RIRD
X125	Initialization failed signal	M156	Device that is turned ON for one scan after failure of reading by GP.RIRD
K1X134	Mode setting switch status signal	M160	Device that is turned ON for one scan after completion of GP.RIRD
X13A	Error status signal	M161	Device that is turned ON for one scan after failure of reading by GP.RIRD
X13B	Remote station ready signal	M165	Device that is turned ON for one scan after completion of GP.RIRD
K8Y120	Remote output (Y120 to Y13F)	M166	Device that is turned ON for one scan after failure of reading by GP.RIRD
Y120	Send request signal	M190	Device that is turned ON for one scan after completion of GP.RIRD
Y121	Send cancel request signal	M191	Device that is turned ON for one scan after failure of reading by GP.RIRD
Y122	Receive data read completion signal	M1002	AJ65BT-R2N mode normal flag
Y123	Forced receive completion request signal	M1003	AJ65BT-R2N mode error flag
Y124	Initialization request signal	D0 to D4	Control data of GP.RIWT instruction
Y126	OS reception area clear request signal	D10	Receive timeout time set value
Y127	E^2PROM function request signal	D30 to D34	Control data of GP.RIRD instruction
Y139	Initial data read request signal	D35 to D39	
Y13A	Error reset request signal	D200	No. of receive data
M0	Operation start request flag	From D201	Receive data
M1	Initial setting write completion flag	D400	Error code
M2	Operation complete flag	D900	Master module RY(n+1)E, RY(n+1)F
M3	Operation failed flag	SW80.1	Other station data link status (Station No.2)

(b) Program example



Turns ON AJ65BT-R2N mode normal flag

Turns ON AJ65BT-R2N mode error flag

Turns ON Operation start request flag

Resets Operation complete flag

Station No. of AJ65BT-R2N

Access code and attribute code

Receive timeout time specification address

No. of write points

Specifies 200ms for Receive timeout time specification

Writes to AJ65BT-R2N buffer memory

Turns ON Initial setting write completion flag

Turns ON Initialization request signal

Resets Initialization request signal

Resets Initial setting write completion flag

Turns ON Operation complete flag

Resets AJ65BT-R2N initial setting start flag

Resets Operation failed flag

Resets Buffer memory access exclusion check flag

Figure 6.47 Program example for receiving data when a receive timeout occurs

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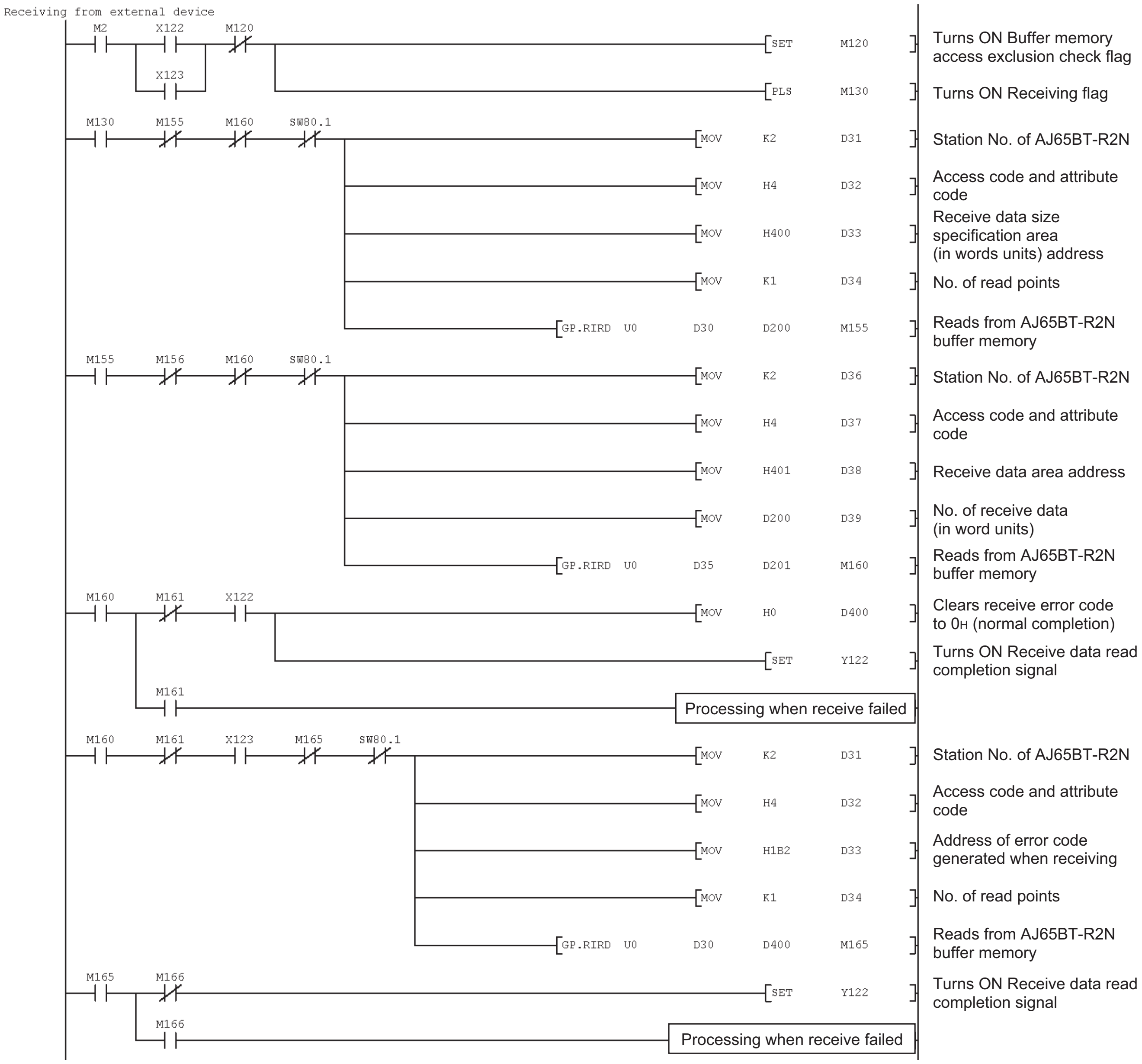

Figure 6.47 Program example for receiving data when a receive timeout occurs (Continued)

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(From previous page)

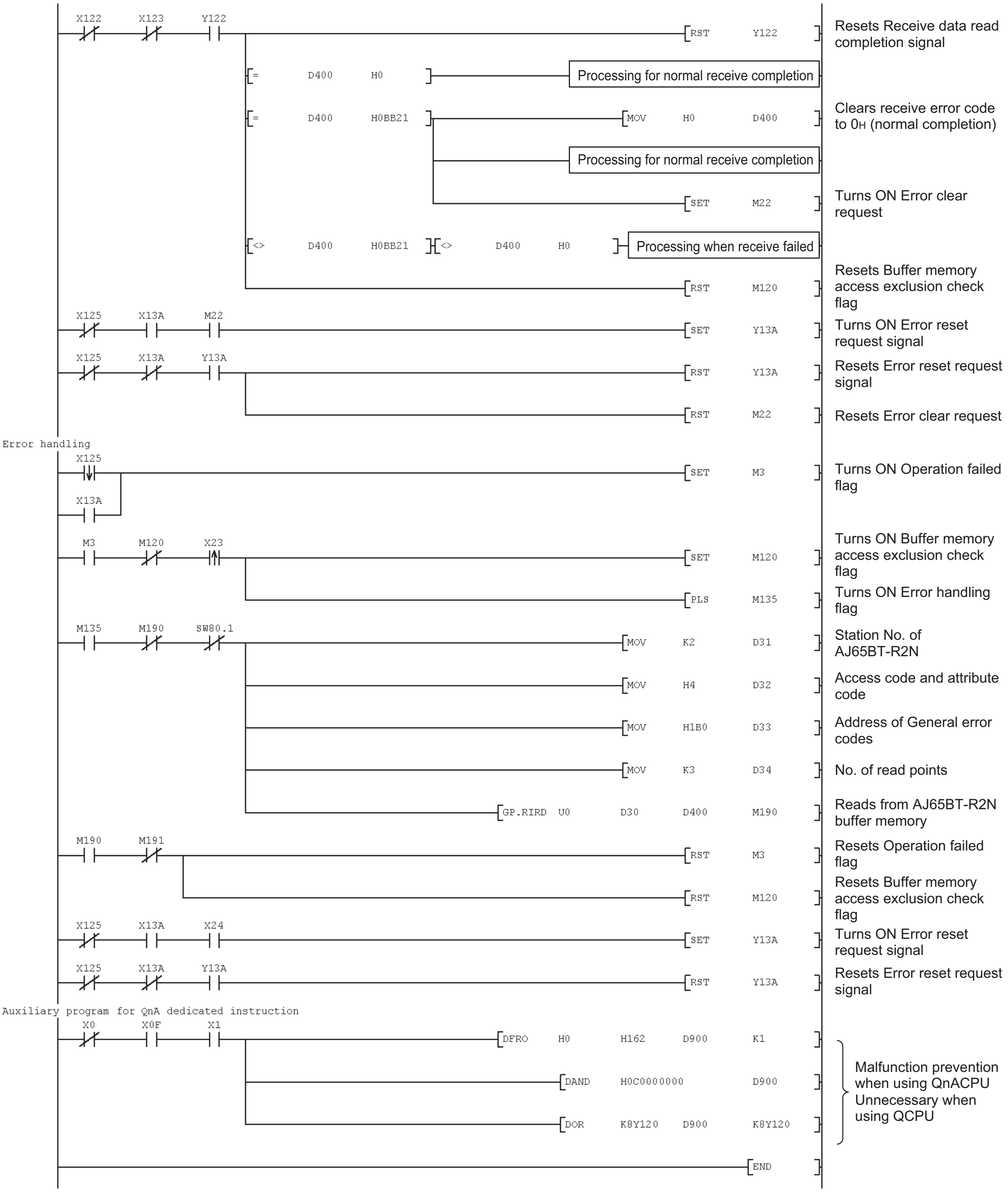


Figure 6.47 Program example for receiving data when a receive timeout occurs (Continued)

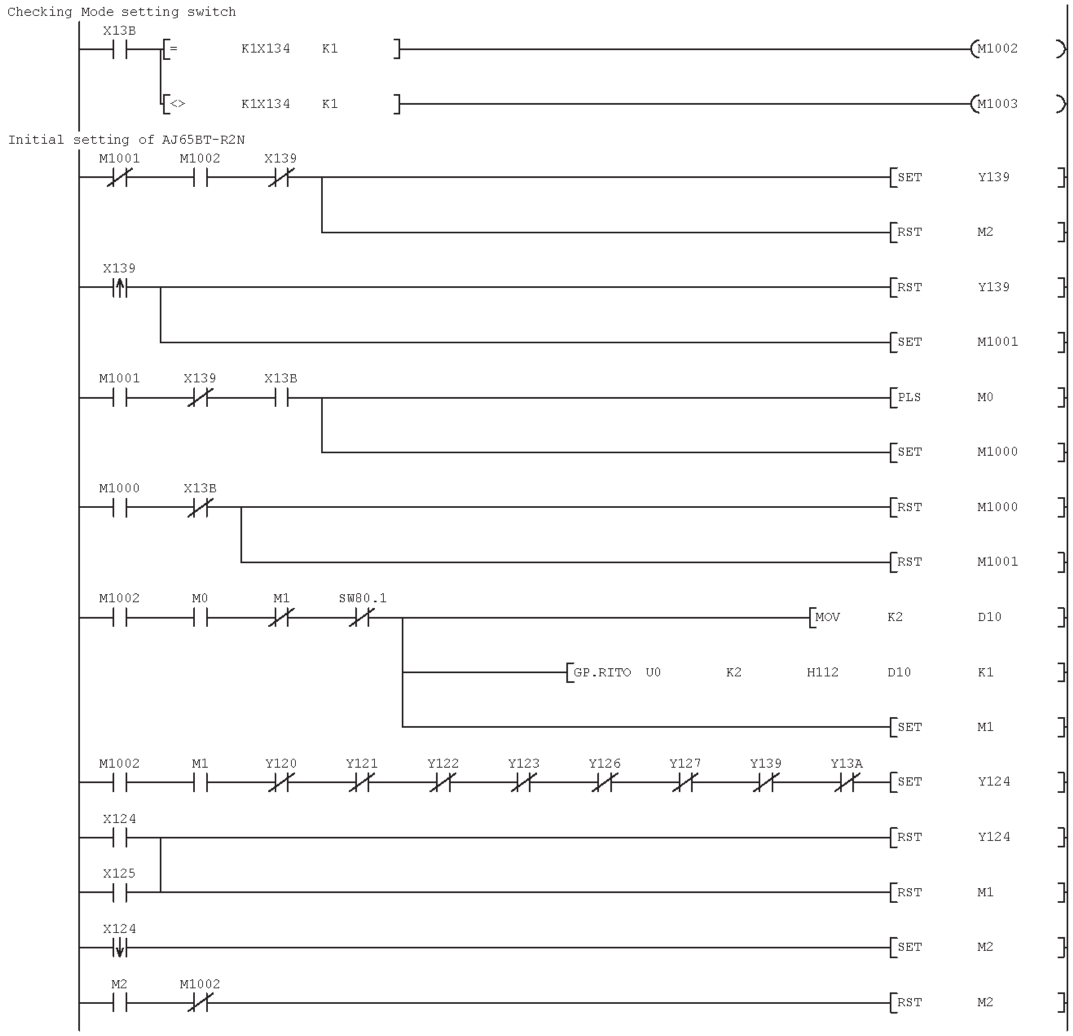
(3) For the buffer memory auto-refresh function

(a) Devices used in the program example

Table 6.48 Devices used in the program example

Device	Description	Device	Description
X23	Error code read flag	Y139	Initial data read request signal
X24	Error clear flag	Y13A	Error reset request signal
X122	Normal receive data read request signal	M0	Operation start request flag
X123	Error receive data read request signal	M1	Initial setting write completion flag
X124	Initialization complete signal	M2	Operation complete flag
X125	Initialization failed signal	M3	Operation failed flag
K1X134	Mode setting switch status signal (X134 to X137)	M22	Error clear request
X139	Initial data read completion signal	M135	Error handling flag
X13A	Error status signal	M1000	AJ65BT-R2N initial data read complete flag
X13B	Remote station ready signal	M1001	AJ65BT-R2N initial data reading flag
Y120	Send request signal	M1002	AJ65BT-R2N mode normal flag
Y121	Send cancel request signal	M1003	AJ65BT-R2N mode error flag
Y122	Receive data read completion signal	D10	Receive timeout time set value
Y123	Forced receive completion request signal	D200	No. of receive data
Y124	Initialization request signal	From D201	Receive data
Y126	OS reception area clear request signal	D400	Error code
Y127	E^2PROM function request signal	SW80.1	Other station data link status (Station No.2)

(b) Program example



Turns ON AJ65BT-R2N mode normal flag

Turns ON AJ65BT-R2N mode error flag

Turns ON Initial data read request signal

Resets Operation complete flag

Resets Initial data read request signal

Turns ON AJ65BT-R2N initial data reading flag

Turns ON Operation start request flag

Turns ON AJ65BT-R2N initial data read complete flag

Resets AJ65BT-R2N initial data read complete flag

Resets AJ65BT-R2N initial data reading flag

Specifies 200ms for Receive timeout time specification

Writes to AJ65BT-R2N buffer memory

Turns ON Initial setting write completion flag

Turns ON Initialization request signal

Resets Initialization request signal

Resets Initial setting write completion flag

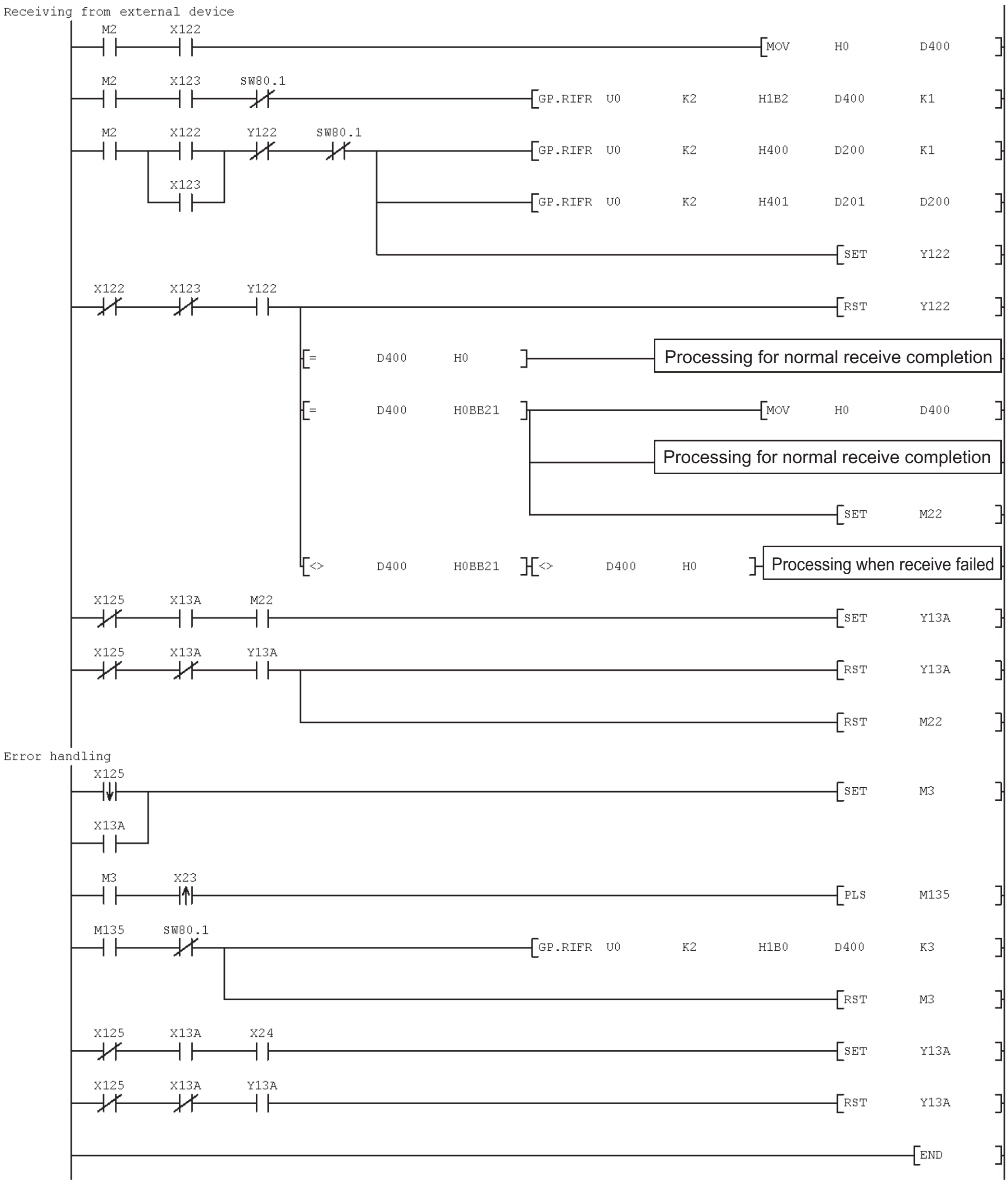
Turns ON Operation complete flag

Resets Operation complete flag

Figure 6.48 Program example for receiving data when a receive timeout occurs

(Continued to next page)

(From previous page)



Clears receive error code to 0H (normal completion)

Reads error code generated when receiving

Reads No. of receive data (in word units) and receive data from AJ65BT-R2N receive area

Turns ON Receive data read completion signal

Resets Receive data read completion signal

Clears receive error code to 0H (normal completion)

Turns ON Error clear request

Turns ON Error reset request signal

Resets Error reset request signal

Resets Error clear request

Turns ON Operation failed flag

Turns ON Error handling flag

Reads General error codes

Resets Operation failed flag

Turns ON Error reset request signal

Resets Error reset request signal

Figure 6.48 Program example for receiving data when a receive timeout occurs (Continued)

CHAPTER 7 PROGRAMMING WHEN USING DEDICATED INSTRUCTIONS IN ACPU/QCPU (A MODE)

(1) How to read this chapter

The configuration of this chapter is as follows.
For details of dedicated instructions, refer to the Type AnSHCPU/AnACPU/AnUCPU/QCPU-A (A Mode) Programming Manual (Dedicated Instructions).

(a) System configuration

This explains the system where the programs described in this chapter are executed.

☞ CHAPTER 7 (2) System configuration for program

(b) Setting of each station

This explains the setting of the master station, remote I/O station and AJ65BT-R2N.

☞ Section 7.1 Setting of each station

(c) Executable programs

Various programs are shown, which can be operated when the settings and system configuration are the same as those given in this chapter.

- Send/Receive program

  ☞ Section 7.2 Entire Send/Receive Program Structure
- Program for changing the auto-refresh buffer assignments and registering the assignment settings to E^2PROM

  ☞ Section 7.9.1 Program example for changing auto-refresh buffer assignments
- Program for sending or receiving data with RISEND and RIRCV instructions

  ☞ Section 7.9.2 Program example for sending/receiving data with RISEND/RIRCV instruction
- Program for receiving data when a receive timeout occurs

  ☞ Section 7.9.3 Program example for receiving data when a receive timeout occurs

(d) Each program processing

Each processing in a program is explained.

☞ Section 7.3 Initial Setting for AJ65BT-R2N to Section 7.6 Error Handling of AJ65BT-R2N

(e) Programs used according to function
Programs used according to function are described.

Table 7.1 Programs added according to function

Function	Reference section
Initial setting for the frame function	Section 7.7
Initial setting for the monitoring-based transmission function	
Initial setting for the flow control function	
Initial setting for the ASCII-binary conversion function	
Initial setting for the RW refresh function	
Send cancel function	Section 7.8
Forced receive completion function	
OS reception area clear function	
E^2PROM function setting	

(2) System configuration for program

The following shows the system configuration for the program described in this chapter.

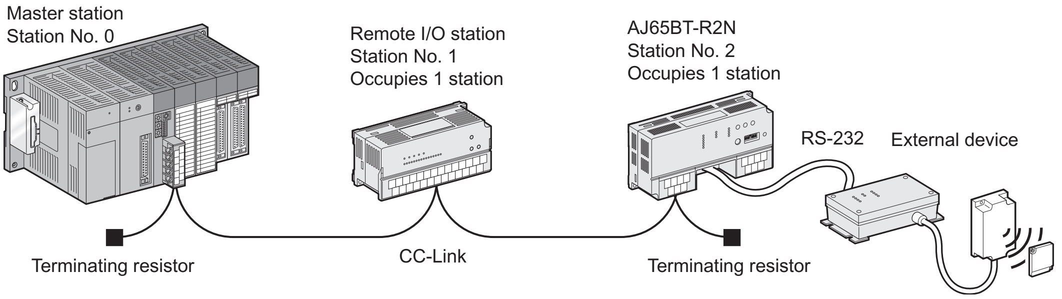


Figure 7.1 System configuration for program

(a) Master station

Table 7.2 Information of master station

Item	Description
Station No.	0
Data link transmission speed	156kbps
Start I/O No.	0000$_H$ (Mounting position of master module)
All connect count	2
Input (X) that reads from RXn0 to RX(n+1)F of AJ65BT-R2N	X120 to X13F
Output (Y) that writes to RYn0 to RY(n+1)F of AJ65BT-R2N	Y120 to Y13F

(b) Remote I/O station

Table 7.3 Information of remote I/O station

Item	Description
Station No.	1
Data link transmission speed	156kbps
No. of occupied stations	Occupies 1 station

(c) AJ65BT-R2N

Table 7.4 Information of AJ65BT-R2N

Item		Description
Station No.		2
Data link transmission speed		156kbps
RS-232 transmission speed		300bps
No. of occupied stations		Occupies 1 station
Mode setting switch	Using send/receive buffer communication function	0 (Mode 0)
	Using buffer memory auto-refresh function	1 (Mode 1)
Send buffer size	Using send/receive buffer communication function	64 words*1
	Using buffer memory auto-refresh function	0 word
Receive buffer size	Using send/receive buffer communication function	64 words*1
	Using buffer memory auto-refresh function	0 word
Auto-refresh buffer size	Using send/receive buffer communication function	0 word
	Using buffer memory auto-refresh function	1536 words*2

* 1 When sending/receiving the following data or more, change the buffer size by the sequence program (☞ Section 7.1.1 (2)).
When using the RIWT or RIRD instruction: 60 words
When using the RISEND or RIRCV instruction: 59 words

* 2 When sending/receiving data of 512 words or more, change the auto-refresh buffer size in the sequence program (☞ Section 7.1.1 (2)) and change the auto-refresh buffer assignment.

(d) Sendable message

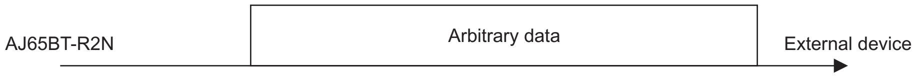


Figure 7.2 Sendable message

Table 7.5 Information of sendable message

Item		Description
Start frame		None*1
End frame		None*1
Data size (including above frames)	Using send/receive buffer communication function	•When using RIWT or RIRD instruction: 59 words or less*2 •When using RISEND or RIRCV instruction: 58 words or less*2
	Using buffer memory auto-refresh function	511 words or less*3

* 1 If required by the external device, each of the frames can be sent.

* 2 When sending/receiving the data mentioned above or more, change the buffer size by the sequence program (☞ Section 7.1.1 (2)).

* 3 When sending/receiving data of 512 words or more, change the auto-refresh buffer size in the sequence program (☞ Section 7.1.1 (2)) and change the auto-refresh buffer assignment.

(e) Receivable message

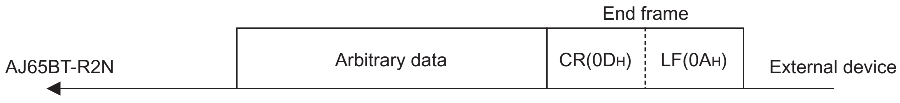


Figure 7.3 Receivable message

Table 7.6 Information of receivable message

Item		Description
Start frame		None
End frame		CR(0DH)＋LF(0AH)
Data size (including above frames)	Using send/receive buffer communication function	•When using RIWT or RIRD instruction: 59 words or less[*1] •When using RISEND or RIRCV instruction: 58 words or less[*1]
	Using buffer memory auto-refresh function	509 words or less[*2]

* 1 When sending/receiving the data mentioned above or more, change the buffer size by the sequence program (☞ Section 7.1.1 (2)).

* 2 When sending/receiving data of 510 words or more, change the auto-refresh buffer size in the sequence program (☞ Section 7.1.1 (2)) and change the auto-refresh buffer assignment.

Remark

Receive data must not contain CR(0DH)＋LF(0AH).
If CR(0DH)＋LF(0AH) is included, the CR(0DH)＋LF(0AH) is regarded as the end frame, resulting in termination of the reception.

7.1 Setting of each station

7.1.1 Setting AJ61BT11 or A1SJ61BT11

When using the AJ61BT11 or A1SJ61BT11, the switches and parameters must be set.

(1) Switch setting

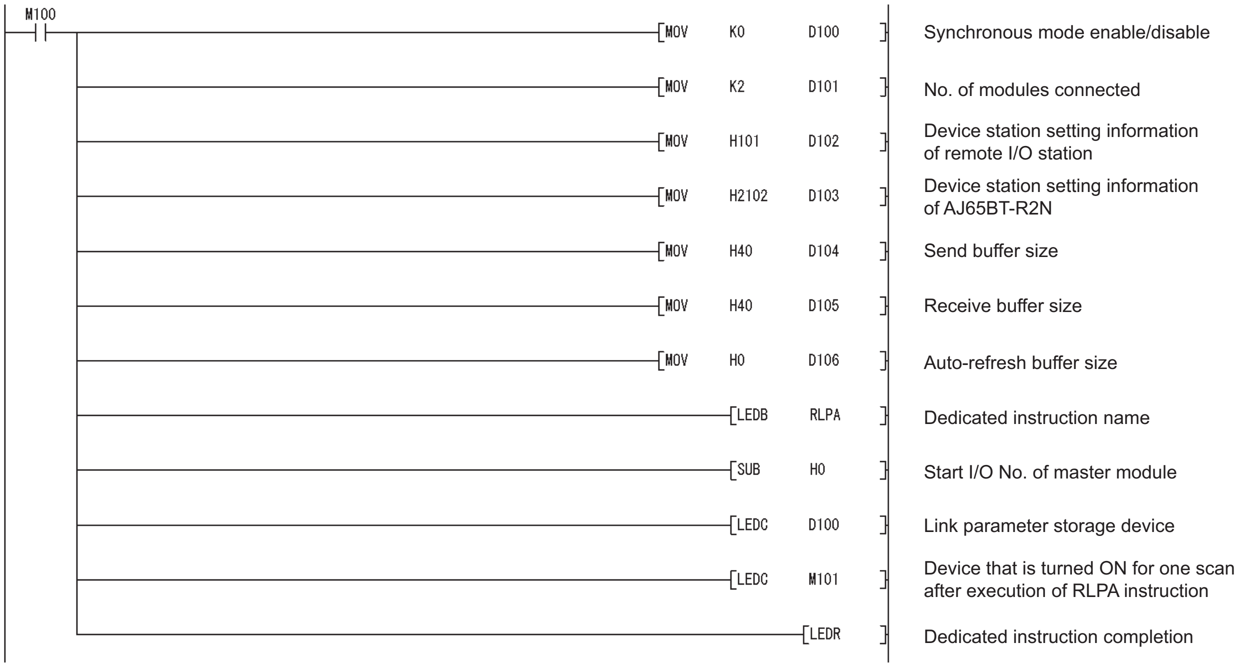
Switch setting for the master station is performed with the switches on the master module.

Table 7.7 Each switch setting example

Item		Description	Set value
Station No. setting switch		Master station	0
Mode setting switch		Online (Remote net mode)	0
Transmission speed setting switch		156kbps	0
Condition setting switch	SW1	Station type: Master station/local station	OFF
	SW2, SW3	Use prohibited	OFF
	SW4	Input data status of data link error station: Cleared	OFF
	SW5, SW6	No. of occupied stations: Invalid	OFF
	SW7	Use prohibited	OFF
	SW8	Module mode: Intelli. mode	OFF

(2) Parameter setting

Set parameters for the master station with the sequence program (dedicated instructions).



```
M100
-| |--[MOV  K0     D100]   Synchronous mode enable/disable
    |-[MOV  K2     D101]   No. of modules connected
    |-[MOV  H101   D102]   Device station setting information of remote I/O station
    |-[MOV  H2102  D103]   Device station setting information of AJ65BT-R2N
    |-[MOV  H40    D104]   Send buffer size
    |-[MOV  H40    D105]   Receive buffer size
    |-[MOV  H0     D106]   Auto-refresh buffer size
    |-[LEDB RLPA       ]   Dedicated instruction name
    |-[SUB  H0         ]   Start I/O No. of master module
    |-[LEDC D100       ]   Link parameter storage device
    |-[LEDC M101       ]   Device that is turned ON for one scan after execution of RLPA instruction
    |-[LEDR            ]   Dedicated instruction completion
```

Figure 7.4 Network parameters setting example (When using the send/receive buffer communication function)

Table 7.8 Network parameters setting example

<table>
<tr><th colspan="2">Item</th><th colspan="3">Set value</th></tr>
<tr><td colspan="2">Synchronous mode valid/invalid</td><td colspan="3">0 (When synchronous mode is invalid)</td></tr>
<tr><td colspan="2">Number of stations connected for communication</td><td colspan="3">2</td></tr>
<tr><td colspan="2" rowspan="3">Device station setting information</td><th>Device station type</th><th>No. of occupied device stations</th><th>Station No.</th></tr>
<tr><td>Remote I/O station</td><td>0 (Remote I/O station)</td><td>1</td><td>1</td></tr>
<tr><td>AJ65BT-R2N</td><td>2 (Intelligent device station)</td><td>1</td><td>2</td></tr>
<tr><td colspan="2">Send buffer size of AJ65BT-R2N</td><td colspan="3">•When using send/receive buffer communication function: 40H*1*2
•When using buffer memory auto-refresh function: 0H</td></tr>
<tr><td colspan="2">Receive buffer size of AJ65BT-R2N</td><td colspan="3">•When using send/receive buffer communication function: 40H*1*2
•When using buffer memory auto-refresh function: 0H</td></tr>
<tr><td colspan="2">Auto-refresh buffer size of AJ65BT-R2N</td><td colspan="3">•When using send/receive buffer communication function: 0H
•When using buffer memory auto-refresh function: 600H*3</td></tr>
</table>

* 1 When using a RIWT or RIRD instruction to send/receive data of 60 words or more, change the value to "(Send/receive data size) ＋5 words".

* 2 When using a RISEND or RIRCV instruction to send/receive data of 59 words or more, change the value to "(Send/receive data size) ＋6 words".

* 3 When sending/receiving data of 512 words or more, change the auto-refresh buffer size and the auto-refresh buffer assignments.

7.1.2 Remote I/O station setting

For the setting method, refer to the manual for the remote I/O station.

Table 7.9 Remote I/O station setting example

Item	Set value
Station No.	1
Transmission speed	156kbps

7.1.3 AJ65BT-R2N setting

Perform the AJ65BT-R2N settings with each switch of the AJ65BT-R2N.

Table 7.10 AJ65BT-R2N setting example

<table>
<tr><th colspan="2">Item</th><th>Description</th><th>Set value</th></tr>
<tr><td colspan="2">Station No. setting switch</td><td>Station No. 2</td><td>×10: 0
×1: 2</td></tr>
<tr><td colspan="2">Data link transmission speed setting switch</td><td>156kbps</td><td>0</td></tr>
<tr><td colspan="2" rowspan="2">Mode setting switch</td><td>•Using send/receive buffer communication function (Mode 0)</td><td>0</td></tr>
<tr><td>•Using buffer memory auto-refresh function (Mode 1)</td><td>1</td></tr>
<tr><td rowspan="4">RS-232 transmission setting switches</td><td>SW1 to SW4</td><td>Transmission speed: 300bps</td><td>OFF</td></tr>
<tr><td>SW5</td><td>Data bit length: 8</td><td>ON</td></tr>
<tr><td>SW6, SW7</td><td>Parity bit: None</td><td>OFF</td></tr>
<tr><td>SW8</td><td>Stop bit length: 1</td><td>OFF</td></tr>
</table>

7.2 Entire Send/Receive Program Structure

The programs in this section can be executed when the following system configuration and settings have been set.

☞ CHAPTER 7 (2) System configuration for program

☞ Section 7.1 Setting of each station

7.2.1 For the send/receive buffer communication function

(1) Overview of program examples

(a) Initial setting program for master station ((3) in this section - 1)
Parameters of the master station are set.

☞ Section 7.1.1 (2) Parameter setting

(b) Program for reading remote input (RX) ((3) in this section - 2)
Remote input (RXn0 to RX(n+1)F) of the AJ65BT-R2N is read out to the input (X120 to X13F) of the programmable controller CPU.

(c) Mode setting switch check program ((3) in this section - 3)
Whether the mode setting switch is set correctly or not is checked.

(d) AJ65BT-R2N initial setting program ((3) in this section - 4)

1) When AJ65BT-R2N initial setting start flag (M20) is turned ON, settings are configured so that data reception is completed by the frame function upon receipt of CR($0D_H$)＋LF($0A_H$).

2) The AJ65BT-R2N is initialized.

☞ Section 7.3.1 For the send/receive buffer communication function

(e) Program for sending data to external device ((3) in this section - 5)
If Send execute flag (X22) is turned ON, the character string "ABCDEF" is sent from the master station to the external device.

☞ Section 7.4.1 For the send/receive buffer communication function

(f) Program for receiving data from external device ((3) in this section - 6)
When data are received from the external device, the received data are read out from the AJ65BT-R2N to the master station.

☞ Section 7.5.1 For the send/receive buffer communication function

(g) Error handling program ((3) in this section - 7)

1) When an error occurs during initialization setting or data transfer, an error code will be read out from the AJ65BT-R2N to the master module if Error code read flag (X23) is turned ON.

2) The error is canceled when Error clear flag (X24) is turned ON after the cause of the error has been eliminated.

☞ Section 7.6.1 For the send/receive buffer communication function

(h) Program for writing data to remote output (RY) ((3) in this section - 8)

1) When using the RIRD, RIWT, RIRCV or RISEND instruction, execute this program immediately before END instruction in order to prevent malfunctions. Failure to do so may cause the remote I/O (RX, RY) not to operate properly.

2) The output (Y120 to Y13F) of the programmable controller CPU is written to the remote output (RYn0 to RY(n+1)F) of the AJ65BT-R2N.

(2) Devices used in the program example

Table 7.11 Devices used in the program example

Device	Description	Device	Description
X0	Module error (Master station)	Y124	Initialization request signal
X1	Own station data link status (Master station)	Y126	OS reception area clear request signal
X0F	Module ready (Master station)	Y127	E^2PROM function request signal
X22	Send execute flag	Y139	Initial data read request signal
X23	Error code read flag	Y13A	Error reset request signal
X24	Error clear flag	M0	Operation start request flag
K4X120	Remote input (X120 to X12F)	M1	Initial setting write completion flag
X120	Send complete signal	M2	Operation complete flag
X121	Send failed signal	M3	Operation failed flag
X122	Normal receive data read request signal	M10	Device that is turned ON for one scan after completion of RIWT
X123	Error receive data read request signal	M11	Device that is turned ON for one scan after failure of writing by RIWT
X124	Initialization complete signal	M20	AJ65BT-R2N initial setting start flag
X125	Initialization failed signal	M21	AJ65BT-R2N initial setting start pulse signal
X128	E^2PROM function failed signal	M22	Operation complete pulse signal
K1X134	Mode setting switch status signal (X134 to X137)	M25	Send completion pulse signal
X13A	Error status signal	M30	Operation failed pulse signal
X13B	Remote station ready signal	M100	Master station parameter setting start pulse signal
K4Y18	Output (Y18 to Y27) (Master station)	M101	Device that is turned ON for one scan after completion of RLPA
Y1C	Buffer memory bank switching specification (Master station)	M102	Device that is turned ON for one scan after failure of writing by RLPA
Y1D		M120	Buffer memory access exclusion check flag
K8Y120	Remote output (Y120 to Y13F)	M125	Sending flag
Y120	Send request signal	M130	Receiving flag
Y121	Send cancel request signal	M135	Error handling flag
Y122	Receive data read completion signal	M155	Device that is turned ON for one scan after completion of RIRD
Y123	Forced receive completion request signal	M156	Device that is turned ON for one scan after failure of reading by RIRD

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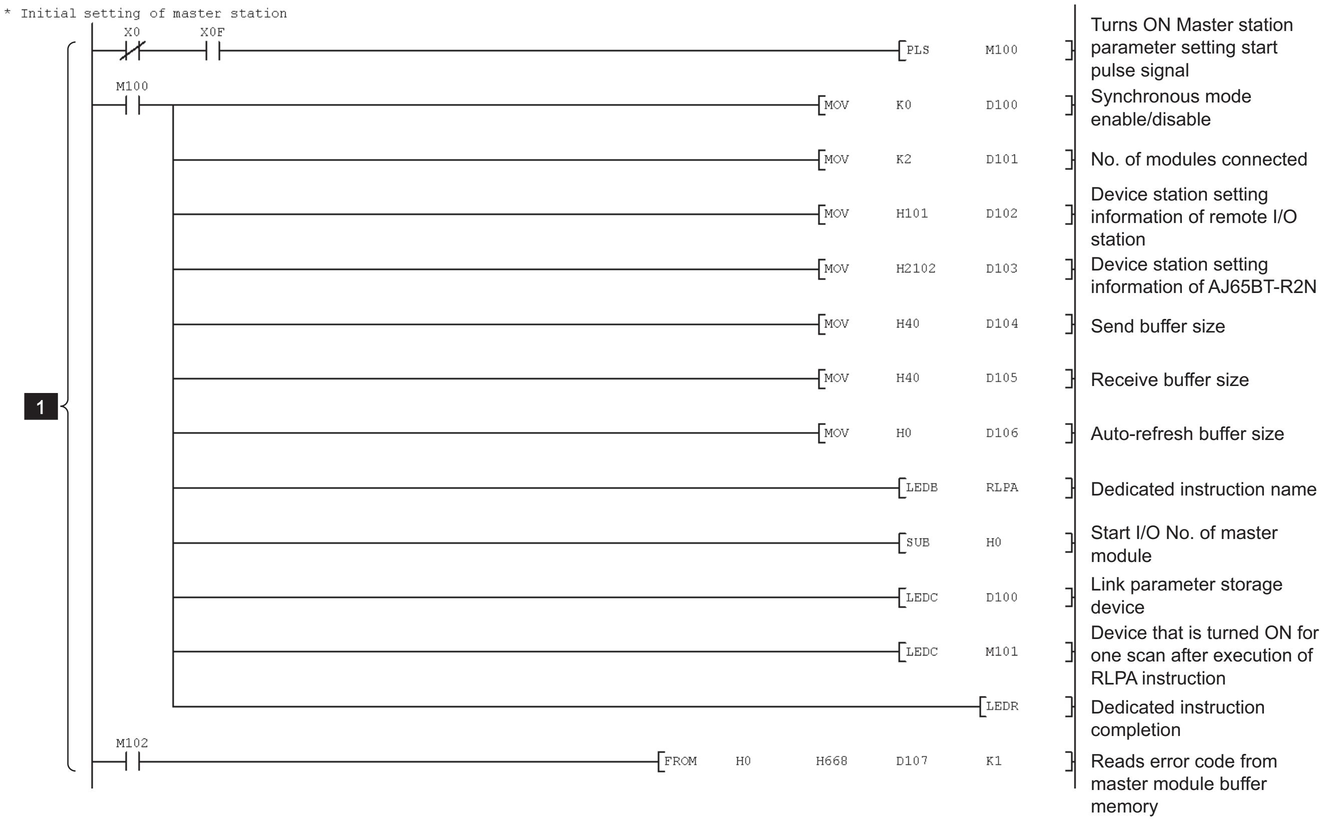
Table 7.11 Devices used in the program example (Continued)

Device	Description	Device	Description
M160	Device that is turned ON for one scan after completion of RIRD	M901	Other station data link status (Station No.2)
M161	Device that is turned ON for one scan after failure of reading by RIRD	M9036	Always ON
M180	Device that is turned ON for one scan after completion of RIWT	M9052	SEG instruction switching
M181	Device that is turned ON for one scan after failure of writing by RIWT	D0 to D7	Control data of RIWT instruction, and set values or send data
M190	Device that is turned ON for one scan after completion of RIRD	D30 to D34	Control data of RIRD instruction, and No. of receive data (in word units)
M191	Device that is turned ON for one scan after failure of reading by RIRD	From D35	Control data of RIRD instruction, and receive data
M220	Send execution pulse signal	D100 to D106	Network parameters of master station
M230	Error handling execution pulse signal	D107	Error code in Network parameters setting
M502	AJ65BT-R2N mode normal flag	D130 to D136	Control data of RIRD instruction, and error code of AJ65BT-R2N
M503	AJ65BT-R2N mode error flag	D900	RY(n+1)E, RY(n+1)F of master module
K4M900	Other station data link status (SW0080)	—	

(3) Program example



Turns ON Master station parameter setting start pulse signal

Synchronous mode enable/disable

No. of modules connected

Device station setting information of remote I/O station

Device station setting information of AJ65BT-R2N

Send buffer size

Receive buffer size

Auto-refresh buffer size

Dedicated instruction name

Start I/O No. of master module

Link parameter storage device

Device that is turned ON for one scan after execution of RLPA instruction

Dedicated instruction completion

Reads error code from master module buffer memory

Figure 7.5 Program example

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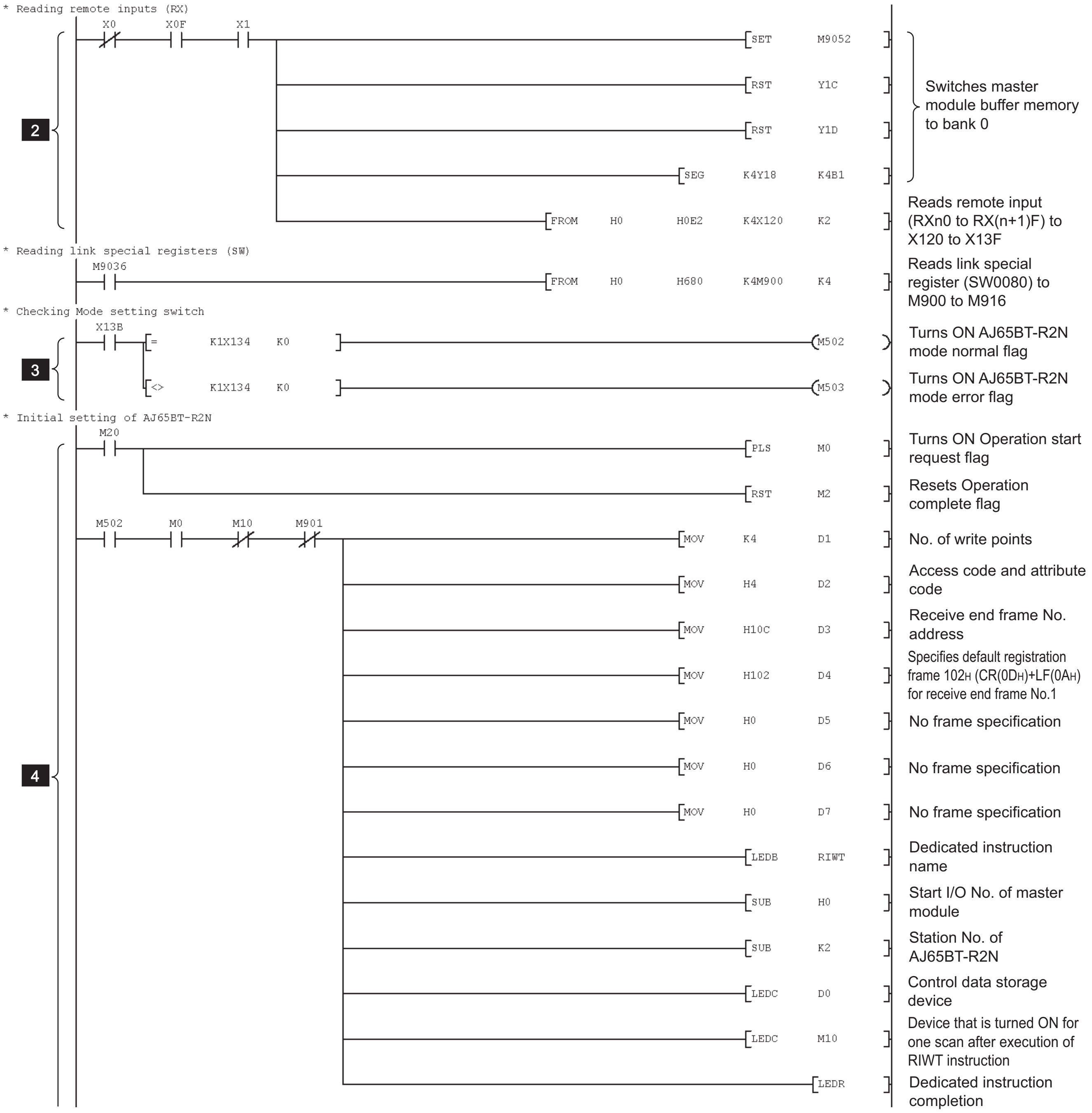

Switches master module buffer memory to bank 0

Reads remote input (RXn0 to RX(n+1)F) to X120 to X13F

Reads link special register (SW0080) to M900 to M916

Turns ON AJ65BT-R2N mode normal flag

Turns ON AJ65BT-R2N mode error flag

Turns ON Operation start request flag

Resets Operation complete flag

No. of write points

Access code and attribute code

Receive end frame No. address

Specifies default registration frame 102H (CR(0DH)+LF(0AH) for receive end frame No.1

No frame specification

No frame specification

No frame specification

Dedicated instruction name

Start I/O No. of master module

Station No. of AJ65BT-R2N

Control data storage device

Device that is turned ON for one scan after execution of RIWT instruction

Dedicated instruction completion

Figure 7.5 Program example (Continued)

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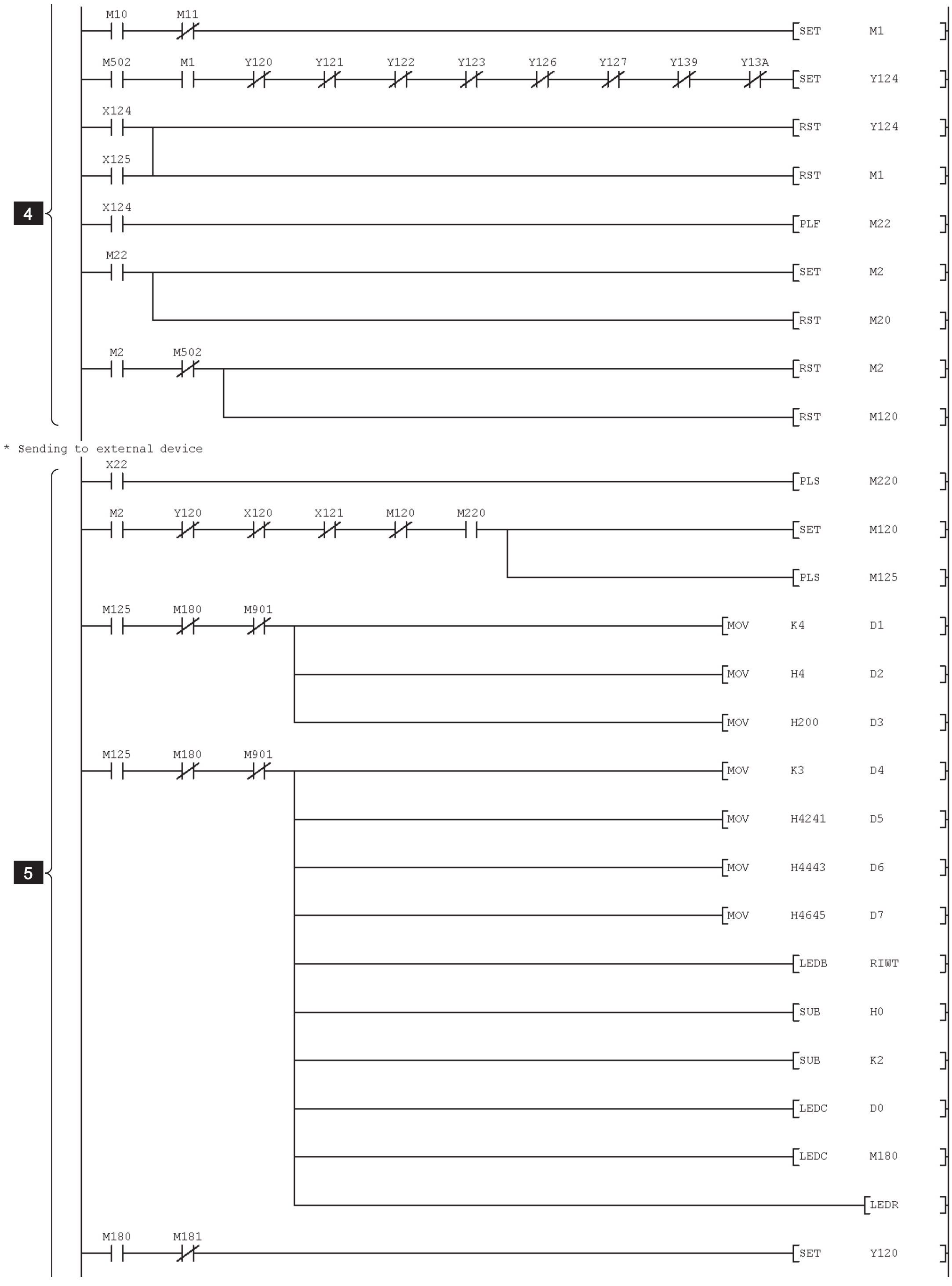

Turns ON Initial setting write completion flag

Turns ON Initialization request signal

Resets Initialization request signal

Resets Initial setting write completion flag

Turns ON Operation complete pulse signal

Turns ON Operation complete flag

Resets AJ65BT-R2N initial setting start flag

Resets Operation complete flag

Resets Buffer memory access exclusion check flag

Turns ON Send execution pulse signal

Turns ON Buffer memory access exclusion check flag

Turns ON Sending flag

No. of write points

Access code and attribute code

Send area address

Specifies No. of send data (in word units)

Specifies (A(41_H)+B(42_H)+C(43_H)+D(44_H)+E(45_H)+F(46_H)) for send data

Dedicated instruction name

Start I/O No. of master module

Station No. of AJ65BT-R2N

Control data storage device

Device that is turned ON for one scan after execution of RIWT instruction

Dedicated instruction completion

Turns ON Buffer memory access exclusion check flag

Figure 7.5 Program example (Continued)

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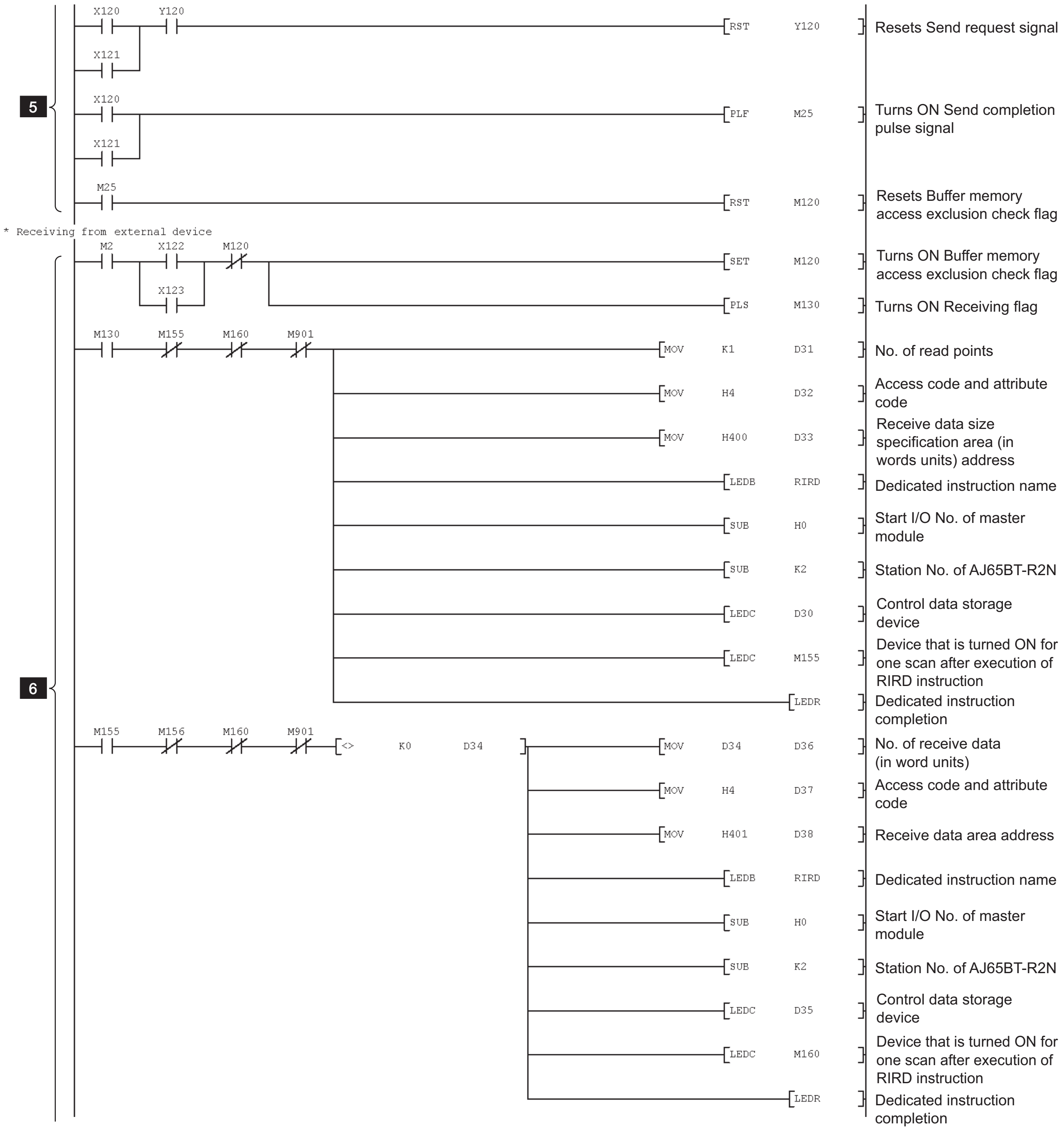

Resets Send request signal

Turns ON Send completion pulse signal

Resets Buffer memory access exclusion check flag

Turns ON Buffer memory access exclusion check flag

Turns ON Receiving flag

No. of read points

Access code and attribute code

Receive data size specification area (in words units) address

Dedicated instruction name

Start I/O No. of master module

Station No. of AJ65BT-R2N

Control data storage device

Device that is turned ON for one scan after execution of RIRD instruction

Dedicated instruction completion

No. of receive data (in word units)

Access code and attribute code

Receive data area address

Dedicated instruction name

Start I/O No. of master module

Station No. of AJ65BT-R2N

Control data storage device

Device that is turned ON for one scan after execution of RIRD instruction

Dedicated instruction completion

Figure 7.5 Program example (Continued)

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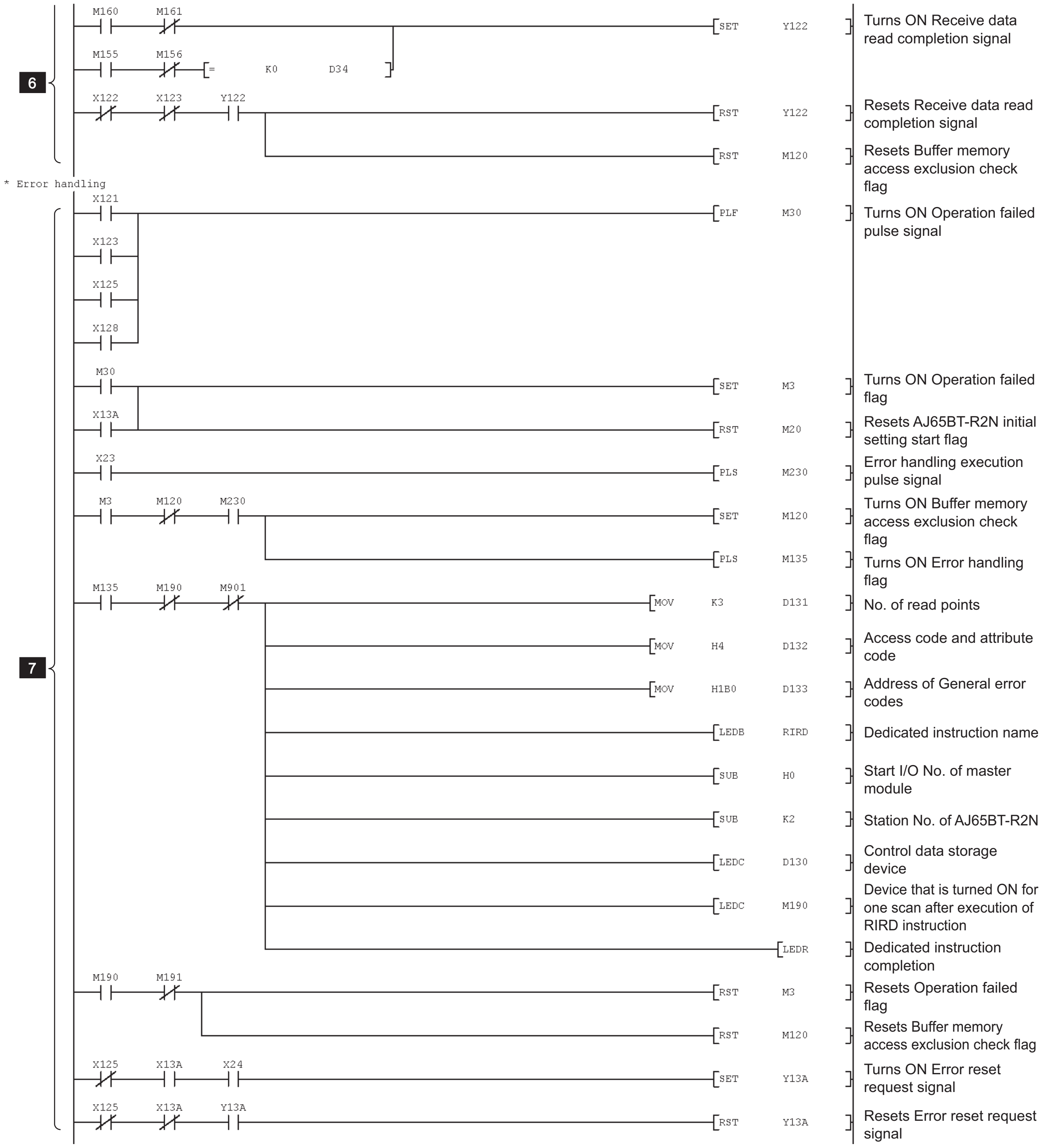

Figure 7.5 Program example (Continued)

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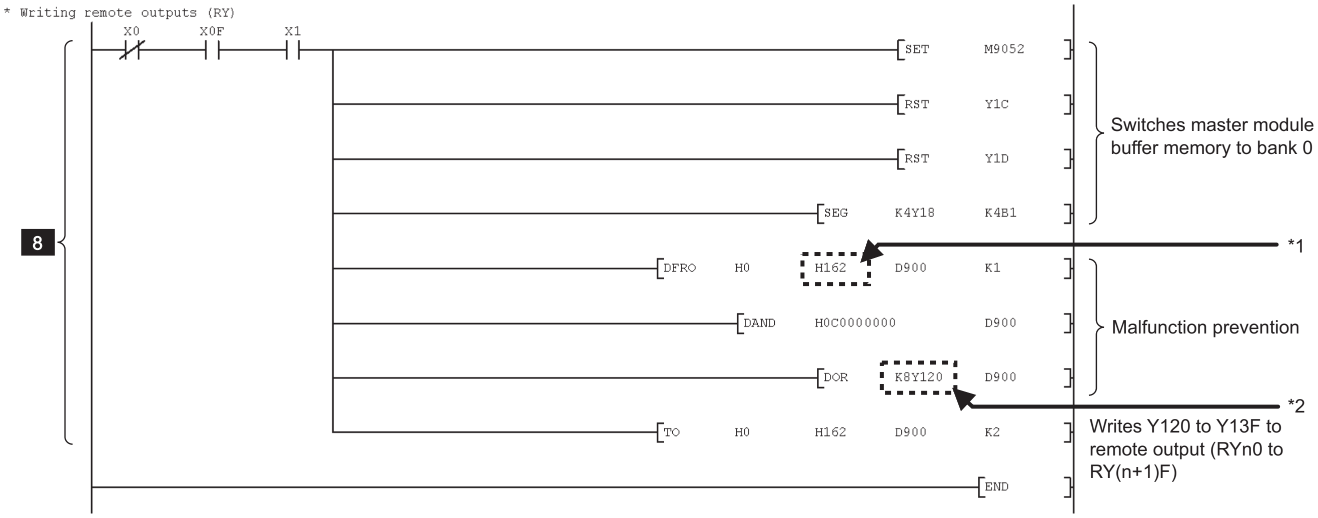

Switches master module buffer memory to bank 0

Malfunction prevention

Writes Y120 to Y13F to remote output (RYn0 to RY(n+1)F)

*1 Master module buffer memory address to which the AJ65BT-R2N remote output (RY) was assigned.
Correct the remote output (RY) assignment if it is different from that of the program example.

*2 Auto-refresh target device of AJ65BT-R2N.
Correct the auto-refresh target device if it is different from that of the program example.

Figure 7.5 Program example (Continued)

7.2.2 For the buffer memory auto-refresh function

(1) Overview of program example

(a) Initial setting program for master station ((3) in this section - 1)
Parameters of the master station are set.

☞ Section 7.1.1 (2) Parameter setting

(b) Program for reading remote input (RX) ((3) in this section - 2)
Remote input (RXn0 to RX(n+1)F) of the AJ65BT-R2N is read out to the input (X120 to X13F) of the programmable controller CPU.

(c) Mode setting switch check program ((3) in this section - 3)
Whether the mode setting switch is set correctly or not is checked.

(d) AJ65BT-R2N initial setting program ((3) in this section - 4)

1) Initial data are read from the AJ65BT-R2N to the master module.
2) By the frame function, reception is completed when CR(0D_H)+LF(0A_H) is received.
3) The AJ65BT-R2N is initialized.

☞ Section 7.3.2 For the buffer memory auto-refresh function

(e) Program for sending data to external device ((3) in this section - 5)
If Send execute flag (X22) is turned ON, the character string "ABCDEF" is sent from the master station to the external device.

☞ Section 7.4.2 For the buffer memory auto-refresh function

(f) Program for receiving data from external device ((3) in this section - 6)
When data are received from the external device, the received data are read out from the AJ65BT-R2N to the master station.

☞ Section 7.5.2 For the buffer memory auto-refresh function

(g) Error handling program ((3) in this section - 7)

1) When an error occurs during initialization setting or data transfer, an error code will be read out from the AJ65BT-R2N to the master module if Error code read flag (X23) is turned ON.
2) The error is canceled when Error clear flag (X24) is turned ON after the cause of the error has been eliminated.

☞ Section 7.6.2 For the buffer memory auto-refresh function

(h) Program for writing data to remote output (RY) ((3) in this section - 8)
The output (Y120 to Y13F) of the programmable controller CPU is written to the remote output (RYn0 to RY(n+1)F) of the AJ65BT-R2N.

(2) Devices used in the program example

Table 7.12 Devices used in the program example

Device	Description	Device	Description
X0	Module error (Master station)	M0	Operation start request flag
X1	Own station data link status (Master station)	M1	Initial setting write completion flag
X0F	Module ready (Master station)	M2	Operation complete flag
X22	Send execute flag	M3	Operation failed flag
X23	Error code read flag	M22	Operation complete pulse signal
X24	Error clear flag	M25	Send completion pulse signal
K4X120	Remote input (X120 to X12F)	M30	Operation failed pulse signal
X120	Send complete signal	M100	Master station parameter setting start pulse signal
X121	Send failed signal	M101	Device that is turned ON for one scan after completion of RLPA
X122	Normal receive data read request signal	M102	Device that is turned ON for one scan after failure of writing by RLPA
X123	Error receive data read request signal	M111	Initial data read completion pulse signal
X124	Initialization complete signal	M120	Send-in-process flag
X125	Initialization failed signal	M125	Sending flag
X128	E^{2}PROM function failed signal	M130	Receiving flag
K1X134	Mode setting switch status signal (X134 to X137)	M135	Error handling flag
X139	Initial data read completion signal	M220	Send execution pulse signal
X13A	Error status signal	M230	Error handling execution pulse signal
X13B	Remote station ready signal	M500	AJ65BT-R2N initial data read complete flag
K4Y18	Output (Y18 to Y27) (Master station)	M501	AJ65BT-R2N initial data reading flag
Y1C	Buffer memory bank switching specification (Master station)	M502	AJ65BT-R2N mode normal flag
Y1D		M503	AJ65BT-R2N mode error flag
K8Y120	Remote output (Y120 to Y13F)	K4M900	Other station data link status (SW0080)
Y120	Send request signal	M901	Other station data link status (Station No.2)
Y121	Send cancel request signal	M9036	Always ON
Y122	Receive data read completion signal	M9052	SEG instruction switching
Y123	Forced receive completion request signal	D10 to D13	Set values, or No. of send data (in word units) and send data
Y124	Initialization request signal	D100 to D106	Network parameters of master station
Y126	OS reception area clear request signal	D107	Error code in Network parameters setting
Y127	E^{2}PROM function request signal	D200	No. of receive data
Y139	Initial data read request signal	From D201	Receive data
Y13A	Error reset request signal	D400 to D402	AJ65BT-R2N error code

(3) Program example

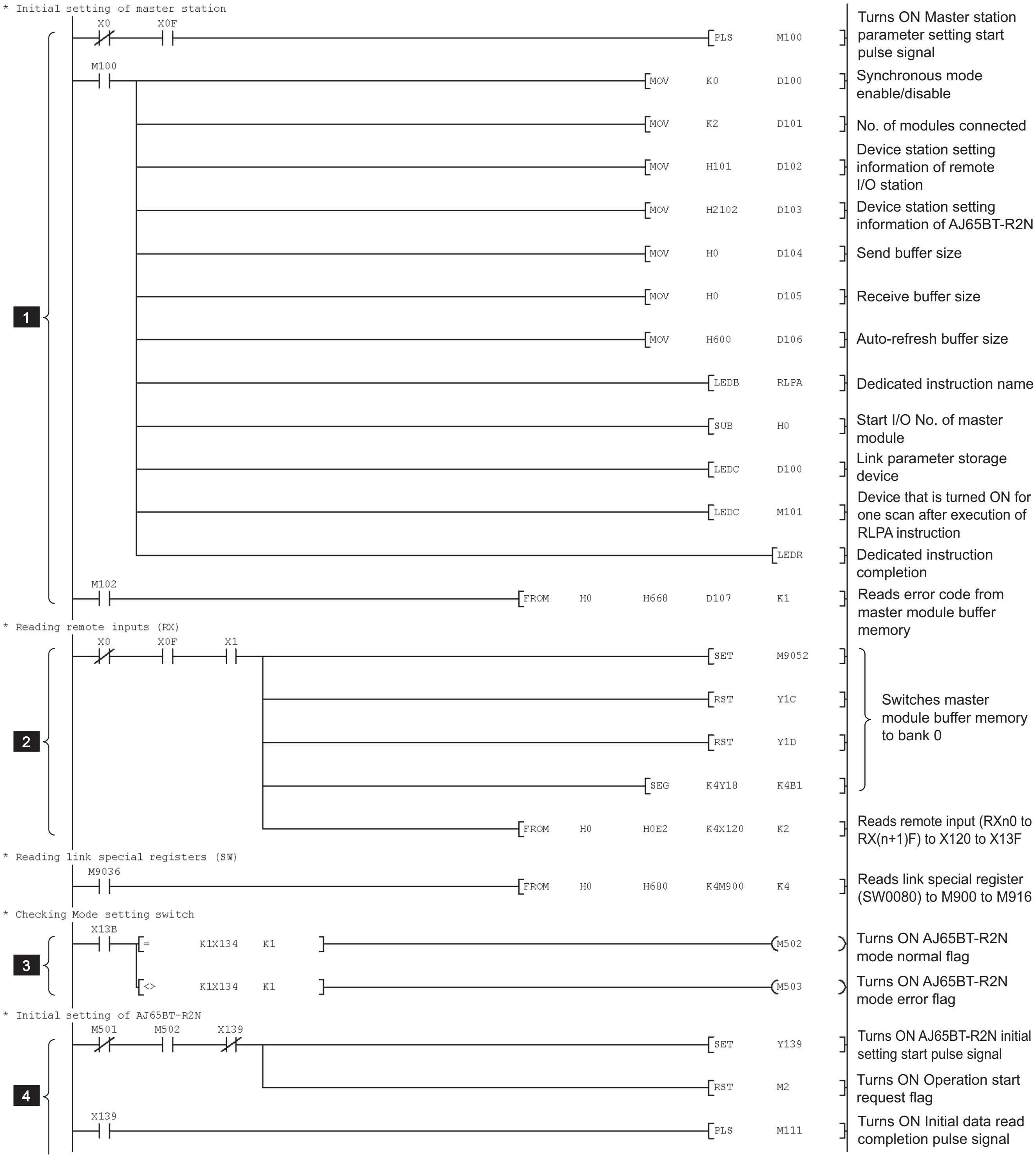

Figure 7.6 Program example

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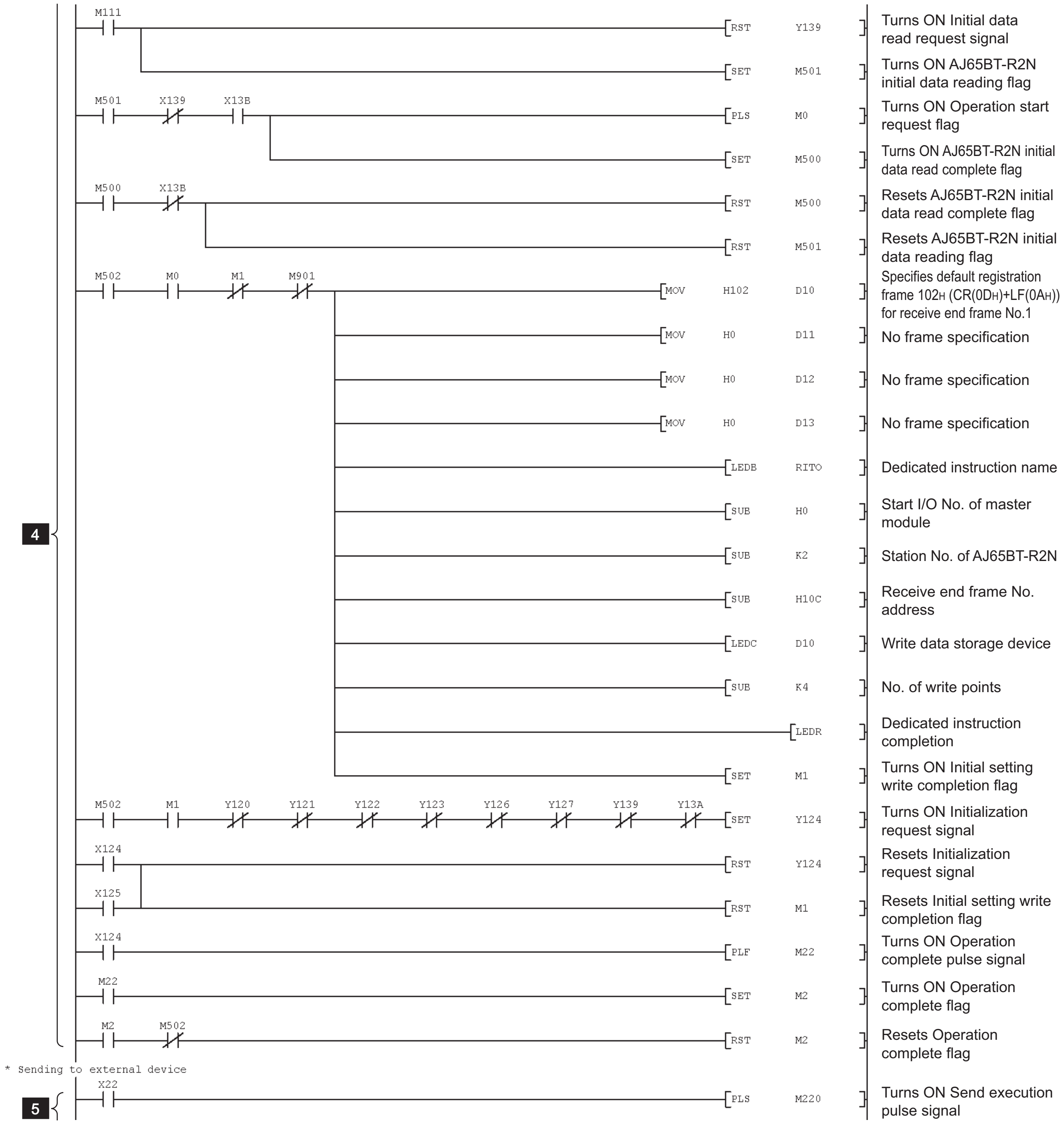

Figure 7.6 Program example (Continued)

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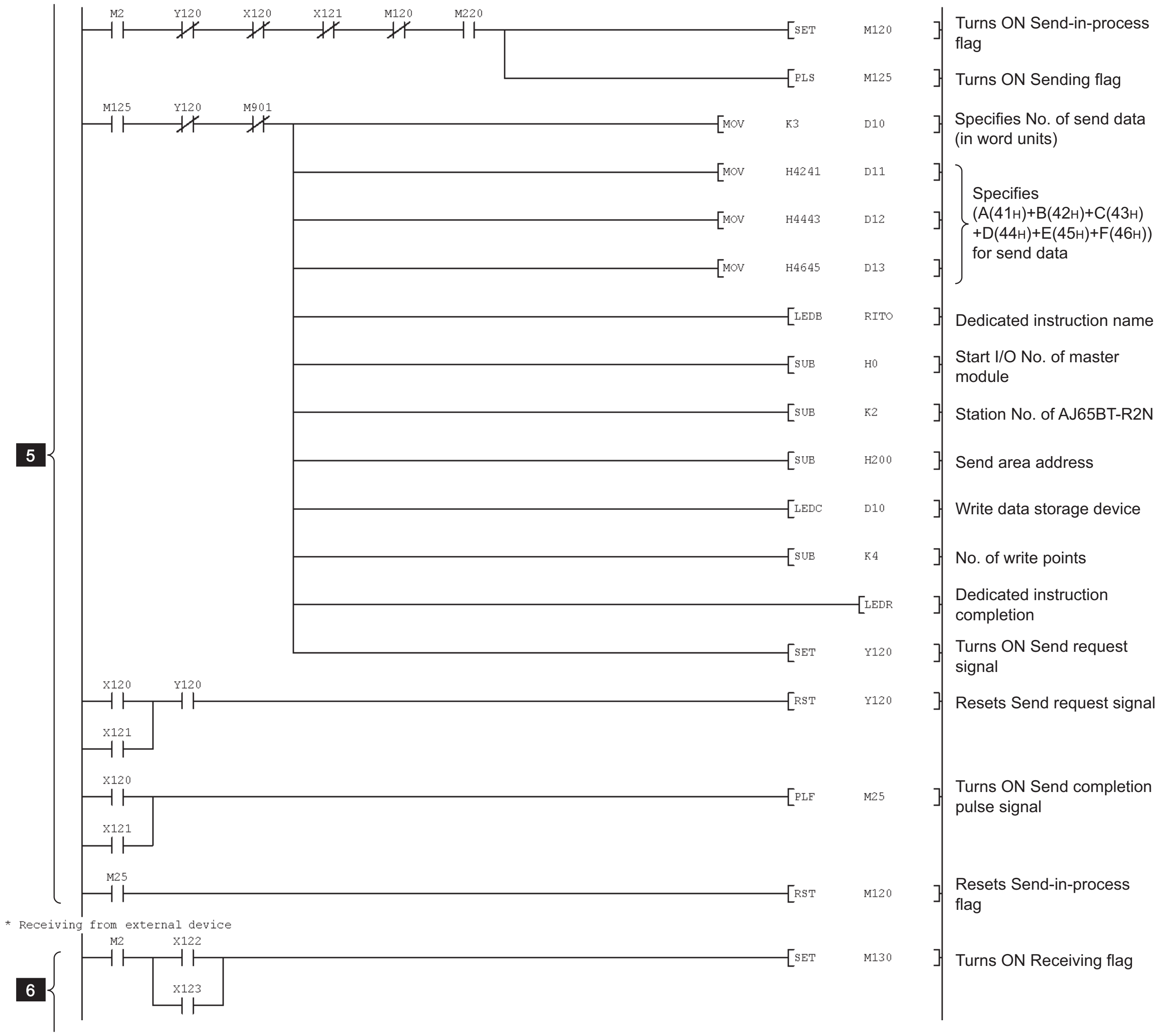

Figure 7.6 Program example (Continued)

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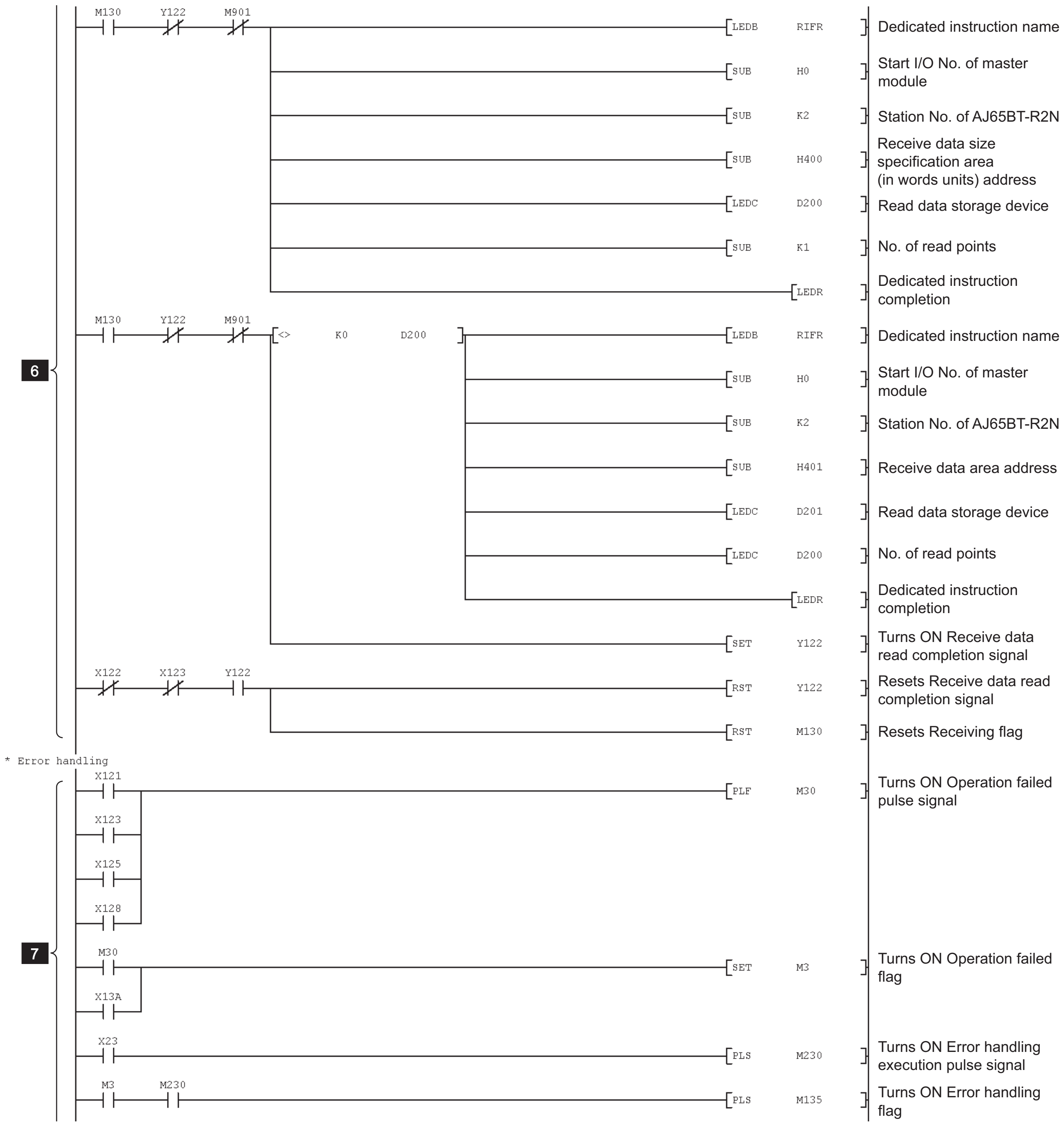

Figure 7.6 Program example (Continued)

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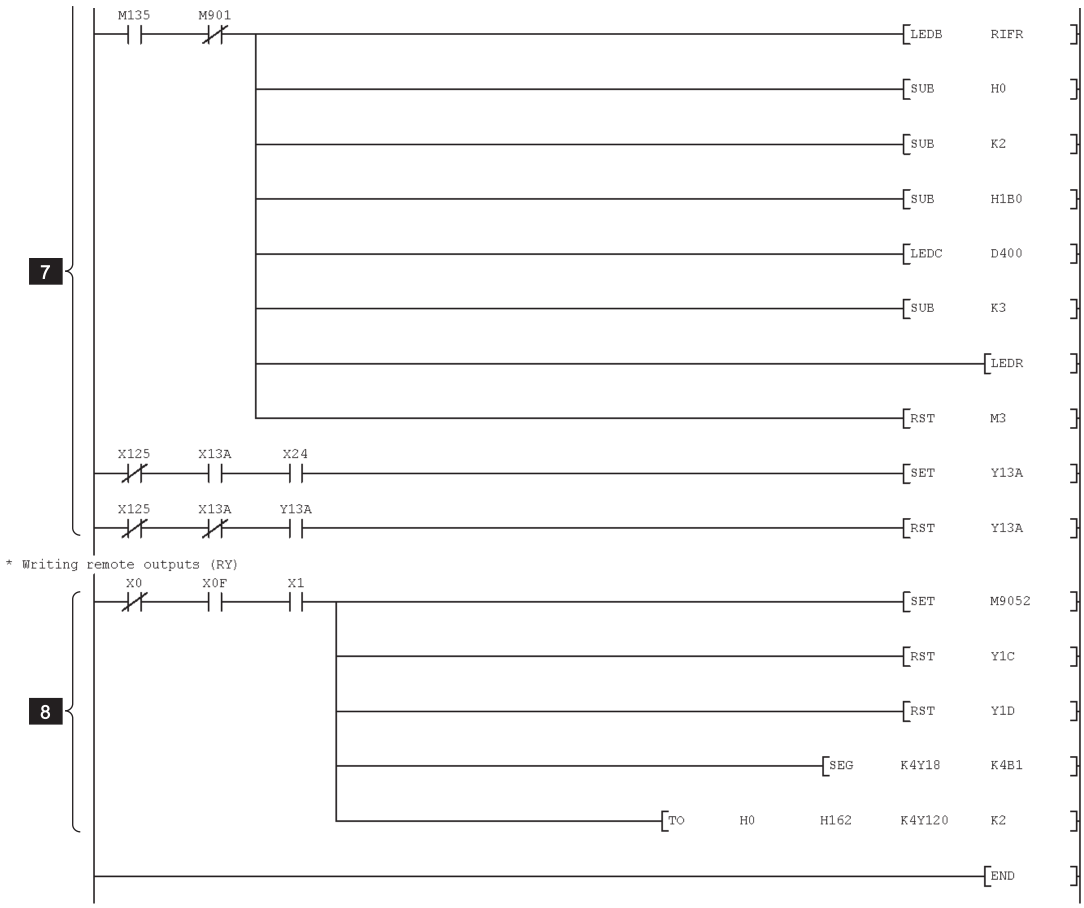

Dedicated instruction name

Start I/O No. of master module

Station No. of AJ65BT-R2N

Address of General error codes

Read data storage device

No. of read points

Dedicated instruction completion

Resets Operation failed flag

Turns ON Error reset request signal

Resets Error reset request signal

Switches master module buffer memory to bank 0

Writes Y120 to Y13F to remote output (RYn0 to RY(n+1)F)

Figure 7.6 Program example (Continued)

7.3 Initial Setting for AJ65BT-R2N

7.3.1 For the send/receive buffer communication function

(1) Overview of program example

1) When AJ65BT-R2N initial setting start flag (M20) is turned ON, settings are configured so that data reception is completed by the frame function upon receipt of CR(0DH)＋LF(0AH).

2) The AJ65BT-R2N is initialized.

(2) Processing in the program example

1) Default registration frame 102H (CR(0DH)＋LF(0AH)) is written to Receive start frame No. 1 (R2N 10CH).

2) After writing is normally completed, Initialization request signal (Y124) is turned ON to complete the initial setting.

(3) Devices used in the program example

Table 7.13 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X124	Initialization complete signal	Section 7.3.1	—
X125	Initialization failed signal	Section 7.3.1	—
Y120	Send request signal	—	Section 7.4.1
Y121	Send cancel request signal	—	—
Y122	Receive data read completion signal	—	Section 7.5.1
Y123	Forced receive completion request signal	—	—
Y124	Initialization request signal	Section 7.3.1	—
Y126	OS reception area clear request signal	—	—
Y127	E^{2}PROM function request signal	—	—
Y139	Initial data read request signal	—	—
Y13A	Error reset request signal	—	Section 7.6.1
M0	Operation start request flag	Section 7.3.1	—
M1	Initial setting write completion flag	Section 7.3.1	—
M2	Operation complete flag	Section 7.3.1	—
M10	Device that is turned ON for one scan after completion of RIWT	Section 7.3.1	—
M11	Device that is turned ON for one scan after failure of writing by RIWT	Section 7.3.1	—
M20	AJ65BT-R2N initial setting start flag	—	—
M21	AJ65BT-R2N initial setting start pulse signal	Section 7.3.1	—
M22	Operation complete pulse signal	Section 7.3.1	—
M120	Buffer memory access exclusion check flag	—	Section 7.4.1, Section 7.5.1, Section 7.6.1
M502	AJ65BT-R2N mode normal flag	—	Section 7.2.1 (3) 1
M901	Other station data link status (Station No.2)	—	—
D0 to D3	Control data of RIWT instruction	—	—
D4 to D7	Initial setting data	—	—

(4) Program example

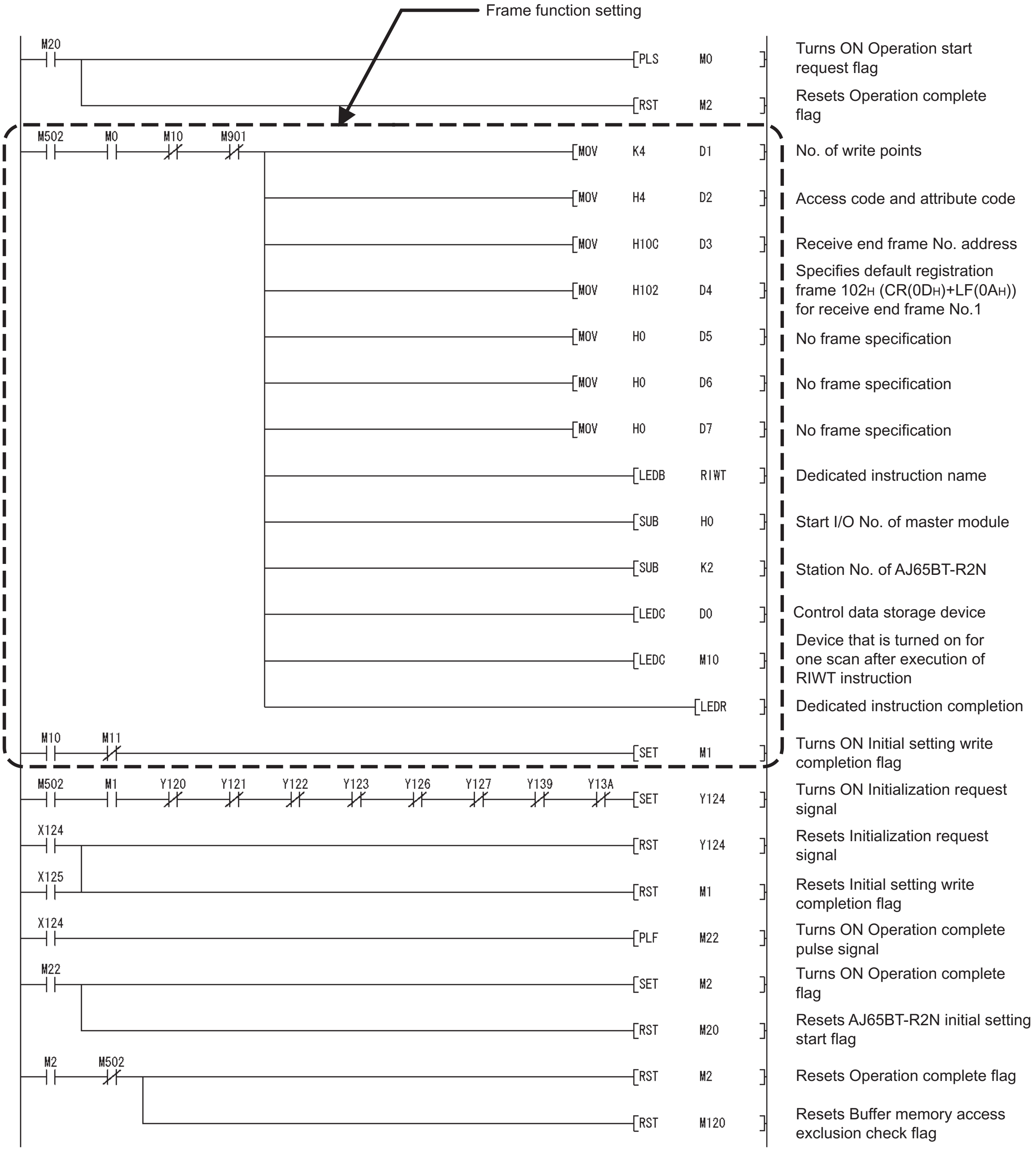

Figure 7.7 Program example

(a) Setting of any other function

When changing the frame function setting to other than the above or when using any other function, refer to the section below and modify the area enclosed by the dotted line.

☞ Section 7.7 Initial Settings for Other Functions

7.3.2 For the buffer memory auto-refresh function

(1) Overview of program example

1) Initial data are read from the AJ65BT-R2N to the master module.

2) By the frame function, reception is completed when CR(0DH)+LF(0AH) is received.

3) The AJ65BT-R2N is initialized.

☒Point

Make sure to read initial data before performing the initial setting.

(2) Processing in the program example

1) Initial data are read out.

2) Default registration frame 102H (CR(0DH)+LF(0AH)) is written to Receive start frame No. 1 (R2N 10CH).

3) After writing is normally completed, Initialization request signal (Y124) is turned ON to complete the initial setting.

(3) Devices used in the program example

Table 7.14 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X124	Initialization complete signal	Section 7.3.2	—
X125	Initialization failed signal	Section 7.3.2	—
X139	Initial data read completion signal	Section 7.3.2	—
X13B	Remote station ready signal	Section 7.3.2	—
Y120	Send request signal	—	Section 7.4.2
Y121	Send cancel request signal	—	—
Y122	Receive data read completion signal	—	Section 7.5.2
Y123	Forced receive completion request signal	—	—
Y124	Initialization request signal	Section 7.3.2	—
Y126	OS reception area clear request signal	—	—
Y127	E^{2}PROM function request signal	—	—
Y139	Initial data read request signal	Section 7.3.2	—
Y13A	Error reset request signal	—	Section 7.6.2
M0	Operation start request flag	Section 7.3.2	—
M1	Initial setting write completion flag	Section 7.3.2	—
M2	Operation complete flag	Section 7.3.2	—
M22	Operation complete pulse signal	Section 7.3.2	—
M111	Initial data read completion pulse signal	—	—
M500	AJ65BT-R2N initial data read complete flag	Section 7.3.2	—
M501	AJ65BT-R2N initial data reading flag	Section 7.3.2	—
M502	AJ65BT-R2N mode normal flag	—	Section 7.2.2 (3) 3

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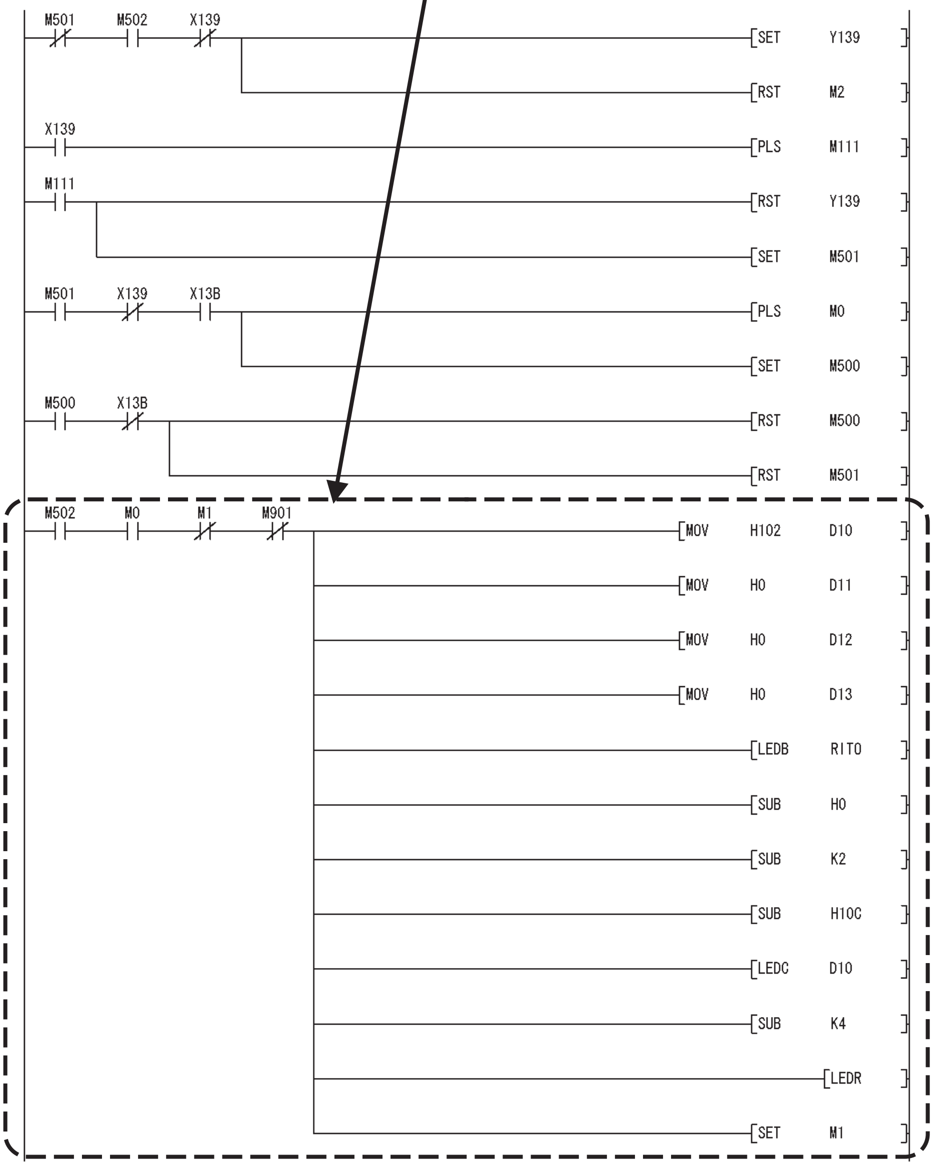
Table 7.14 Devices used in the program example (Continued)

Device	Description	Reference section	
		This program	Other programs
M901	Other station data link status (Station No.2)	—	—
D10 to D13	Initial setting data	—	—

(4) Program example



Frame function setting

Turns ON AJ65BT-R2N initial setting start pulse signal

Turns ON Operation start request flag

Turns ON Initial data read completion pulse signal

Turns ON Initial data read request signal

Turns ON AJ65BT-R2N initial data reading flag

Turns ON Operation start request flag

Turns ON AJ65BT-R2N initial data read complete flag

Resets AJ65BT-R2N initial data read complete flag

Resets AJ65BT-R2N initial data reading flag

Specifies default registration frame 102H (CR(0DH)+LF(0AH)) for receive end frame No.1

No frame specification

No frame specification

No frame specification

Dedicated instruction name

Start I/O No. of master module

Station No. of AJ65BT-R2N

Receive end frame No. address

Write data storage device

No. of write points

Dedicated instruction completion

Turns ON Initial setting write completion flag

Figure 7.8 Program example

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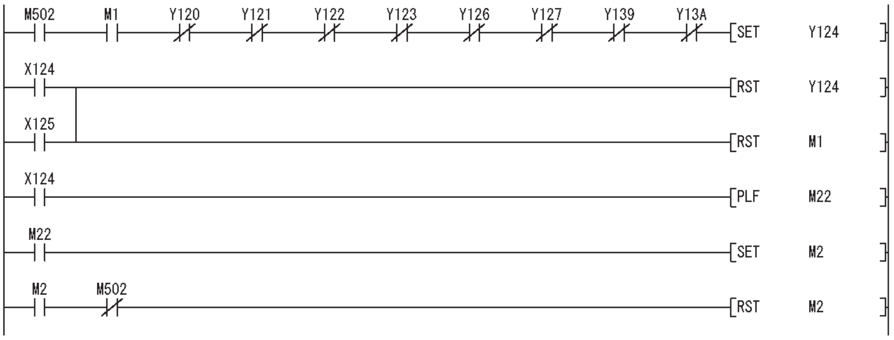


Turns ON Initialization request signal

Resets Initialization request signal

Resets Initial setting write completion flag

Turns ON Operation complete pulse signal

Turns ON Operation complete flag

Resets Operation complete flag

Figure 7.8 Program example (Continued)

(a) Setting of any other function

When changing the frame function setting to other than the above or when using any other function, refer to the section below and modify the area enclosed by the dotted line.

☞ Section 7.7 Initial Settings for Other Functions

7.4 Sending to External Device

7.4.1 For the send/receive buffer communication function

(1) Overview of program example

If Send execute flag (X22) is turned ON, the character string "ABCDEF" is sent from the master station to the external device.

(2) Processing in the program example

1) No. of send data (3) is written to Send data size specification area (R2N 200H) and the send data ("ABCDEF") is written to Send data area (R2N 201H).
2) Send request signal (Y120) is turned ON to send the data to the external device.
3) Send request signal (Y120) is turned OFF to complete the transmission.

(3) Devices used in the program example

Table 7.15 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X22	Send execute flag	—	—
X120	Send complete signal	Section 7.4.1	—
X121	Send failed signal	Section 7.4.1	—
Y120	Send request signal	Section 7.4.1	—
M2	Operation complete flag	—	Section 7.3.1
M25	Send completion pulse signal	Section 7.4.1	—
M120	Buffer memory access exclusion check flag	Section 7.4.1	Section 7.5.1, Section 7.6.1
M125	Sending flag	Section 7.4.1	—
M180	Device that is turned ON for one scan after completion of RIWT	Section 7.4.1	—
M181	Device that is turned ON for one scan after failure of writing by RIWT	Section 7.4.1	—
M220	Send execution pulse signal	Section 7.4.1	—
M901	Other station data link status (Station No.2)	—	—
D0 to D7	Control data of RIWT instruction, No. of send data and send data	—	—

(4) Program example

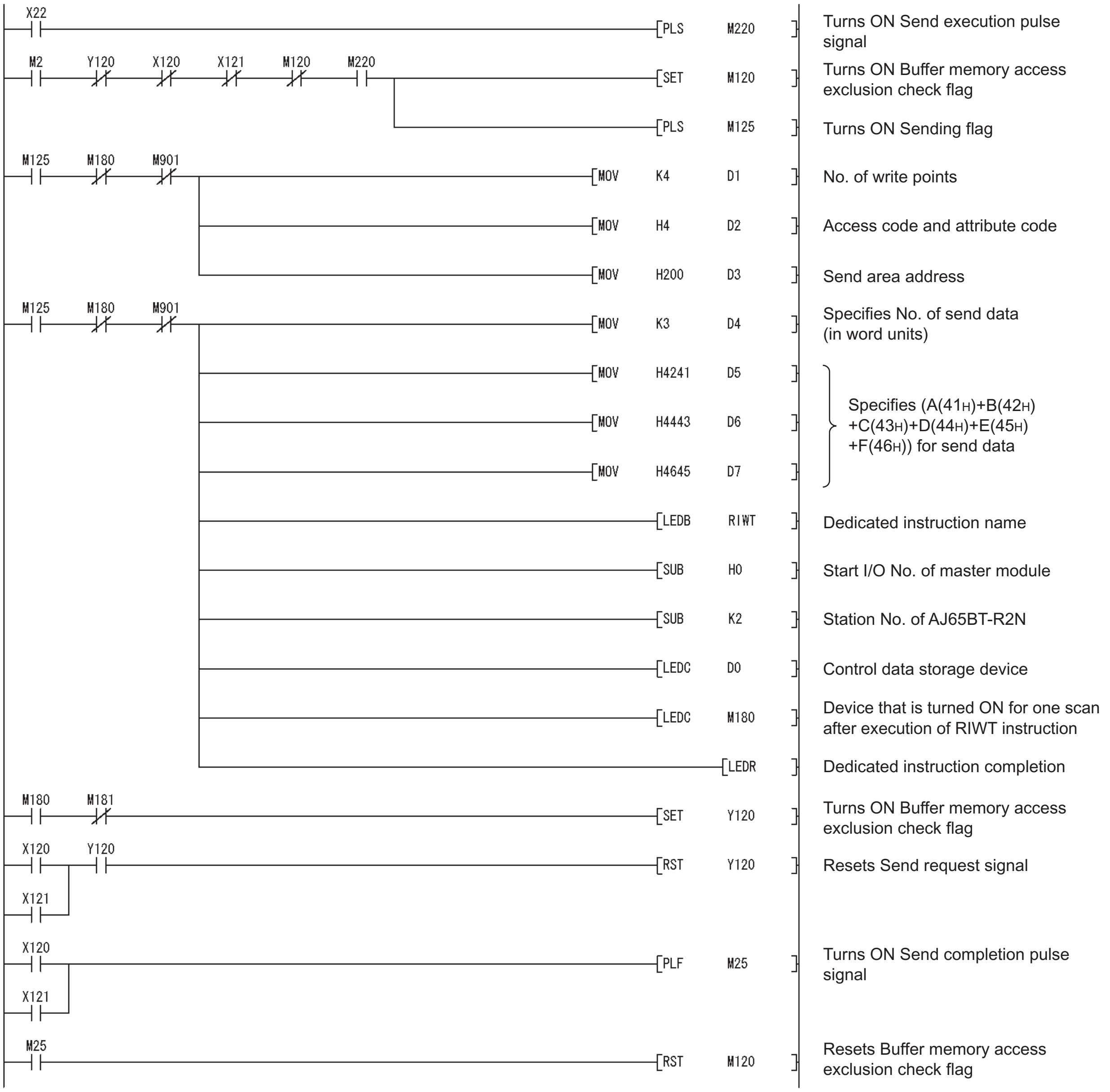


Figure 7.9 Program example

☒Point

When sending data of 481 words or more to the external device using the RIWT instruction, divide the send data into parts, each of which contains 480 words or less, to write them to the AJ65BT-R2N.
With the RIWT instruction, data of 481 words or more cannot be written to the AJ65BT-R2N at one time.

7.4.2 For the buffer memory auto-refresh function

(1) Overview of program example

If Send execute flag (X22) is turned ON, the character string "ABCDEF" is sent to the external device.

(2) Processing in the program example

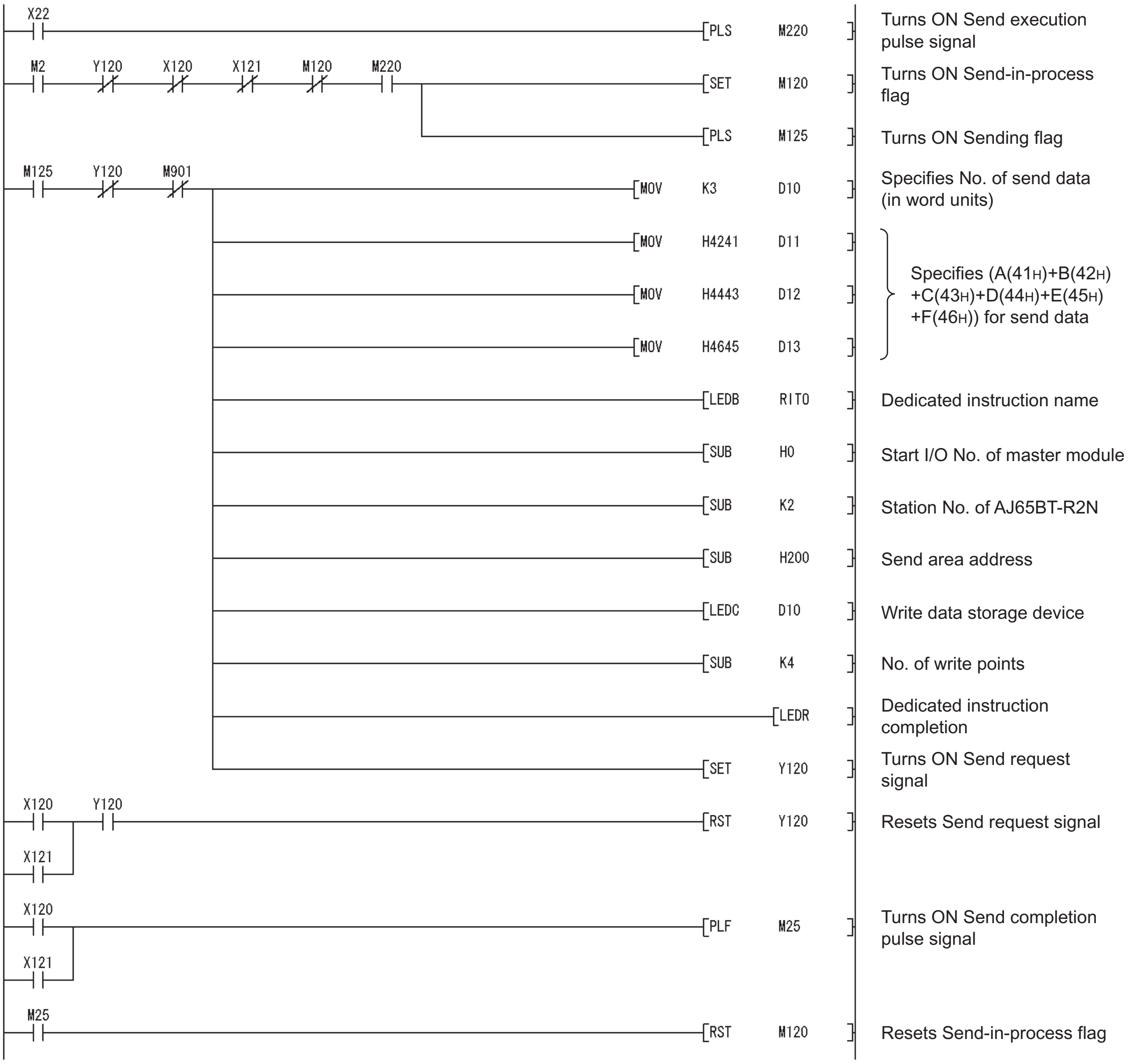
1) No. of send data (3) is written to Send data size specification area (R2N 200H) and the send data ("ABCDEF") is written to Send data area (R2N 201H).
2) Send request signal (Y120) is turned ON to send the data to the external device.
3) Send request signal (Y120) is turned OFF to complete the transmission.

(3) Devices used in the program example

Table 7.16 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X22	Send execute flag	—	—
X120	Send complete signal	Section 7.4.2	—
X121	Send failed signal	Section 7.4.2	—
Y120	Send request signal	Section 7.4.2	—
M2	Operation complete flag	—	Section 7.3.2
M25	Send completion pulse signal	Section 7.4.2	—
M120	Send-in-process flag	Section 7.4.2	—
M125	Sending flag	Section 7.4.2	—
M220	Send execution pulse signal	Section 7.4.2	—
M901	Other station data link status (Station No.2)	—	—
D10 to D13	No. of send data and send data	—	—

(4) Program example



Turns ON Send execution pulse signal

Turns ON Send-in-process flag

Turns ON Sending flag

Specifies No. of send data (in word units)

Specifies (A(41H)+B(42H) +C(43H)+D(44H)+E(45H) +F(46H)) for send data

Dedicated instruction name

Start I/O No. of master module

Station No. of AJ65BT-R2N

Send area address

Write data storage device

No. of write points

Dedicated instruction completion

Turns ON Send request signal

Resets Send request signal

Turns ON Send completion pulse signal

Resets Send-in-process flag

Figure 7.10 Program example

☒Point

When sending data of 4097 words or more to the external device using the RITO instruction, divide the send data into parts, each of which contains 4096 words or less, to write them to the AJ65BT-R2N.

With the RITO instruction, data of 4097 words or more cannot be written to the AJ65BT-R2N at one time.

7.5 Receiving from External Device

7.5.1 For the send/receive buffer communication function

(1) Overview of program example

If the AJ65BT-R2N receives data from the external device, the received data are read out to the master station word device (D39).

(2) Processing in the program example

1) No. of receive data is read from Receive data size specification area (R2N 400H) to the master station word device (D34).
2) The receive data are read from Receive data area (R2N 401H) to the master station word device (from D39).
3) Receive data read completion signal (Y122) is turned ON → OFF to terminate the reception.

(3) Devices used in the program example

Table 7.17 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X122	Normal receive data read request signal	—	—
X123	Error receive data read request signal	—	—
Y122	Receive data read completion signal	Section 7.5.1	—
M2	Operation complete flag	—	Section 7.3.1
M120	Buffer memory access exclusion check flag	Section 7.5.1	Section 7.4.1, Section 7.6.1
M130	Receiving flag	Section 7.5.1	—
M155	Device that is turned ON for one scan after completion of RIRD	Section 7.5.1	—
M156	Device that is turned ON for one scan after failure of reading by RIRD	Section 7.5.1	—
M160	Device that is turned ON for one scan after completion of RIRD	Section 7.5.1	—
M161	Device that is turned ON for one scan after failure of reading by RIRD	Section 7.5.1	—
M901	Other station data link status (Station No.2)	—	—
D30 to D34	Control data of RIRD instruction, and No. of receive data (in word units)	—	—
From D35	Control data of RIRD instruction, and receive data	—	—

(4) Program example

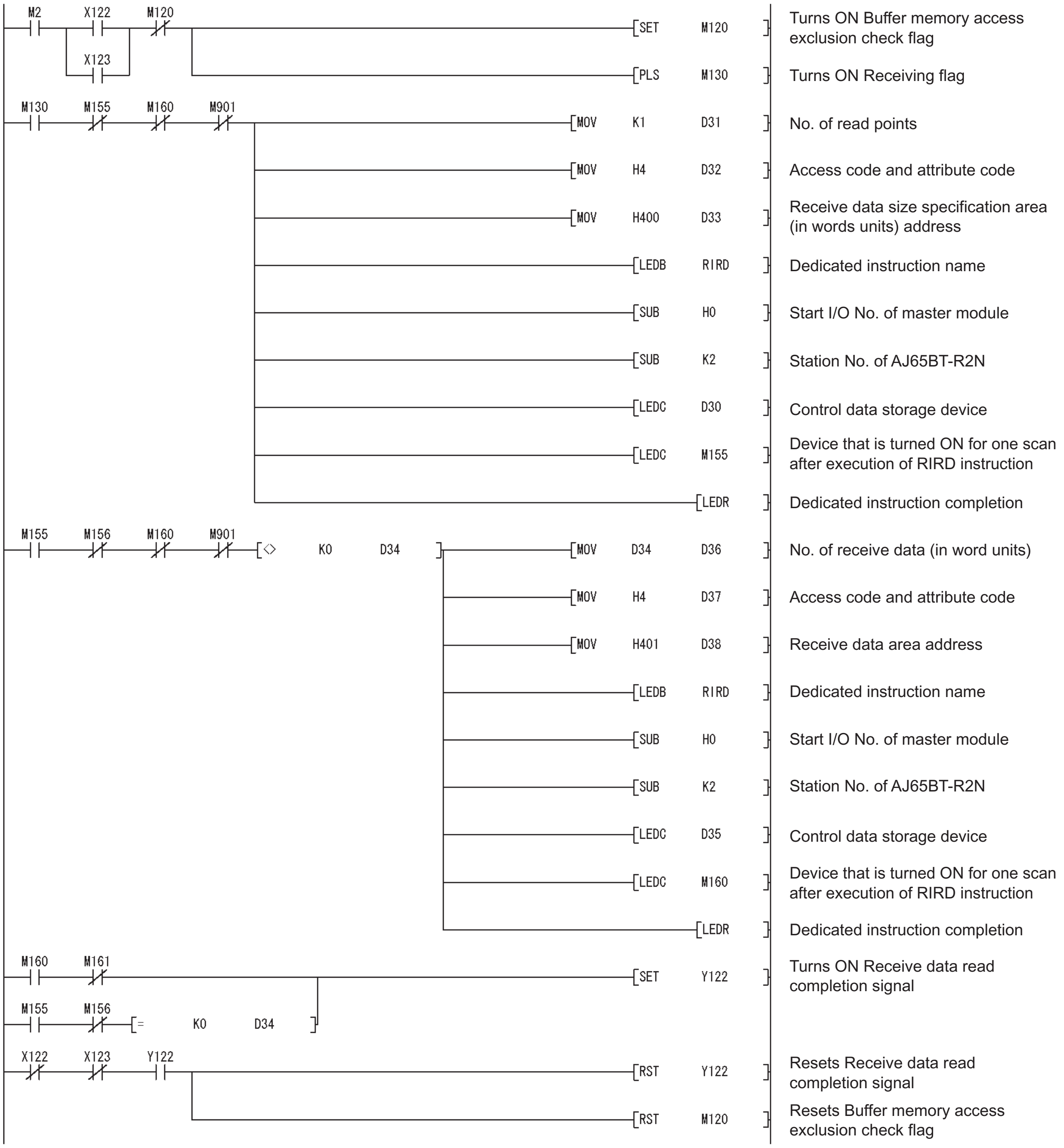


Figure 7.11 Program example

☒**Point**

When receiving data of 481 words or more from the external device using the RIRD instruction, divide the receive data into parts, each of which contains 480 words or less, to read them from the AJ65BT-R2N.
With the RIRD instructions, data of 481 words or more cannot be read from the AJ65BT-R2N at one time.

7.5.2 For the buffer memory auto-refresh function

(1) Overview of program example

When the AJ65BT-R2N receives data from the external device, the received data are read out to the master station word device (D200).

(2) Processing in the program example

1) No. of receive data is read from Receive data size specification area (R2N 400H) to the master station word device (D200).
2) The receive data are read from Receive data area(R2N 401H) to the master station word device (D201 or later).
3) Receive data read completion signal (Y122) is turned ON → OFF to terminate the reception.

(3) Devices used in the program example

Table 7.18 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X122	Normal receive data read request signal	—	—
X123	Error receive data read request signal	—	—
Y122	Receive data read completion signal	Section 7.5.2	—
M2	Operation complete flag	—	Section 7.3.2
M130	Receiving flag	Section 7.5.2	—
M901	Other station data link status (Station No.2)	—	—
D200	No. of receive data	—	—
From D201	Receive data	—	—

(4) Program example

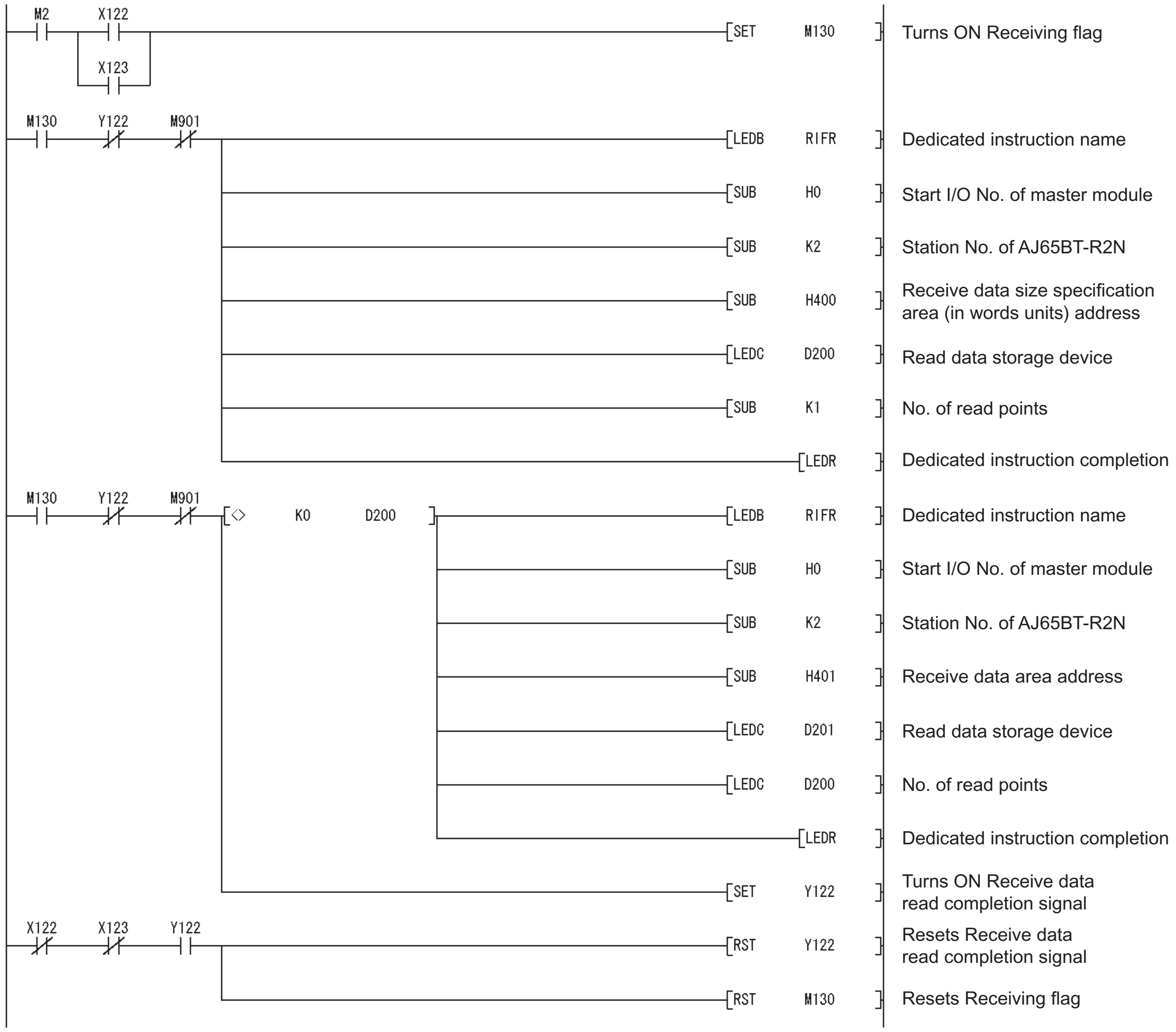


Figure 7.12 Program example

☒ **Point**

When receiving data of 4097 words or more from the external device using the RIFR instruction, divide the receive data into parts, each of which contains 4096 words or less, to read them from the AJ65BT-R2N.
With the RIFR instructions, data of 4097 words or more cannot be read from the AJ65BT-R2N at one time.

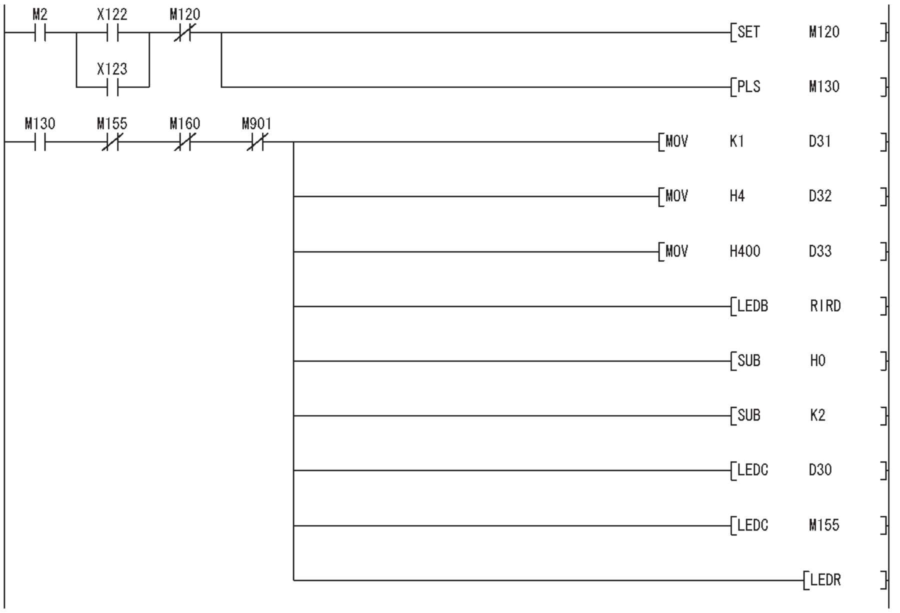
7.5.3 Precautions when receiving data from external device

(1) Precautions for specification in byte units

The setting in Word/byte specification (R2N 102H) influences the number of the data handled by the following buffer memory areas.

- No. of receive end data (R2N 111H)
- No. of actual send data (R2N 1B4H)
- No. of data stored in OS reception area (R2N 1B6H)
- Send data size specification area (R2N 200H (at default))
- Receive data size specification area (R2N 400H (at default))

In the case of byte specification, to use any of the above memory values as set data of a dedicated instruction, the byte data must be changed to word data as shown below.



Reads No. of receive data (in byte units)

Figure 7.13 Receive program example in the case of byte specification

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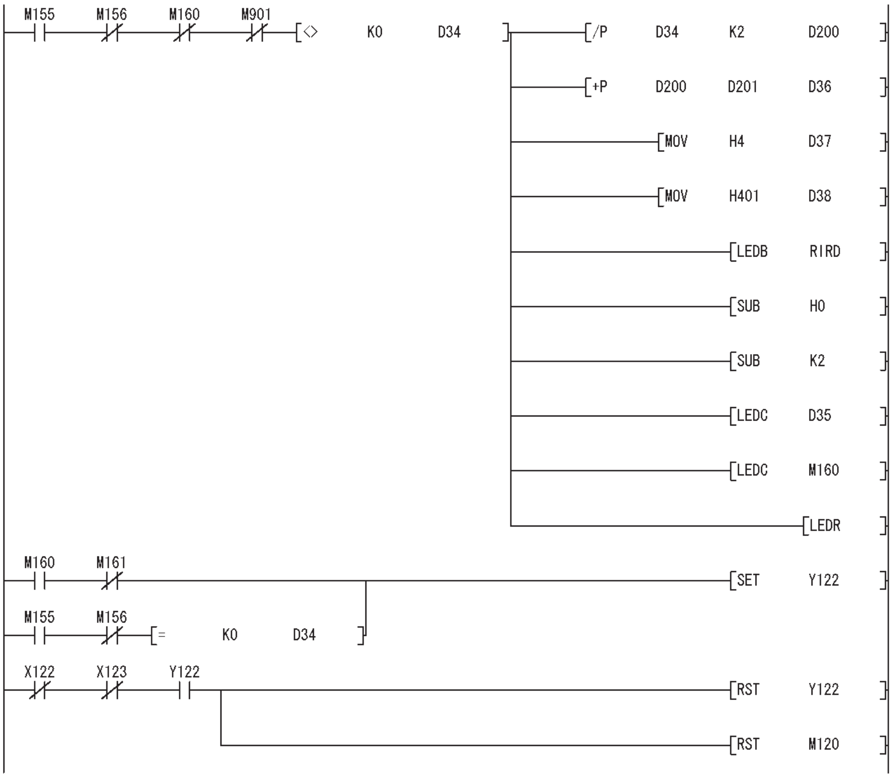


Changes No. of receive data (in byte units) to No. of words (fractions rounded up) and specifies as No. of read points in RIRD instruction

Figure 7.13 Receive program example in the case of byte specification (Continued)

7.6 Error Handling of AJ65BT-R2N

7.6.1 For the send/receive buffer communication function

(1) Overview of program example

1) When an error occurs during initialization setting or data transfer, an error code will be read out from the AJ65BT-R2N to the master module if Error code read flag (X23) is turned ON.

2) The error is canceled when Error clear flag (X24) is turned ON after the cause of the error has been eliminated.

(2) Processing in the program example

1) If any of the signals below are turned ON and Error code read flag (X23) is turned ON, an error code will be read out from the AJ65BT-R2N to the master module.
   - Send failed signal (X121)
   - Error receive data read request signal (X123)
   - Initialization failed signal (X125)
   - E^{2}PROM function failed signal (X128)

2) If Error clear flag (X24) is turned ON after the cause of the error has been eliminated, Error reset request signal (RY(n+1)A) will be turned ON and the error will be cleared.

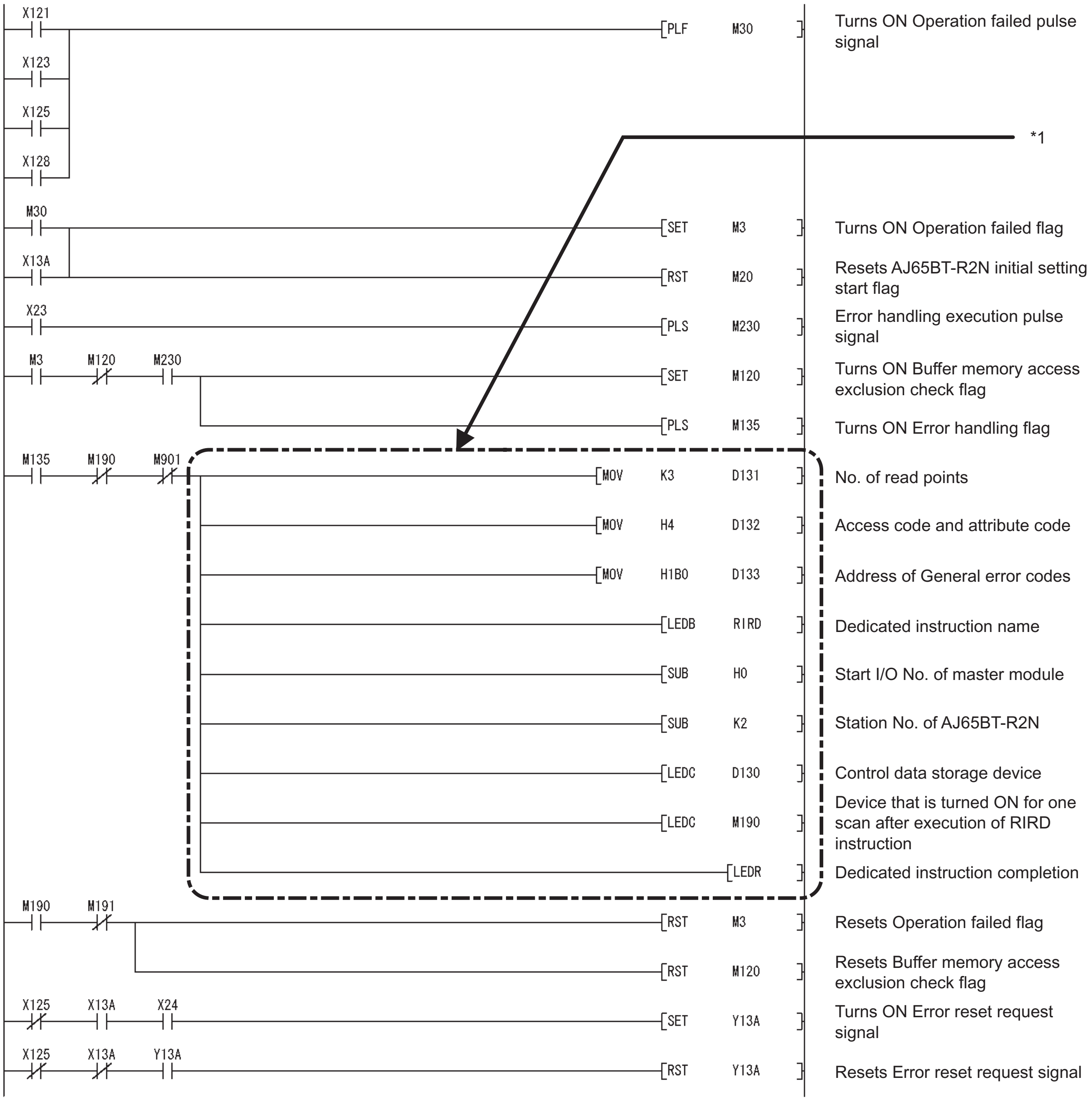
3) This turns off the ERR.LED, and error handling is complete when Error code storage area (R2N 1A8$_H$ to 1B2$_H$) is cleared.

(3) Devices used in the program example

Table 7.19 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X23	Error code read flag	—	—
X24	Error clear flag	—	—
X121	Send failed signal	—	Section 7.4.1
X123	Error receive data read request signal	—	—
X125	Initialization failed signal	—	Section 7.3.1
X128	E^{2}PPROM function failed signal	—	—
X13A	Error status signal	Section 7.6.1	—
Y13A	Error reset request signal	Section 7.6.1	—
M3	Operation failed flag	Section 7.6.1	—
M20	AJ65BT-R2N initial setting start flag	—	—
M30	Operation failed pulse signal	Section 7.6.1	—
M120	Buffer memory access exclusion check flag	Section 7.6.1	Section 7.4.1, Section 7.5.1
M135	Error handling flag	—	—
M190	Device that is turned ON for one scan after completion of RIRD	Section 7.6.1	—
M191	Device that is turned ON for one scan after failure of reading by RIRD	Section 7.6.1	—
M230	Error handling execution pulse signal	Section 7.6.1	—
M901	Other station data link status (Station No.2)	—	—
D130 to D133	Control data of RIRD instruction	—	—

(4) Program example



*1 Modify this according to the system being used and processing executed, etc.

Figure 7.14 Program example

7.6.2 For the buffer memory auto-refresh function

(1) Overview of program example

1) When an error occurs during initialization setting or data transfer, an error code will be read out from the AJ65BT-R2N to the master module if Error code read flag (X23) is turned ON.

2) The error is canceled when Error clear flag (X24) is turned ON after the cause of the error has been eliminated.

(2) Processing in the program example

1) If any of the signals below are turned ON and Error code read flag (X23) is turned ON, an error code will be read out from the AJ65BT-R2N to the master module.
   - Send failed signal (X121)
   - Error receive data read request signal (X123)
   - Initialization failed signal (X125)
   - E^{2}PROM function failed signal (X128)

2) If Error clear flag (X24) is turned ON after the cause of the error has been eliminated, Error reset request signal (RY(n+1)A) will be turned ON and the error will be cleared.

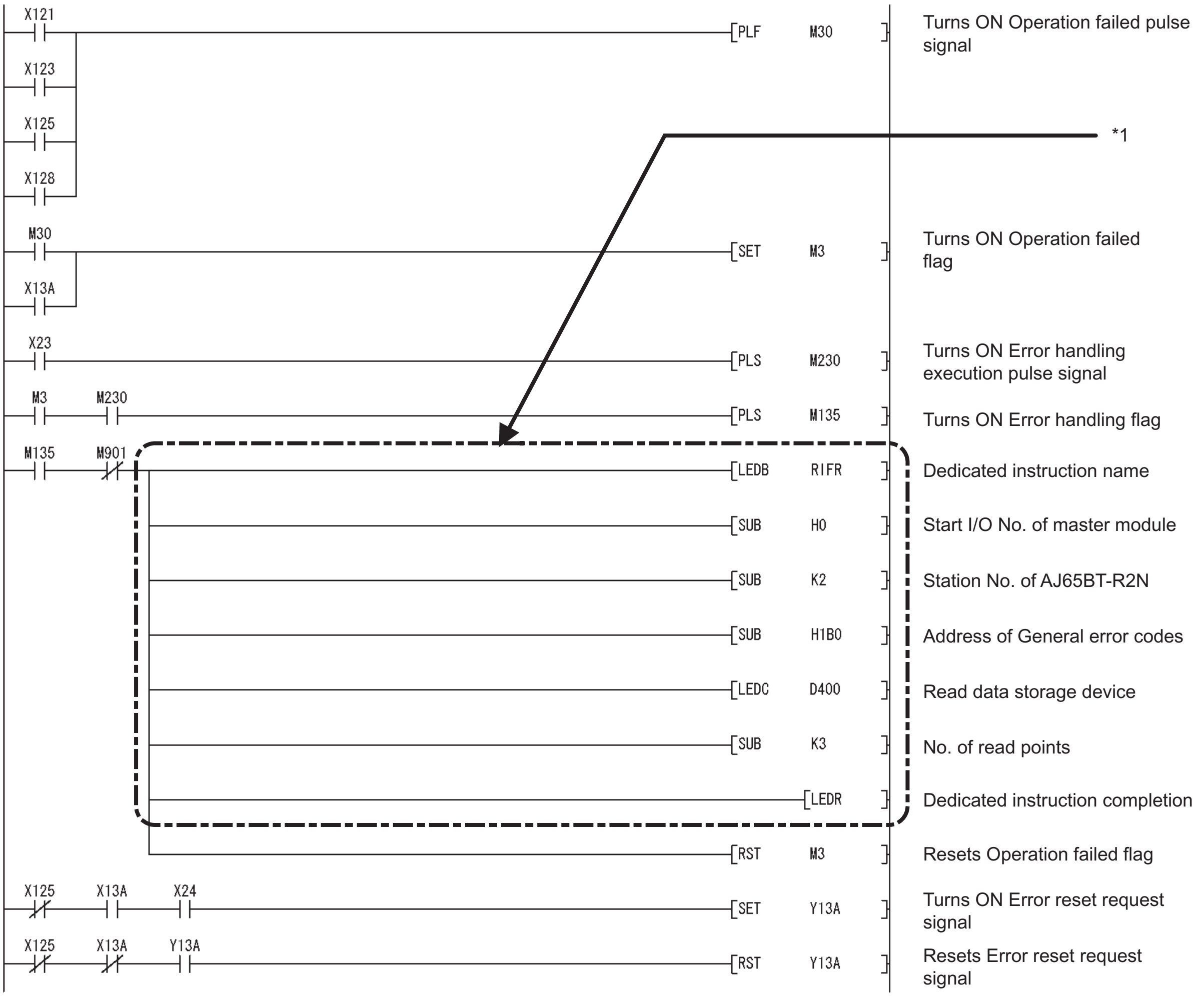
3) This turns off the ERR.LED, and error handling is complete when Error code storage area (R2N 1A8H to 1B2H) is cleared.

(3) Devices used in the program example

Table 7.20 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X23	Error code read flag	—	—
X24	Error clear flag	—	—
X121	Send failed signal	—	Section 7.4.2
X123	Error receive data read request signal	—	—
X125	Initialization failed signal	—	Section 7.3.2
X128	E^{2}PROM function failed signal	—	—
X13A	Error status signal	Section 7.6.2	—
Y13A	Error reset request signal	Section 7.6.2	—
M3	Operation failed flag	Section 7.6.2	—
M30	Operation failed pulse signal	Section 7.6.2	—
M135	Error handling flag	Section 7.6.2	—
M230	Error handling execution pulse signal	Section 7.6.2	—
M901	Other station data link status (Station No.2)	—	—
D400 to D402	AJ65BT-R2N error code	—	—

(4) Program example



Turns ON Operation failed pulse signal

Turns ON Operation failed flag

Turns ON Error handling execution pulse signal

Turns ON Error handling flag

Dedicated instruction name

Start I/O No. of master module

Station No. of AJ65BT-R2N

Address of General error codes

Read data storage device

No. of read points

Dedicated instruction completion

Resets Operation failed flag

Turns ON Error reset request signal

Resets Error reset request signal

*1 Modify this according to the system being used and processing executed, etc.

Figure 7.15 Program example

7.7 Initial Settings for Other Functions

This section explains programs for the initial setting of the functions listed below.

Table 7.21 List of other functions

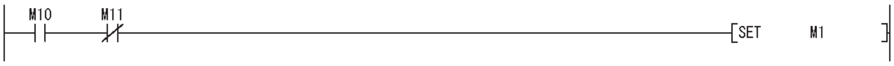
Function	Reference section
Initial setting for the frame function	Section 7.7.1
Initial setting for the monitoring-based transmission function	Section 7.7.2
Initial setting for the flow control function	Section 7.7.3
Initial setting for the ASCII-binary conversion function	Section 7.7.4
Initial setting for the RW refresh function	Section 7.7.5

Only the initial setting program is extracted for each function.
When using each function, apply the extracted program to the program given in the following section.

☞ Section 7.3 Initial Setting for AJ65BT-R2N

Remark

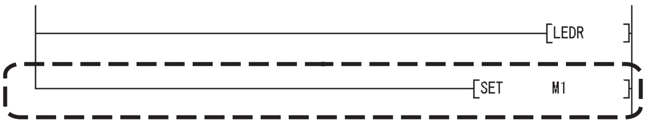
(1) When using more than one of the above functions during use of the send/ receive buffer communication function, modify the program as follows:
- Avoid any duplicate settings with the devices (M10 to M17) that turn ON after completion of the RIWT instruction.
- For the RIWT instruction used at the end of initial setting, specify M10 as the device that turns ON after completion of the instruction.
- Have the following program, which is included in each program, executed one time at the end of all initial setting procedures.



Turns ON Initial setting write completion flag

Figure 7.16 Program executed only at the end of initial setting

(2) When using more than one of the above functions during use of the buffer memory auto-refresh function, modify the program as follows:
- Have the program part enclosed as shown below, which is included in each program, executed one time at the end of all initial setting procedures.



Dedicated instruction completion

Turns ON Initial setting write completion flag

Figure 7.17 Program executed only at the end of initial setting

7.7.1 Initial setting for the frame function

(1) For the send/receive buffer communication function

(a) Overview of program example
Reception is completed when ETX(03H) or NUL(00H) is received.

(b) Devices used in the program example

Table 7.22 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 7.3.1
M1	Initial setting write completion flag	Section 7.7.1	Section 7.3.1
M10	Device that is turned ON for one scan after completion of RIWT	Section 7.7.1	Section 7.3.1
M11	Device that is turned ON for one scan after failure of writing by RIWT	Section 7.7.1	Section 7.3.1
M502	AJ65BT-R2N mode normal flag	—	Section 7.2.1 (3)
M901	Other station data link status (Station No.2)	—	—
D0 to D3	Control data of RIWT instruction	—	—
D4 to D7	Receive end frame No.1 to 4	—	—

(c) Program example

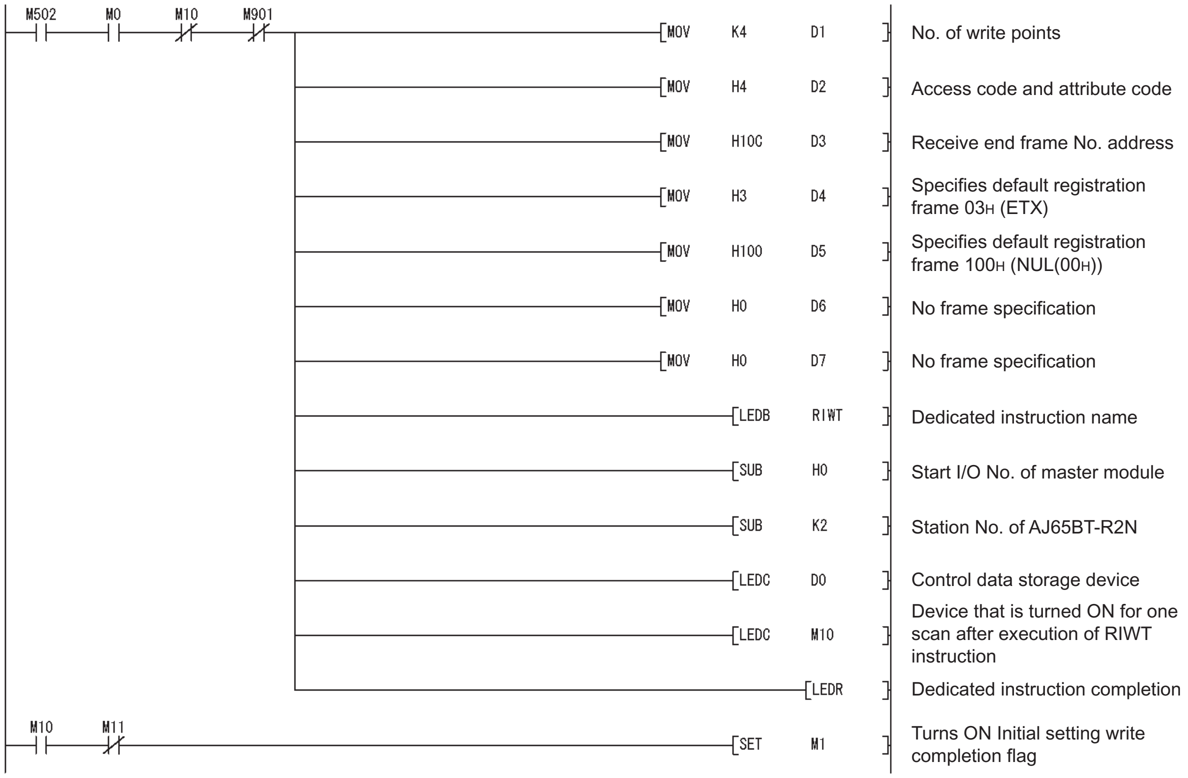


Figure 7.18 Program example

(2) For the buffer memory auto-refresh function

(a) Overview of program example
Reception is completed when ETX(03H) or NUL(00H) is received.

(b) Devices used in the program example

Table 7.23 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 7.3.2
M1	Initial setting write completion flag	Section 7.7.1	Section 7.3.2
M502	AJ65BT-R2N mode normal flag	—	Section 7.2.2 (3) 3
M901	Other station data link status (Station No.2)	—	—
D10 to D13	Receive end frame No.1 to 4	—	—

(c) Program example

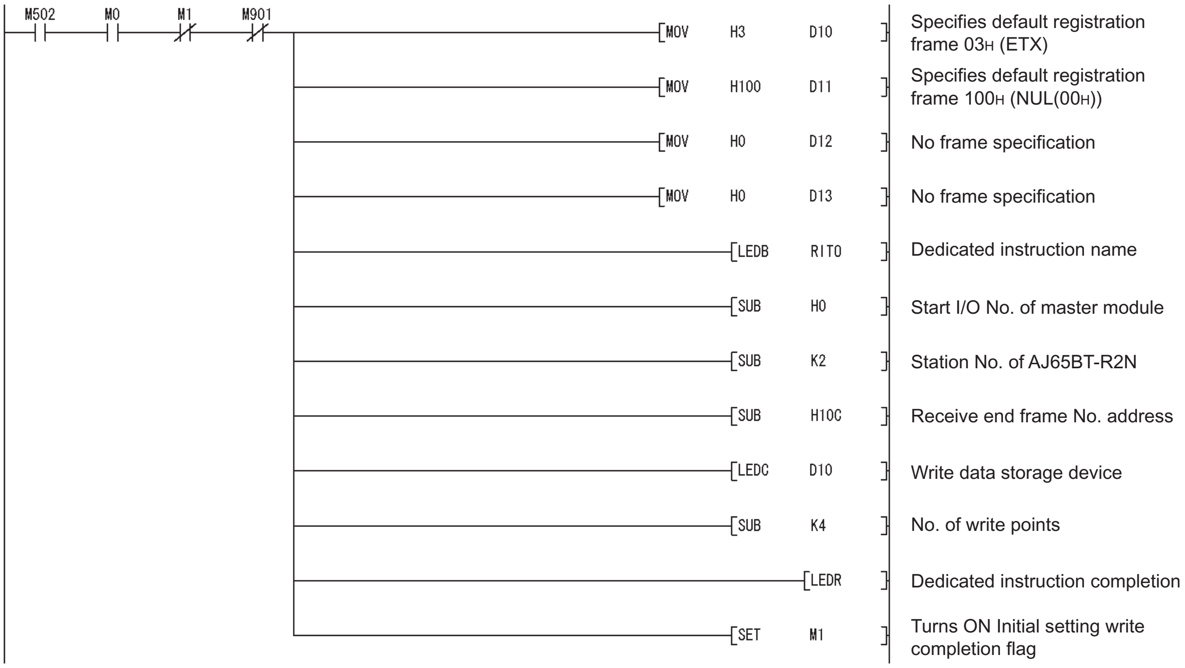


Figure 7.19 Program example

7.7.2 Initial setting for the monitoring-based transmission function

(1) For the send/receive buffer communication function

(a) Overview of program example

- The monitoring interval is set to 200ms and the send timeout time is set to 500ms.
- Data are sent when RX5 of the module of station No.1 turns ON.
- STX (02H) + User registration frame (3E8H) + ETX(03H) is set as the send data.

(b) Devices used in the program example

Table 7.24 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 7.3.1
M1	Initial setting write completion flag	Section 7.7.2	Section 7.3.1
M10	Device that is turned ON for one scan after completion of RIWT	Section 7.7.2	Section 7.3.1
M11	Device that is turned ON for one scan after failure of writing by RIWT	Section 7.7.2	Section 7.3.1
M12	Device that is turned ON for one scan after completion of RIWT	Section 7.7.2	—
M13	Device that is turned ON for one scan after failure of writing by RIWT	Section 7.7.2	—
M14	Device that is turned ON for one scan after completion of RIWT	Section 7.7.2	—
M15	Device that is turned ON for one scan after failure of writing by RIWT	Section 7.7.2	—
M16	Device that is turned ON for one scan after completion of RIWT	Section 7.7.2	—
M17	Device that is turned ON for one scan after failure of writing by RIWT	Section 7.7.2	—
M502	AJ65BT-R2N mode normal flag	—	Section 7.2.1 (3) 3
M901	Other station data link status (Station No.2)	—	—
D0 to D4	Control data of RIWT instruction	—	—
D5 to D8	Monitoring-based transmission function set values	—	—

(c) Program example

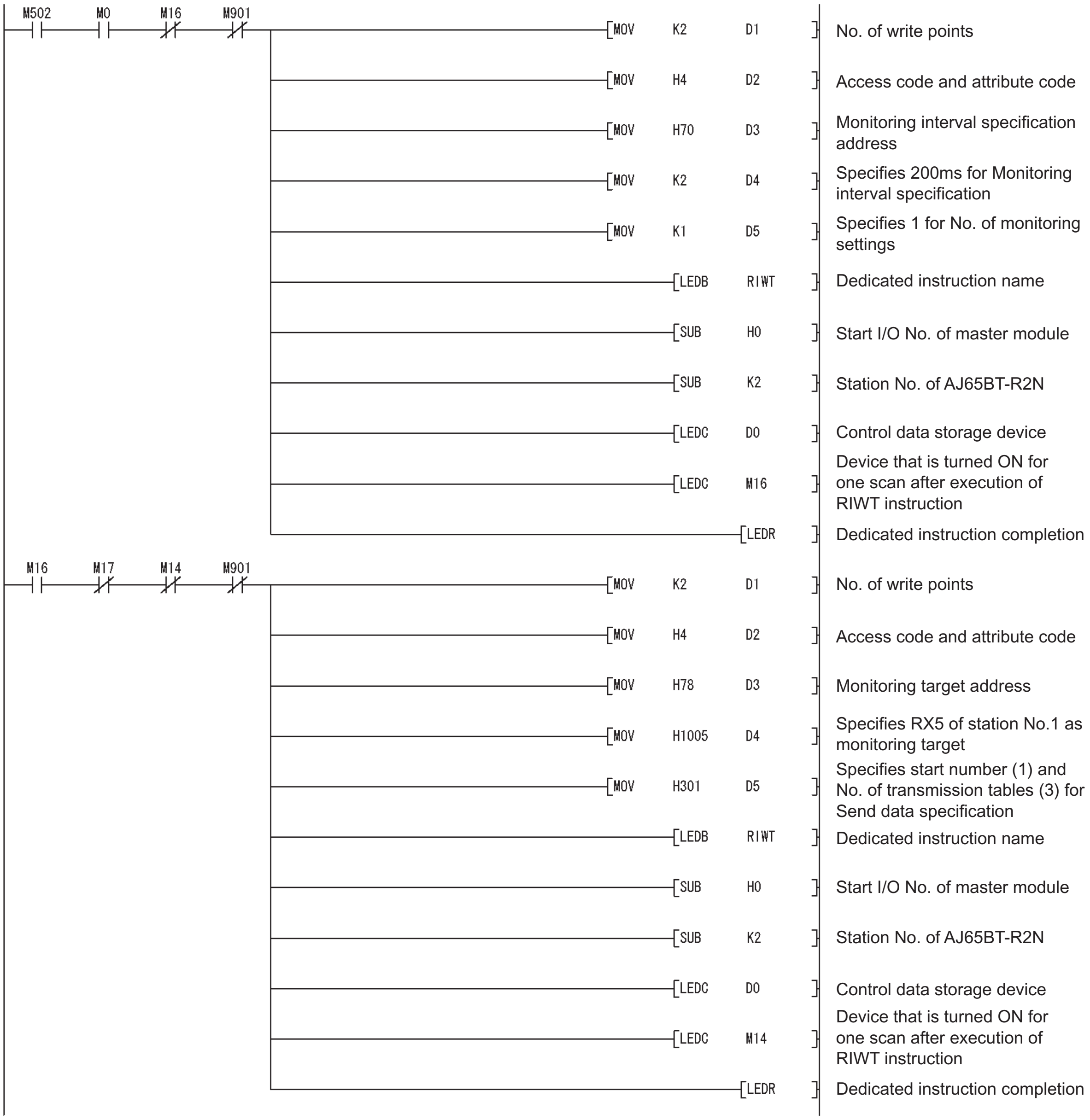


Figure 7.20 Program example

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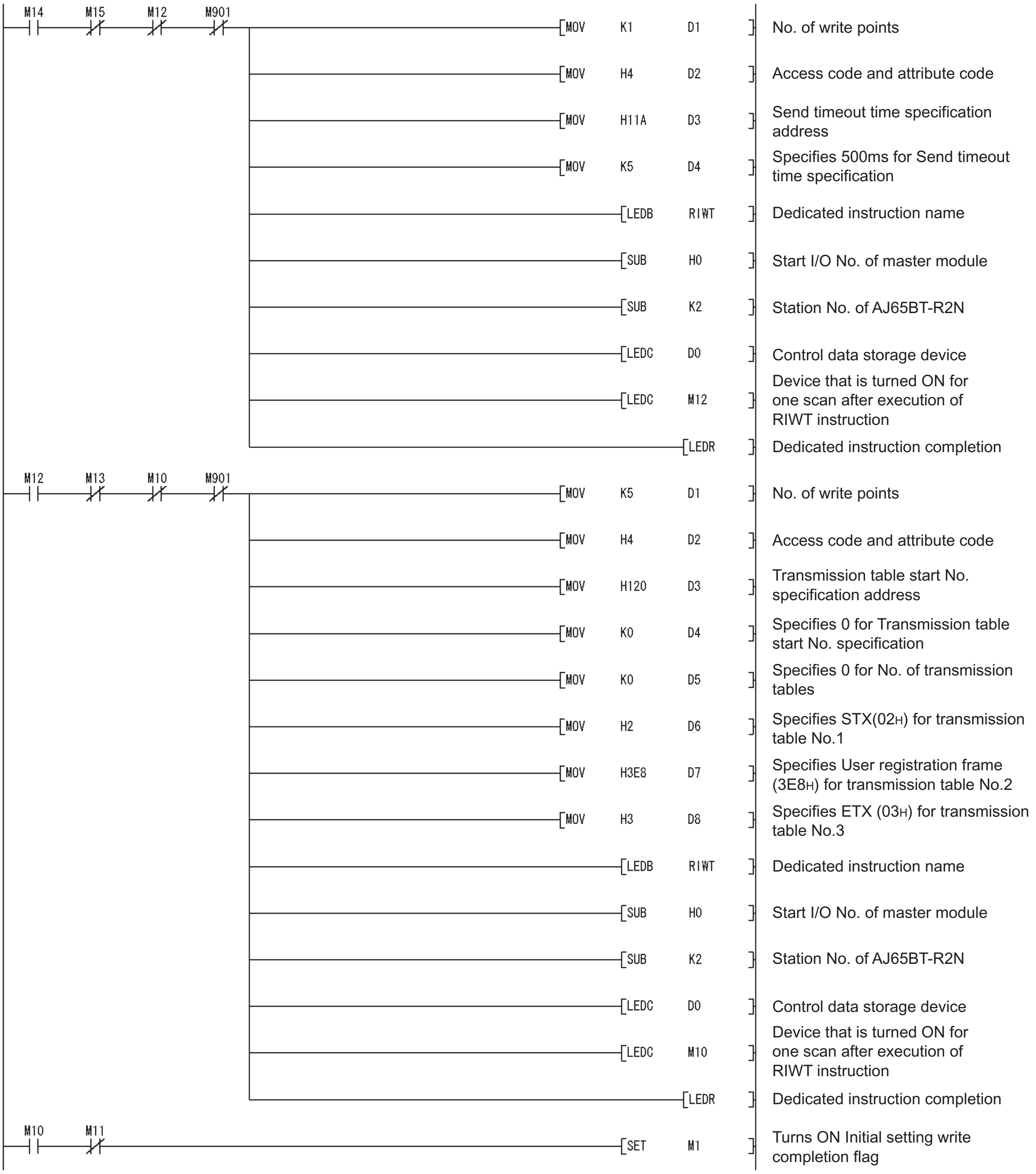


```
MOV   K1    D1      No. of write points
MOV   H4    D2      Access code and attribute code
MOV   H11A  D3      Send timeout time specification address
MOV   K5    D4      Specifies 500ms for Send timeout time specification
LEDB  RIWT          Dedicated instruction name
SUB   H0            Start I/O No. of master module
SUB   K2            Station No. of AJ65BT-R2N
LEDC  D0            Control data storage device
LEDC  M12           Device that is turned ON for one scan after execution of RIWT instruction
LEDR                Dedicated instruction completion
MOV   K5    D1      No. of write points
MOV   H4    D2      Access code and attribute code
MOV   H120  D3      Transmission table start No. specification address
MOV   K0    D4      Specifies 0 for Transmission table start No. specification
MOV   K0    D5      Specifies 0 for No. of transmission tables
MOV   H2    D6      Specifies STX(02H) for transmission table No.1
MOV   H3E8  D7      Specifies User registration frame (3E8H) for transmission table No.2
MOV   H3    D8      Specifies ETX (03H) for transmission table No.3
LEDB  RIWT          Dedicated instruction name
SUB   H0            Start I/O No. of master module
SUB   K2            Station No. of AJ65BT-R2N
LEDC  D0            Control data storage device
LEDC  M10           Device that is turned ON for one scan after execution of RIWT instruction
LEDR                Dedicated instruction completion
SET   M1            Turns ON Initial setting write completion flag
```

Figure 7.20 Program example (Continued)

(2) For the buffer memory auto-refresh function

(a) Overview of program example

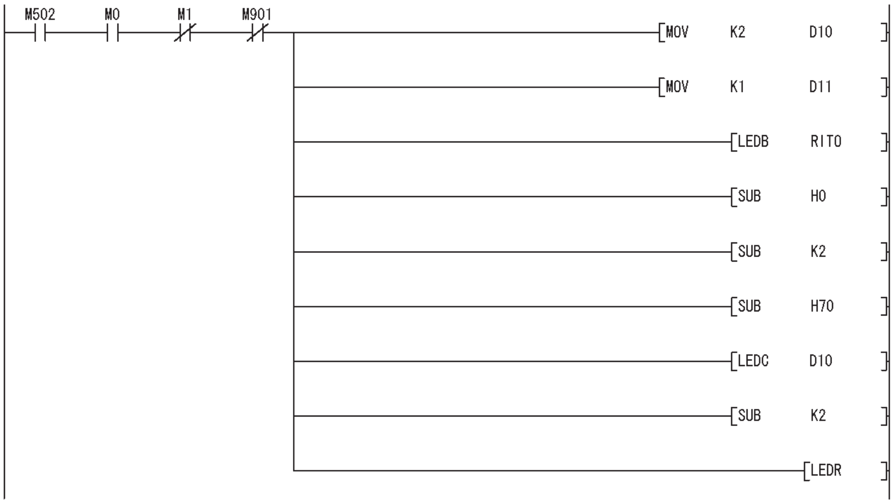
- The monitoring interval is set to 200ms and the send timeout time is set to 500ms.
- Data are sent when RX5 of the module of station No.1 turns ON.
- STX (02H) + User registration frame (3E8H) + ETX(03H) is set as the send data.

(b) Devices used in the program example

Table 7.25 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 7.3.2
M1	Initial setting write completion flag	Section 7.7.2	Section 7.3.2
M502	AJ65BT-R2N mode normal flag	—	Section 7.2.2 (3) 3
M901	Other station data link status (Station No.2)	—	—
D10 to D14	Monitoring-based transmission function set values	—	—

(c) Program example



Specifies 200ms for Monitoring interval specification

Specifies 1 for No. of monitoring settings

Dedicated instruction name

Start I/O No. of master module

Station No. of AJ65BT-R2N

Monitoring interval specification address

Write data storage device

No. of write points

Dedicated instruction completion

Figure 7.21 Program example

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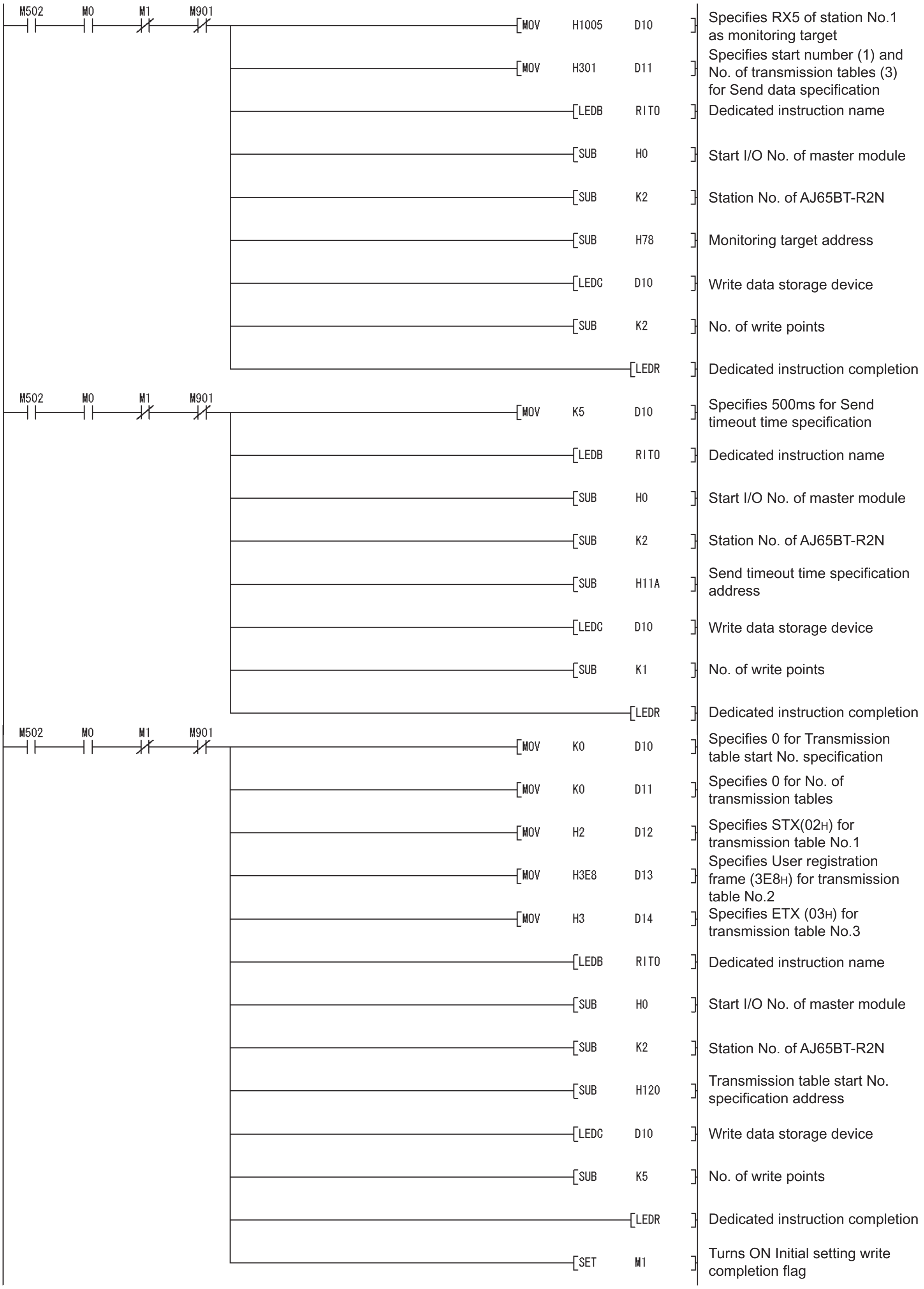


```
M502  M0  M1  M901
─┤├───┤├──┤/├──┤/├─┬─[MOV   H1005  D10 ]  Specifies RX5 of station No.1 as monitoring target
                   ├─[MOV   H301   D11 ]  Specifies start number (1) and No. of transmission tables (3) for Send data specification
                   ├─[LEDB  RIT0       ]  Dedicated instruction name
                   ├─[SUB   H0         ]  Start I/O No. of master module
                   ├─[SUB   K2         ]  Station No. of AJ65BT-R2N
                   ├─[SUB   H78        ]  Monitoring target address
                   ├─[LEDC  D10        ]  Write data storage device
                   ├─[SUB   K2         ]  No. of write points
                   └─[LEDR             ]  Dedicated instruction completion
M502  M0  M1  M901
─┤├───┤├──┤/├──┤/├─┬─[MOV   K5     D10 ]  Specifies 500ms for Send timeout time specification
                   ├─[LEDB  RIT0       ]  Dedicated instruction name
                   ├─[SUB   H0         ]  Start I/O No. of master module
                   ├─[SUB   K2         ]  Station No. of AJ65BT-R2N
                   ├─[SUB   H11A       ]  Send timeout time specification address
                   ├─[LEDC  D10        ]  Write data storage device
                   ├─[SUB   K1         ]  No. of write points
                   └─[LEDR             ]  Dedicated instruction completion
M502  M0  M1  M901
─┤├───┤├──┤/├──┤/├─┬─[MOV   K0     D10 ]  Specifies 0 for Transmission table start No. specification
                   ├─[MOV   K0     D11 ]  Specifies 0 for No. of transmission tables
                   ├─[MOV   H2     D12 ]  Specifies STX(02H) for transmission table No.1
                   ├─[MOV   H3E8   D13 ]  Specifies User registration frame (3E8H) for transmission table No.2
                   ├─[MOV   H3     D14 ]  Specifies ETX (03H) for transmission table No.3
                   ├─[LEDB  RIT0       ]  Dedicated instruction name
                   ├─[SUB   H0         ]  Start I/O No. of master module
                   ├─[SUB   K2         ]  Station No. of AJ65BT-R2N
                   ├─[SUB   H120       ]  Transmission table start No. specification address
                   ├─[LEDC  D10        ]  Write data storage device
                   ├─[SUB   K5         ]  No. of write points
                   ├─[LEDR             ]  Dedicated instruction completion
                   └─[SET   M1         ]  Turns ON Initial setting write completion flag
```

Figure 7.21 Program example (Continued)

7.7.3 Initial setting for the flow control function

(1) For the send/receive buffer communication function

(a) Overview of program example
The flow control is performed by the DC code control.

(b) Devices used in the program example

Table 7.26 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 7.3.1
M1	Initial setting write completion flag	Section 7.7.3	Section 7.3.1
M10	Device that is turned ON for one scan after completion of RIWT	Section 7.7.3	Section 7.3.1
M11	Device that is turned ON for one scan after failure of writing by RIWT	Section 7.7.3	Section 7.3.1
M502	AJ65BT-R2N mode normal flag	—	Section 7.2.1 (3) 3
M901	Other station data link status (Station No.2)	—	—
D0 to D3	Control data of RIWT instruction	—	—
D4	Flow control function set value	—	—

(c) Program example

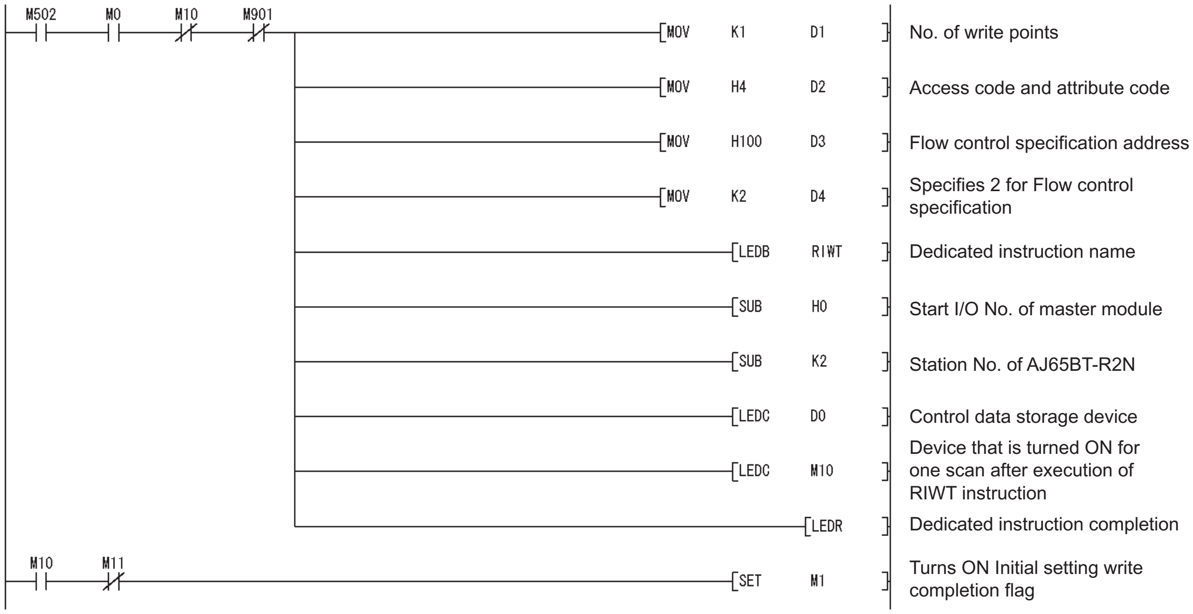


Figure 7.22 Program example

(2) For the buffer memory auto-refresh function

(a) Overview of program example
The flow control is performed by the DC code control.

(b) Devices used in the program example

Table 7.27 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 7.3.2
M1	Initial setting write completion flag	Section 7.7.3	Section 7.3.2
M502	AJ65BT-R2N mode normal flag	—	Section 7.2.2 (3) 3
M901	Other station data link status (Station No.2)	—	—
D10	Flow control function set value	—	—

(c) Program example

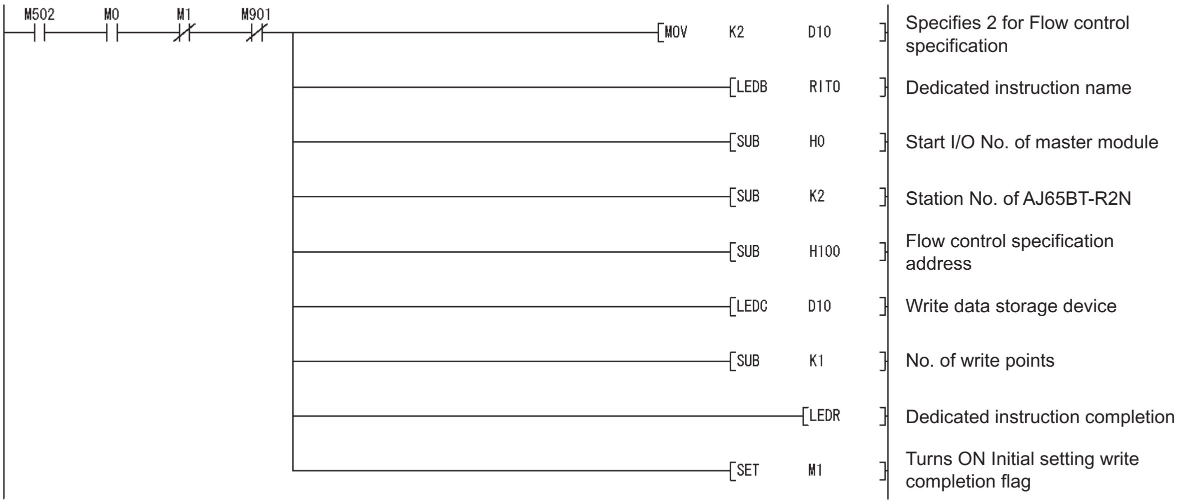


Figure 7.23 Program example

7.7.4 Initial setting for the ASCII-binary conversion function

(1) For the send/receive buffer communication function

(a) Overview of program example
The ASCII-binary conversion function is used.

(b) Devices used in the program example

Table 7.28 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 7.3.1
M1	Initial setting write completion flag	Section 7.7.4	Section 7.3.1
M10	Device that is turned ON for one scan after completion of RIWT	Section 7.7.4	Section 7.3.1
M11	Device that is turned ON for one scan after failure of writing by RIWT	Section 7.7.4	Section 7.3.1
M502	AJ65BT-R2N mode normal flag	—	Section 7.2.1 (3) 3
M901	Other station data link status (Station No.2)	—	—
D0 to D3	Control data of RIWT instruction	—	—
D4	ASCII-binary conversion function set value	—	—

(c) Program example

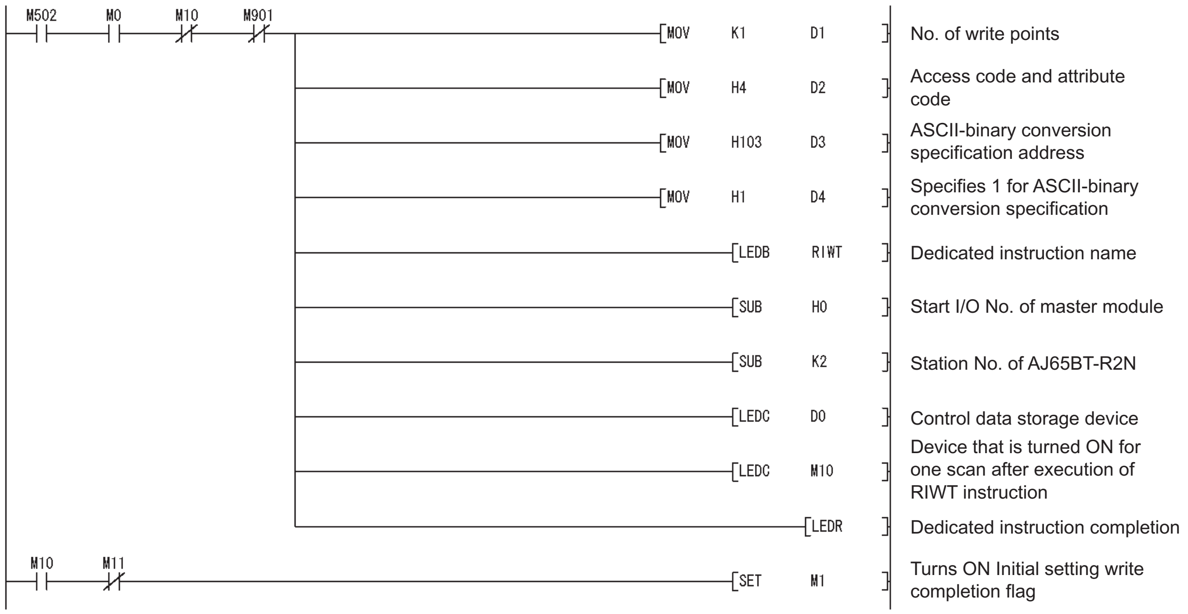


Figure 7.24 Program example

(2) For the buffer memory auto-refresh function

(a) Overview of program example
The ASCII-binary conversion function is used.

(b) Devices used in the program example

Table 7.29 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 7.3.2
M1	Initial setting write completion flag	Section 7.7.4	Section 7.3.2
M502	AJ65BT-R2N mode normal flag	—	Section 7.2.2 (3) 3
M901	Other station data link status (Station No.2)	—	—
D10	ASCII-binary conversion function set value	—	—

(c) Program example

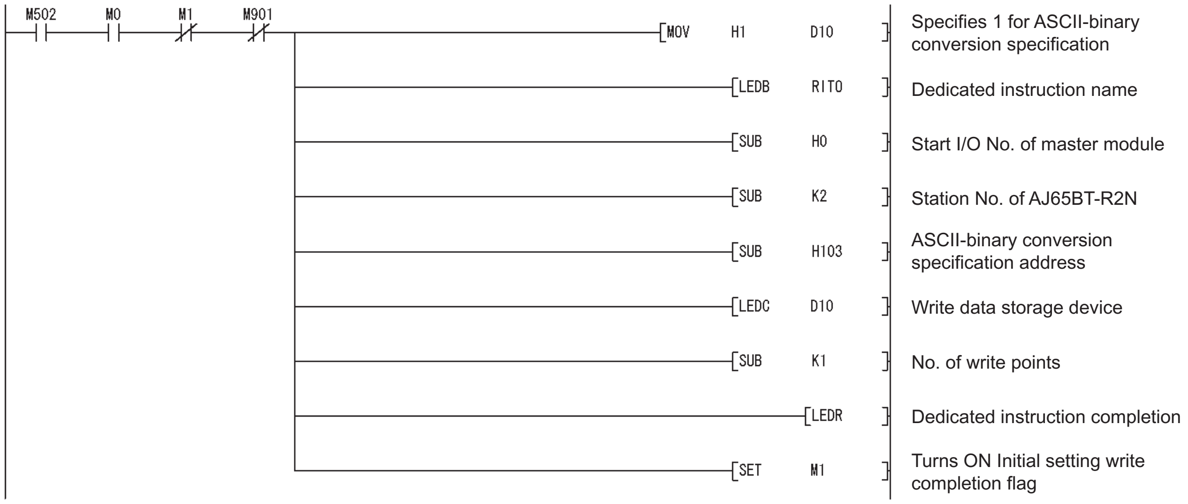


Figure 7.25 Program example

7.7.5 Initial setting for the RW refresh function

(1) For the send/receive buffer communication function

(a) Overview of program example

- The remote register (RW) assignments are changed to those listed below so that the assigned buffer memories can be monitored.

Table 7.30 Devices used in the program example

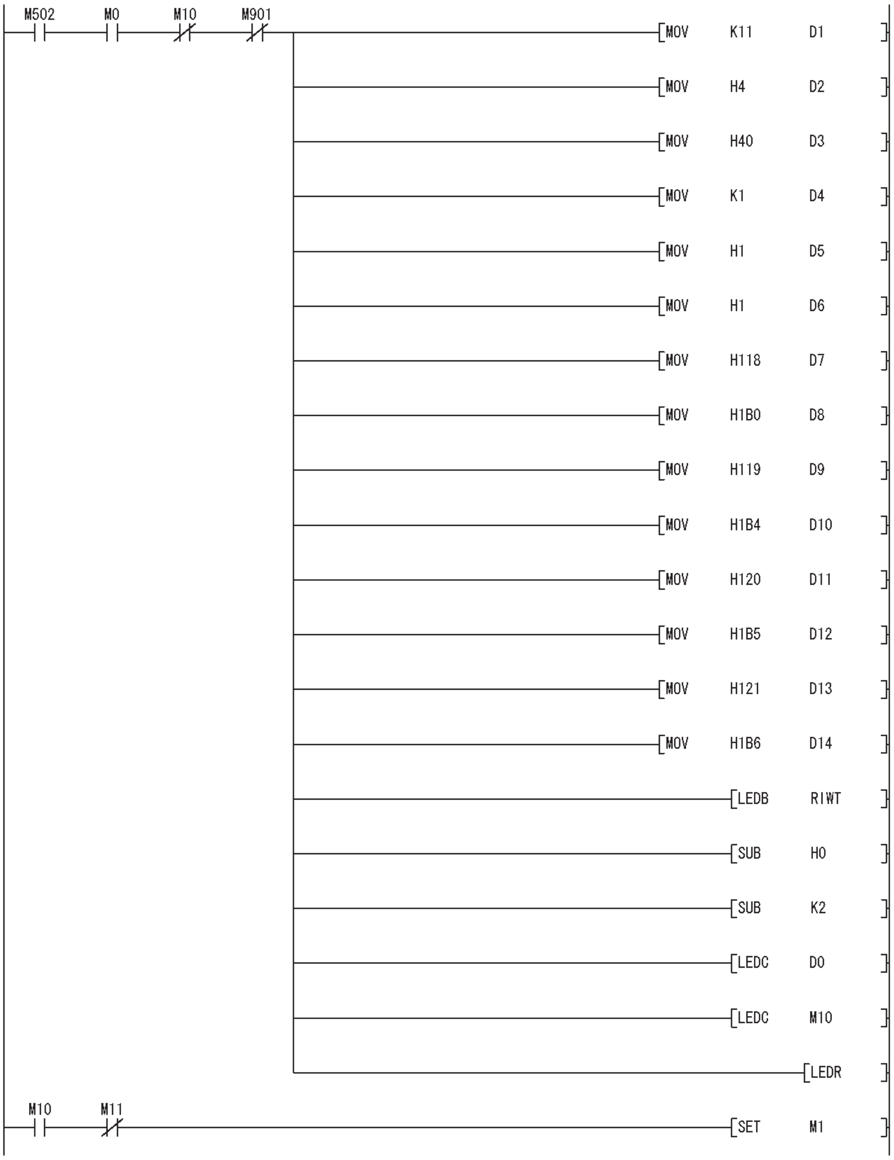
Device	Buffer memory	Device	Buffer memory
RWrm	General error codes (R2N 1B0$_H$)	RWwm	Send start frame No. (R2N 118$_H$)
RWr(m+1)	No. of actual send data (R2N 1B4$_H$)	RWw(m+1)	Send end frame No. (R2N 119$_H$)
RWr(m+2)	Receive frame index No. storage (R2N 1B5$_H$)	RWw(m+2)	Transmission table start No. specification (R2N 120$_H$)
RWr(m+3)	No. of data stored in OS reception area (R2N 1B6$_H$)	RWw(m+3)	No. of transmission tables (R2N 121$_H$)

(b) Devices used in the program example

Table 7.31 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 7.3.1
M1	Initial setting write completion flag	Section 7.7.5	Section 7.3.1
M10	Device that is turned ON for one scan after completion of RIWT	Section 7.7.5	Section 7.3.1
M11	Device that is turned ON for one scan after failure of writing by RIWT	Section 7.7.5	Section 7.3.1
M502	AJ65BT-R2N mode normal flag	—	Section 7.2.1 (3) 3
M901	Other station data link status (Station No.2)	—	—
D0 to D3	Control data of RIWT instruction	—	—
D4 to D14	RW refresh function set values	—	—

(c) Program example



MOV	K11	D1	No. of write points
MOV	H4	D2	Access code and attribute code
MOV	H40	D3	RW refresh interval specification address
MOV	K1	D4	Specifies 100ms for RW refresh interval specification
MOV	H1	D5	Specifies Enable for RWw refresh enable/disable setting
MOV	H1	D6	Specifies Enable for RWr refresh enable/disable setting
MOV	H118	D7	Specifies Send start frame No. (R2N 118H) for RWwm
MOV	H1B0	D8	Specifies General error codes (R2N 1B0H) for RWrm
MOV	H119	D9	Specifies Send end frame No. (R2N 119H) for RWw(m+1)
MOV	H1B4	D10	Assigns No. of actual send data (R2N 1B4H) to RWr(m+1)
MOV	H120	D11	Specifies Transmission table start No. specification (R2N 120H) for RWw(m+2)
MOV	H1B5	D12	Assigns Receive frame index No. storage (R2N 1B5H) to RWr(m+2)
MOV	H121	D13	Specifies No. of transmission tables (R2N 121H) for RWw(m+3)
MOV	H1B6	D14	Specifies No. of data stored in OS reception area (R2N 1B6H) for RWr(m+3)
LEDB	RIWT		Dedicated instruction name
SUB	H0		Start I/O No. of master module
SUB	K2		Station No. of AJ65BT-R2N
LEDC	D0		Control data storage device
LEDC	M10		Device that is turned ON for one scan after execution of RIWT instruction
LEDR			Dedicated instruction completion
SET	M1		Turns ON Initial setting write completion flag

Figure 7.26 Program example

(2) For the buffer memory auto-refresh function

(a) Overview of program example

- The remote register (RW) assignments are changed to those listed below so that the assigned buffer memories can be monitored.

Table 7.32 Devices used in the program example

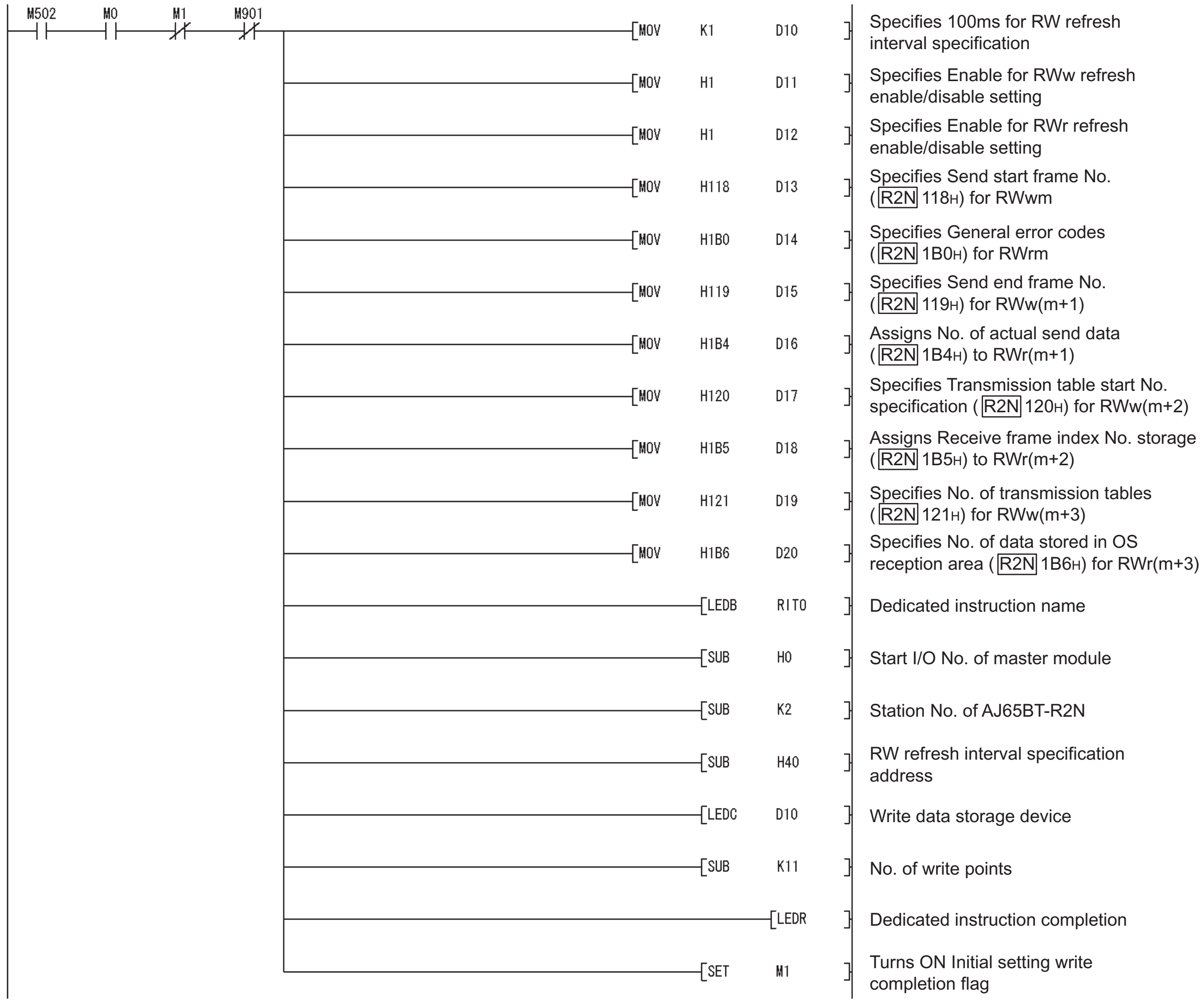
Device	Buffer memory	Device	Buffer memory
RWrm	General error codes (R2N 1B0$_{H}$)	RWwm	Send start frame No. (R2N 118$_{H}$)
RWr(m+1)	No. of actual send data (R2N 1B4$_{H}$)	RWw(m+1)	Send end frame No. (R2N 119$_{H}$)
RWr(m+2)	Receive frame index No. storage (R2N 1B5$_{H}$)	RWw(m+2)	Transmission table start No. specification (R2N 120$_{H}$)
RWr(m+3)	No. of data stored in OS reception area (R2N 1B6$_{H}$)	RWw(m+3)	No. of transmission tables (R2N 121$_{H}$)

(b) Devices used in the program example

Table 7.33 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 7.3.2
M1	Initial setting write completion flag	Section 7.7.5	Section 7.3.2
M502	AJ65BT-R2N mode normal flag	—	Section 7.2.2 (3) 3
M901	Other station data link status (Station No.2)	—	—
D10 to D20	RW refresh function set values	—	—

(c) Program example



MOV	K1	D10	Specifies 100ms for RW refresh interval specification
MOV	H1	D11	Specifies Enable for RWw refresh enable/disable setting
MOV	H1	D12	Specifies Enable for RWr refresh enable/disable setting
MOV	H118	D13	Specifies Send start frame No. (R2N 118$_{\text{H}}$) for RWwm
MOV	H1B0	D14	Specifies General error codes (R2N 1B0$_{\text{H}}$) for RWrm
MOV	H119	D15	Specifies Send end frame No. (R2N 119$_{\text{H}}$) for RWw(m+1)
MOV	H1B4	D16	Assigns No. of actual send data (R2N 1B4$_{\text{H}}$) to RWr(m+1)
MOV	H120	D17	Specifies Transmission table start No. specification (R2N 120$_{\text{H}}$) for RWw(m+2)
MOV	H1B5	D18	Assigns Receive frame index No. storage (R2N 1B5$_{\text{H}}$) to RWr(m+2)
MOV	H121	D19	Specifies No. of transmission tables (R2N 121$_{\text{H}}$) for RWw(m+3)
MOV	H1B6	D20	Specifies No. of data stored in OS reception area (R2N 1B6$_{\text{H}}$) for RWr(m+3)
LEDB	RIT0		Dedicated instruction name
SUB	H0		Start I/O No. of master module
SUB	K2		Station No. of AJ65BT-R2N
SUB	H40		RW refresh interval specification address
LEDC	D10		Write data storage device
SUB	K11		No. of write points
LEDR			Dedicated instruction completion
SET	M1		Turns ON Initial setting write completion flag

Figure 7.27 Program example

7.8 Other Functions

This section explains programs for executing the functions below.
Execute each program in this section after AJ65BT-R2N initialization.

Table 7.34 List of other functions

Function	Reference section
Send cancel function	Section 7.8.1
Forced receive completion function	Section 7.8.2
OS reception area clear function	Section 7.8.3
E^{2}PROM function setting	Section 7.8.4

7.8.1 Send cancel function

The same program example can be used for the send/receive buffer communication function and buffer memory auto-refresh function.

(1) Overview of program example

Transmission is canceled when Send cancel execute flag (X25) is turned ON after a send request and before send completion.

(2) Processing in the program example

1) After turn-ON of Send request signal (Y120), Send cancel request signal (Y121) is turned ON before Send complete signal (X120) or Send failed signal (X121) turns ON.
2) Send request signal (Y120) and Send cancel request signal (Y121) are turned OFF after turn-ON of Send complete signal (X120) or Send failed signal (X121).

(3) Devices used in the program example

Table 7.35 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X25	Send cancel execute flag	—	—
X120	Send complete signal	Section 7.8.1	Section 7.4.1
X121	Send failed signal	Section 7.8.1	Section 7.4.1
Y120	Send request signal	—	Section 7.4.1
Y121	Send cancel request signal	Section 7.8.1	—

(4) Program example

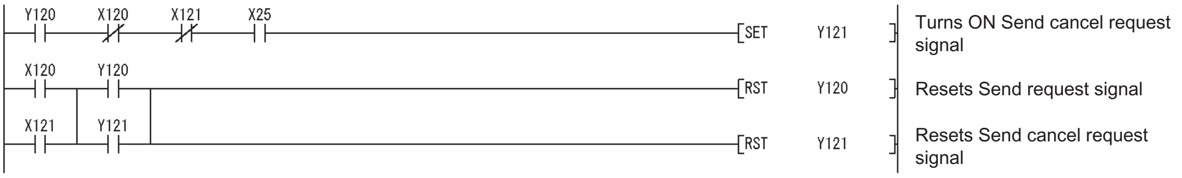


Figure 7.28 Program example

7.8.2 Forced receive completion function

(1) For the send/receive buffer communication function

(a) Overview of program example
When Forced receive completion execute flag (X26) turns ON before reception completion, the receive processing is forcibly completed at the point and data that have been received are read out.

(b) Processing in the program example

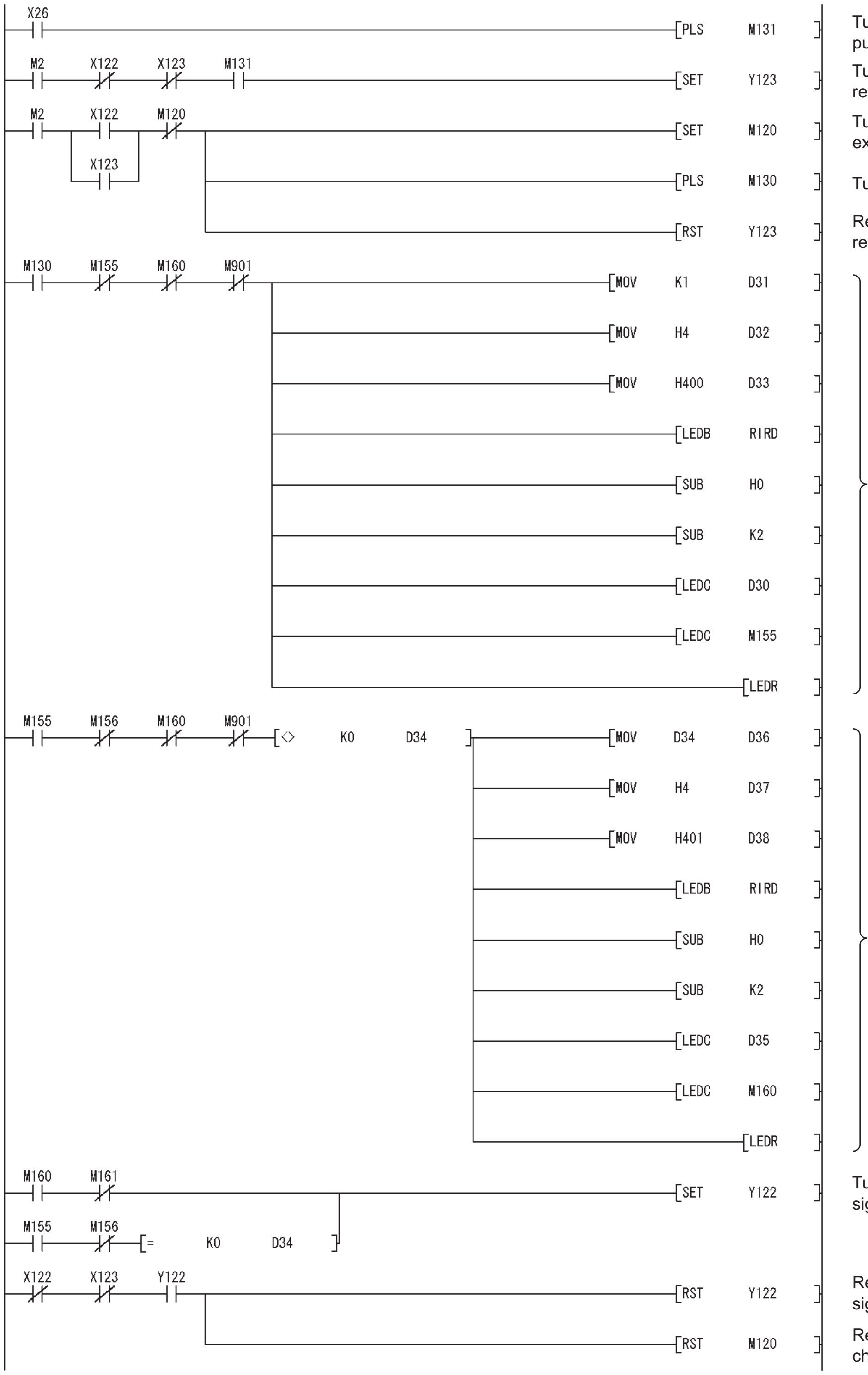
1) Forced receive completion request signal (Y123) is turned ON to forcibly terminate reception.
2) Received data are read from Receive data size specification area (R2N 400H) and Receive data area (R2N 401H) to the master station word devices (areas starting from D39).
3) Receive data read completion signal (Y122) is turned OFF to terminate the reception.

(c) Devices used in the program example

Table 7.36 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X26	Forced receive completion execute flag	—	—
X122	Normal receive data read request signal	Section 7.8.2	—
X123	Error receive data read request signal	Section 7.8.2	—
Y122	Receive data read completion signal	Section 7.8.2	Section 7.5.1
Y123	Forced receive completion request signal	Section 7.8.2	—
M2	Operation complete flag	—	Section 7.3.1
M120	Buffer memory access exclusion check flag	Section 7.8.2	Section 7.4.1, Section 7.5.1, Section 7.6.1
M130	Receiving flag	Section 7.8.2	Section 7.5.1
M131	Forced reception start pulse signal	Section 7.8.2	—
M135	Forced receiving flag	Section 7.8.2	—
M155	Device that is turned ON for one scan after completion of RIRD	Section 7.8.2	Section 7.5.1
M156	Device that is turned ON for one scan after failure of reading by RIRD	Section 7.8.2	Section 7.5.1
M160	Device that is turned ON for one scan after completion of RIRD	Section 7.8.2	Section 7.5.1
M161	Device that is turned ON for one scan after failure of reading by RIRD	Section 7.8.2	Section 7.5.1
D30 to D364	Control data of RIRD instruction, and No. of receive data (in word units)	—	—
From D35	Control data of RIRD instruction, and receive data	—	—

(d) Program example



Turns ON Forced reception start pulse signal

Turns ON Forced receive completion request signal

Turns ON Buffer memory access exclusion check flag

Turns ON Receiving flag

Resets Forced receive completion request signal

Reads No. of receive data from AJ65BT-R2N receive data size specification area (in word units)

Reads receive data from AJ65BT-R2N receive data area

Turns ON Receive data read completion signal

Resets Receive data read completion signal

Resets Buffer memory access exclusion check flag

Figure 7.29 Program example

(2) For the buffer memory auto-refresh function

(a) Overview of program example
When Forced receive completion execute flag (X26) turns ON before reception completion, the receive processing is forcibly completed at the point and data that have been received are read out.

(b) Processing in the program example

1) Forced receive completion request signal (Y123) is turned ON to forcibly terminate reception.

2) Received data are read from Receive data size specification area (R2N 400H) and Receive data area (R2N 401H) to the master station word device (D200).

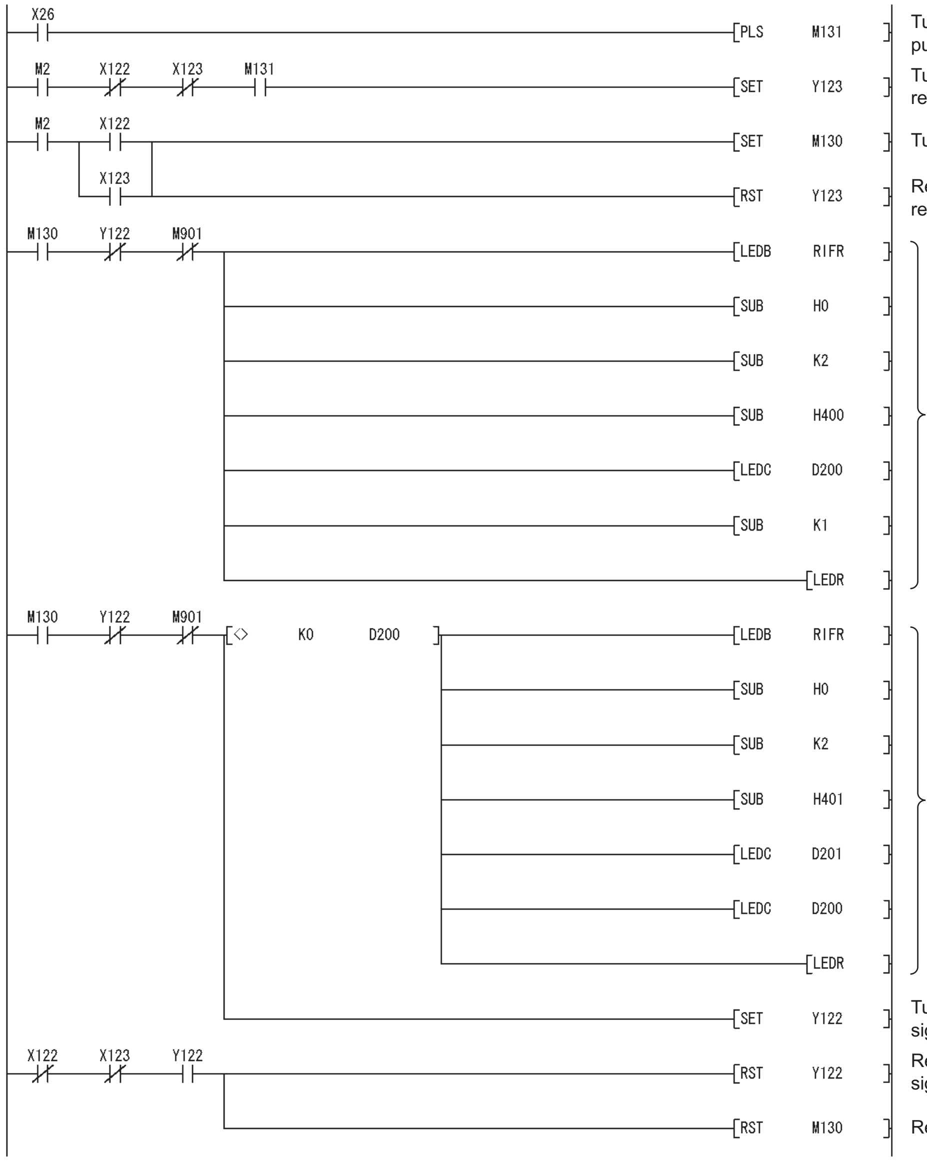
3) Receive data read completion signal (Y122) is turned OFF to terminate the reception.

(c) Devices used in the program example

Table 7.37 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X26	Forced receive completion execute flag	—	—
X122	Normal receive data read request signal	Section 7.8.2	—
X123	Error receive data read request signal	Section 7.8.2	—
Y122	Receive data read completion signal	Section 7.8.2	Section 7.5.2
Y123	Forced receive completion request signal	Section 7.8.2	—
M2	Operation complete flag	—	Section 7.3.2
M130	Receiving flag	Section 7.8.2	Section 7.5.2
M901	Other station data link status (Station No.2)	—	—
D200	No. of receive data	—	—
From D201	Receive data	—	—

(d) Program example



Turns ON Forced reception start pulse signal

Turns ON Forced receive completion request signal

Turns ON Receiving flag

Resets Forced receive completion request signal

Reads No. of receive data from AJ65BT-R2N receive data size specification area (in word units)

Reads receive data from AJ65BT-R2N receive data area

Turns ON Receive data read completion signal

Resets Receive data read completion signal

Resets Receiving flag

Figure 7.30 Program example

7.8.3 OS reception area clear function

The same program example can be used for the send/receive buffer communication function and buffer memory auto-refresh function.

(1) Overview of program example

The OS reception area is cleared when the AJ65BT-R2N fails to receive data from the external device.

(2) Processing in the program example

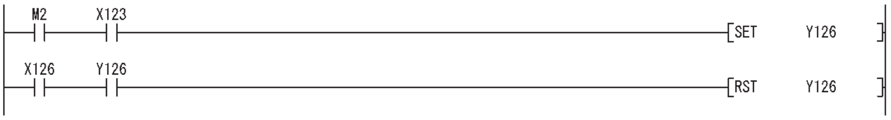
When Error receive data read request signal (X123) is ON, OS reception area clear request signal (Y126) is turned ON to clear the OS reception area.

(3) Devices used in the program example

Table 7.38 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X123	Error receive data read request signal	—	—
X126	OS reception area cleared signal	Section 7.8.3	—
Y126	OS reception area clear request signal	Section 7.8.3	—
M2	Operation complete flag	—	Section 7.3.2

(4) Program example



Turns ON OS reception area clear request signal

Resets OS reception area clear request signal

Figure 7.31 Program example

7.8.4 E^2PROM function setting

Point

(1) Do not execute registration to E^2PROM each time the AJ65BT-R2N is started up.

Doing so may cause the maximum number of writes to E^2PROM (service life) to be reached earlier.

(2) Execute the E^2PROM function after initialization of the AJ65BT-R2N is normally completed.

For E^2PROM function sample programs, refer to the following.

☞ Section 7.9.1 Program example for changing auto-refresh buffer assignments

7.9 Program Example

This section gives program examples for the following processing.

Table 7.39 Program example

Description	Reference section
Program example for changing auto-refresh buffer assignments	Section 7.9.1
Program example for sending/receiving data with RISEND/RIRCV instruction	Section 7.9.2
Program example for receiving data when a receive timeout occurs	Section 7.9.3

7.9.1 Program example for changing auto-refresh buffer assignments

(1) Overview of program example

- When Operation start request flag (M0) is turned ON, the assignments are changed so that the AJ65BT-R2N auto-refresh buffer size is 80H, and they are registered to the E^2PROM.
  When the auto-refresh buffer size changes to 80H, the buffer memory auto-refresh function can be used with up to 20 AJ65BT-R2Ns connected.
- The AJ65BT-R2N operates with the auto-refresh buffer size setting changed to 80H after restart.

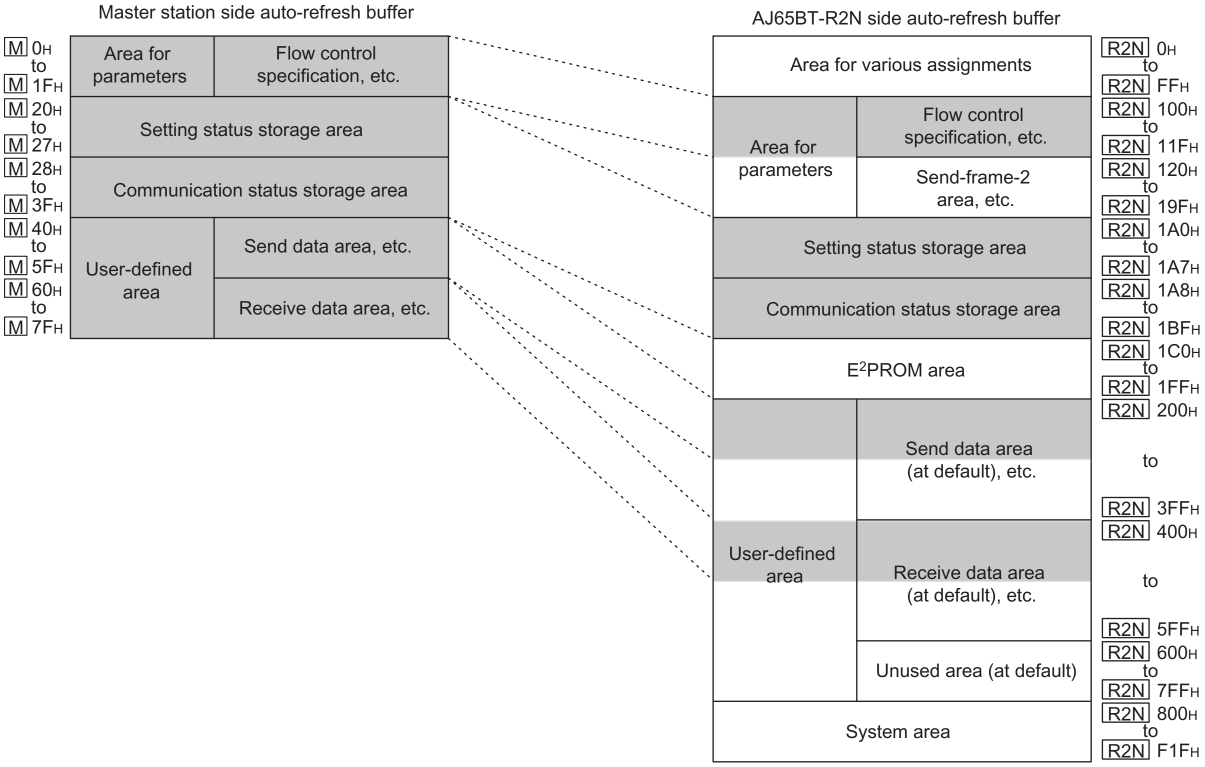


Figure 7.32 Auto-refresh buffer after assignment change

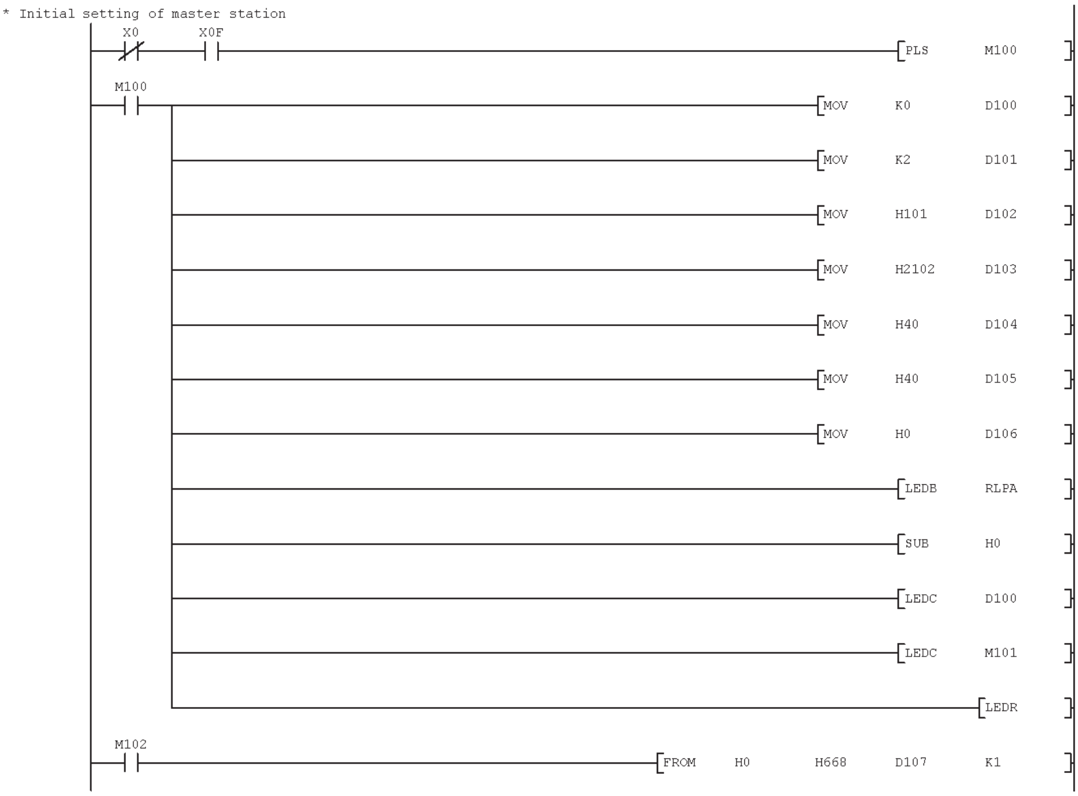
(2) For the send/receive buffer communication function

(a) Devices used in the program example

Table 7.40 Devices used in the program example

Device	Description	Device	Description
X0	Module error (Master station)	M10	Device that is turned ON for one scan after completion of RIWT
X1	Own station data link status (Master station)	M11	Device that is turned ON for one scan after failure of writing by RIWT
X0F	Module ready (Master station)	M12	Device that is turned ON for one scan after completion of RIWT
X23	Error code read flag	M13	Device that is turned ON for one scan after failure of writing by RIWT
X24	Error clear flag	M14	Device that is turned ON for one scan after completion of RIWT
X27	E2PROM function execute flag	M15	Device that is turned ON for one scan after failure of writing by RIWT
K4X120	Remote input (X120 to X12F)	M20	AJ65BT-R2N initial setting start flag
X124	Initialization complete signal	M22	Operation complete pulse signal
X125	Initialization failed signal	M27	E^{2}PROM function execution start pulse signal
X127	E^{2}PROM function complete signal	M28	E^{2}PROM function complete pulse signal
X128	E^{2}PROM function failed signal	M29	E^{2}PROM function execute completion pulse signal
K1X134	Mode setting switch status signal (X134 to X137)	M30	Operation failed pulse signal
X13A	Error status signal	M100	Master station parameter setting start pulse signal
X13B	Remote station ready signal	M101	Device that is turned ON for one scan after completion of RLPA
K4Y18	Output (Y18 to Y27) (Master station)	M102	Device that is turned ON for one scan after failure of writing by RLPA
Y1C	Buffer memory bank switching specification (Master station)	M120	Buffer memory access exclusion check flag
Y1D		M135	Error handling flag
KBY120	Remote output (Y120 to Y13F)	M190	Device that is turned ON for one scan after completion of RIRD
Y120	Send request signal	M191	Device that is turned ON for one scan after failure of reading by RIRD
Y121	Send cancel request signal	M230	Error handling execution pulse signal
Y122	Receive data read completion signal	M502	AJ65BT-R2N mode normal flag
Y123	Forced receive completion request signal	M503	AJ65BT-R2N mode error flag
Y124	Initialization request signal	M504	E^{2}PROM function setting start pulse signal
Y126	OS reception area clear request signal	K4M900	Other station data link status (SW0080)
Y127	E^{2}PROM function request signal	M901	Other station data link status (Station No.2)
Y139	Initial data read request signal	M9036	Always ON
Y13A	Error reset request signal	M9052	SEG instruction switching
M0	Operation start request flag	D0 to D39	Control data of RIWT instruction, and set values
M1	Initial setting write completion flag	D100 to D106	Network parameters of master station
M2	Operation complete flag	D107	Error code in Network parameters setting
M3	Operation failed flag	D130 to D136	Control data of RIRD instruction, and error code of AJ65BT-R2N
M4	E^{2}PROM function failed flag	D900	Master module RY(n+1)E, RY(n+1)F

(b) Program example



Turns ON Master station parameter setting start pulse signal

Synchronous mode enable/disable

No. of modules connected

Device station setting information of remote I/O station

Device station setting information of AJ65BT-R2N

Send buffer size

Receive buffer size

Auto-refresh buffer size

Dedicated instruction name

Start I/O No. of master module

Link parameter storage device

Device that is turned ON for one scan after execution of RLPA instruction

Dedicated instruction completion

Reads error code from master module buffer memory

Figure 7.33 Program example for changing auto-refresh buffer assignments

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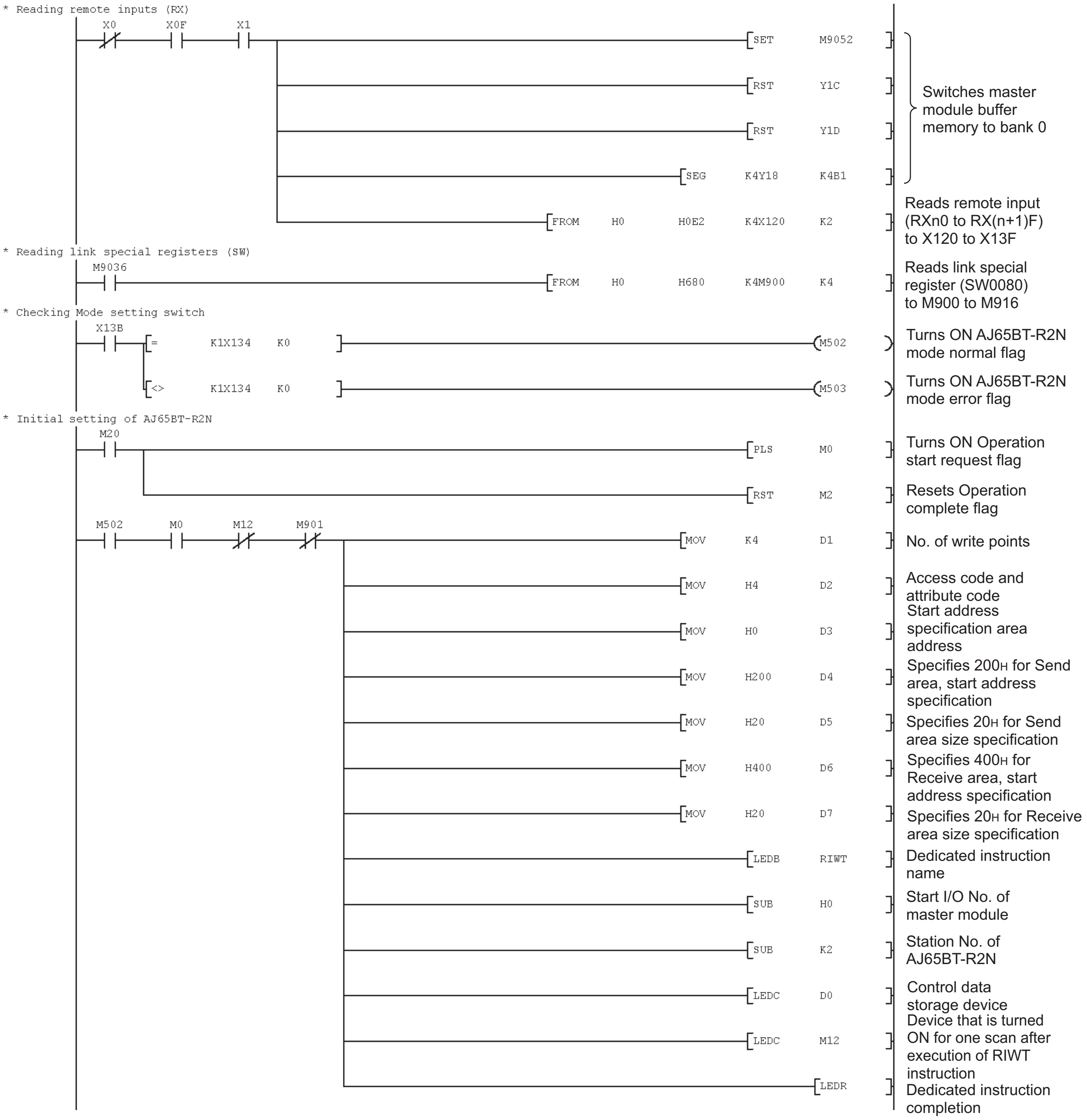

Switches master module buffer memory to bank 0

Reads remote input (RXn0 to RX(n+1)F) to X120 to X13F

Reads link special register (SW0080) to M900 to M916

Turns ON AJ65BT-R2N mode normal flag

Turns ON AJ65BT-R2N mode error flag

Turns ON Operation start request flag

Resets Operation complete flag

No. of write points

Access code and attribute code

Start address specification area address

Specifies 200H for Send area, start address specification

Specifies 20H for Send area size specification

Specifies 400H for Receive area, start address specification

Specifies 20H for Receive area size specification

Dedicated instruction name

Start I/O No. of master module

Station No. of AJ65BT-R2N

Control data storage device

Device that is turned ON for one scan after execution of RIWT instruction

Dedicated instruction completion

Figure 7.33 Program example for changing auto-refresh buffer assignments (Continued)

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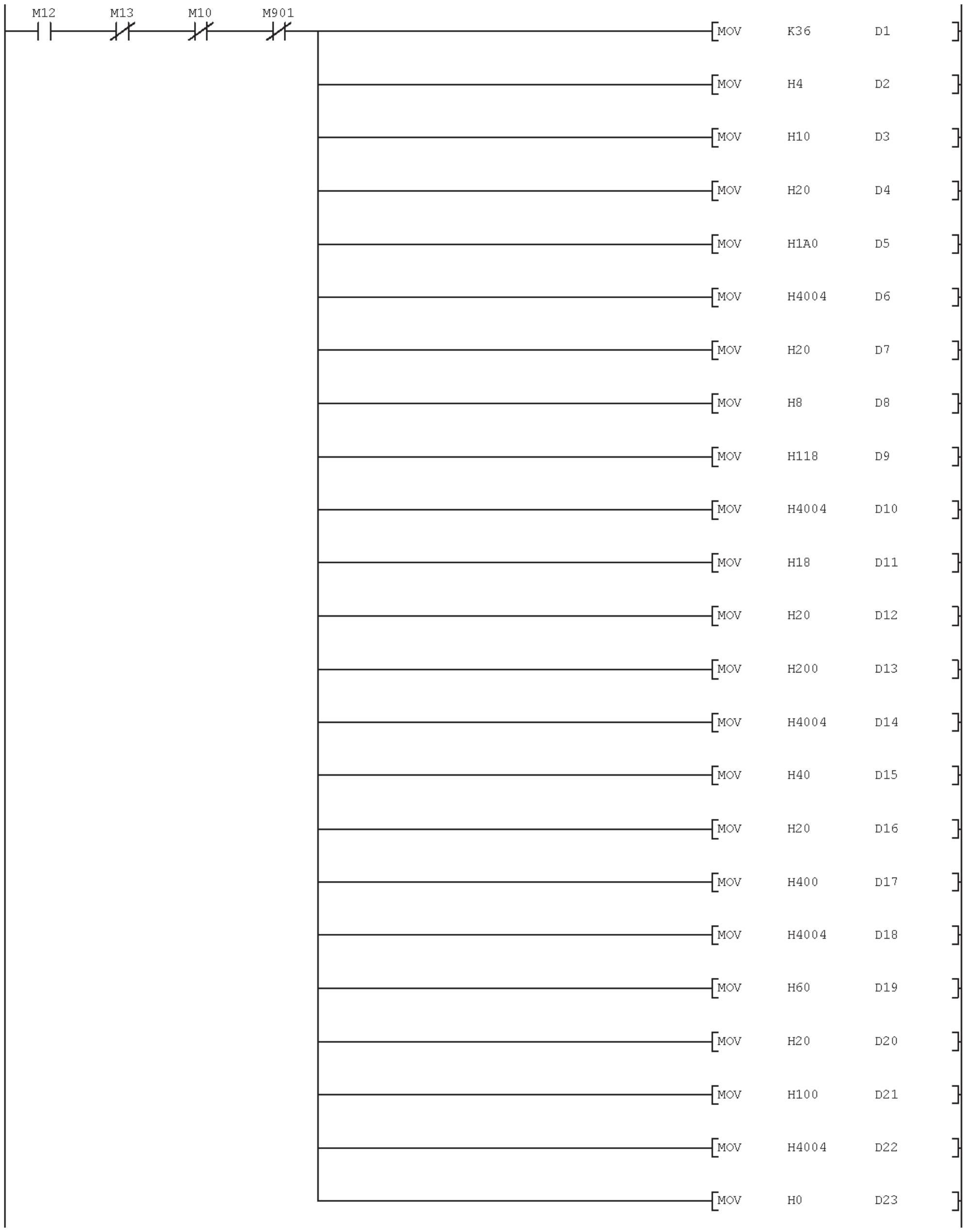

No. of write points

Access code and attribute code

Auto-refresh area specification address

Specifies the following for Status data storage area
- Transfer size : 20H
- AJ65BT-R2N side start address : 1A0H
- Master station side offset address : 20H

Specifies the following for Send area 1)
- Transfer size : 8H
- AJ65BT-R2N side start address : 118H
- Master station side offset address : 18H

Specifies the following for Send area 2)
- Transfer size : 20H
- AJ65BT-R2N side start address : 200H
- Master station side offset address : 40H

Specifies the following for Receive area
- Transfer size : 20H
- AJ65BT-R2N side start address : 400H
- Master station side offset address : 60H

Specifies the following for Initial setting area
- Transfer size : 20H
- AJ65BT-R2N side start address : 100H
- Master station side offset address : 0H

Figure 7.33 Program example for changing auto-refresh buffer assignments (Continued)

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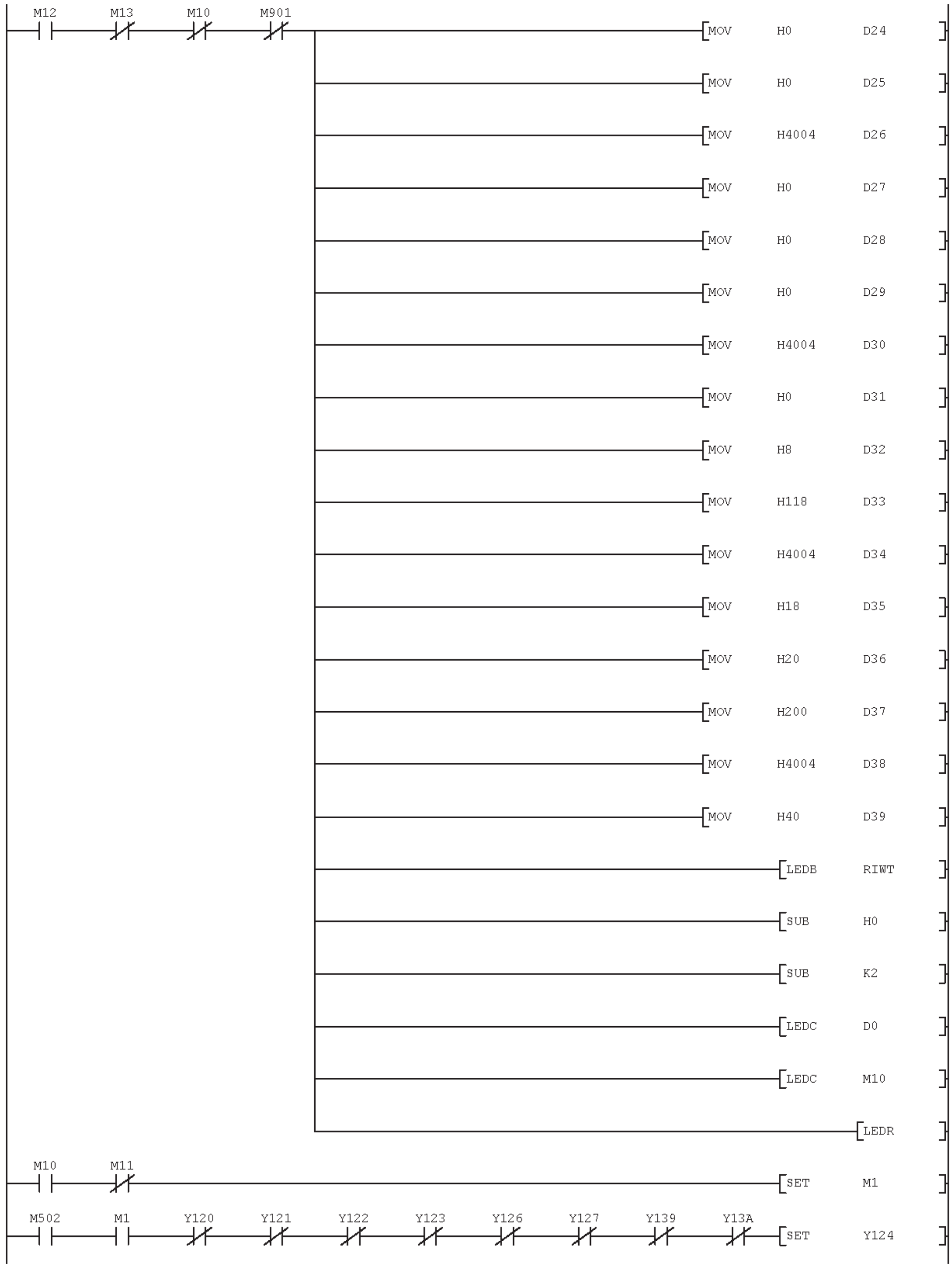

```
M12  M13  M10  M901
─┤├──┤/├──┤/├──┤/├─┬─[MOV   H0     D24 ]
                   ├─[MOV   H0     D25 ]
                   ├─[MOV   H4004  D26 ]
                   ├─[MOV   H0     D27 ]
                   ├─[MOV   H0     D28 ]
                   ├─[MOV   H0     D29 ]
                   ├─[MOV   H4004  D30 ]
                   ├─[MOV   H0     D31 ]
                   ├─[MOV   H8     D32 ]
                   ├─[MOV   H118   D33 ]
                   ├─[MOV   H4004  D34 ]
                   ├─[MOV   H18    D35 ]
                   ├─[MOV   H20    D36 ]
                   ├─[MOV   H200   D37 ]
                   ├─[MOV   H4004  D38 ]
                   ├─[MOV   H40    D39 ]
                   ├─[LEDB  RIWT ]
                   ├─[SUB   H0   ]
                   ├─[SUB   K2   ]
                   ├─[LEDC  D0   ]
                   ├─[LEDC  M10  ]
                   └─[LEDR ]
M10  M11
─┤├──┤/├─────────────[SET   M1   ]
M502 M1   Y120 Y121 Y122 Y123 Y126 Y127 Y139 Y13A
─┤├──┤├───┤/├──┤/├──┤/├──┤/├──┤/├──┤/├──┤/├──┤/├──[SET   Y124 ]
```

Specifies the following for E^{2}PROM function area
- Transfer size : 0H
- AJ65BT-R2N side start address : 0H
- Master station side offset address : 0H

Specifies the following for User registration frame area
- Transfer size : 0H
- AJ65BT-R2N side start address : 0H
- Master station side offset address : 0H

Specifies the following for Monitoring-based transmission area 1)
- Transfer size : 8H
- AJ65BT-R2N side start address : 118H
- Master station side offset address : 18H

Specifies the following for Monitoring-based transmission area 2)
- Transfer size : 20H
- AJ65BT-R2N side start address : 200H
- Master station side offset address : 40H

Dedicated instruction name

Start I/O No. of master module

Station No. of AJ65BT-R2N

Control data storage device

Device that is turned ON for one scan after execution of RIWT instruction

Dedicated instruction completion

Turns ON Initial setting write completion flag

Turns ON Initialization request signal

Figure 7.33 Program example for changing auto-refresh buffer assignments (Continued)

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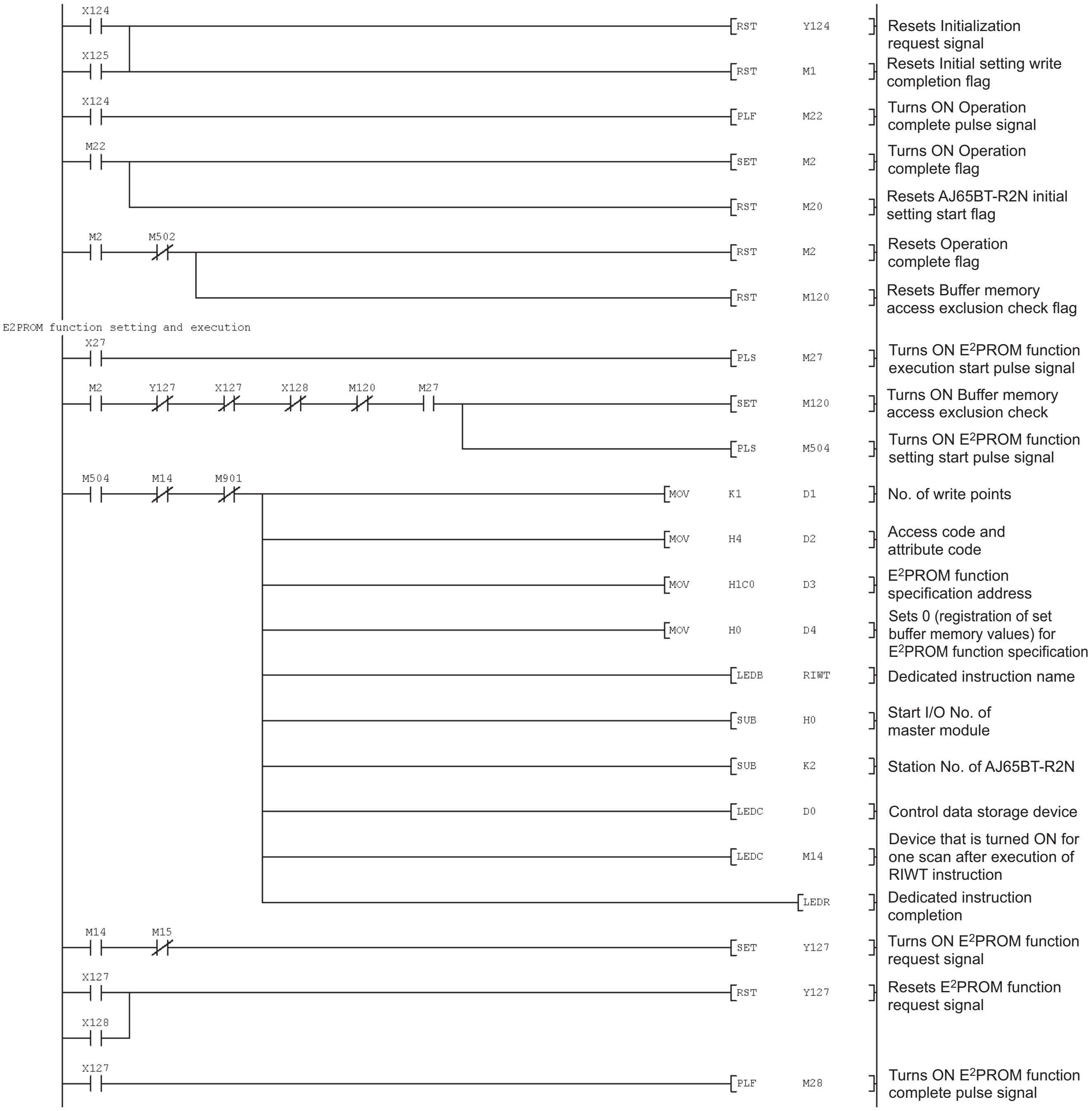

Figure 7.33 Program example for changing auto-refresh buffer assignments (Continued)

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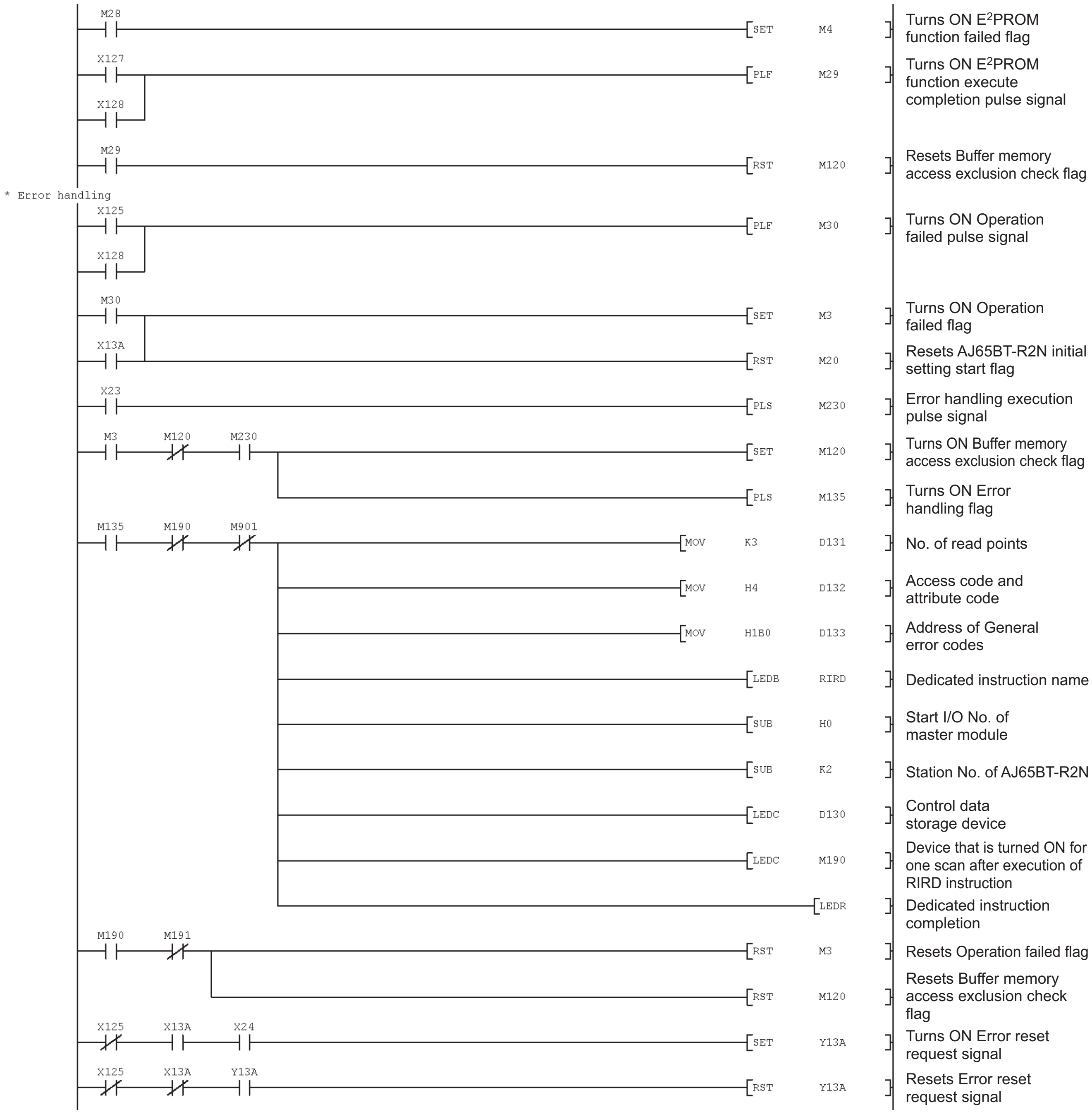

Figure 7.33 Program example for changing auto-refresh buffer assignments (Continued)

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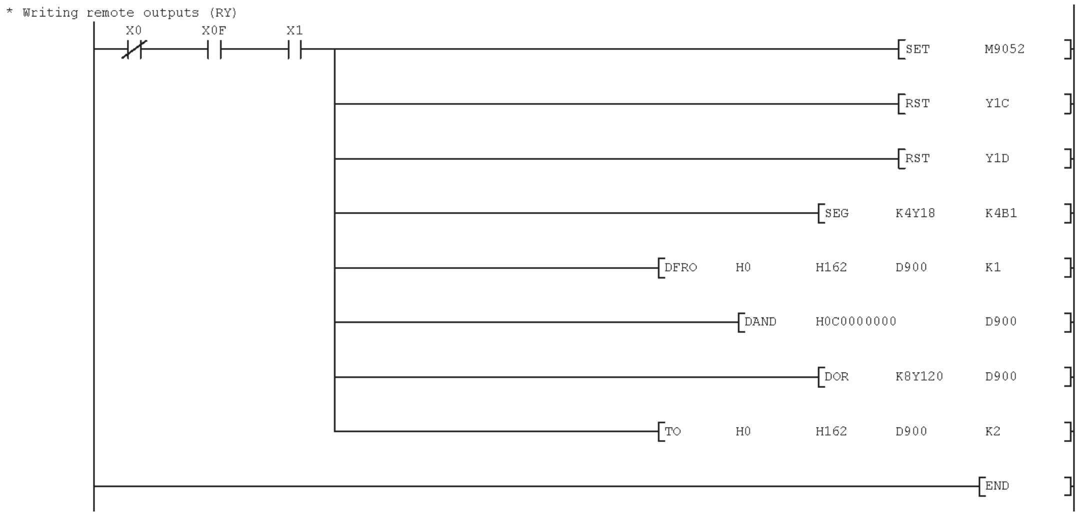


Switches master module buffer memory to bank 0

Malfunction prevention

Writes Y120 to Y13F to remote output (RYn0 to RY(n+1)F)

Figure 7.33 Program example for changing auto-refresh buffer assignments (Continued)

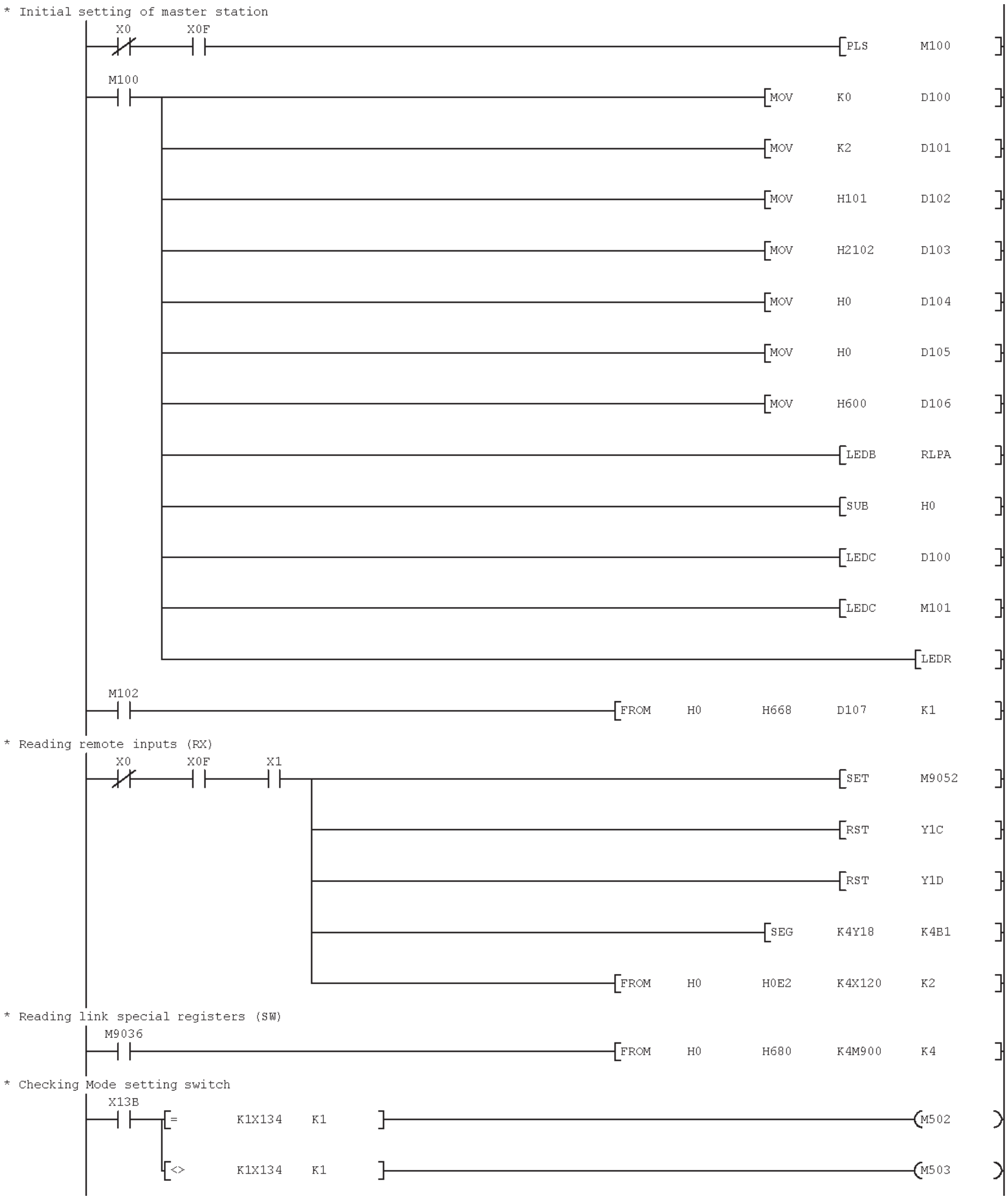
(3) For the buffer memory auto-refresh function

(a) Devices used in the program example

Table 7.41 Devices used in the program example

Device	Description	Device	Description
X0	Module error (Master station)	M1	Initial setting write completion flag
X1	Own station data link status (Master station)	M2	Operation complete flag
X0F	Own station data link status (Master station)	M3	Operation failed flag
X23	Error code read flag	M4	E^2PROM function failed flag
X24	Error clear flag	M22	Operation complete pulse signal
X27	E^2PROM function execute flag	M27	E^2PROM function execution start pulse signal
K4X120	Remote input (X120 to X12F)	M28	E^2PROM function complete pulse signal
X124	Initialization complete signal	M29	E^2PROM function execute completion pulse signal
X125	Initialization failed signal	M30	Operation failed pulse signal
X127	E^2PROM function complete signal	M100	Master station parameter setting start pulse signal
X128	E^2PROM function failed signal	M101	Device that is turned ON for one scan after completion of RLPA
K1X134	Mode setting switch status signal (X134 to X137)	M102	Device that is turned ON for one scan after failure of writing by RLPA
X139	Initial data read completion signal	M111	Initial data read completion pulse signal
Y13A	Error reset request signal	M135	Error handling flag
X13B	Remote station ready signal	M230	Error handling execution pulse signal
K4Y18	Output (Y18 to Y27) (Master station)	M270	E^2PROM function in-execution flag
Y1C	Buffer memory bank switching specification (Master station)	M500	AJ65BT-R2N initial data read complete flag
Y1D		M501	AJ65BT-R2N initial data reading flag
KBY120	Remote output (Y120 to Y13F)	M502	AJ65BT-R2N mode normal flag
Y120	Send request signal	M503	AJ65BT-R2N mode error flag
Y121	Send cancel request signal	M504	E^2PROM function setting start pulse signal
Y122	Receive data read completion signal	K4M900	Other station data link status (SW0080)
Y123	Forced receive completion request signal	M901	Other station data link status (Station No.2)
Y124	Initialization request signal	M9036	Always ON
Y126	OS reception area clear request signal	M9052	SEG instruction switching
Y127	E^2PROM function request signal	D10 to D45	Set values
Y139	Initial data read request signal	D100 to D106	Network parameters of master station
Y13A	Error reset request signal	D107	Error code in Network parameters setting
M0	Operation start request flag	D400 to D402	AJ65BT-R2N error code

(b) Program example



Turns ON Master station parameter setting start pulse signal

Synchronous mode enable/disable

No. of modules connected

Device station setting information of remote I/O station

Device station setting information of AJ65BT-R2N

Send buffer size

Receive buffer size

Auto-refresh buffer size

Dedicated instruction name

Start I/O No. of master module

Link parameter storage device

Device that is turned on for one scan after execution of RLPA instruction

Dedicated instruction completion

Reads error code from master module buffer memory

Switches master module buffer memory to bank 0

Reads remote input (RXn0 to RX(n+1)F) to X120 to X13F

Reads link special register (SW0080) to M900 to M916

Turns ON AJ65BT-R2N mode normal flag

Turns ON AJ65BT-R2N mode error flag

Figure 7.34 Program example for changing auto-refresh buffer assignments

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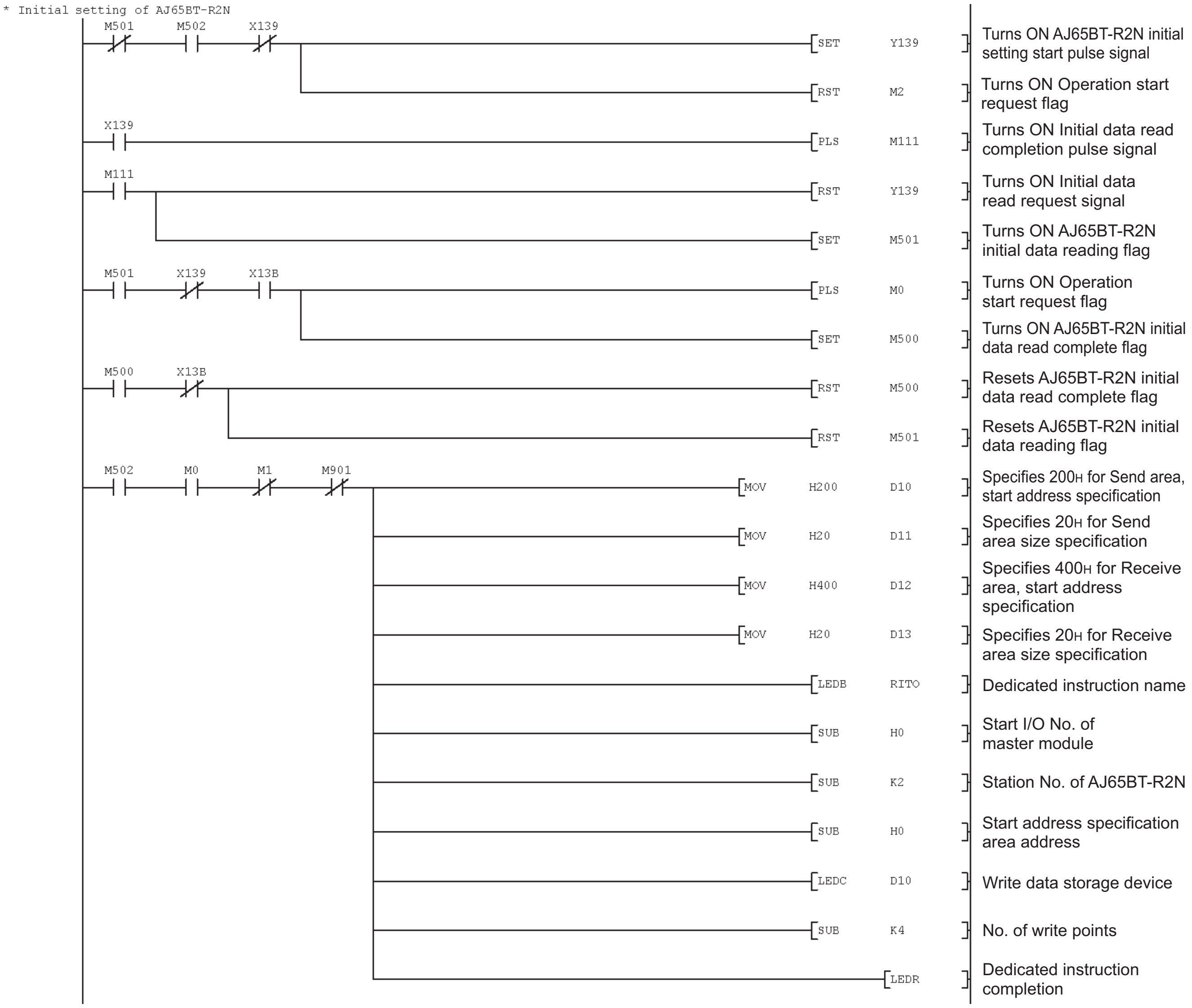

Figure 7.34 Program example for changing auto-refresh buffer assignments (Continued)

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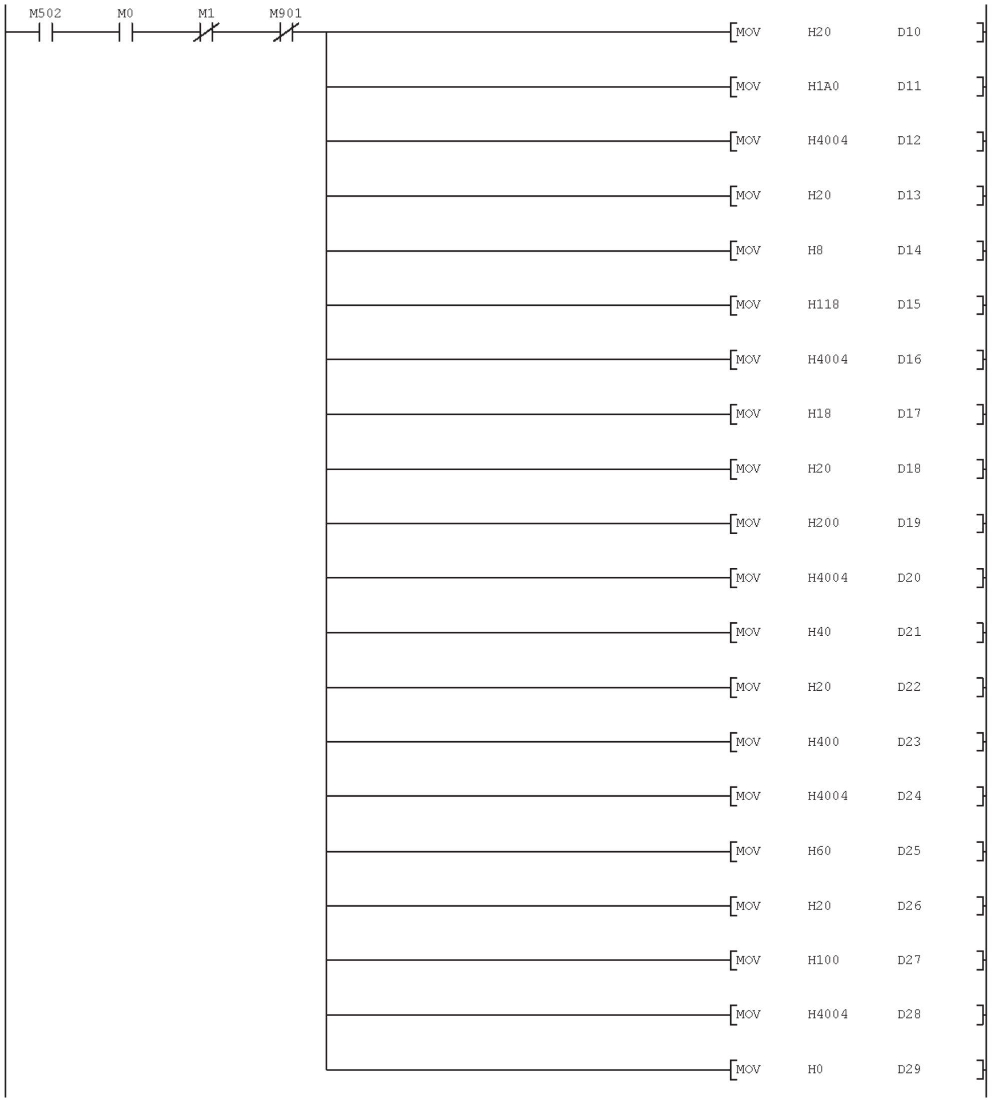

Specifies the following for Status data storage area
- Transfer size : 20_H
- AJ65BT-R2N side start address : $1A0_H$
- Master station side offset address : 20_H

Specifies the following for Send area 1)
- Transfer size : 8_H
- AJ65BT-R2N side start address : 118_H
- Master station side offset address : 18_H

Specifies the following for Send area 2)
- Transfer size : 20_H
- AJ65BT-R2N side start address : 200_H
- Master station side offset address : 40_H

Specifies the following for Receive area
- Transfer size : 20_H
- AJ65BT-R2N side start address : 400_H
- Master station side offset address : 60_H

Specifies the following for Initial setting area
- Transfer size : 20_H
- AJ65BT-R2N side start address : 100_H
- Master station side offset address : 0_H

Figure 7.34 Program example for changing auto-refresh buffer assignments (Continued)

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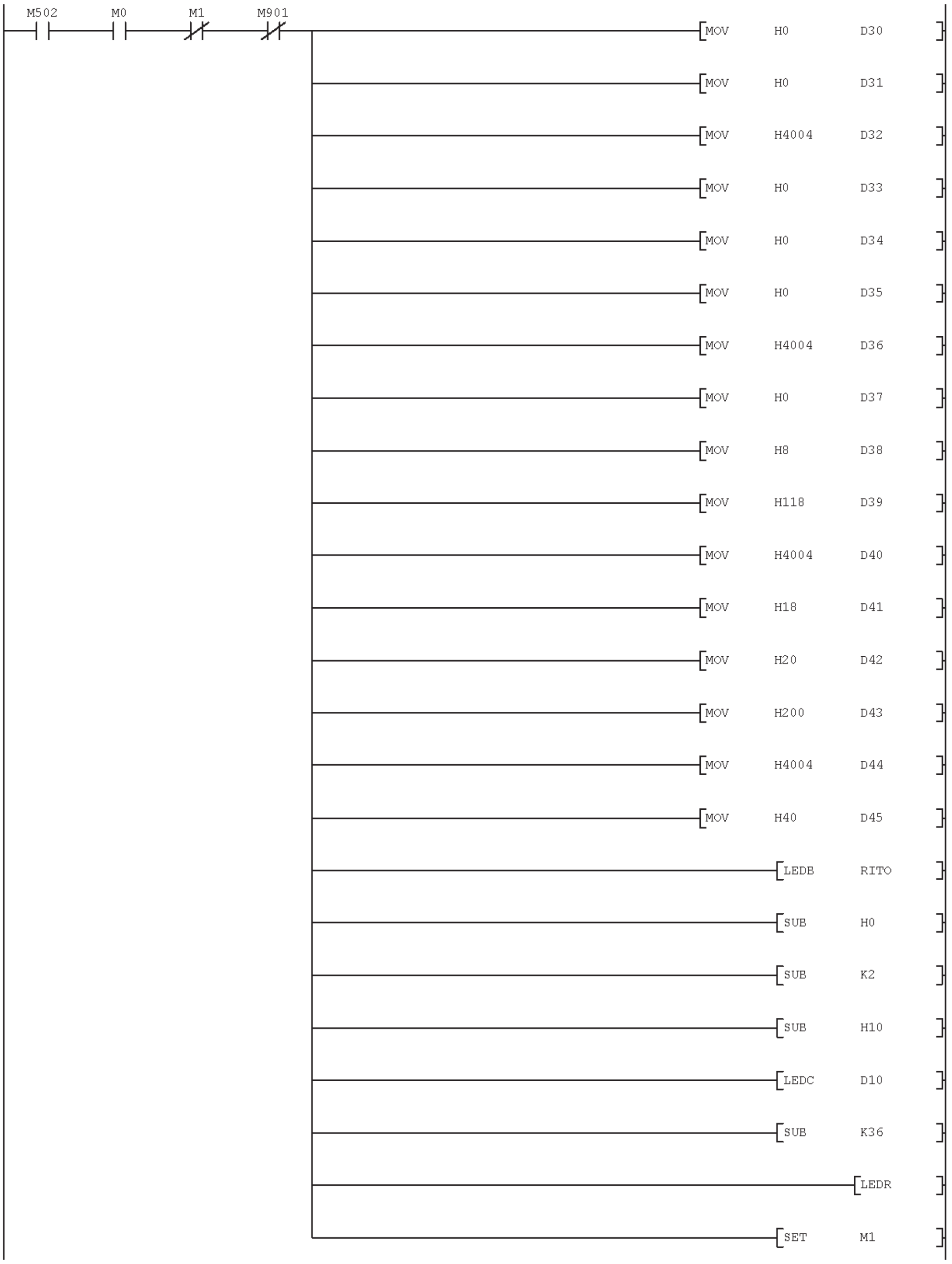

Specifies the following for E^{2}PROM function area
- Transfer size : 0_H
- AJ65BT-R2N side start address : 0_H
- Master station side offset address : 0_H

Specifies the following for User registration frame area
- Transfer size : 0_H
- AJ65BT-R2N side start address : 0_H
- Master station side offset address : 0_H

Specifies the following for Monitoring-based transmission area 1)
- Transfer size : 8_H
- AJ65BT-R2N side start address : 118_H
- Master station side offset address : 18_H

Specifies the following for Monitoring-based transmission area 2)
- Transfer size : 20_H
- AJ65BT-R2N side start address : 200_H
- Master station side offset address : 40_H

Dedicated instruction name

Start I/O No. of master module

Station No. of AJ65BT-R2N

Auto-refresh area specification address

Write data storage device

No. of write points

Dedicated instruction completion

Turns ON Initial setting write completion flag

Figure 7.34 Program example for changing auto-refresh buffer assignments (Continued)

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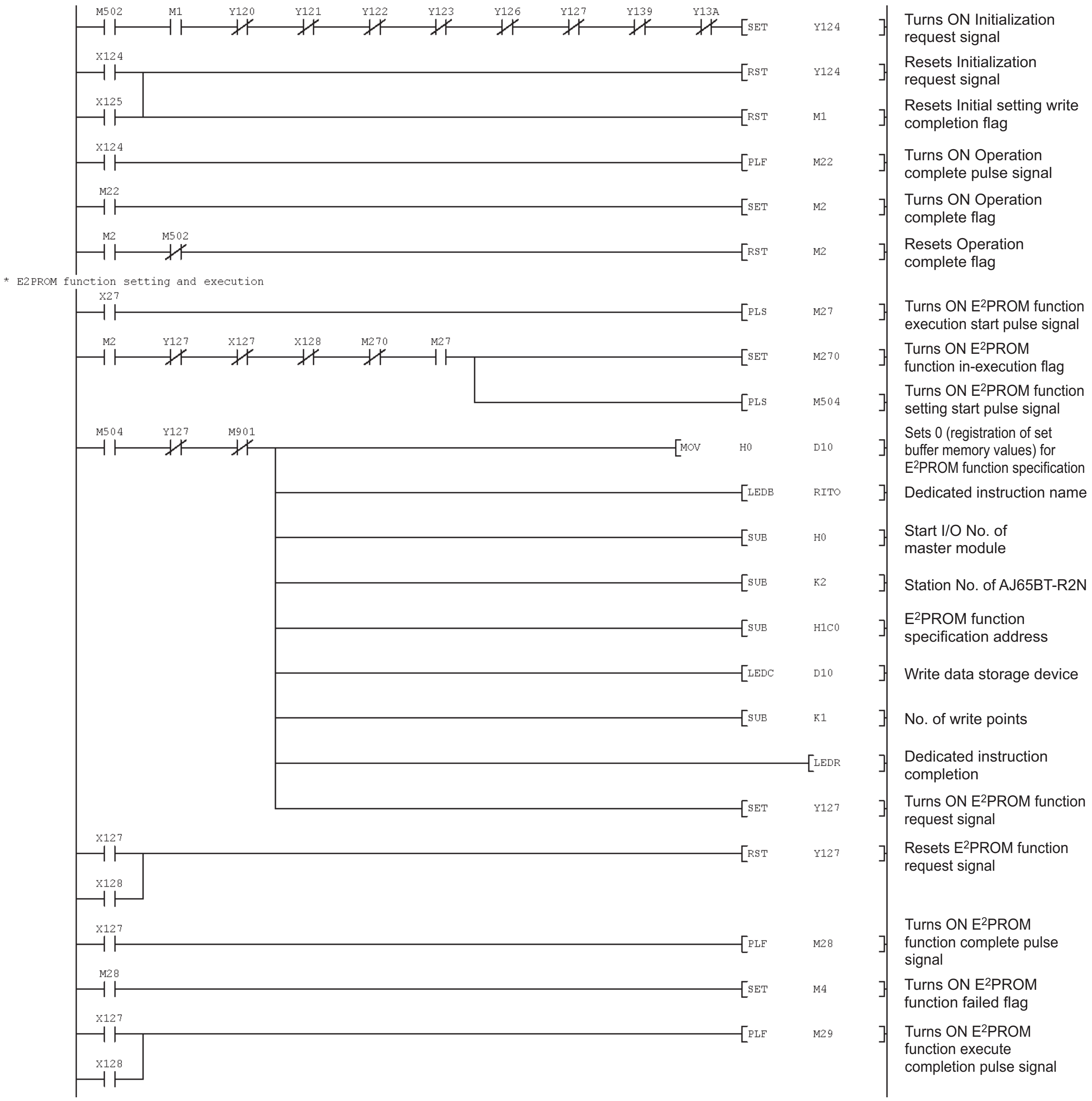

Figure 7.34 Program example for changing auto-refresh buffer assignments (Continued)

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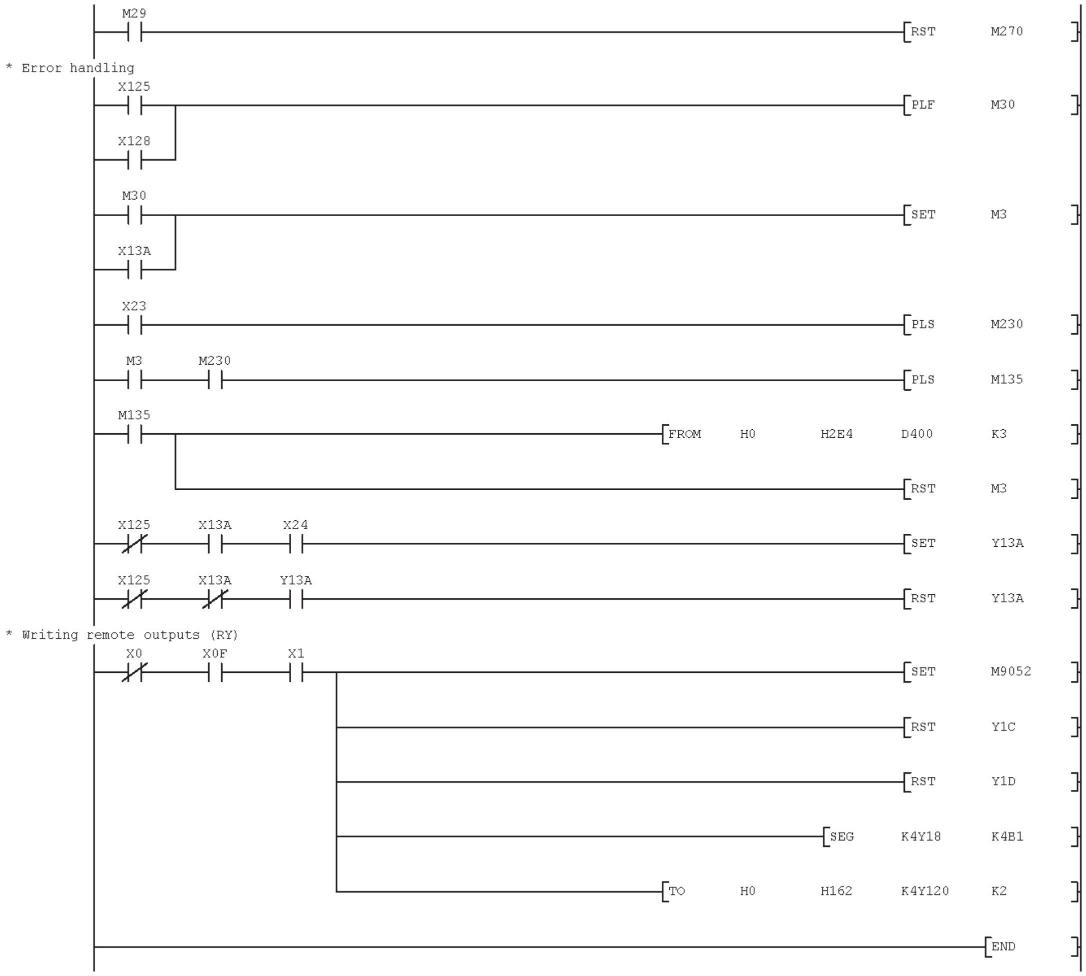

Resets E^{2}PROM function in-execution flag

Turns ON Operation failed pulse signal

Turns ON Operation failed flag

Turns ON Error handling execution pulse signal

Turns ON Error handling flag

Reads from master module buffer memory

Resets Operation failed flag

Turns ON Error reset request signal

Resets Error reset request signal

Switches master module buffer memory to bank 0

Writes Y120 to Y13F to remote output (RYn0 to RY(n+1)F)

Figure 7.34 Program example for changing auto-refresh buffer assignments (Continued)

7.9.2 Program example for sending/receiving data with RISEND/RIRCV instruction

The RISEND and RIRCV instructions are dedicated instructions for sending/receiving using the send/receive buffer communication function.
For this reason, this program example can only be used when using the send/receive buffer communication function.

(1) Overview of program example

- When Operation send execute flag (X22) is turned ON, a character string "ABCDEFGHI"＋LF (0AH) is sent with the RISEND instruction.
- When the AJ65BT-R2N receives data from the external device, six words of the received data are read out to the word device (D50) with the RIRCV instruction.

(2) Devices used in the program example

Table 7.42 Devices used in the program example

Device	Description	Device	Description
X0	Module error (Master station)	M120	Buffer memory access exclusion check flag
X1	Own station data link status (Master station)	M125	Sending flag
X0F	Module ready (Master station)	M130	Receiving flag
X22	Send execute flag	M135	Error handling flag
X23	Error code read flag	M160	Device that is turned ON for one scan after completion of RIRCV
X24	Error clear flag	M161	Device that is turned ON for one scan after failure of reading by RIRCV
K4X120	Remote input (X120 to X12F)	M180	Device that is turned ON for one scan after completion of RISEND
X121	Send failed signal	M181	Device that is turned ON for one scan after failure of reading by RISEND
X122	Normal receive data read request signal	M190	Device that is turned ON for one scan after completion of RIRD
X123	Error receive data read request signal	M191	Device that is turned ON for one scan after failure of reading by RIRD
X125	Initialization failed signal	M220	Send execution pulse signal
X128	E^2PROM function failed signal	M230	Error handling execution pulse signal
K1X134	Mode setting switch status signal (X134 to X137)	M502	AJ65BT-R2N mode normal flag
X13A	Error status signal	M503	AJ65BT-R2N mode error flag
X13B	Remote station ready signal	K4M900	Other station data link status (SW0080)
K4Y18	Output (Y18 to Y27) (Master station)	M901	Other station data link status (Station No.2)
Y1C	Buffer memory bank switching specification (Master station)	M9036	Always ON
Y1D		M9052	SEG instruction switching
K8Y120	Remote output (Y120 to Y13F)	C0	Normal send counter
Y13A	Error reset request signal	C1	Abnormal send counter
M3	Operation failed flag	C2	Normal receive counter
M30	Operation failed pulse signal	C3	Abnormal receive counter
M52	AJ65BT-R2N error pulse signal	D0 to D4	Control data of RISEND instruction
M100	Master station parameter setting start pulse signal	D5 to D10	No. of send data and send data
M101	Device that is turned ON for one scan after completion of RLPA	D15 to D16	Link devices for handshake
M102	Device that is turned ON for one scan after failure of writing by RLPA	D30 to D42	Control data of RIRCV instruction, and receive data

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Table 7.42 Devices used in the program example (Continued)

Device	Description	Device	Description
D45 to D46	Link devices for handshake	D130 to D136	Control data of RIRD instruction, and error code of AJ65BT-R2N
D100 to D106	Network parameters of master station	D900	Master module RY(n+1)E, RY(n+1)F
D107	Error code in Network parameters setting	—	

(3) Program example

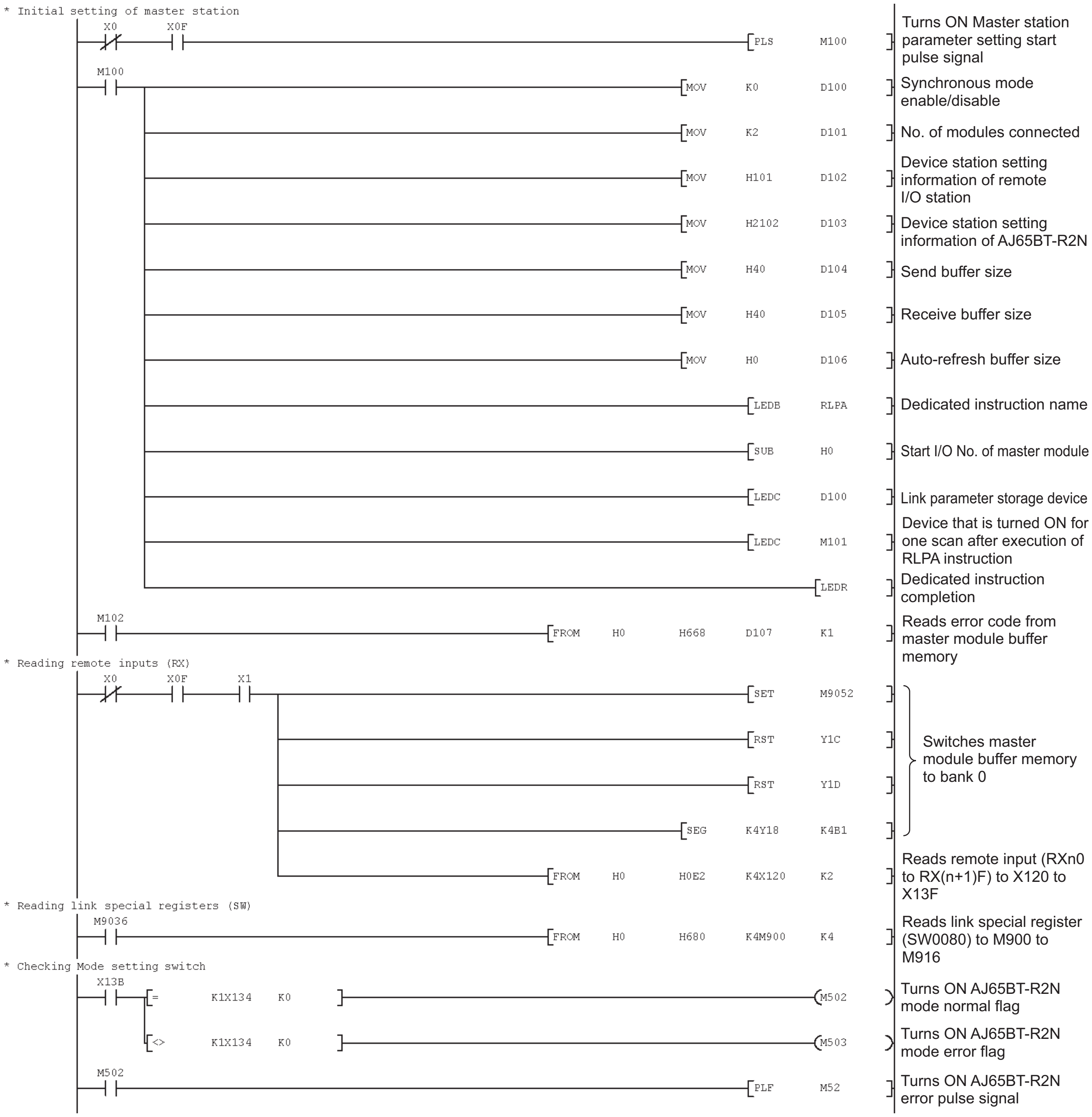

Figure 7.35 Program example for sending/receiving data with RISEND/RIRCV instruction

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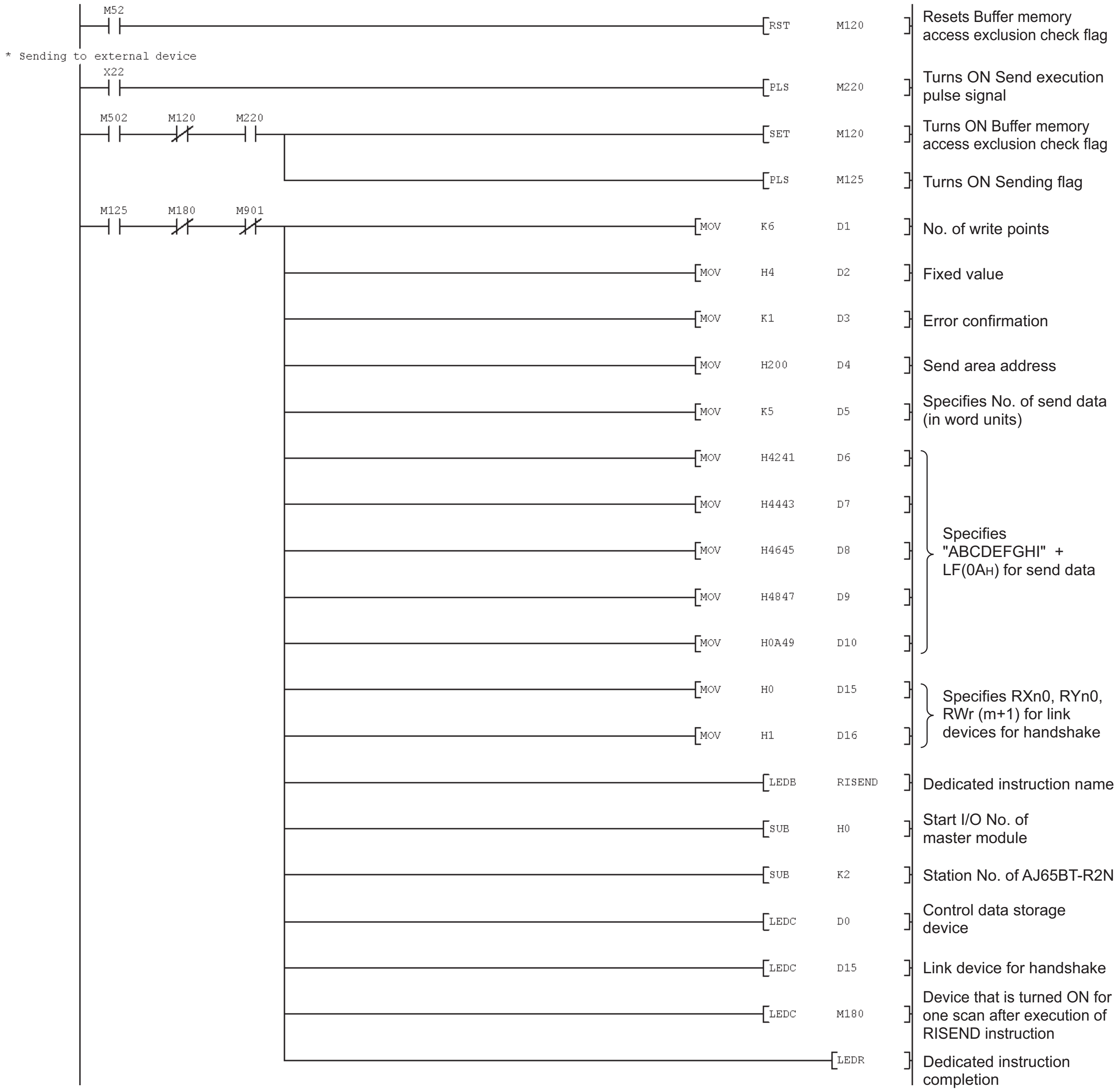

Figure 7.35 Program example for sending/receiving data with RISEND/RIRCV instruction (Continued)

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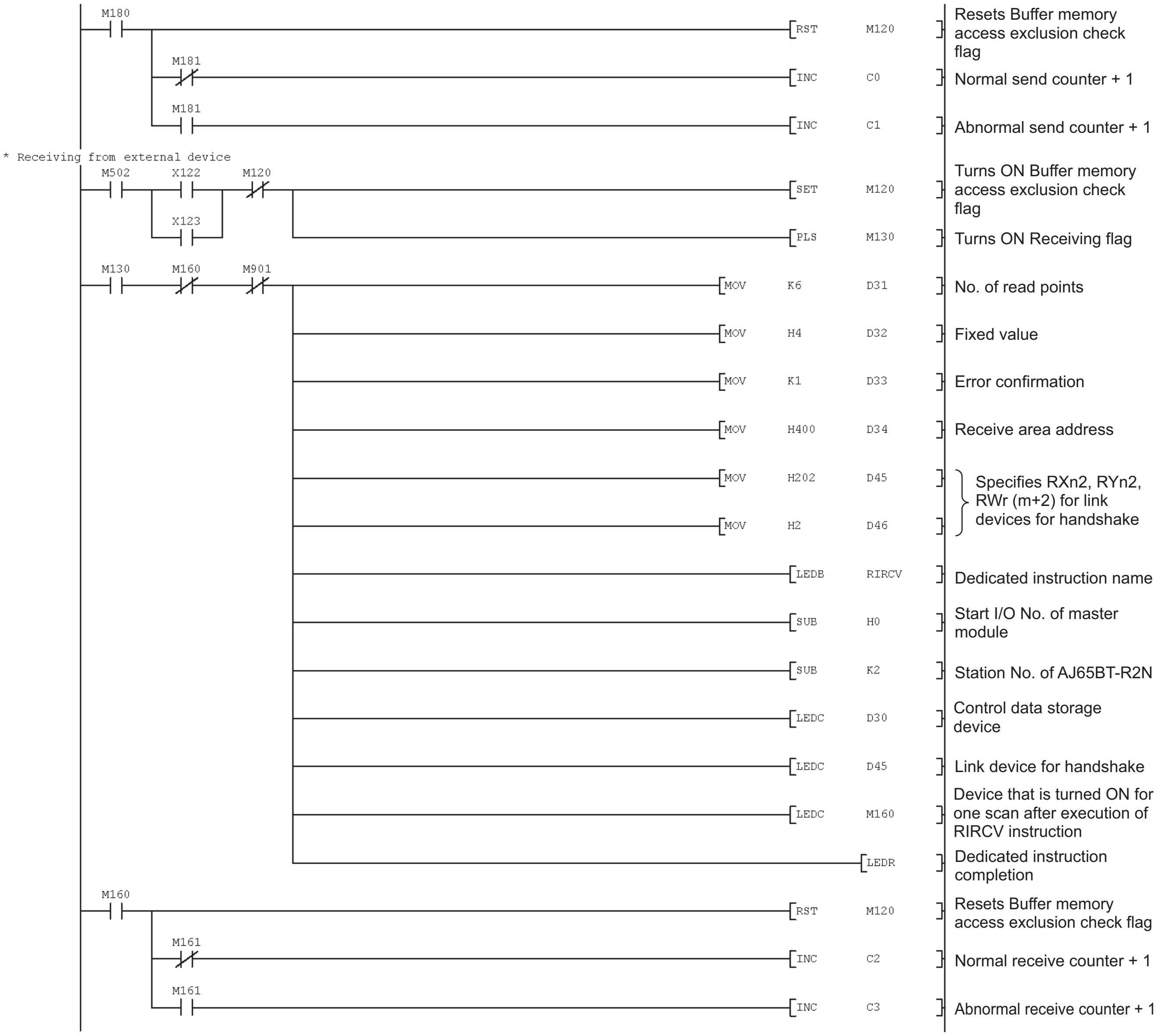

Figure 7.35 Program example for sending/receiving data with RISEND/RIRCV instruction (Continued)

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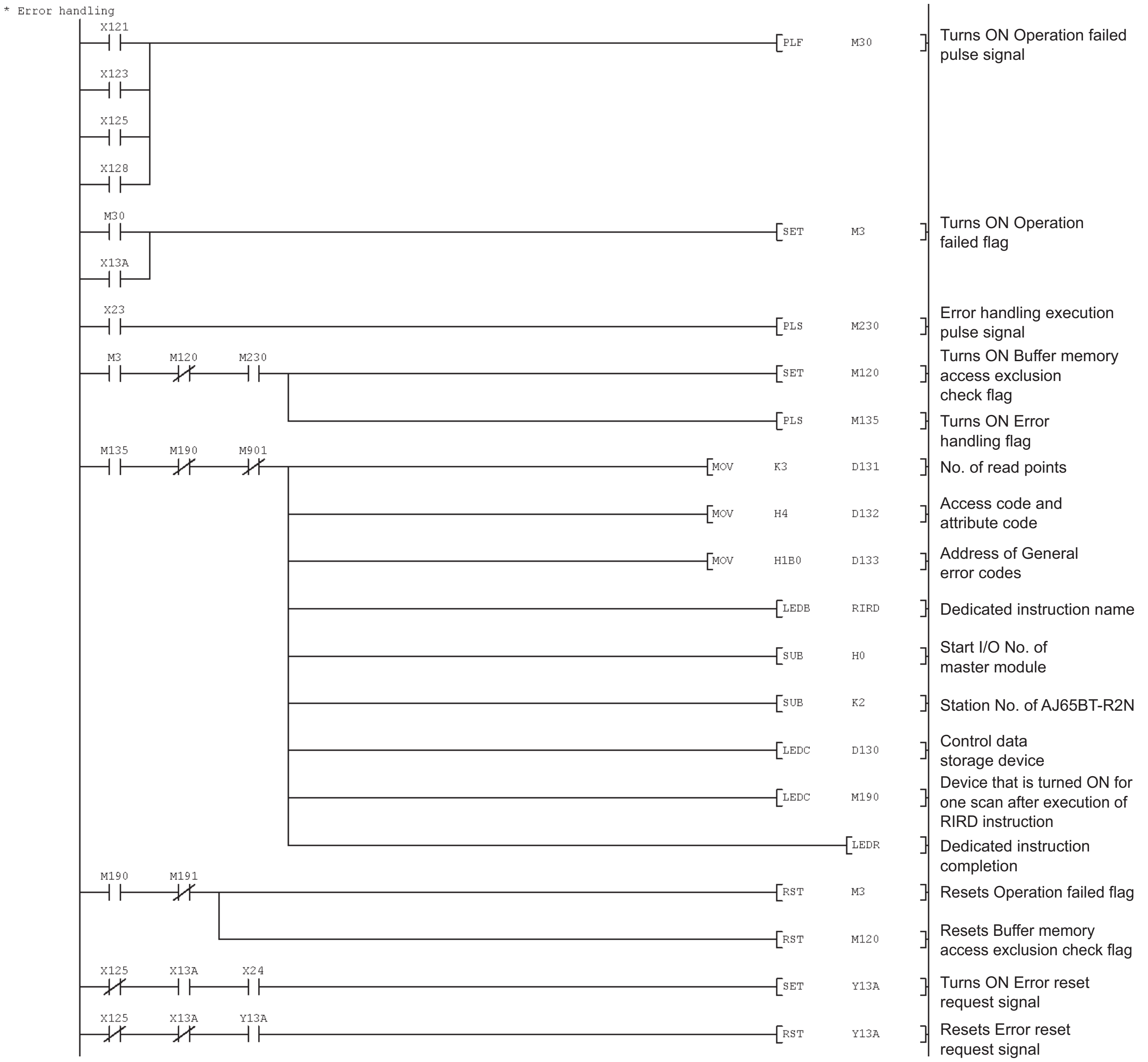

Figure 7.35 Program example for sending/receiving data with RISEND/RIRCV instruction (Continued)

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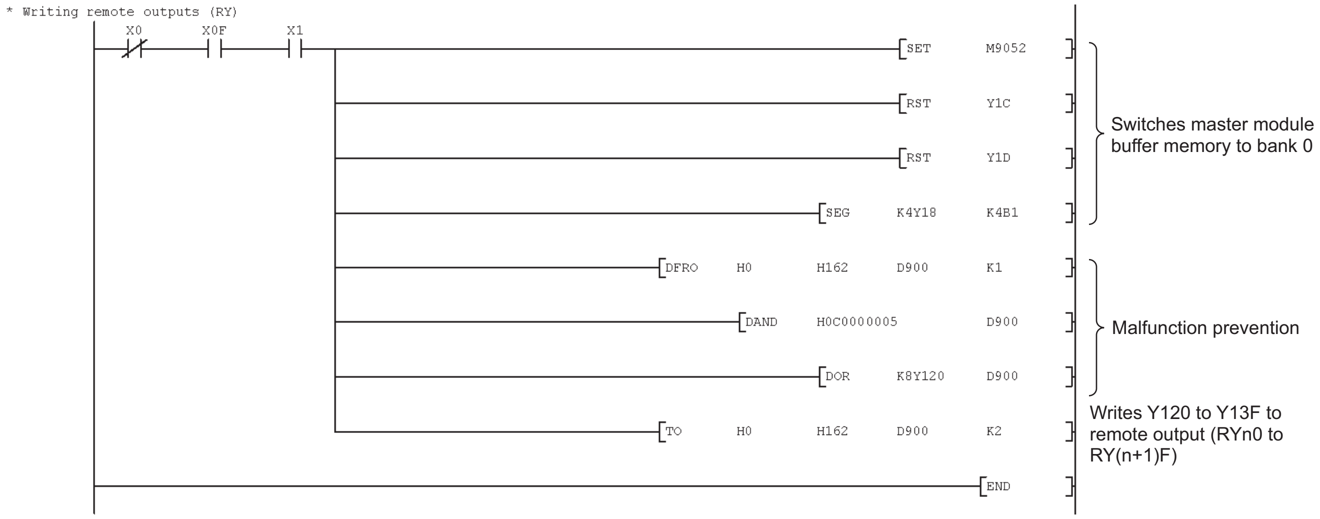

Switches master module buffer memory to bank 0

Malfunction prevention

Writes Y120 to Y13F to remote output (RYn0 to RY(n+1)F)

Figure 7.35 Program example for sending/receiving data with RISEND/RIRCV instruction (Continued)

☒Point

When sending/receiving data of 481 words or more to/from the external device using a RISEND or RIRCV instruction, divide the data into parts, each of which contains 480 words or less, to write and read to the AJ65BT-R2N.
With RISEND and RIRCV instructions, data of 481 words or more cannot be written or read to the AJ65BT-R2N at one time.

7.9.3 Program example for receiving data when a receive timeout occurs

(1) Overview of program example

- The receive timeout time is set to 200ms.
- If a receive timeout error (BB21H) occurs, data received up to that point are read out from the AJ65BT-R2N buffer memory to word devices of the master station.
- After reading is completed, the error is cleared.

(2) For the send/receive buffer communication function

(a) Devices used in the program example

Table 7.43 Devices used in the program example

Device	Description	Device	Description
X0	Module error (Master station)	Y127	E^{2}PROM function request signal
X1	Own station data link status (Master station)	Y139	Initial data read request signal
X0F	Module ready (Master station)	Y13A	Error reset request signal
X23	Error code read flag	M0	Operation start request flag
X24	Error clear flag	M1	Initial setting write completion flag
K4X120	Remote input (X120 to X12F)	M2	Operation complete flag
X122	Normal receive data read request signal	M3	Operation failed flag
X123	Error receive data read request signal	M10	Device that is turned ON for one scan after completion of RIWT
X124	Initialization complete signal	M11	Device that is turned ON for one scan after failure of writing by RIWT
X125	Initialization failed signal	M20	AJ65BT-R2N initial setting start flag
K1X134	Mode setting switch status signal (X134 to X137)	M22	Error clear request
X13A	Error status signal	M24	Operation complete pulse signal
X13B	Remote station ready signal	M30	Operation failed pulse signal
K4Y18	Output (Y18 to Y27) (Master station)	M100	Master station parameter setting start pulse signal
Y1C	Buffer memory bank switching specification (Master station)	M101	Device that is turned ON for one scan after completion of RLPA
Y1D		M102	Device that is turned ON for one scan after failure of writing by RLPA
K8Y120	Remote output (Y120 to Y13F)	M120	Buffer memory access exclusion check flag
Y120	Send request signal	M130	Receiving flag
Y121	Send cancel request signal	M135	Error handling flag
Y122	Receive data read completion signal	M155	Device that is turned ON for one scan after completion of RIRD
Y123	Forced receive completion request signal	M156	Device that is turned ON for one scan after failure of reading by RIRD
Y124	Initialization request signal	M160	Device that is turned ON for one scan after completion of RIRD
Y126	OS reception area clear request signal	M161	Device that is turned ON for one scan after failure of reading by RIRD

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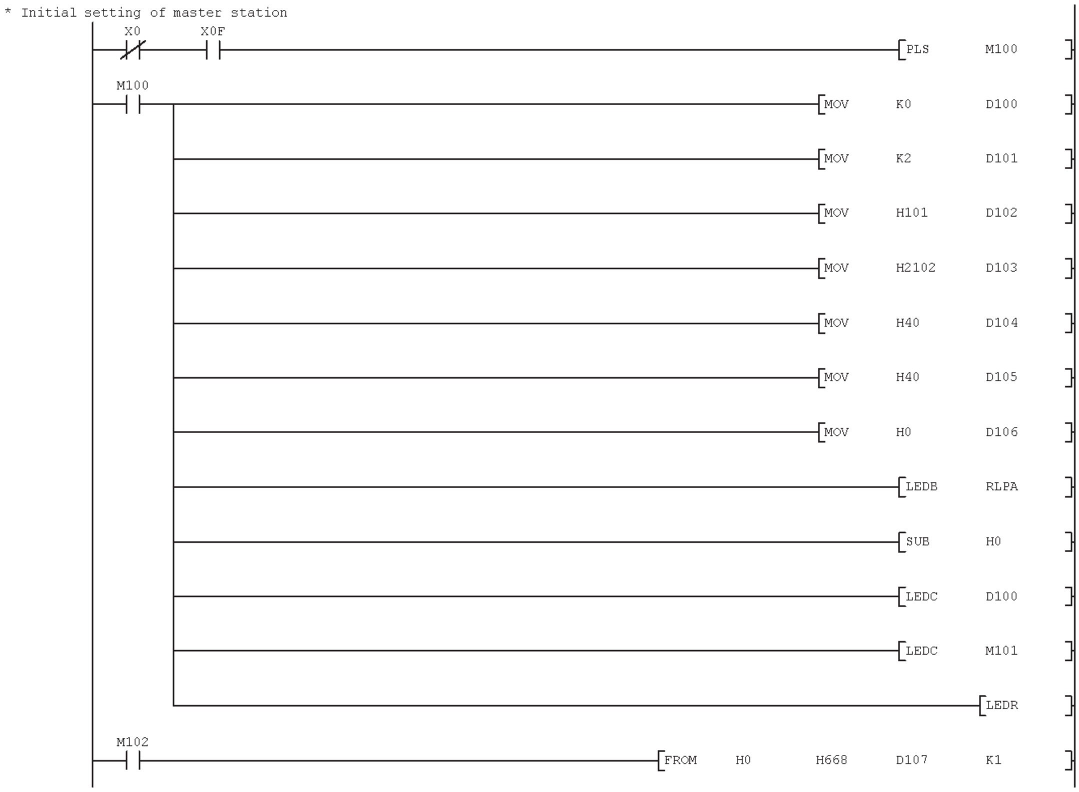
Table 7.43 Devices used in the program example (Continued)

Device	Description	Device	Description
M165	Device that is turned ON for one scan after completion of RIRD	M9036	Always ON
M166	Device that is turned ON for one scan after failure of reading by RIRD	M9052	SEG instruction switching
M190	Device that is turned ON for one scan after completion of RIRD	D0 to D4	Control data of RIWT instruction, and set values
M191	Device that is turned ON for one scan after failure of reading by RIRD	From D30	Control data of RIRD instruction, and receive data
M230	Error handling execution pulse signal	D100 to D106	Network parameters of master station
M502	AJ65BT-R2N mode normal flag	D107	Error code in Network parameters setting
M503	AJ65BT-R2N mode error flag	D130 to D136	Control data of RIRD instruction, and error code of AJ65BT-R2N
K4M900	Other station data link status (SW0080)	D396 to D400	Control data of RIRD instruction, and error code reported when receiving
M901	Other station data link status (Station No.2)	D900	Master module RY(n+1)E, RY(n+1)F

(b) Program example



Turns ON Master station parameter setting start pulse signal

Synchronous mode enable/disable

No. of modules connected

Device station setting information of remote I/O station

Device station setting information of AJ65BT-R2N

Send buffer size

Receive buffer size

Auto-refresh buffer size

Dedicated instruction name

Start I/O No. of master module

Link parameter storage device

Device that is turned ON for one scan after execution of RLPA instruction

Dedicated instruction completion

Reads error code from master module buffer memory

Figure 7.36 Program example for receiving data when a receive timeout occurs

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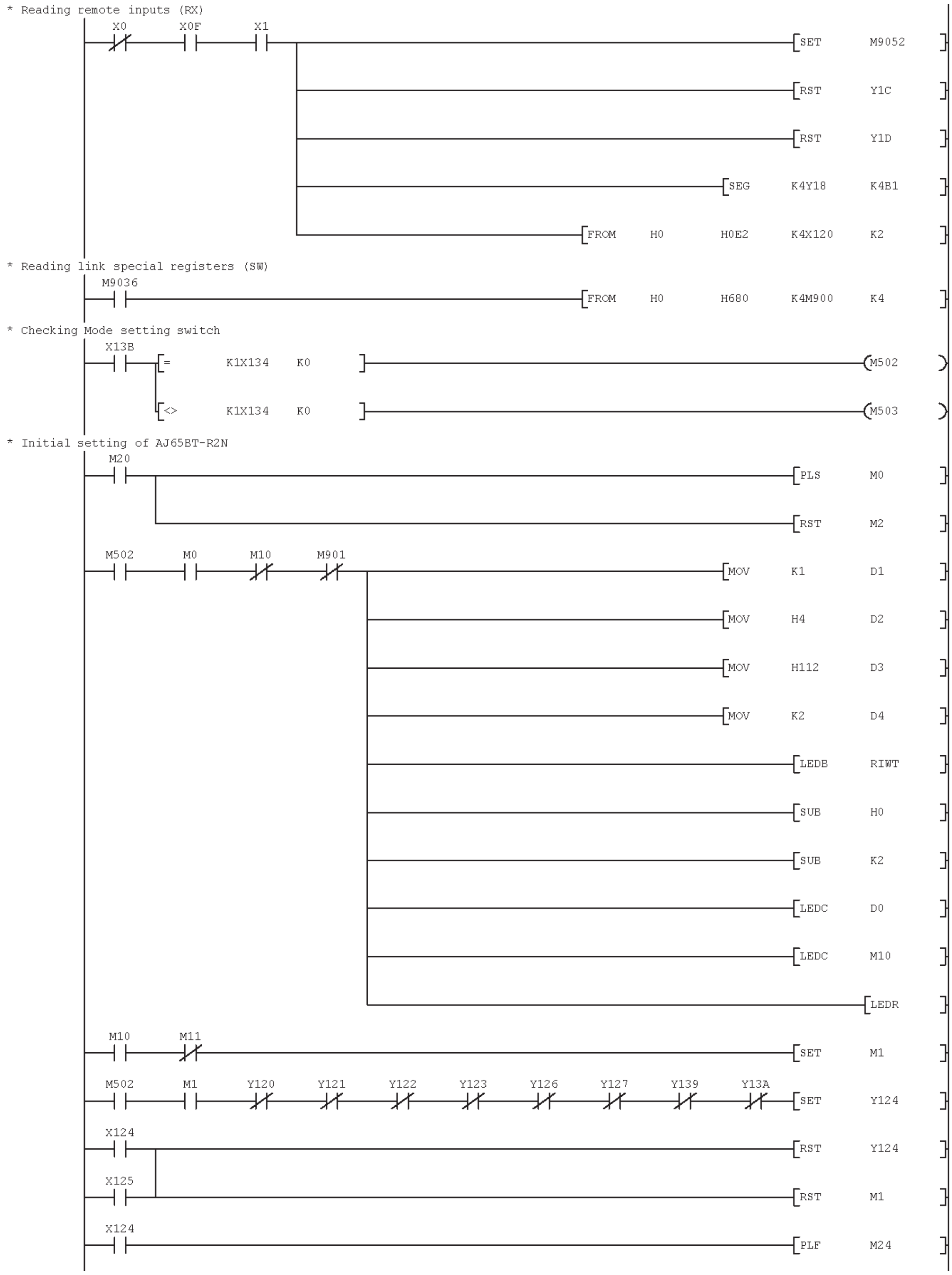

Switches master module buffer memory to bank 0

Reads remote input (RXn0 to RX(n+1)F) to X120 to X13F

Reads link special register (SW0080) to M900 to M916

Turns ON AJ65BT-R2N mode normal flag

Turns ON AJ65BT-R2N mode error flag

Turns ON Operation start request flag

Resets Operation complete flag

No. of write points

Access code and attribute code

Receive timeout time specification address

Specifies 200ms for Receive timeout time specification

Dedicated instruction name

Start I/O No. of master module

Station No. of AJ65BT-R2N

Control data storage device

Device that is turned ON for one scan after execution of RIWT instruction

Dedicated instruction completion

Turns ON Initial setting write completion flag

Turns ON Initialization request signal

Resets Initialization request signal

Resets Initial setting write completion flag

Turns ON Operation complete pulse signal

Figure 7.36 Program example for receiving data when a receive timeout occurs (Continued)

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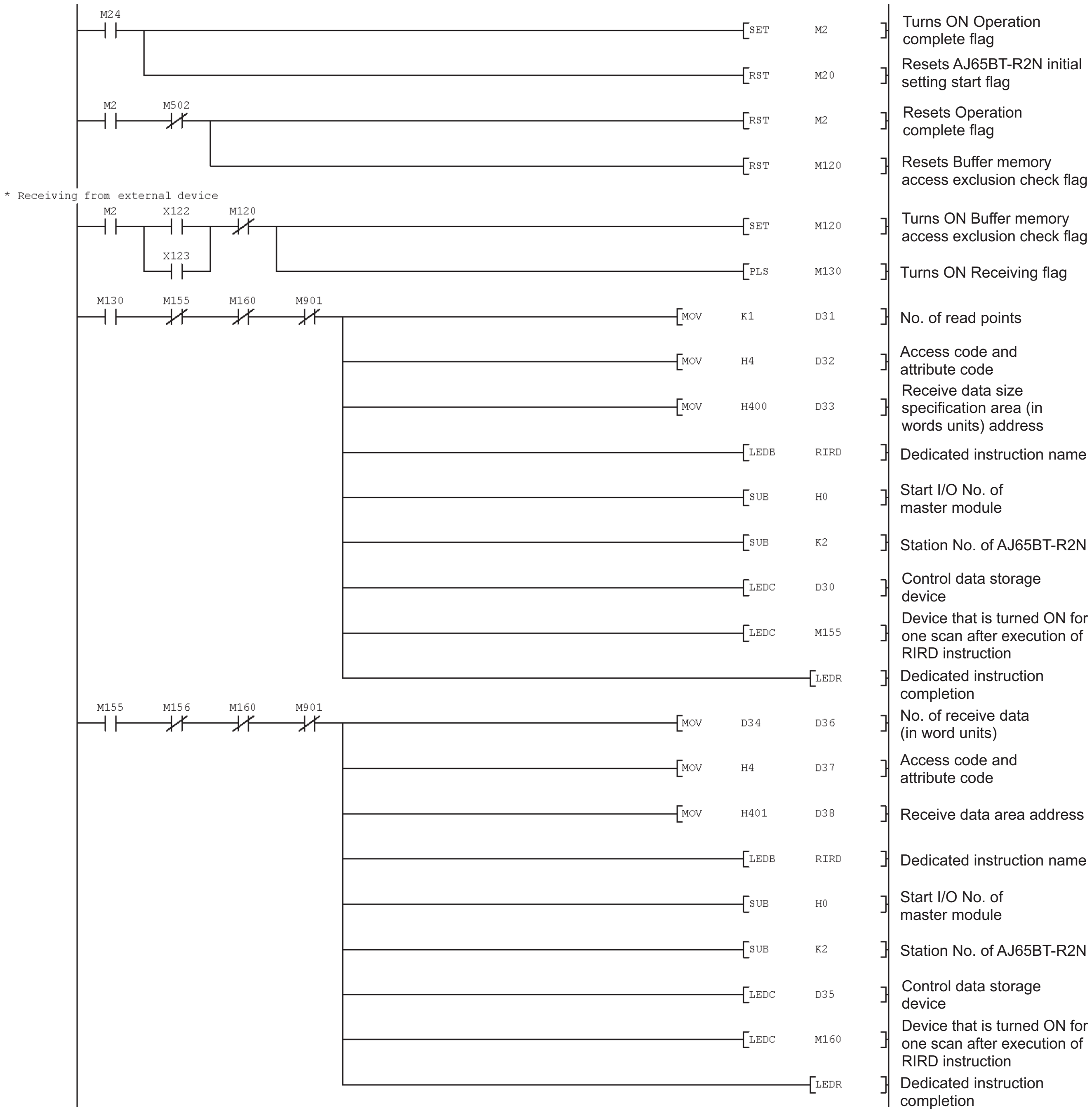

Figure 7.36 Program example for receiving data when a receive timeout occurs (Continued)

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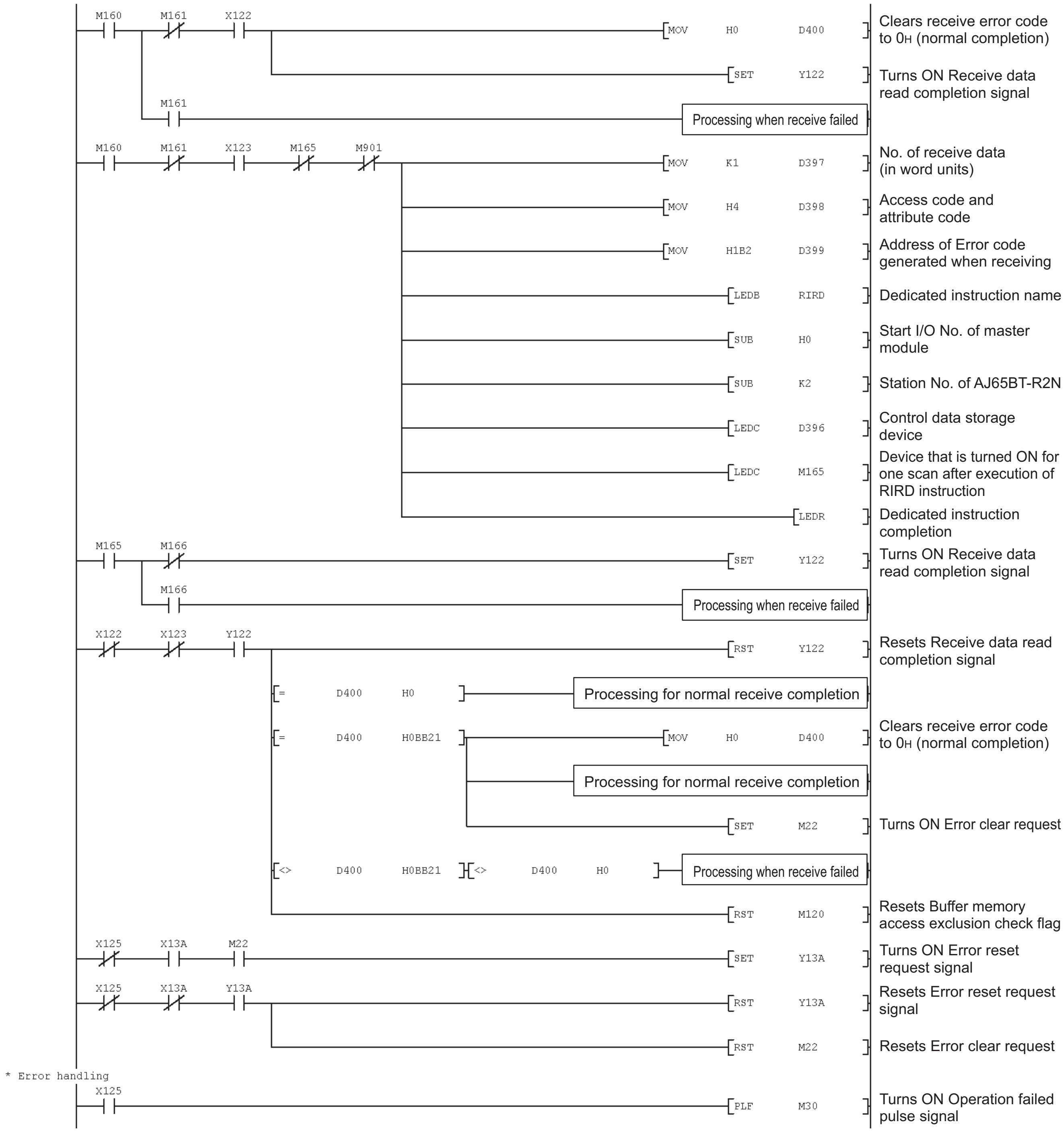

Figure 7.36 Program example for receiving data when a receive timeout occurs (Continued)

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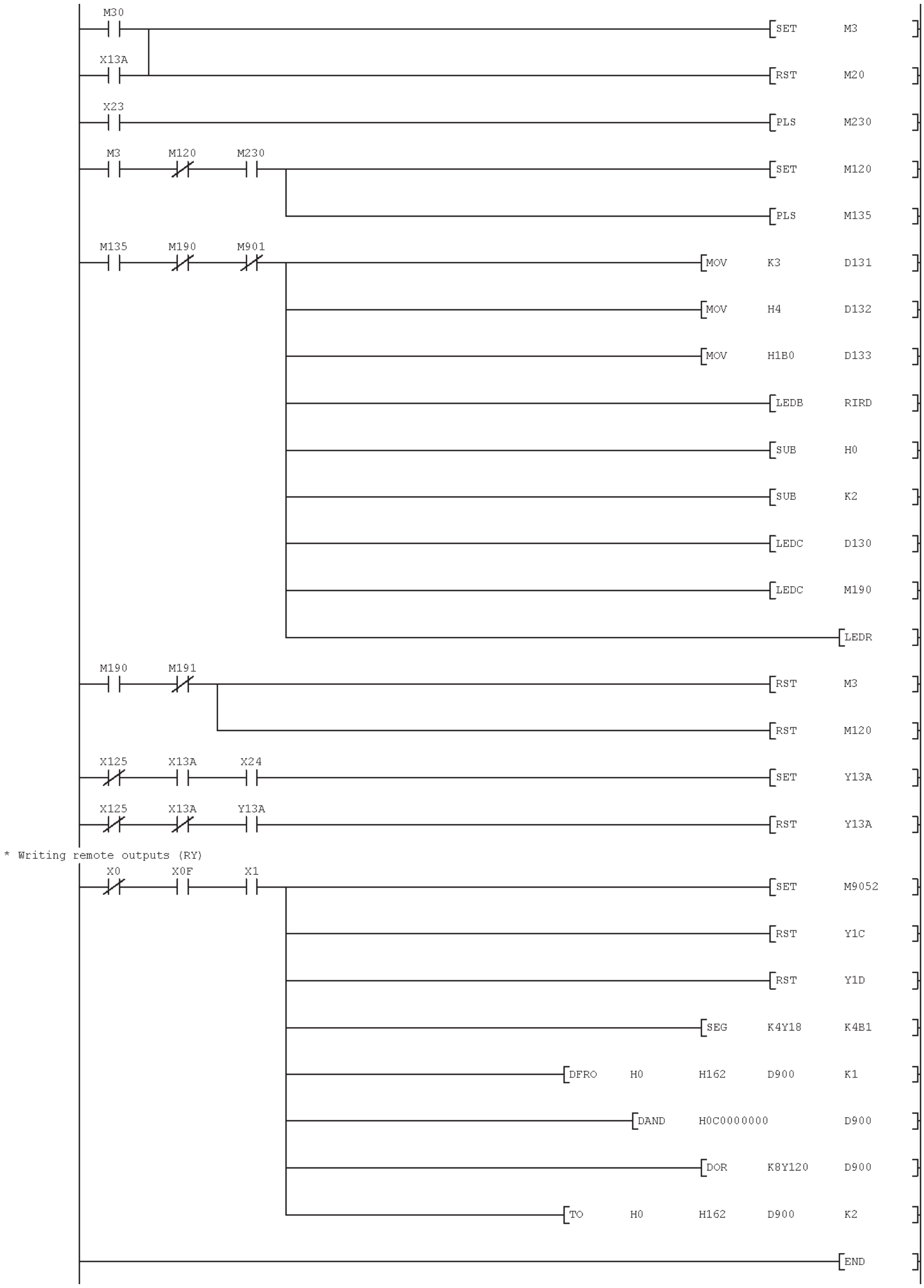


Turns ON Operation failed flag

Resets AJ65BT-R2N initial setting start flag

Error handling execution pulse signal

Turns ON Buffer memory access exclusion check flag

Turns ON Error handling flag

No. of read points

Access code and attribute code

Address of General error codes

Dedicated instruction name

Start I/O No. of master module

Station No. of AJ65BT-R2N

Control data storage device

Device that is turned ON for one scan after execution of RIRD instruction

Dedicated instruction completion

Resets Operation failed flag

Resets Buffer memory access exclusion check flag

Turns ON Error reset request signal

Resets Error reset request signal

Switches master module buffer memory to bank 0

Malfunction prevention

Writes Y120 to Y13F to remote output (RYn0 to RY(n+1)F)

Figure 7.36 Program example for receiving data when a receive timeout occurs (Continued)

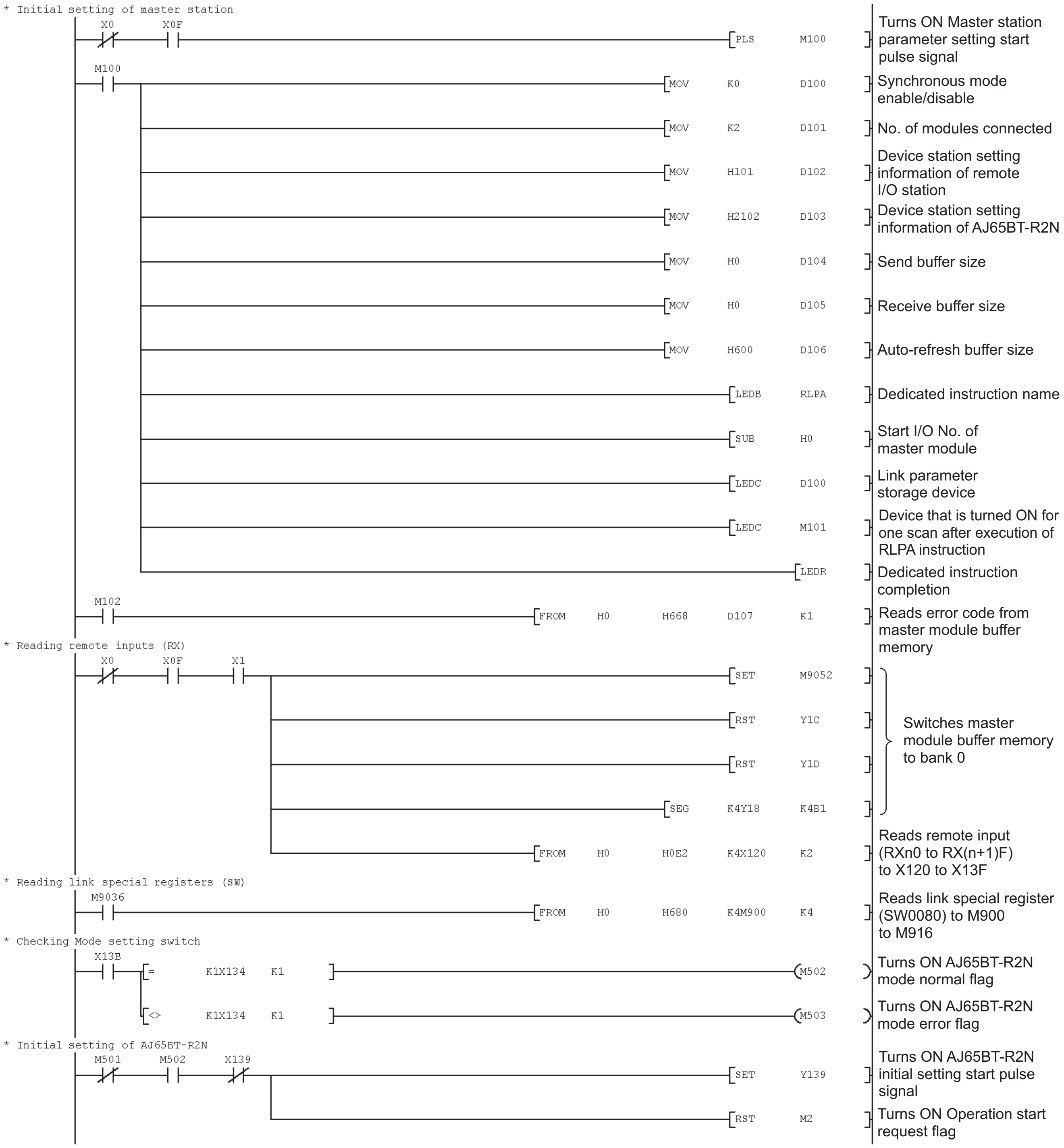
(3) For the buffer memory auto-refresh function

(a) Devices used in the program example

Table 7.44 Devices used in the program example

Device	Description	Device	Description
X0	Module error (Master station)	M0	Operation start request flag
X1	Own station data link status (Master station)	M1	Initial setting write completion flag
X0F	Module ready (Master station)	M2	Operation complete flag
X23	Error code read flag	M3	Operation failed flag
X24	Error clear flag	M22	Error clear request
K4X120	Remote input (X120 to X12F)	M24	Operation complete pulse signal
X122	Normal receive data read request signal	M30	Operation failed pulse signal
X123	Error receive data read request signal	M100	Master station parameter setting start pulse signal
X124	Initialization complete signal	M101	Device that is turned ON for one scan after completion of RLPA
X125	Initialization failed signal	M102	Device that is turned ON for one scan after failure of writing by RLPA
K1X134	Mode setting switch status signal (X134 to X137)	M111	Initial data read completion pulse signal
X13A	Error status signal	M135	Error handling flag
X13B	Remote station ready signal	M230	Error handling execution pulse signal
K4Y18	Output (Y18 to Y27) (Master station)	M500	AJ65BT-R2N initial data read complete flag
Y1C	Buffer memory bank switching specification (Master station)	M501	AJ65BT-R2N initial data reading flag
Y1D		M502	AJ65BT-R2N mode normal flag
K4Y120	Remote output (Y120 to Y12F)	M503	AJ65BT-R2N mode error flag
Y120	Send request signal	K4M900	Other station data link status (SW0080)
Y121	Send cancel request signal	M901	Other station data link status (Station No.2)
Y122	Receive data read completion signal	M9036	Always ON
Y123	Forced receive completion request signal	M9052	SEG instruction switching
Y124	Initialization request signal	D10	Set value
Y126	OS reception area clear request signal	D100 to D106	Network parameters of master station
Y127	E^{2}PROM function request signal	D107	Error code in Network parameters setting
Y139	Initial data read request signal	From D200	No. of receive data, receive data
Y13A	Error reset request signal	D400 to D402	AJ65BT-R2N error code

(b) Program example



Turns ON Master station parameter setting start pulse signal

Synchronous mode enable/disable

No. of modules connected

Device station setting information of remote I/O station

Device station setting information of AJ65BT-R2N

Send buffer size

Receive buffer size

Auto-refresh buffer size

Dedicated instruction name

Start I/O No. of master module

Link parameter storage device

Device that is turned ON for one scan after execution of RLPA instruction

Dedicated instruction completion

Reads error code from master module buffer memory

Switches master module buffer memory to bank 0

Reads remote input (RXn0 to RX(n+1)F) to X120 to X13F

Reads link special register (SW0080) to M900 to M916

Turns ON AJ65BT-R2N mode normal flag

Turns ON AJ65BT-R2N mode error flag

Turns ON AJ65BT-R2N initial setting start pulse signal

Turns ON Operation start request flag

Figure 7.37 Program example for receiving data when a receive timeout occurs

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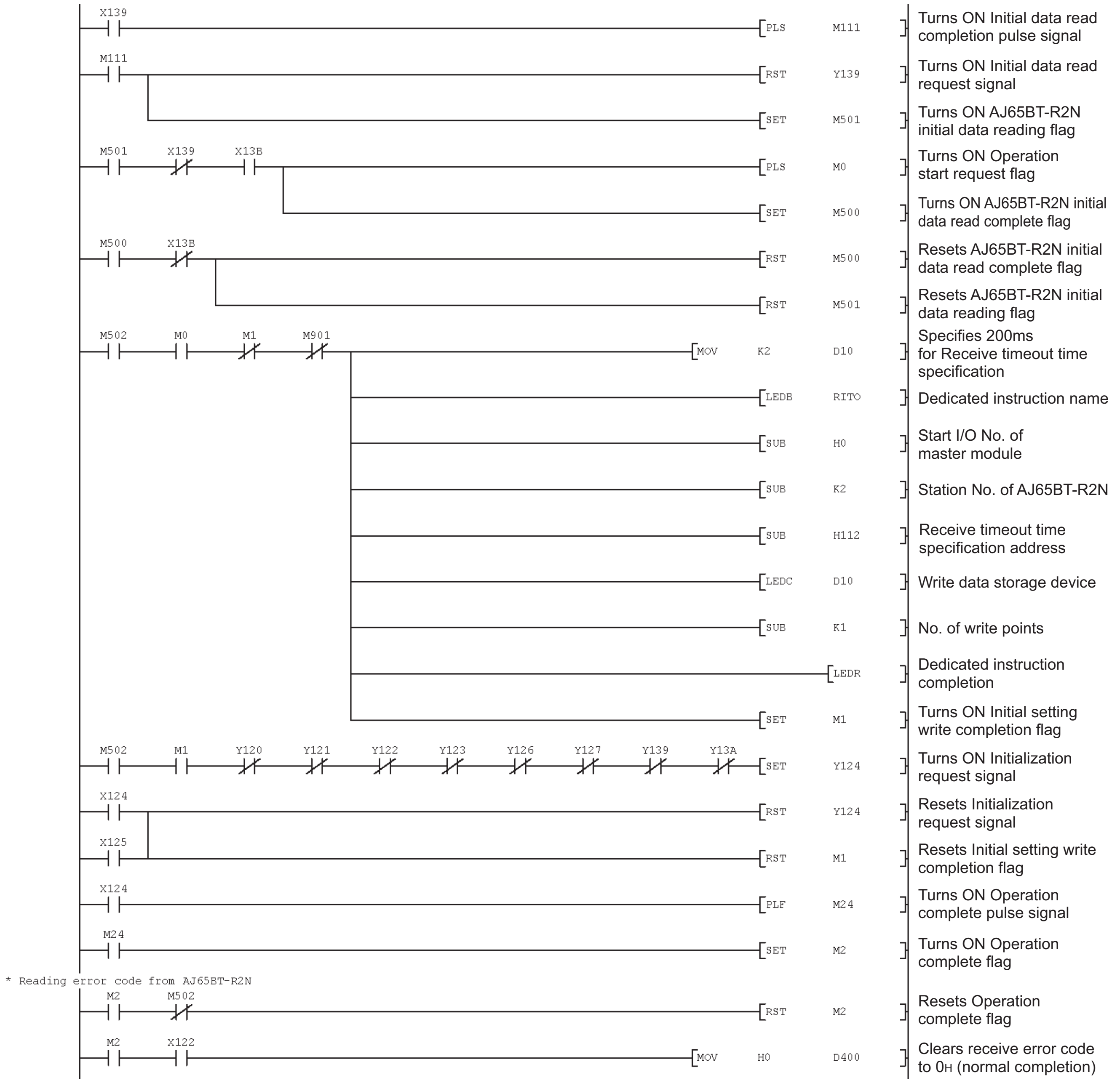

Figure 7.37 Program example for receiving data when a receive timeout occurs (Continued)

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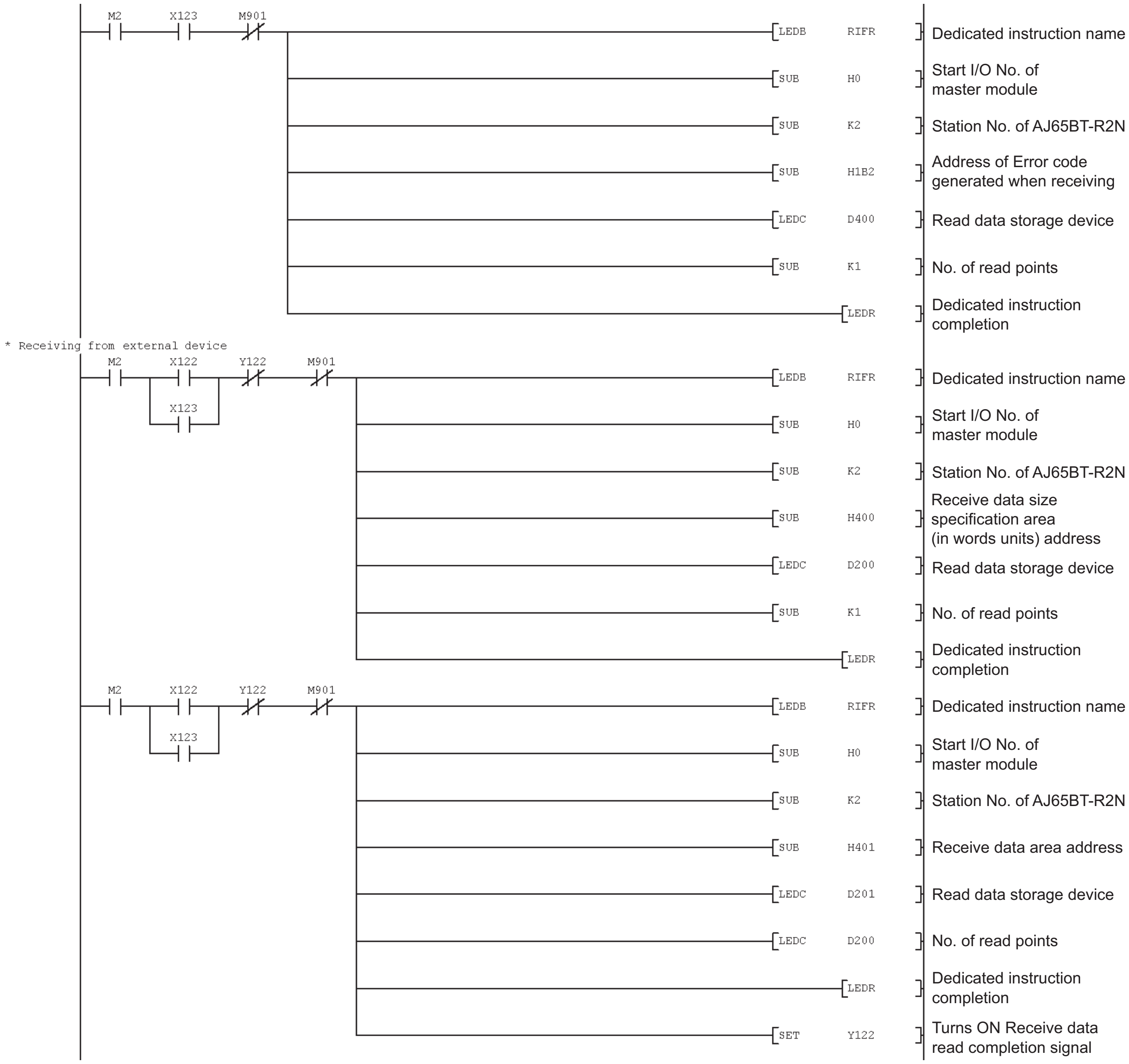

Figure 7.37 Program example for receiving data when a receive timeout occurs (Continued)

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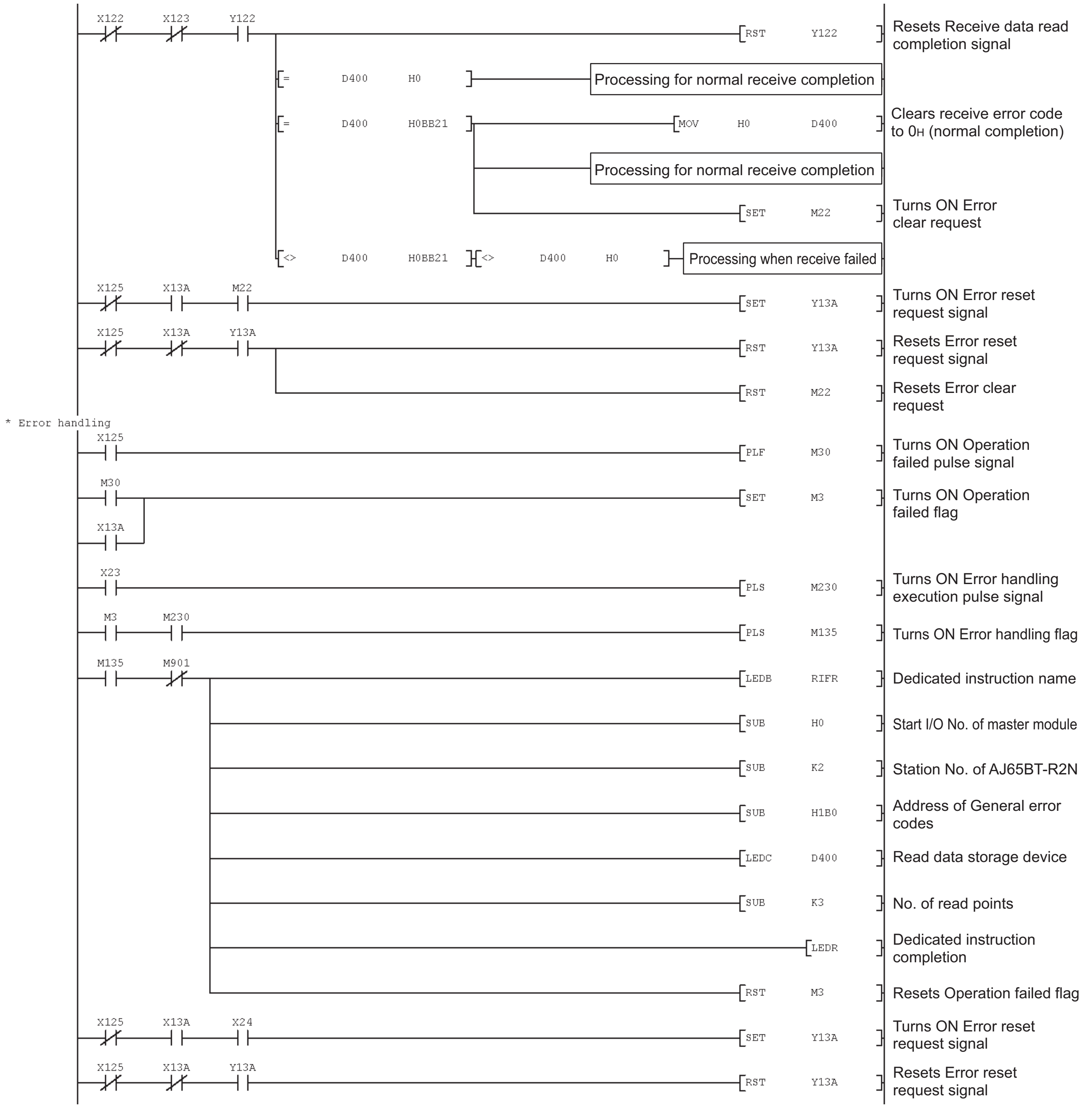

Figure 7.37 Program example for receiving data when a receive timeout occurs (Continued)

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1 OVERVIEW
2 SYSTEM CONFIGURATION
3 SPECIFICATIONS
4 FUNCTIONS
5 SET-UP AND PROCEDURE BEFORE OPERATION
6 PROGRAMMING FOR USING QCPU (Q MODE)/ QnACPU
7 PROGRAMMING WHEN USING DEDICATED INSTRUCTIONS IN ACPU/QCPU (A MODE)
8 PROGRAMMING WHEN USING FROM/TO INSTRUCTION IN ACPU/QCPU (A MODE)

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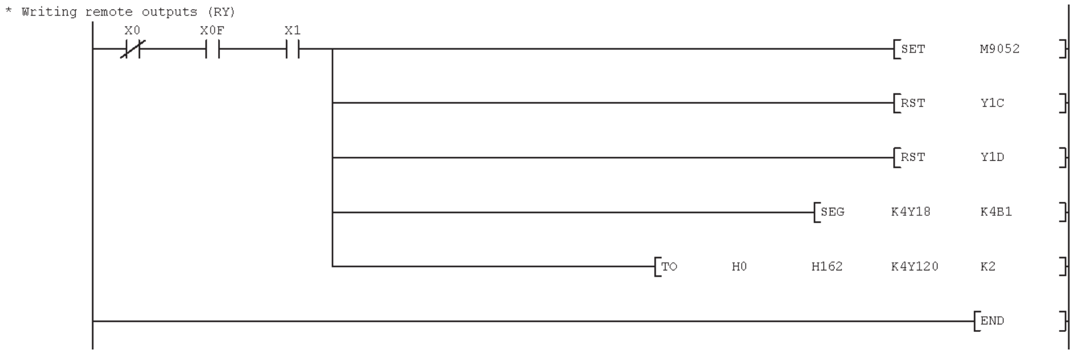

Switches master module buffer memory to bank 0

Writes Y120 to Y13F to remote output (RYn0 to RY(n+1)F)

Figure 7.37 Program example for receiving data when a receive timeout occurs (Continued)

CHAPTER 8 PROGRAMMING WHEN USING FROM/TO INSTRUCTION IN ACPU/QCPU (A MODE)

(1) How to read this chapter

(a) System configuration
This explains the system for executing the programs described in this chapter.

☞ CHAPTER 8 (2) System configuration for program

(b) Setting of each station
This explains the setting of the master station, remote I/O station and AJ65BT-R2N.

☞ Section 8.1 Setting of Each Station

(c) Executable programs
Various programs are shown, which can be operated when the settings and system configuration are the same as those given in this chapter.

- Send/Receive program

  ☞ Section 8.2 Entire Send/Receive Program Structure
- Program for changing the auto-refresh buffer assignments and registering the assignment settings to E^2PROM

  ☞ Section 8.9.1 Program example for changing auto-refresh buffer assignments
- Program for receiving data when a receive timeout occurs

  ☞ Section 8.9.2 Program example for receiving data when a receive timeout occurs

(d) Each program processing
Each processing in a program is explained.

☞ Section 8.3 Initial Setting for AJ65BT-R2N to Section 8.6 Error Handling of AJ65BT-R2N

(e) Programs used according to function
Programs used according to function are described.

Table 8.1 Programs added according to function

Function	Reference section
Initial setting for the frame function	Section 8.7
Initial setting for the monitoring-based transmission function	
Initial setting for the flow control function	
Initial setting for the ASCII-binary conversion function	
Initial setting for the RW refresh function	
Send cancel function	Section 8.8
Forced receive completion function	
OS reception area clear function	
E^2PROM function setting	

(2) System configuration for program

The following shows the system configuration for the program described in this chapter.

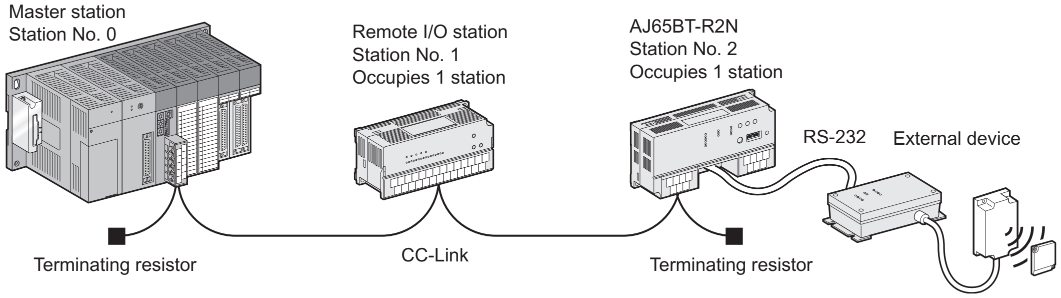

Figure 8.1 System configuration for program

(a) Master station

Table 8.2 Information of master station

Item	Description
Station No.	0
Data link transmission speed	156kbps
Start I/O No.	0000_H (Mounting position of master module)
All connect count	2
Input (X) that reads from RXn0 to RX(n+1)F of AJ65BT-R2N	X120 to X13F
Output (Y) that writes to RYn0 to RY(n+1)F of AJ65BT-R2N	Y120 to Y13F

(b) Remote I/O station

Table 8.3 Information of remote I/O station

Item	Description
Station No.	1
Data link transmission speed	156kbps
No. of occupied stations	Occupies 1 station

(c) AJ65BT-R2N

Table 8.4 Information of AJ65BT-R2N

Item		Description
Station No.		2
Transmission speed of data link		156kbps
RS-232 transmission speed		300bps
No. of occupied stations		Occupies 1 station
Mode setting switch	Using send/receive buffer communication function	0 (Mode 0)
	Using buffer memory auto-refresh function	1 (Mode 1)
Send buffer size	Using send/receive buffer communication function	64 words*1
	Using buffer memory auto-refresh function	0 word
Receive buffer size	Using send/receive buffer communication function	64 words*1
	Using buffer memory auto-refresh function	0 word
Auto-refresh buffer size	Using send/receive buffer communication function	0 word
	Using buffer memory auto-refresh function	1536 words*2

* 1 When sending/receiving data of 57 words or more, change each buffer size by sequence program (☞ Section 8.1.1 (2)).

* 2 When sending/receiving data of 512 words or more, change the auto-refresh buffer size by the sequence program (☞ Section 8.1.1 (2)) and change the assignment of the auto-refresh buffer.

(d) Sendable message

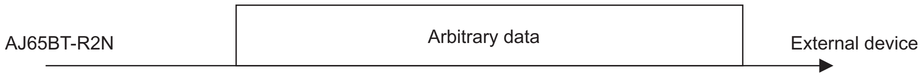

Figure 8.2 Sendable message

Table 8.5 Information of sendable message

Item		Description
Start frame		None*1
End frame		None*1
Data size (including above frames)	Using send/receive buffer communication function	56 words or less*2
	Using buffer memory auto-refresh function	511 words or less*3

* 1 If required by the external device, each of the frames can be sent.

* 2 When sending/receiving the data mentioned above or more, change the buffer size by the sequence program (☞ Section 8.1.1 (2)).

* 3 When sending/receiving data of 512 words or more, change the auto-refresh buffer size by the sequence program (☞ Section 8.1.1 (2)) and change the assignment of the auto-refresh buffer.

(e) Receivable message

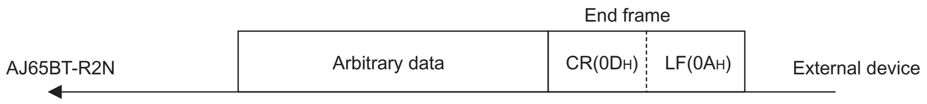

Figure 8.3 Receivable message

Table 8.6 Information of receivable message

Item		Description
Start frame		None
End frame		CR(0DH)＋LF(0AH)
Data size (including above frames)	Using send/receive buffer communication function	56 words or less*1
	Using buffer memory auto-refresh function	509 words or less*2

* 1 When sending/receiving the data mentioned above or more, change the buffer size by the sequence program (☞ Section 8.1.1 (2)).

* 2 When sending/receiving data of 510 words or more, change the auto-refresh buffer size by the sequence program (☞ Section 8.1.1 (2)) and change the assignment of the auto-refresh buffer.

Remark

Receive data must not contain CR(0DH)＋LF(0AH).
If CR(0DH)＋LF(0AH) is included, the CR(0DH)＋LF(0AH) is regarded as the end frame, resulting in termination of the reception.

8.1 Setting of Each Station

8.1.1 Setting AJ61BT11 or A1SJ61BT11

When using the AJ61BT11 or A1SJ61BT11, the switches and parameters must be set.

(1) Switch setting
Switch setting for the master station is performed with the switches on the master module.

Table 8.7 Each switch setting example

Item		Description	Set value
Station No. setting switch		Master station	0
Mode setting switch		Online (Remote net mode)	0
Transmission speed setting switch		156kbps	0
Condition setting switch	SW1	Station type: Master station/Local station	OFF
	SW2, SW3	Use prohibited	OFF
	SW4	Input data status of data link error station: Cleared	OFF
	SW5, SW6	No. of occupied stations: Invalid	OFF
	SW7	Use prohibited	OFF
	SW8	Module mode: Intelli. mode	OFF

(2) Parameter setting
Set parameters for the master station with the sequence program (dedicated instructions).

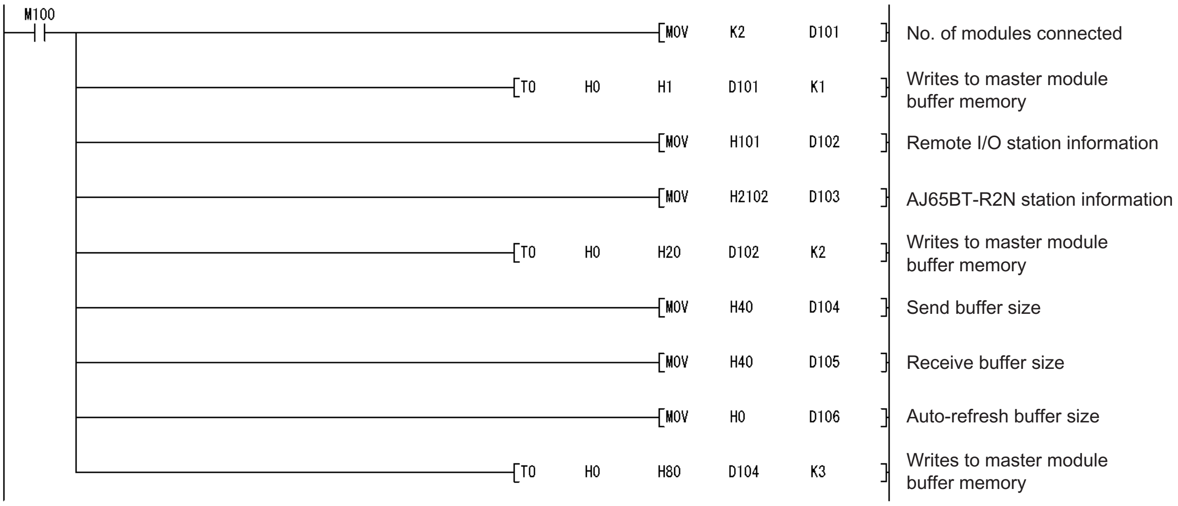

Figure 8.4 Network parameters setting example (When using the send/receive buffer communication function)

Table 8.8 Network parameters setting example

Item		Set value		
Synchronous mode valid/invalid		0 (When synchronous mode is invalid)		
Number of stations connected for communication		2		
Device station setting information		**Device station type**	**No. of occupied device stations**	**Station No.**
	Remote I/O station	0 (Remote I/O station)	1	1
	AJ65BT-R2N	2 (Intelligent device station)	1	2
Send buffer size of AJ65BT-R2N		•When using send/receive buffer communication function: 40H[*1] •When using buffer memory auto-refresh function: 0H		
Receive buffer size of AJ65BT-R2N		•When using send/receive buffer communication function: 40H[*1] •When using buffer memory auto-refresh function: 0H		
Auto-refresh buffer size of AJ65BT-R2N		•When using send/receive buffer communication function: 0H •When using buffer memory auto-refresh function: 600H[*2]		

[*1] When sending/receiving data of 57 words or more, change the value to "(Send/receive data size) ＋8 words".

[*2] When sending/receiving data of 512 words or more, change the auto-refresh buffer size by the sequence program (☞ Section 8.1.1 (2)) and change the assignment of the auto-refresh buffer.

8.1.2 Remote I/O station setting

For the setting method, refer to the manual for the remote I/O station.

Table 8.9 Remote I/O station setting example

Item	Set value
Station No.	1
Transmission speed	156kbps

8.1.3 AJ65BT-R2N setting

Perform the AJ65BT-R2N settings with each switch of the AJ65BT-R2N.

Table 8.10 AJ65BT-R2N setting example

Item		Description	Set value
Station No. setting switch		Station No.2	×10:0 ×1:2
Data link transmission speed setting switch		156kbps	0
Mode setting switch		•Using send/receive buffer communication function (Mode 0)	0
		•Using buffer memory auto-refresh function (Mode 1)	1
RS-232 transmission setting switches	SW1 to SW4	Transmission speed: 300bps	OFF
	SW5	Data bit length: 8	ON
	SW6, SW7	Parity bit: None	OFF
	SW8	Stop bit length: 1	OFF

8.2 Entire Send/Receive Program Structure

The programs in this section can be executed when the following system configuration and settings have been set.

☞ CHAPTER 8 (2) System configuration for program

☞ Section 8.1 Setting of Each Station

8.2.1 For the send/receive buffer communication function

(1) Overview of program example

(a) Initial setting program for master station ((3) in this section - **1**)
Parameters of the master station are set.

☞ Section 8.1.1 (2) Parameter setting

(b) Program for reading remote input (RX) ((3) in this section - **2**)
Remote input (RXn0 to RX(n+1)F) of the AJ65BT-R2N is read out to the input (X120 to X13F) of the programmable controller CPU.

(c) Mode setting switch check program ((3) in this section - **3**)
Whether the mode setting switch is set correctly or not is checked.

(d) AJ65BT-R2N initial setting program ((3) in this section - **4**)

1) When AJ65BT-R2N initial setting start flag (M20) is turned ON, settings are configured so that data reception is completed by the frame function upon receipt of CR(0DH)＋LF(0AH).
2) The AJ65BT-R2N is initialized.

☞ Section 8.3.1 For the send/receive buffer communication function

(e) Program for sending data to external device ((3) in this section - **5**)
If Send execute flag (X22) is turned ON, the character string "ABCDEF" is sent from the master station to the external device.

☞ Section 8.4.1 For the send/receive buffer communication function

(f) Program for receiving data from external device ((3) in this section - **6**)
When data are received from the external device, the received data are read out from the AJ65BT-R2N to the master station.

☞ Section 8.5.1 For the send/receive buffer communication function

(g) Error handling program ((3) in this section - **7**)

1) When an error occurs during initialization setting or data transfer, an error code will be read out from the AJ65BT-R2N to the master module if Error code read flag (X23) is turned ON.
2) The error is canceled when Error clear flag (X24) is turned ON after the cause of the error has been eliminated.

☞ Section 8.6.1 For the send/receive buffer communication function

(h) Program for writing remote output (RY) ((3) in this section - 8)
The programmable controller CPU output (Y120 to Y13F) is written to remote output (RYn0 to RY(n+1)F) of the AJ65BT-R2N.

(2) Devices used in the program example

Table 8.11 Devices used in the program example

Device	Description	Device	Description
X0	Module error (Master station)	M0	Operation start request flag
X1	Own station data link status (Master station)	M1	Initial setting write completion flag
X6	Data link start by parameters in buffer memory normally completed (Master station)	M2	Operation complete flag
X7	Data link start by parameters in buffer memory failed (Master station)	M3	Operation failed flag
X0F	Module ready (Master station)	M10	TO instruction executed flag
X22	Send execute flag	M11	Intelligent device station access request completion flag
X23	Error code read flag	M20	AJ65BT-R2N initial setting start flag
X24	Error clear flag	M22	Operation complete pulse signal
K4X120	Remote input (X120 to X12F)	M25	Send completion pulse signal
X120	Send complete signal	M30	Operation failed pulse signal
X121	Send failed signal	M100	Master station parameter setting start pulse signal
X122	Normal receive data read request signal	M120	Buffer memory access exclusion check flag
X123	Error receive data read request signal	M125	Sending flag
X124	Initialization complete signal	M130	Receiving flag
X125	Initialization failed signal	M135	Error handling flag
X128	E^2PROM function failed signal	M155	TO instruction executed flag
K1X134	Mode setting switch status signal (X134 to X137)	M156	Intelligent device station access request completion flag
X13A	Error status signal	M157	Read request completion flag
X13B	Remote station ready signal	M158	TO instruction executed flag
X13E	Intelligent device station access completion signal	M159	Intelligent device station access request completion flag
Y0	Refresh instruction (Master station)	M160	Read request completion flag
Y6	Request for data link start by parameters in buffer memory (Master station)	M180	TO instruction executed flag
K4Y18	Output (Y18 to Y27) (Master station)	M181	Intelligent device station access request completion flag
Y1C	Buffer memory bank switching specification (Master station)	M190	TO instruction executed flag
Y1D		M191	Intelligent device station access request completion flag
K8Y120	Remote output (Y120 to Y13F)	M220	Send execution pulse signal
Y120	Send request signal	M230	Error handling execution pulse signal
Y121	Send cancel request signal	M502	AJ65BT-R2N mode normal flag
Y122	Receive data read completion signal	M503	AJ65BT-R2N mode error flag
Y123	Forced receive completion request signal	K4M900	Other station data link status (SW0080)
Y124	Initialization request signal	M901	Other station data link status (Station No.2)
Y126	OS reception area clear request signal	M9036	Always ON
Y127	E^2PROM function request signal	M9052	SEG instruction switching
Y139	Initial data read request signal	D0 to D10	Control data of TO instruction, and set values or send data
Y13A	Error reset request signal	D30 to D36	Control data of TO instruction
Y13E	Intelligent device station access request signal	D37	No. of receive data

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Table 8.11 Devices used in the program example (Continued)

Device	Description	Device	Description
D40 to D46	Control data of TO instruction	D137 to D139	AJ65BT-R2N error code
D50 or later	Receive data	Z	No. of receive data
D101 to D106	Master station network parameters	P0	Switching to bank 0
D107	Error code in Network parameters setting	P1	Switching to bank 1
D130 to D136	Control data of TO instruction	—	

(3) Program example

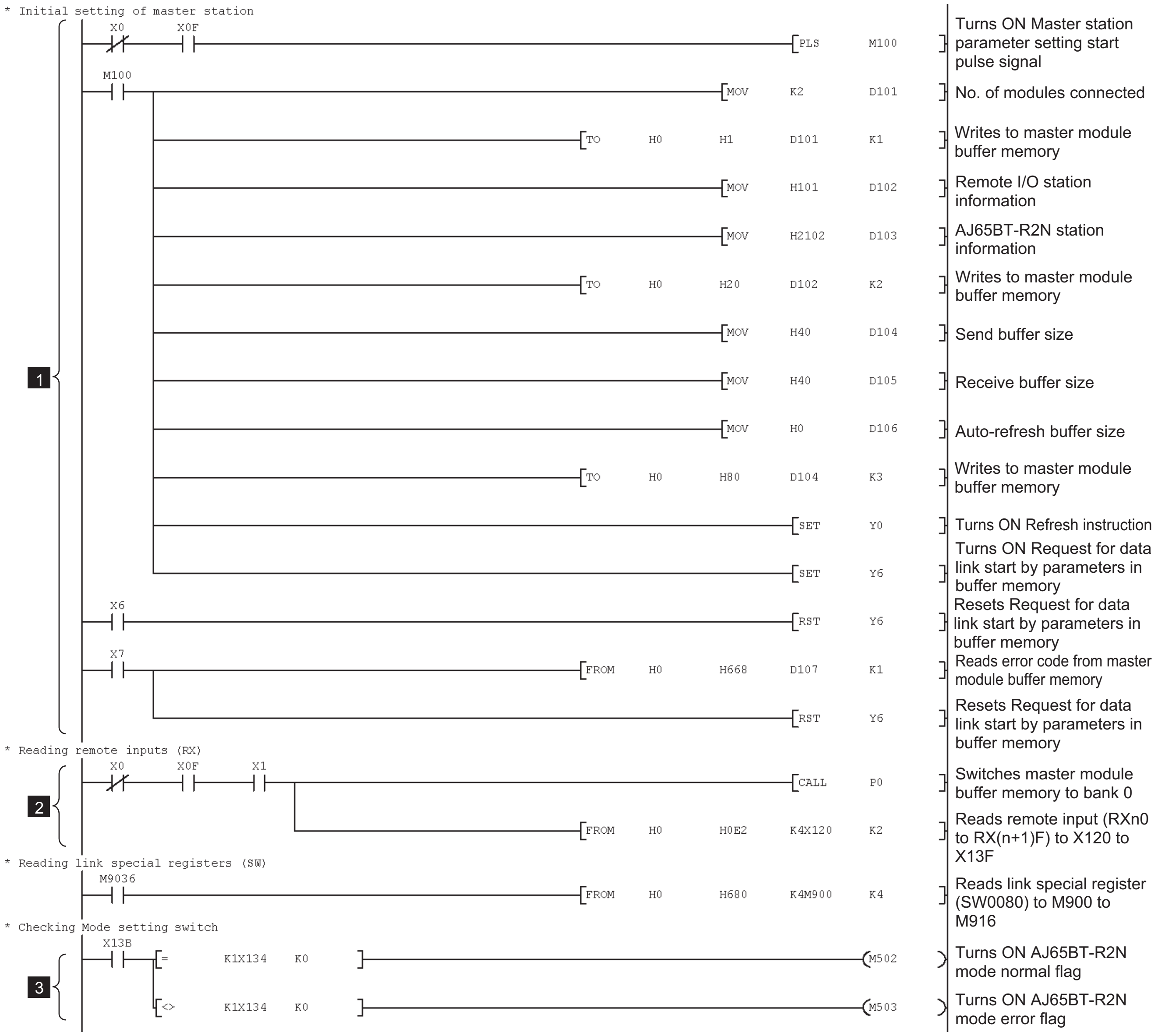

Figure 8.5 Program example

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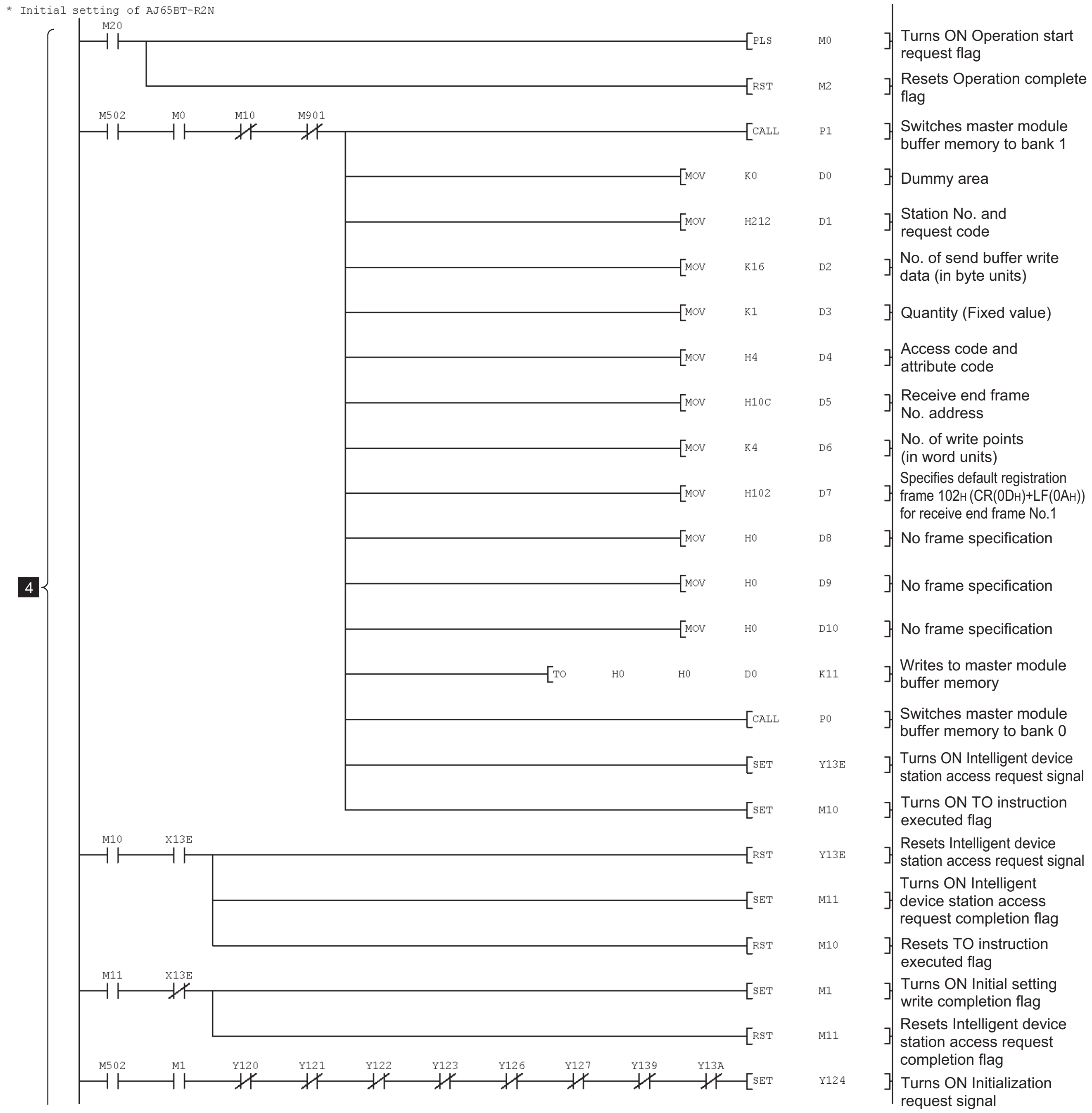

Figure 8.5 Program example (Continued)

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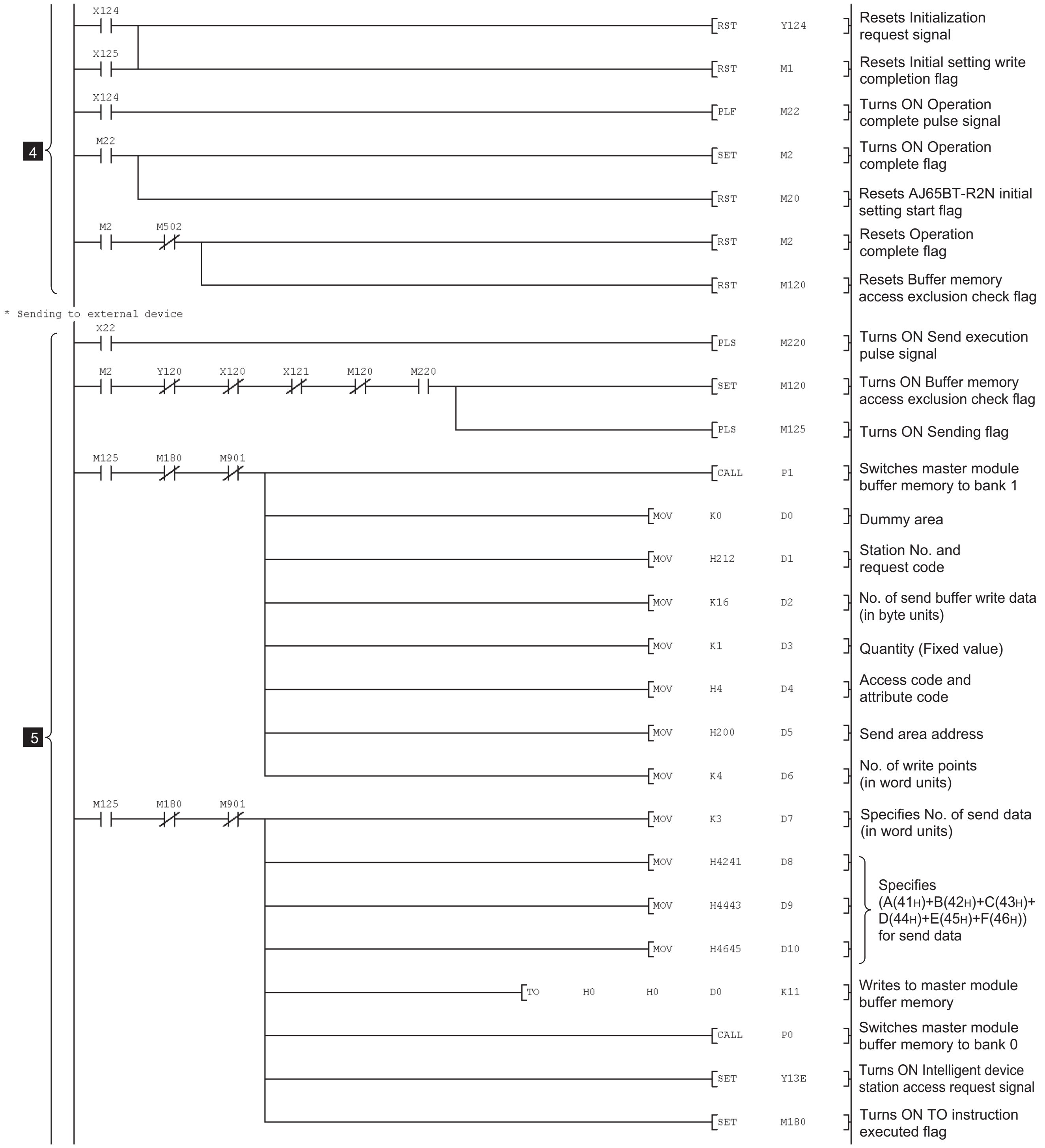

Figure 8.5 Program example (Continued)

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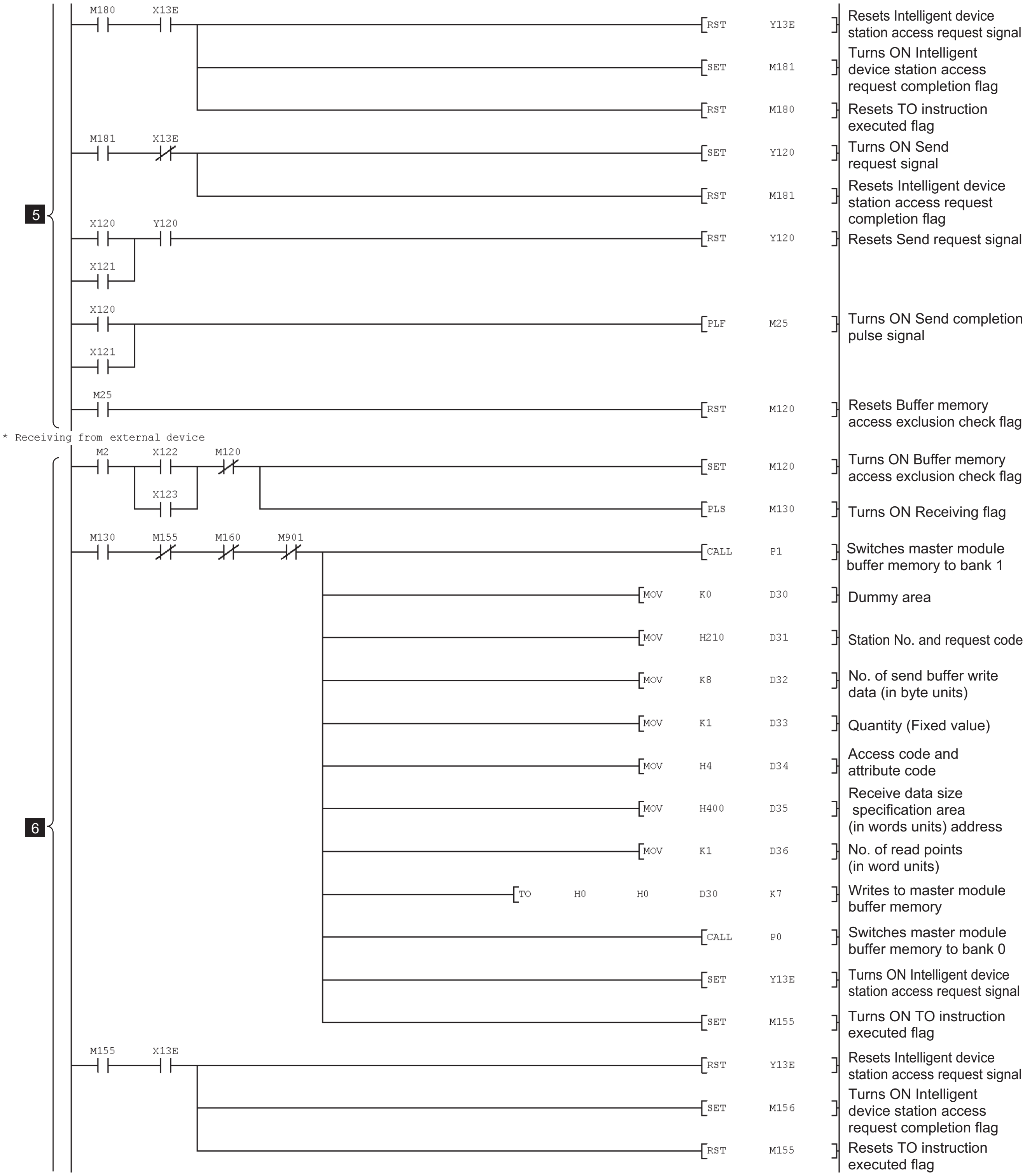

Figure 8.5 Program example (Continued)

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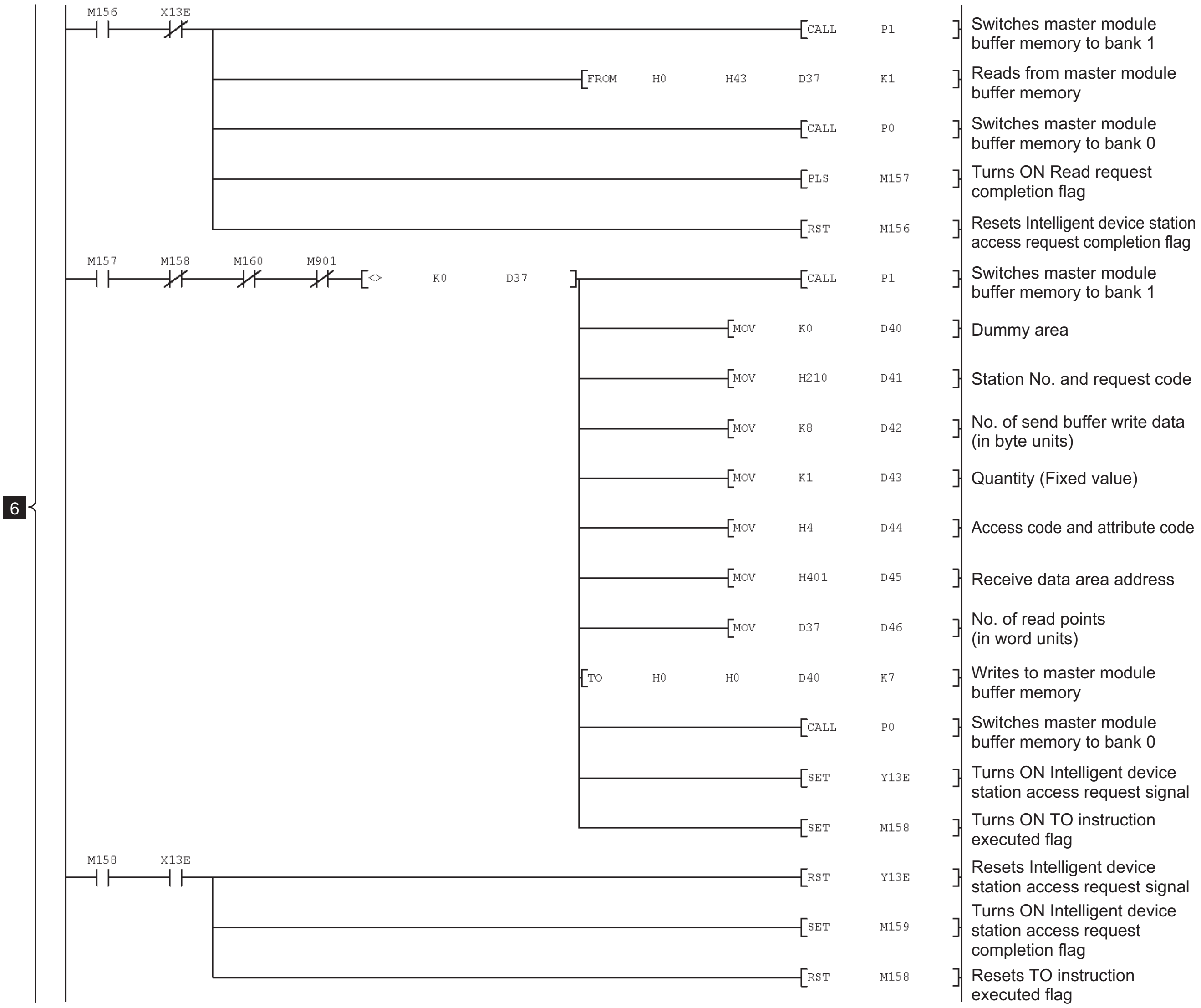

Figure 8.5 Program example (Continued)

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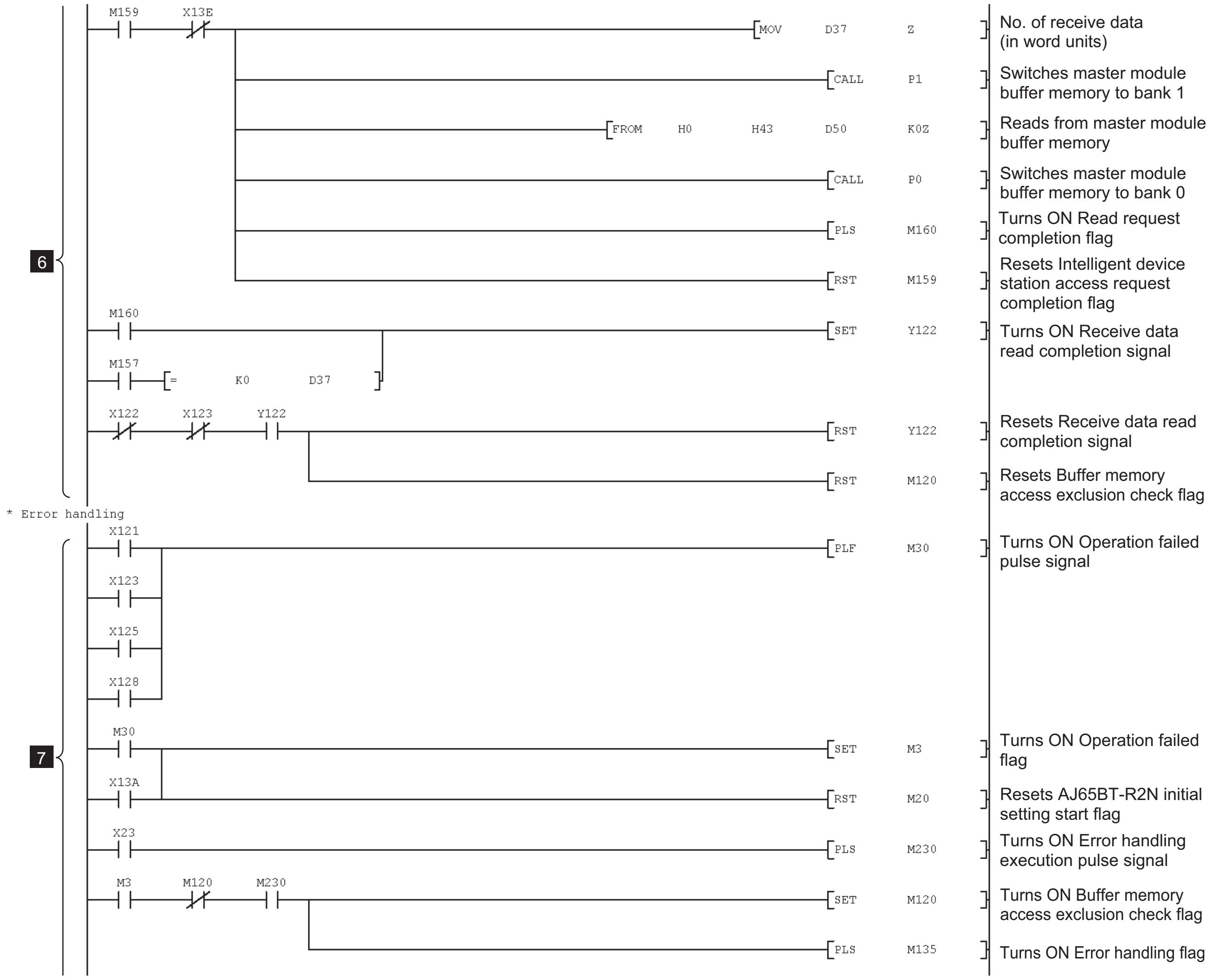

No. of receive data (in word units)

Switches master module buffer memory to bank 1

Reads from master module buffer memory

Switches master module buffer memory to bank 0

Turns ON Read request completion flag

Resets Intelligent device station access request completion flag

Turns ON Receive data read completion signal

Resets Receive data read completion signal

Resets Buffer memory access exclusion check flag

Turns ON Operation failed pulse signal

Turns ON Operation failed flag

Resets AJ65BT-R2N initial setting start flag

Turns ON Error handling execution pulse signal

Turns ON Buffer memory access exclusion check flag

Turns ON Error handling flag

Figure 8.5 Program example (Continued)

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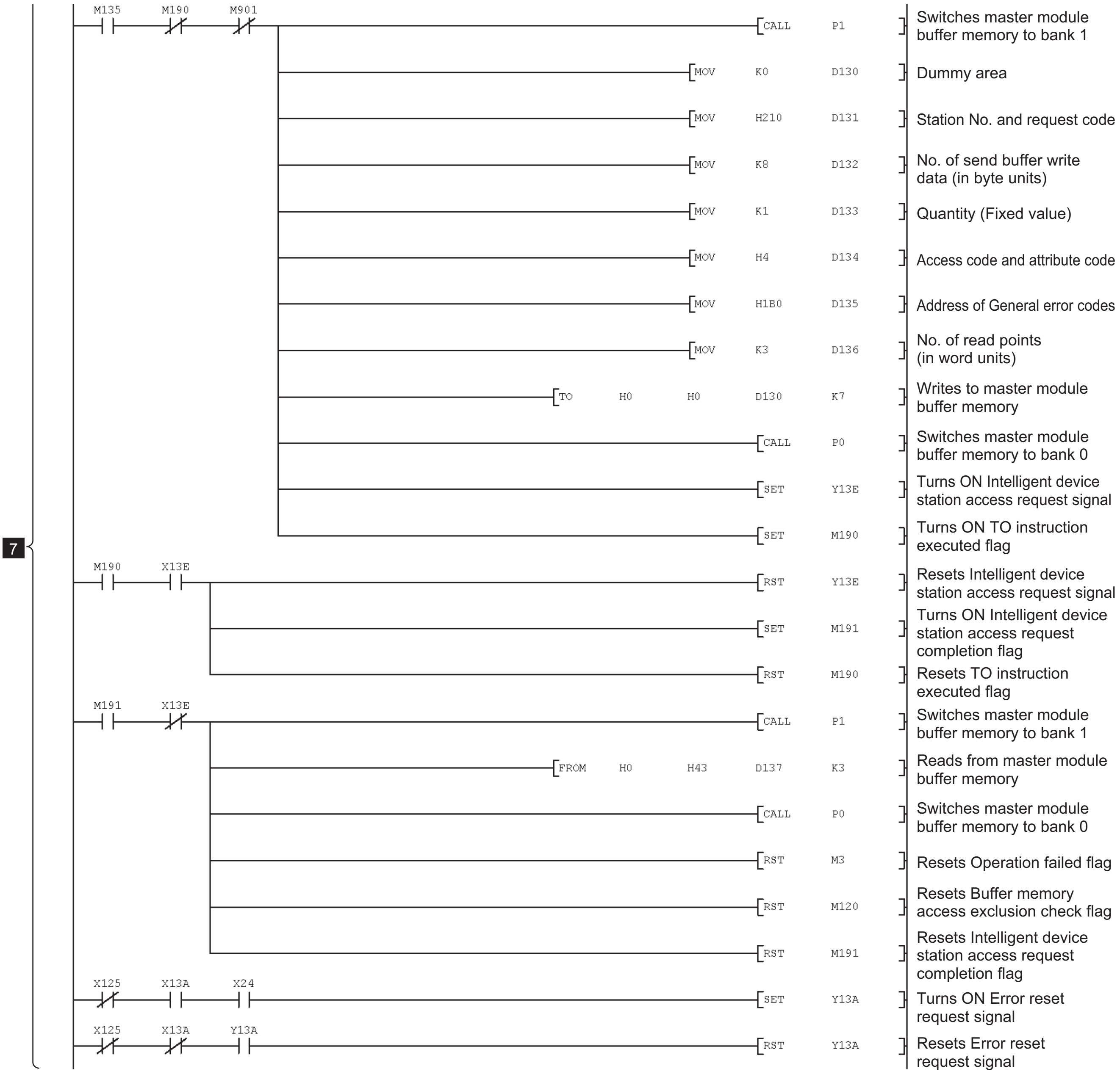

Switches master module buffer memory to bank 1
Dummy area
Station No. and request code
No. of send buffer write data (in byte units)
Quantity (Fixed value)
Access code and attribute code
Address of General error codes
No. of read points (in word units)
Writes to master module buffer memory
Switches master module buffer memory to bank 0
Turns ON Intelligent device station access request signal
Turns ON TO instruction executed flag
Resets Intelligent device station access request signal
Turns ON Intelligent device station access request completion flag
Resets TO instruction executed flag
Switches master module buffer memory to bank 1
Reads from master module buffer memory
Switches master module buffer memory to bank 0
Resets Operation failed flag
Resets Buffer memory access exclusion check flag
Resets Intelligent device station access request completion flag
Turns ON Error reset request signal
Resets Error reset request signal

Figure 8.5 Program example (Continued)

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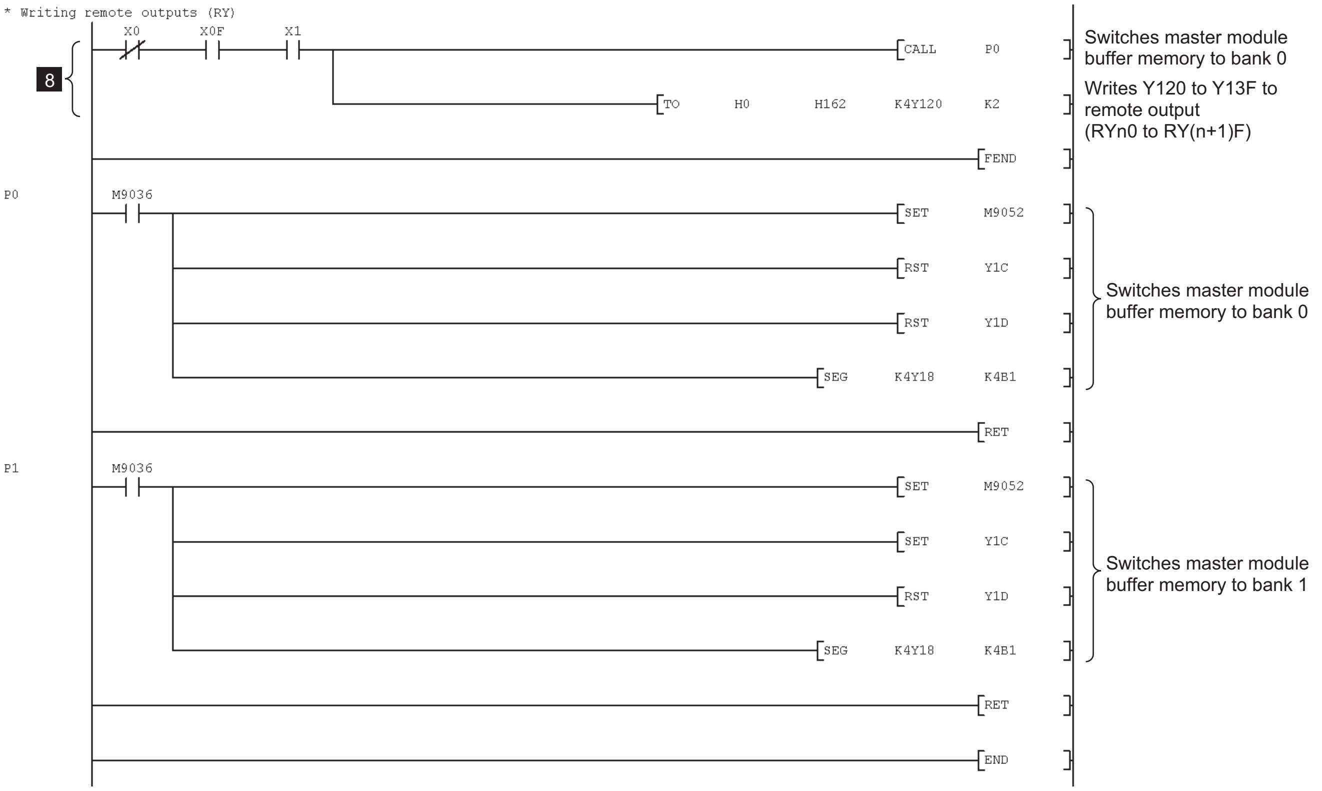

Switches master module buffer memory to bank 0

Writes Y120 to Y13F to remote output (RYn0 to RY(n+1)F)

Switches master module buffer memory to bank 0

Switches master module buffer memory to bank 1

Figure 8.5 Program example (Continued)

8.2.2 For buffer memory auto-refresh function

(1) Overview of program example

(a) Initial setting program for master station ((3) in this section - 1)
Parameters of the master station are set.

☞ Section 8.1.1 (2) Parameter setting

(b) Program for reading remote input (RX) ((3) in this section - 2)
Remote input (RXn0 to RX(n+1)F) of the AJ65BT-R2N is read out to the input (X120 to X13F) of the programmable controller CPU.

(c) Mode setting switch check program ((3) in this section - 3)
Whether the mode setting switch is set correctly or not is checked.

(d) AJ65BT-R2N initial setting program ((3) in this section - 4)

1) Initial data are read from the AJ65BT-R2N to the master module.
2) By the frame function, reception is completed when CR(0DH)＋LF(0AH) is received.
3) The AJ65BT-R2N is initialized.

☞ Section 8.3.2 For the buffer memory auto-refresh function

(e) Program for sending data to external device ((3) in this section - 5)
If Send execute flag (X22) is turned ON, the character string "ABCDEF" is sent from the master station to the external device.

☞ Section 8.4.2 For the buffer memory auto-refresh function

(f) Program for receiving data from external device ((3) in this section - 6)
When data are received from the external device, the received data are read out from the AJ65BT-R2N to the master station.

☞ Section 8.5.2 For the buffer memory auto-refresh function

(g) Error handling program ((3) in this section - 7)

1) When an error occurs during initialization setting or data transfer, an error code will be read out from the AJ65BT-R2N to the master module if Error code read flag (X23) is turned ON.
2) The error is canceled when Error clear flag (X24) is turned ON after the cause of the error has been eliminated.

☞ Section 8.6.2 For the buffer memory auto-refresh function

(h) Program for writing data to remote output (RY) ((3) in this section - 8)
The output (Y120 to Y13F) of the programmable controller CPU is written to the remote output (RYn0 to RY(n+1)F) of the AJ65BT-R2N.

(2) Devices used in the program example

Table 8.12 Devices used in the program example

Device	Description	Device	Description
X0	Module error (Master station)	Y13A	Error reset request signal
X1	Own station data link status (Master station)	M0	Operation start request flag
X6	Data link start by parameters in buffer memory normally completed (Master station)	M1	Intelligent device station access request completion flag
X7	Data link start by parameters in buffer memory failed (Master station)	M2	Operation complete flag
X0F	Module ready (Master station)	M3	Operation failed flag
X22	Send execute flag	M22	Operation complete pulse signal
X23	Error code read flag	M25	Send completion pulse signal
X24	Error clear flag	M30	Operation failed pulse signal
K4X120	Remote input (X120 to X12F)	M100	Master station parameter setting start pulse signal
X120	Send complete signal	M111	Initial data read request pulse signal
X121	Send failed signal	M120	Send-in-process flag
X122	Normal receive data read request signal	M125	Sending flag
X123	Error receive data read request signal	M130	Receiving flag
X124	Initialization complete signal	M135	Error handling flag
X125	Initialization failed signal	M220	Send execution pulse signal
X128	E^{2}PROM function failed signal	M230	Error handling execution pulse signal
K1X134	Mode setting switch status signal (X134 to X137)	M500	AJ65BT-R2N initial data read complete flag
X139	Initial data read completion signal	M501	AJ65BT-R2N initial data reading flag
X13A	Error status signal	M502	AJ65BT-R2N mode normal flag
X13B	Remote station ready signal	M503	AJ65BT-R2N mode error flag
Y0	Refresh instruction (Master station)	K4M900	Other station data link status (SW0080)
Y6	Request for data link start by parameters in buffer memory (Master station)	M901	Other station data link status (Station No.2)
K4Y18	Output (Y18 to Y27) (Master station)	M9036	Always ON
Y1C	Buffer memory bank switching specification (Master station)	M9052	SEG instruction switching
Y1D		D10 to D13	Set value or send data
K4Y120	Remote output (Y120 to Y12F)	D101 to D106	Network parameters of master station
Y120	Send request signal	D107	Error code in Network parameters setting
Y121	Send cancel request signal	D200	No. of receive data
Y122	Receive data read completion signal	D201 or later	Receive data
Y123	Forced receive completion request signal	D400 to D402	AJ65BT-R2N error code
Y124	Initialization request signal	Z	No. of receive data
Y126	OS reception area clear request signal	P0	Switching to bank 0
Y127	E^{2}PROM function request signal	P2	Switching to bank 2
Y139	Initial data read request signal	—	

(3) Program example

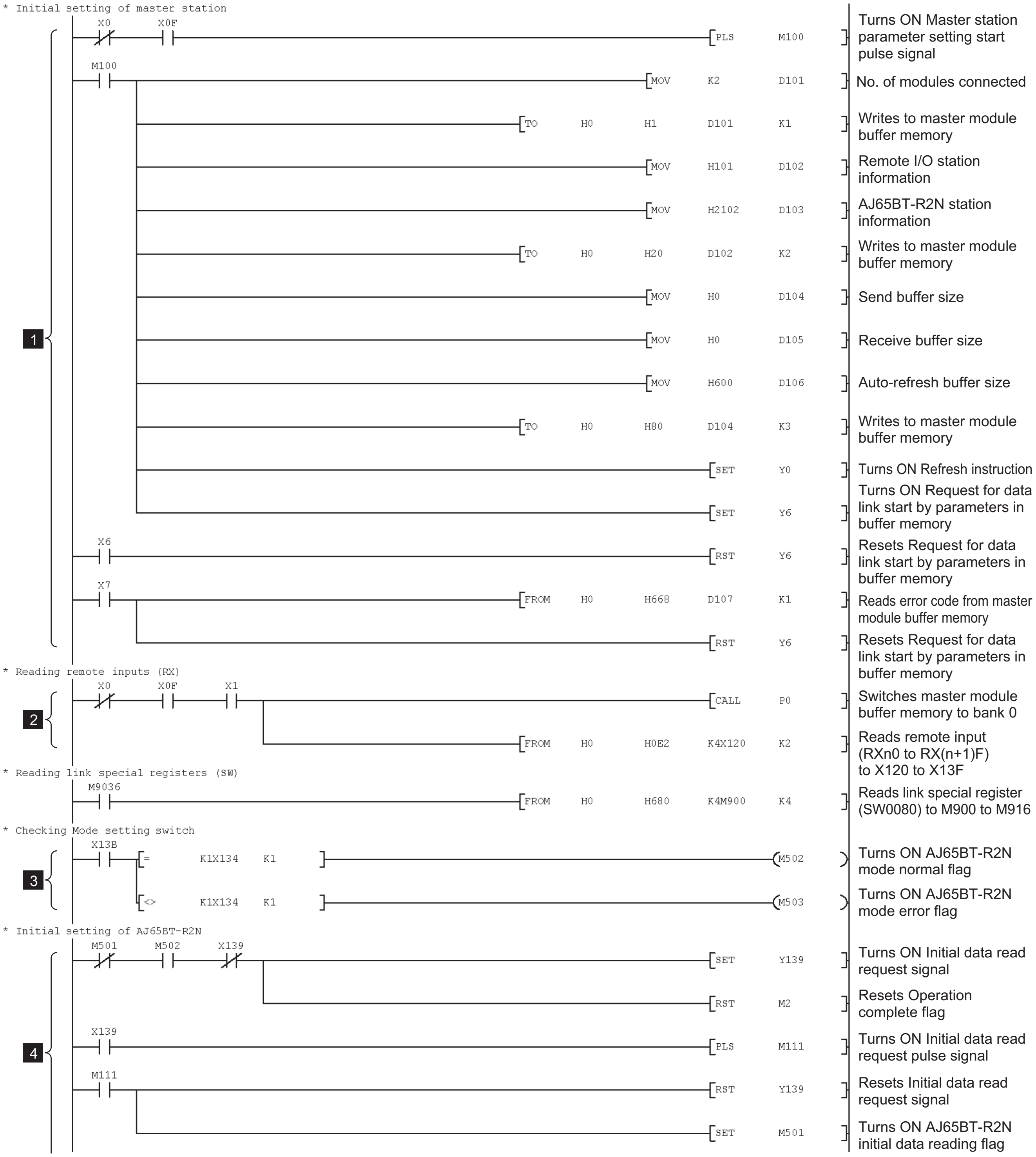

Figure 8.6 Program example

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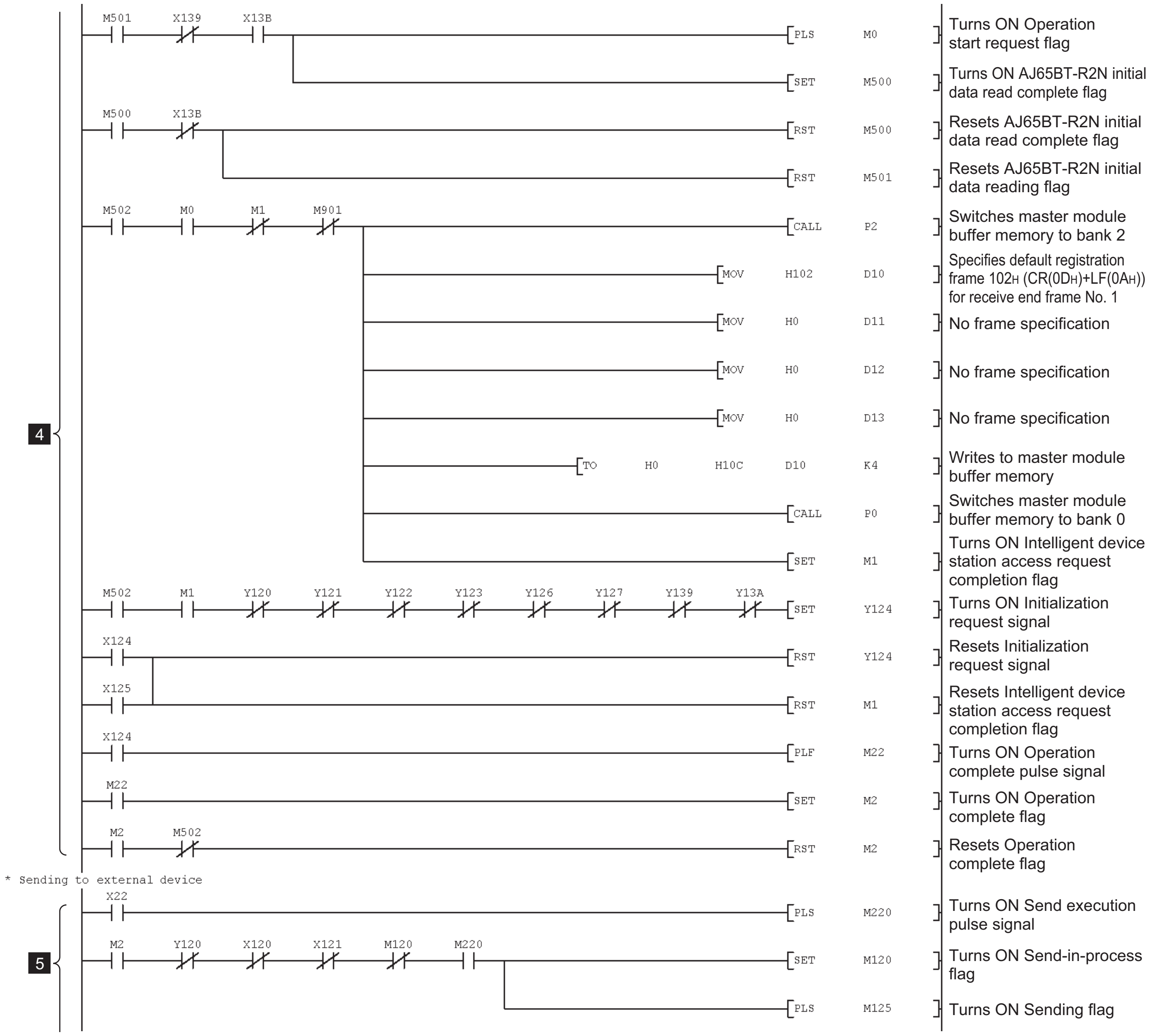

Figure 8.6 Program example (Continued)

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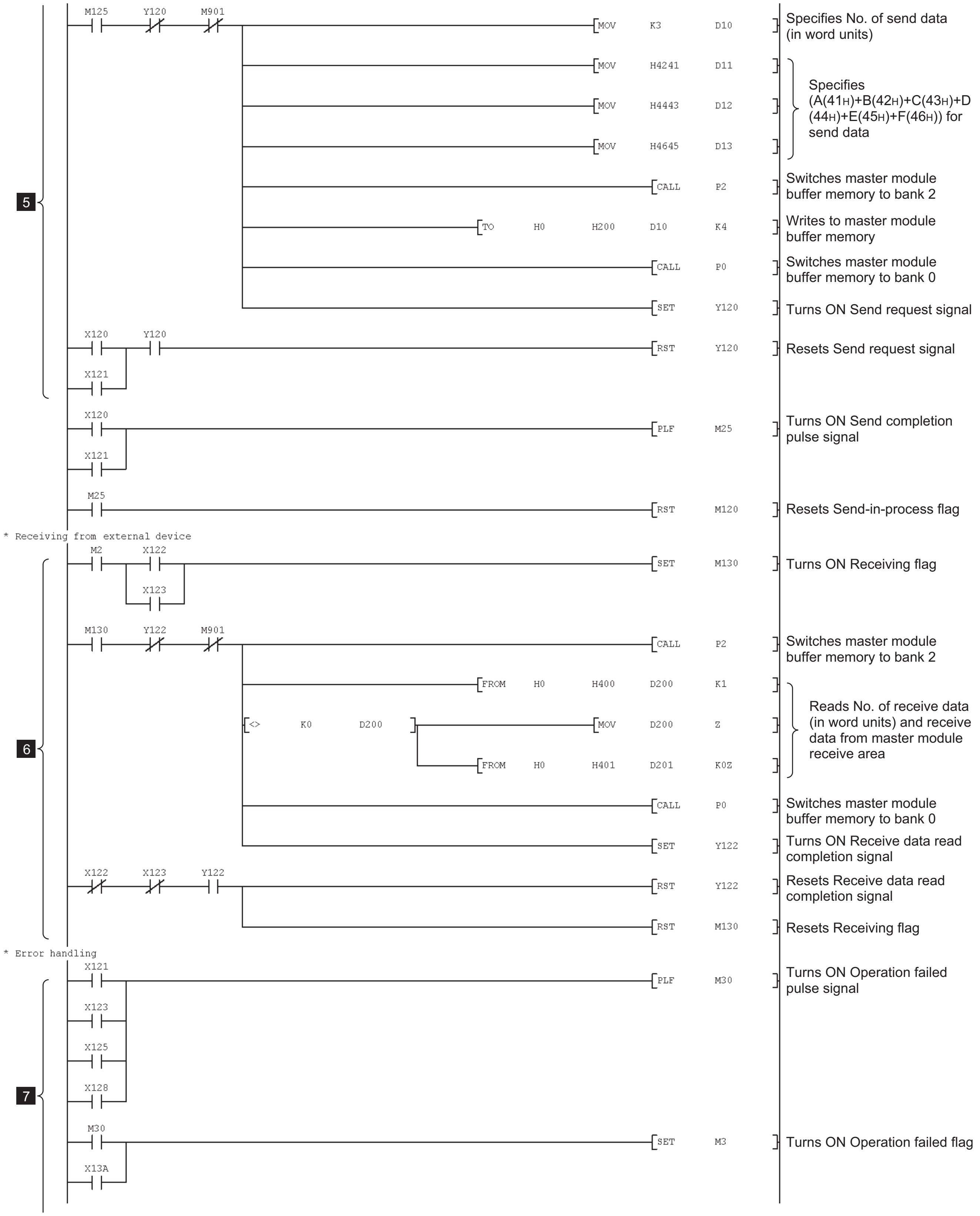

Figure 8.6 Program example (Continued)

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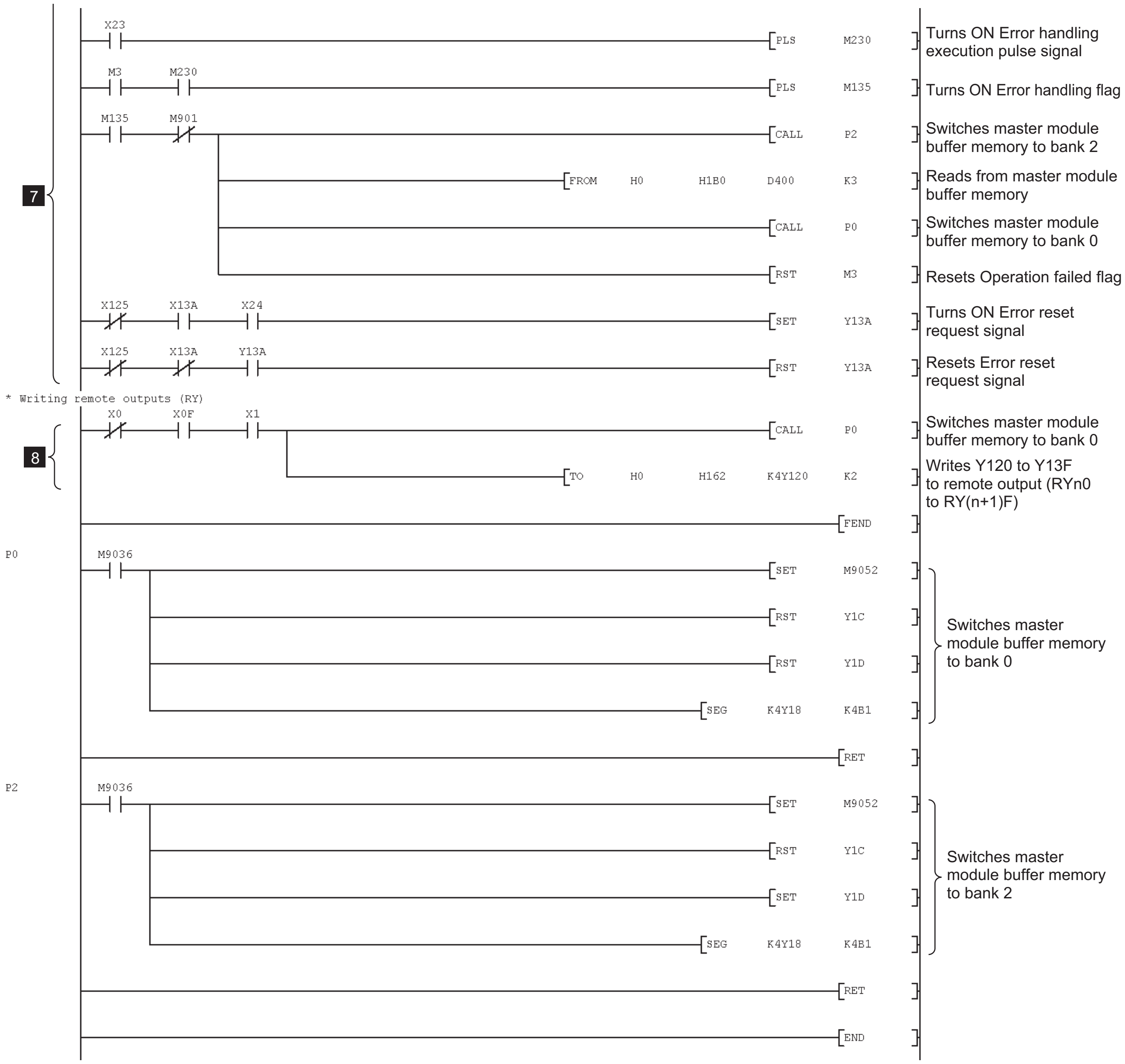


Figure 8.6 Program example (Continued)

8.2.3 Precautions for programming

(1) Control data (When using send/receive buffer communication function)
If the buffer memory of the AJ65BT-R2N is accessed when using the send/receive buffer communication function, write control data, etc., to the master module.

(a) When writing to the buffer memory of the AJ65BT-R2N
When writing to the buffer memory of the AJ65BT-R2N, use the control data and the send buffer (buffer memory of the master module) for the data to be written. The completion status is stored into the receive buffer after sending data is completed.

The data specified in the send buffer are written to the buffer memory of the AJ65BT-R2N using the following remote I/O (RX, RY).

- Intelligent device station access request signal (RY(n+1)E)
- Intelligent device station access completion signal (RX(n+1)E)

(Example) Writing No. of receive end data and receive timeout time

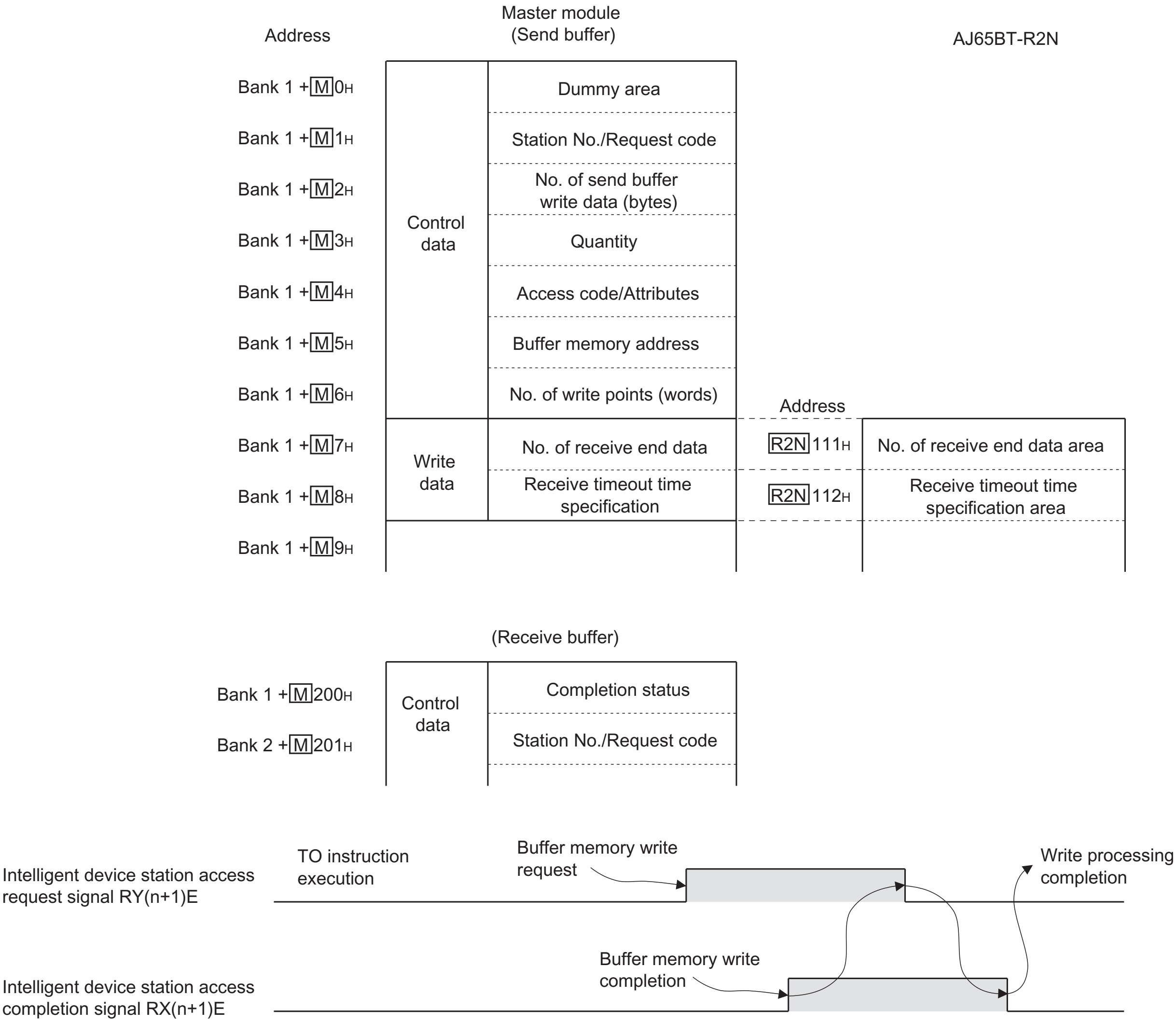
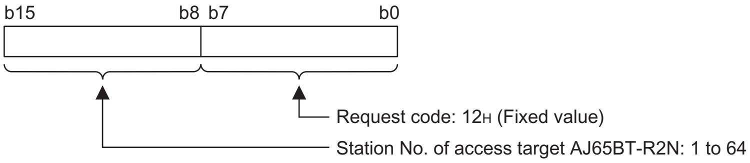


Figure 8.7 Writing No. of receive end data and receive timeout time

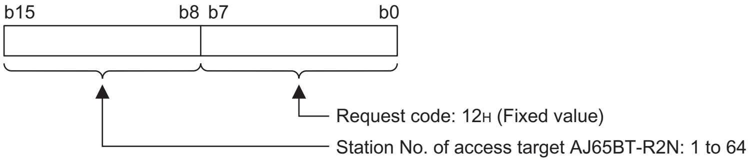
1) Specification of send buffer

Table 8.13 Specification of send buffer

Item		Description
Control data	Dummy area	0 (Fixed value)
	Station No./Request code	Specify the station No. and request code as shown below. 
	No. of send buffer write data (bytes)	Specify the total number of bytes for the calculation formula below. Set range: 8 ＋ (Data to be written) × 2 (Unit: words)
	Quantity	1 (Fixed value)
	Access code/Attribute	0004H (Fixed)
	Buffer memory address	Specify the start address (0H or later) of the write destination buffer memory. Setting range: 0H to 7FFH
	No. of write points (words)	Specify No. of data to be written to the buffer memory of the AJ65BT-R2N. Setting range: 1H to 480H (Unit: words)
Write data		Specify the data to be written to the buffer memory of the AJ65BT-R2N.

2) Storage of receive buffer

Table 8.14 Specification of receive buffer

Item	Description
Completion status	The completion status of the instruction is stored. •0H: Completed normally •Other than 0H: Failed (Error code) For details of error codes, refer to the following. ☞ Section 9.2 Error code list
Station No./Request code	The station No. and request code are stored as shown below. 

(b) When reading from the buffer memory of the AJ65BT-R2N
When reading from the buffer memory of the AJ65BT-R2N, use the send buffer (buffer memory of master module) for the control data.
If received, the completion status and receive data are stored in the receive buffer.

The data specified in the send buffer are read from the buffer memory of the AJ65BT-R2N using the following remote I/O (RX, RY).

- Intelligent device station access request signal (RY(n+1)E)
- Intelligent device station access completion signal (RX(n+1)E)

(Example) Reading error information

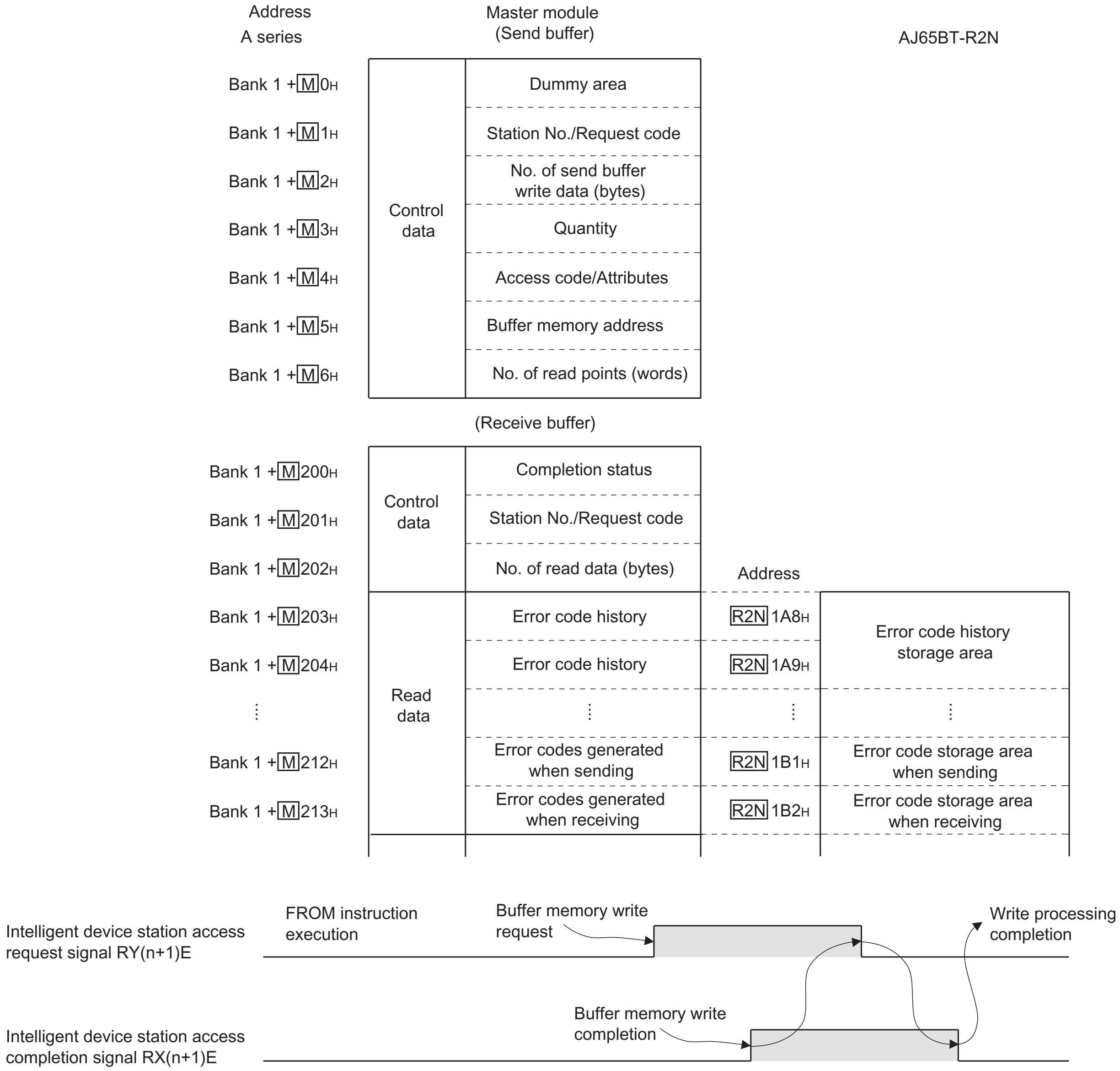
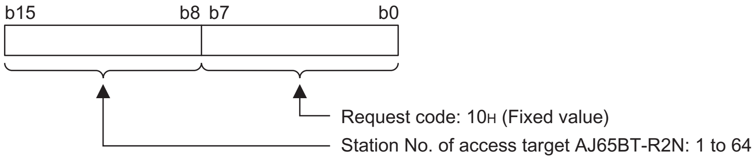


Figure 8.8 Reading error information

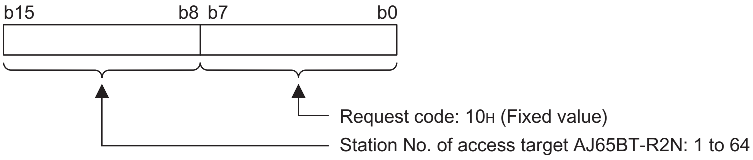
1) Specification of send buffer

Table 8.15 Specification of send buffer

Item		Description
Control data	Dummy area	0 (Fixed value)
	Station No./Request code	Specify the station No. and request code as shown below. 
	No. of send buffer write data (bytes)	8 (Fixed value)
	Quantity	1 (Fixed value)
	Access code/Attribute	0004_H (Fixed value)
	Buffer memory address	Specify the start address (0_H or later) of the buffer memory to be read. Setting range: 0_H to $7FF_H$
	No. of read points (words)	Specify No. of data to be read from the buffer memory of the AJ65BT-R2N. Setting range: 1_H to 480_H (Unit: words)

2) Storage of receive buffer

Table 8.16 Specification of receive buffer

Item	Description
Completion status	The completion status of the instruction is stored. •0_H: Completed normally •Other than 0_H: Failed (Error code) For details of error codes, refer to the following. Section 9.2 Error code list
Station No./Request code	The station No. and request code are stored as shown below. 
No. of read data	The total number of bytes of the read data is stored. (Unit: bytes)
Read data	The data read from the buffer memory of the AJ65BT-R2N is stored.

(2) Switching banks of the AJ61BT11 or A1SJ61BT11

If using the AJ65BT-R2N, use the send/receive buffer or auto-refresh buffer of the master station.

For the AJ61BT11 or A1SJ61BT11, it is necessary to switch banks because the send/receive buffer and the auto-refresh buffer are separated by banks.

☒ **Point**

When using the dedicated instructions (RIRD, RIWT, RISEND, and RIRCV), bank is automatically switched by the dedicated instruction.

The user does not have to switch banks.

- Buffer memory of AJ61BT11 or A1SJ61BT11

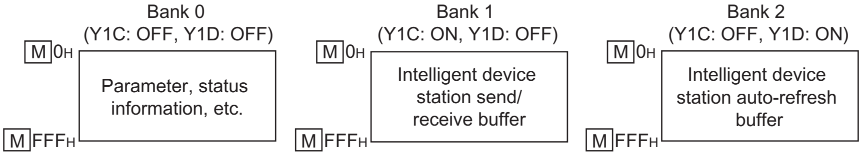


Figure 8.9 Buffer memory of AJ61BT11 or A1SJ61BT11

☒ **Point**

Make sure to back to bank 0 after switching to bank 1 or bank 2 to read/write data.

If a bank is not switched to bank 0, information such as the remote I/O (RX, RY) and remote register (RWw, RWr) will not be updated.

(a) Program for switching banks

1) Program for switching to bank 0

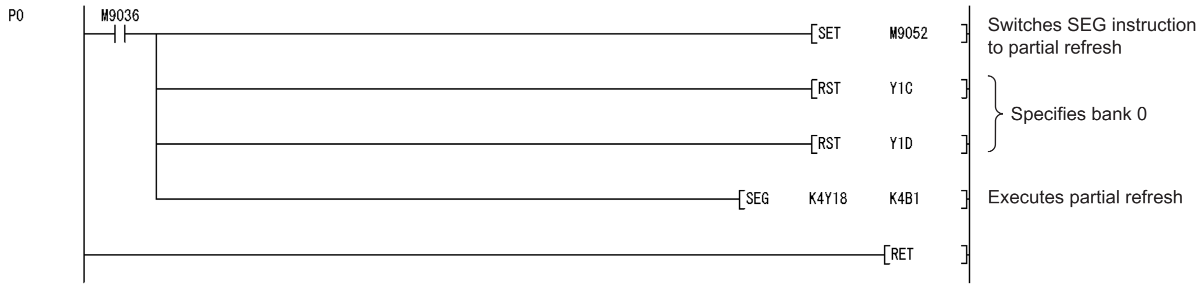


Figure 8.10 Program for switching to bank 0

2) Program for switching to bank 1

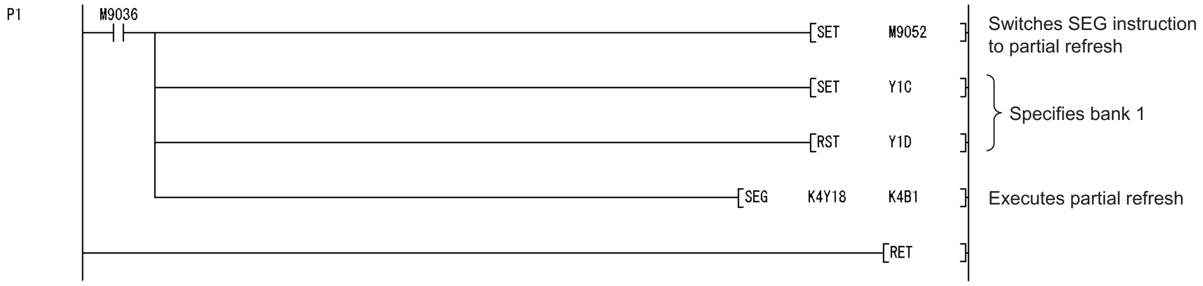


Figure 8.11 Program for switching to bank 1

3) Program for switching to bank 2

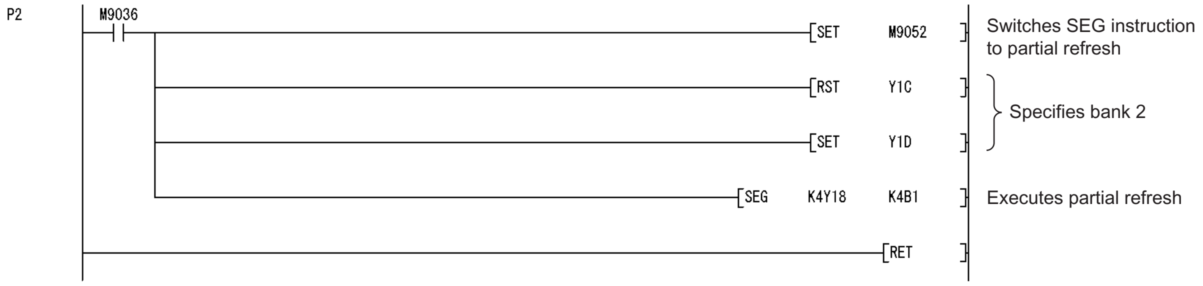


Figure 8.12 Program for switching to bank 2

Remark

The programs above are subroutine programs executed from the programs described in this chapter.

8.3 Initial Setting for AJ65BT-R2N

8.3.1 For the send/receive buffer communication function

(1) Overview of program example

1) When AJ65BT-R2N initial setting start flag (M20) is turned ON, settings are configured so that data reception is completed by the frame function upon receipt of CR(0DH)＋LF(0AH).

2) The AJ65BT-R2N is initialized.

(2) Processing in the program example

1) Default registration frame 102H (CR(0DH)＋LF(0AH)) is written to Receive start frame No.1 (R2N 10CH).

2) After writing is normally completed, Initialization request signal (Y124) is turned ON to complete the initial setting.

(3) Devices used in the program example

Table 8.17 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X124	Initialization complete signal	Section 8.3.1	—
X125	Initialization failed signal	Section 8.3.1	—
X13E	Intelligent device station access completion signal	Section 8.3.1	Section 8.4.1, Section 8.5.1, Section 8.6.1
Y120	Send request signal	—	Section 8.4.1
Y121	Send cancel request signal	—	—
Y122	Receive data read completion signal	—	Section 8.5.1
Y123	Forced receive completion request signal	—	—
Y124	Initialization request signal	Section 8.3.1	—
Y126	OS reception area clear request signal	—	—
Y127	E^{2}PROM function request signal	—	—
Y139	Initial data read request signal	—	—
Y13A	Error reset request signal	—	Section 8.6.1
Y13E	Intelligent device station access request signal	Section 8.3.1	Section 8.4.1, Section 8.5.1, Section 8.6.1
M0	Operation start request flag	Section 8.3.1	—
M1	Initial setting write completion flag	Section 8.3.1	—
M2	Operation complete flag	Section 8.3.1	—
M10	TO instruction executed flag	Section 8.3.1	—
M11	Intelligent device station access request completion flag	Section 8.3.1	—
M20	AJ65BT-R2N initial setting start flag	—	—
M22	Operation complete pulse signal	Section 8.3.1	—
M120	Buffer memory access exclusion check flag	—	Section 8.4.1, Section 8.5.1, Section 8.6.1

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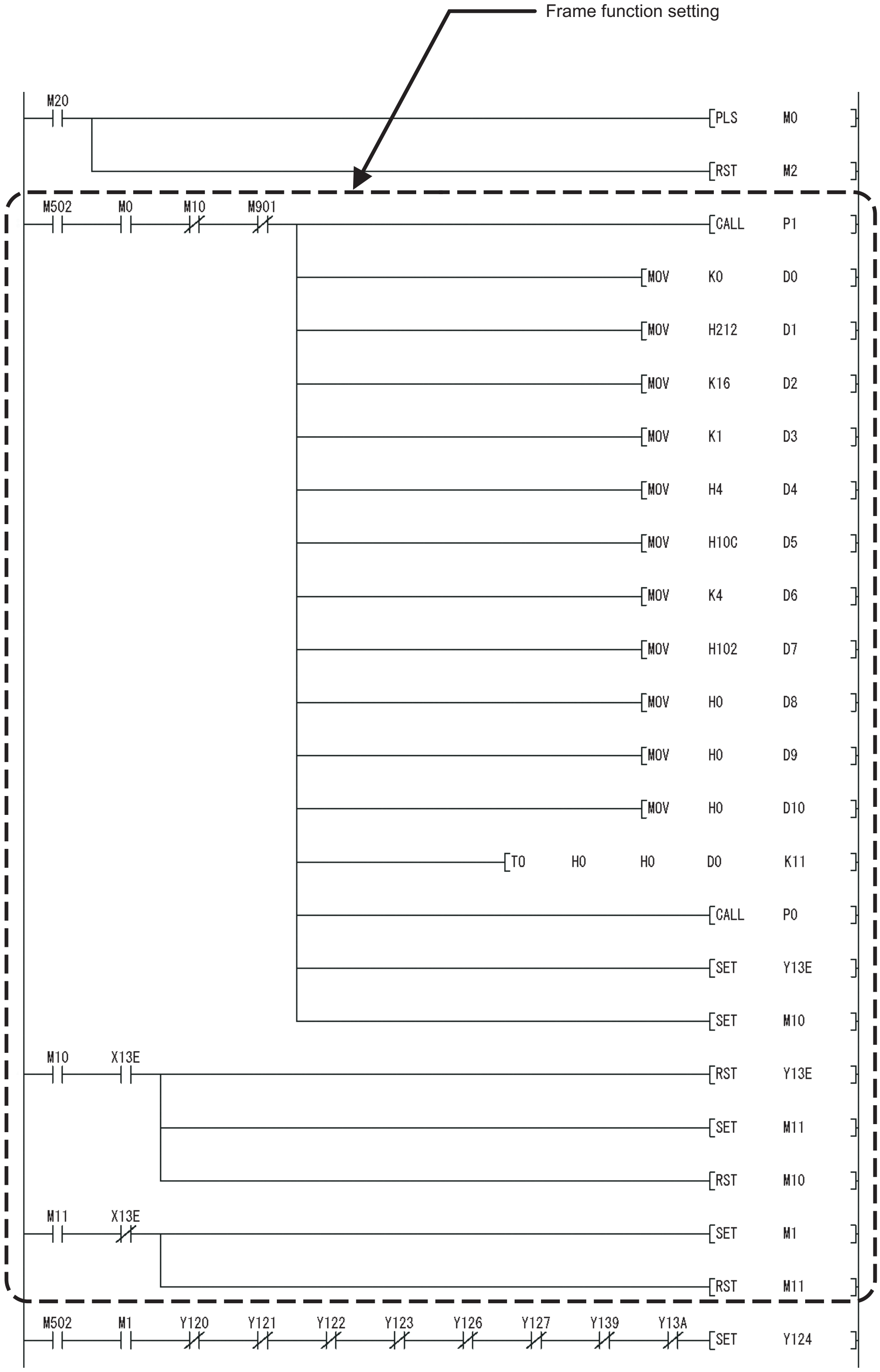
Table 8.17 Devices used in the program example (Continued)

Device	Description	Reference section	
		This program	Other programs
M502	AJ65BT-R2N mode normal flag	—	Section 8.2.1 (3) 3
M901	Other station data link status (Station No.2)	—	—
D0 to D11	Initial setting data	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P1	Switching to bank 1 (executing sample program in Section 8.2.3 (2)(a))	—	—

(4) Program example



Turns ON Operation start request flag

Resets Operation complete flag

Switches master module buffer memory to bank 1 (Refer to Section 8.2.3 (2)(a))

Dummy area

Station No. and request code

No. of send buffer write data (in byte units)

Quantity (Fixed value)

Access code and attribute code

Receive end frame No. address

No. of write points (in word units)

Specifies default registration frame 102H (CR(0DH)+LF(0AH)) for receive end frame No.1

No frame specification

No frame specification

No frame specification

Writes to master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Intelligent device station access request signal

Turns ON TO instruction executed flag

Resets Intelligent device station access request signal

Turns ON Intelligent device station access request completion flag

Resets TO instruction executed flag

Turns ON Initial setting write completion flag

Resets Intelligent device station access request completion flag

Turns ON Initialization request signal

Figure 8.13 Program example

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Figure 8.13 Program example (Continued)

(a) Setting of any other function
When changing the frame function setting to other than the above or when using any other function, refer to the section below and modify the area enclosed by the dotted line.

☞ Section 8.7 Initial Settings for Other Functions

8.3.2 For the buffer memory auto-refresh function

(1) Overview of program example

1) Initial data are read from the AJ65BT-R2N to the master module.
2) By the frame function, reception is completed when CR(0DH)＋LF(0AH) is received.
3) The AJ65BT-R2N is initialized.

☒Point

Make sure to read initial data before performing the initial setting.

(2) Processing in the program example

1) Initial data are read out.
2) Default registration frame 102H (CR(0DH)＋LF(0AH)) is written to Receive start frame No.1 (R2N 10CH).
3) After writing is normally completed, Initialization request signal (Y124) is turned ON to complete the initial setting.

(3) Devices used in the program example

Table 8.18 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X124	Initialization complete signal	Section 8.3.2	—
X125	Initialization failed signal	Section 8.3.2	—
X139	Initial data read completion signal	Section 8.3.2	—
X13B	Remote station ready signal	Section 8.3.2	—
Y120	Send request signal	—	Section 8.4.2
Y121	Send cancel request signal	—	—
Y122	Receive data read completion signal	—	Section 8.5.2
Y123	Forced receive completion request signal	—	—
Y124	Initialization request signal	Section 8.3.2	—
Y126	OS reception area clear request signal	—	—
Y127	E^2PROM function request signal	—	—
Y139	Initial data read request signal	Section 8.3.2	—
Y13A	Error reset request signal	—	Section 8.6.2
M0	Operation start request flag	Section 8.3.2	—
M1	Intelligent device station access request completion flag	Section 8.3.2	—
M2	Operation complete flag	Section 8.3.2	—
M22	Operation complete pulse signal	Section 8.3.2	—
M111	Initial data read request pulse signal	Section 8.3.2	—
M500	AJ65BT-R2N initial data read complete flag	Section 8.3.2	—
M501	AJ65BT-R2N initial data reading flag	Section 8.3.2	—
M502	AJ65BT-R2N mode normal flag	—	Section 8.2.2 (3) 3
M901	Other station data link status (Station No.2)	—	—
D10 to D13	Initial setting data	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P2	Switching to bank 2 (executing sample program in Section 8.2.3 (2)(a))	—	—

(4) Program example

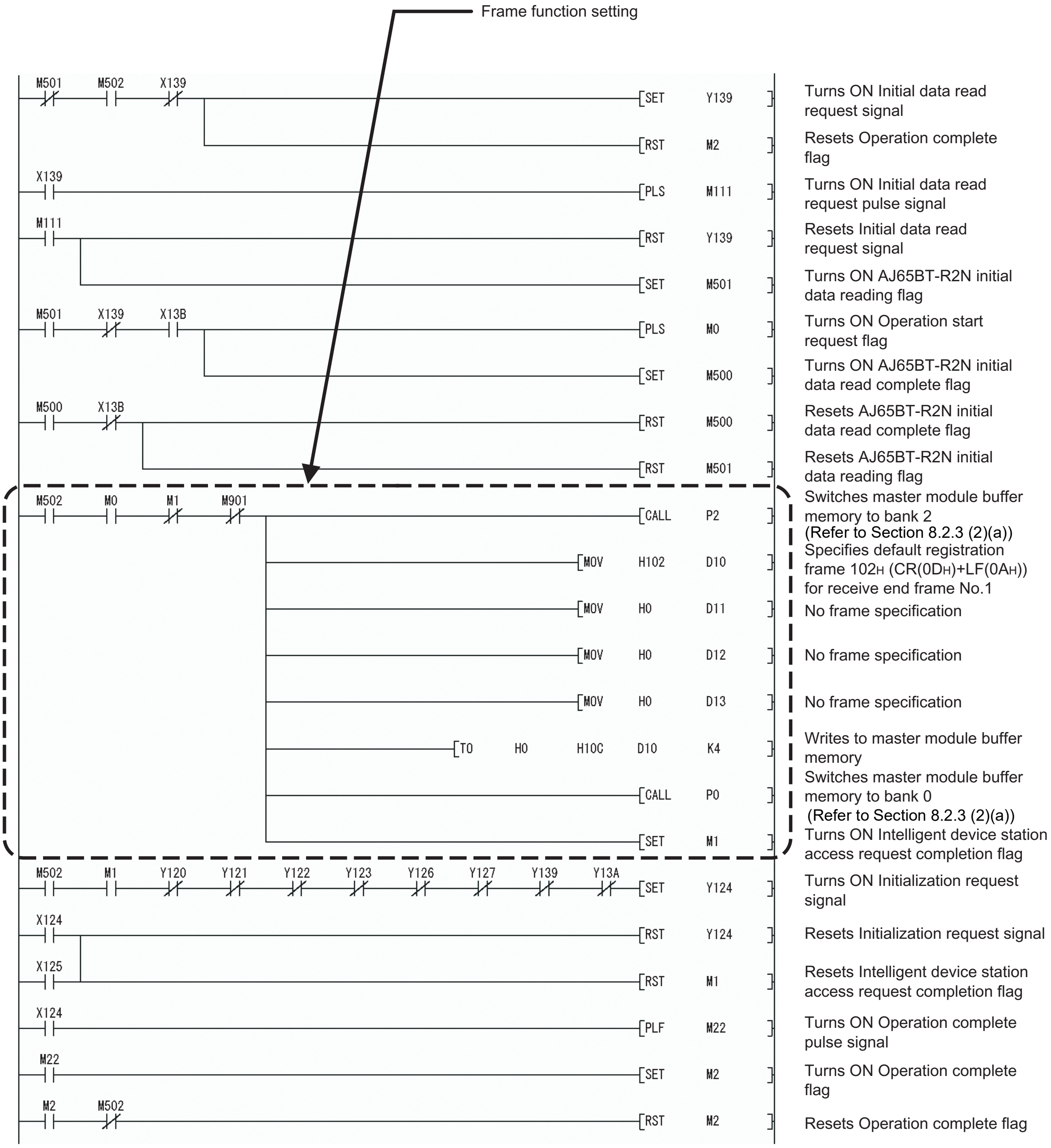

Figure 8.14 Program example

(a) Setting of any other function
When changing the frame function setting to other than the above or when using any other function, refer to the section below and modify the area enclosed by the dotted line.

☞ Section 8.7 Initial Settings for Other Functions

8.4 Sending to External Device

8.4.1 For the send/receive buffer communication function

(1) Overview of program example

If Send execute flag (X22) is turned ON, the character string "ABCDEF" is sent from the master station to the external device.

(2) Processing in the program example

1) No. of send data (3) is written to Send data size specification area (R2N 200H) and the send data ("ABCDEF") is written to Send data area (R2N 201H).
2) Send request signal (Y120) is turned ON to send the data to the external device.
3) Send request signal (Y120) is turned OFF to complete the transmission.

(3) Devices used in the program example

Table 8.19 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X22	Send execute flag	—	—
X120	Send complete signal	Section 8.4.1	—
X121	Send failed signal	Section 8.4.1	—
X13E	Intelligent device station access completion signal	Section 8.4.1	Section 8.3.1, Section 8.5.1, Section 8.6.1
Y120	Send request signal	Section 8.4.1	—
Y13E	Intelligent device station access request signal	Section 8.4.1	Section 8.3.1, Section 8.5.1, Section 8.6.1
M2	Operation complete flag	—	Section 8.3.1
M25	Send completion pulse signal	Section 8.4.1	—
M120	Buffer memory access exclusion check flag	Section 8.4.1	Section 8.5.1, Section 8.6.1
M125	Sending flag	Section 8.4.1	—
M180	TO instruction executed flag	Section 8.4.1	—
M181	Intelligent device station access request completion flag	Section 8.4.1	—
M220	Send execution pulse signal	Section 8.4.1	—
M901	Other station data link status (Station No.2)	—	—
D0 to D10	Control data of TO instruction and send data	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P1	Switching to bank 1 (executing sample program in Section 8.2.3 (2)(a))	—	—

(4) Program example

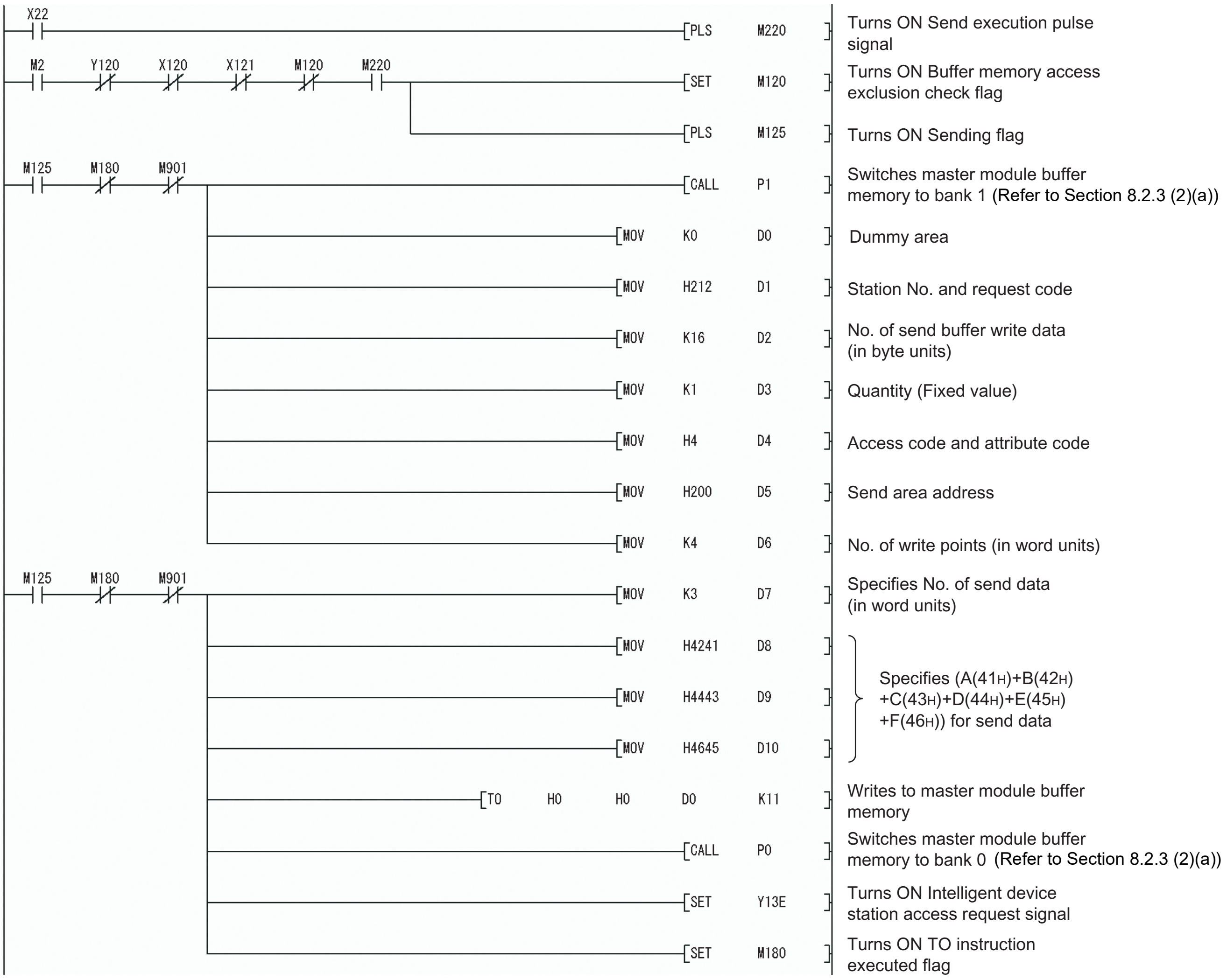

Figure 8.15 Program example

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Resets Intelligent device station access request signal

Turns ON Intelligent device station access request completion flag

Resets TO instruction executed flag

Turns ON Send request signal

Resets Intelligent device station access request completion flag

Resets Send request signal

Turns ON Send completion pulse signal

Resets Buffer memory access exclusion check flag

Figure 8.15 Program example (Continued)

☒Point

When sending data of 481 words or more to the external device using the FROM/TO instruction, divide the send data into parts with 480 words or less and write them to the AJ65BT-R2N.

With the FROM/TO instructions, data with 481 words or more cannot be written to the AJ65BT-R2N at one time.

8.4.2 For the buffer memory auto-refresh function

(1) Overview of program example

If Send execute flag (X22) is turned ON, the character string "ABCDEF" is sent to the external device.

(2) Processing in the program example

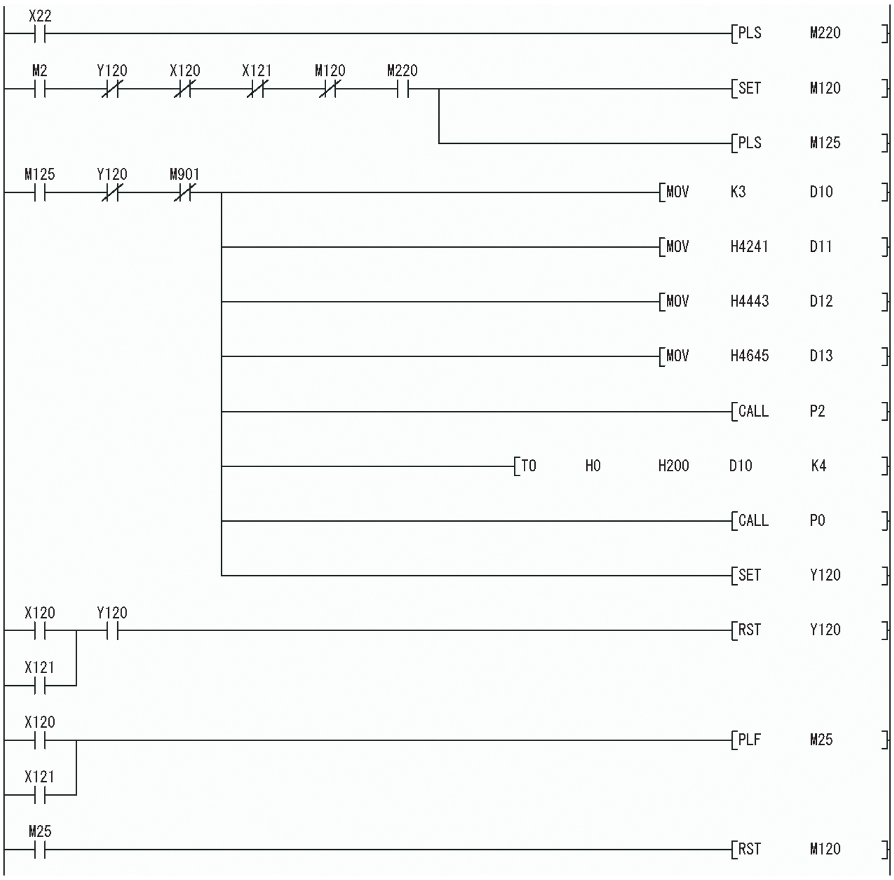
1) No. of send data (3) is written to Send data size specification area (R2N 200H) and the send data ("ABCDEF") is written to Send data area (R2N 201H).
2) Send request signal (Y120) is turned ON to send the data to the external device.
3) Send request signal (Y120) is turned OFF to complete the transmission.

(3) Devices used in the program example

Table 8.20 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X22	Send execute flag	—	—
X120	Send complete signal	Section 8.4.2	—
X121	Send failed signal	Section 8.4.2	—
Y120	Send request signal	Section 8.4.2	—
M2	Operation complete flag	—	Section 8.3.2
M25	Send completion pulse signal	Section 8.4.2	—
M120	Send-in-process flag	Section 8.4.2	—
M125	Sending flag	Section 8.4.2	—
M220	Send execution pulse signal	Section 8.4.2	—
M901	Other station data link status (Station No.2)	—	—
D10 to D13	No. of send data and send data	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P2	Switching to bank 2 (executing sample program in Section 8.2.3 (2)(a))	—	—

(4) Program example



Turns ON Send execution pulse signal

Turns ON Send-in-process flag

Turns ON Sending flag

Specifies No. of send data (in word units)

Specifies (A(41_H)+B(42_H)+C(43_H)+D(44_H)+E(45_H)+F(46_H)) for send data

Switches master module buffer memory to bank 2 (Refer to Section 8.2.3 (2)(a))

Writes to master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Send request signal

Resets Send request signal

Turns ON Send completion pulse signal

Resets Send-in-process flag

Figure 8.16 Program example

8.5 Receiving from External Device

8.5.1 For the send/receive buffer communication function

(1) Overview of program example

When data are received from the external device, the received data are read out from the AJ65BT-R2N to the master station.

(2) Processing in the program example

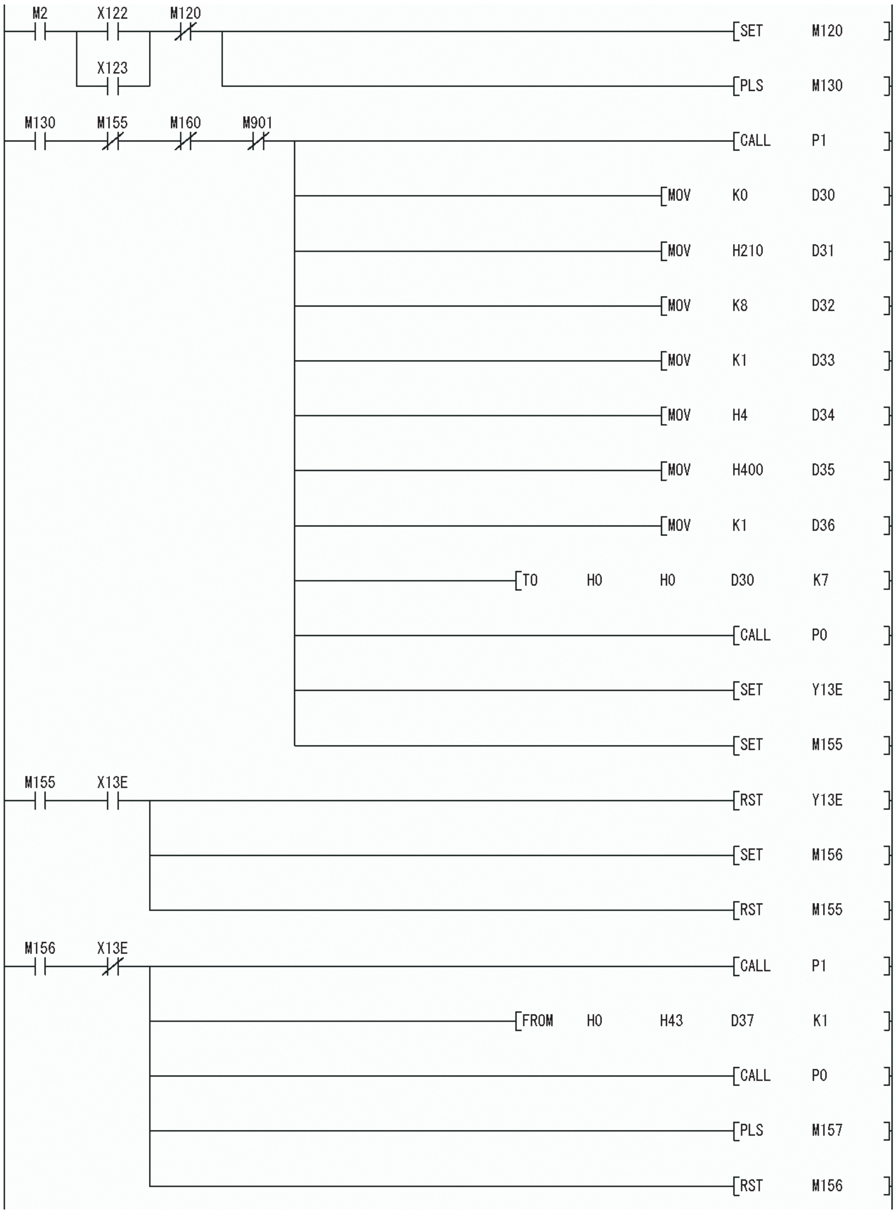
1) No. of receive data is read from Receive data size specification area (R2N 400H) to the master station word device (D37).
2) The receive data are read from Receive data area (R2N 401H) to the master station word device (D50 or later).
3) Receive data read completion signal (Y122) is turned ON→ OFF to terminate the reception.

(3) Devices used in the program example

Table 8.21 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X122	Normal receive data read request signal	—	—
X123	Error receive data read request signal	—	—
X13E	Intelligent device station access completion signal	Section 8.5.1	Section 8.3.1, Section 8.4.1, Section 8.6.1
Y122	Receive data read completion signal	Section 8.5.1	—
Y13E	Intelligent device station access request signal	Section 8.5.1	Section 8.3.1, Section 8.4.1, Section 8.6.1
M2	Operation complete flag	—	Section 8.3.1
M120	Buffer memory access exclusion check flag	Section 8.5.1	Section 8.4.1, Section 8.6.1
M130	Receiving flag	Section 8.5.1	—
M155	TO instruction executed flag	Section 8.5.1	—
M156	Intelligent device station access request completion flag	Section 8.5.1	—
M157	Read request completion flag	Section 8.5.1	—
M158	TO instruction executed flag	Section 8.5.1	—
M159	Intelligent device station access request completion flag	Section 8.5.1	—
M160	Read request completion flag	Section 8.5.1	—
M901	Other station data link status (Station No.2)	—	—
D30 to D36	Control data of TO instruction	—	—
D37	No. of receive data	—	—
D40 to D46	Control data of TO instruction	—	—
D50 or later	Receive data	—	—
Z	No. of receive data	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P1	Switching to bank 1 (executing sample program in Section 8.2.3 (2)(a))	—	—

(4) Program example



Turns ON Buffer memory access exclusion check flag

Turns ON Receiving flag

Switches master module buffer memory to bank 1 (Refer to Section 8.2.3 (2)(a))

Dummy area

Station No. and request code

No. of send buffer write data (in byte units)

Quantity (Fixed value)

Access code and attribute code

Receive data size specification area (in words units) address

No. of read points (in word units)

Writes to master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Intelligent device station access request signal

Turns ON TO instruction executed flag

Resets Intelligent device station access request signal

Turns ON Intelligent device station access request completion flag

Resets TO instruction executed flag

Switches master module buffer memory to bank 1 (Refer to Section 8.2.3 (2)(a))

Reads from master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Read request completion flag

Resets Intelligent device station access request completion flag

Figure 8.17 Program example

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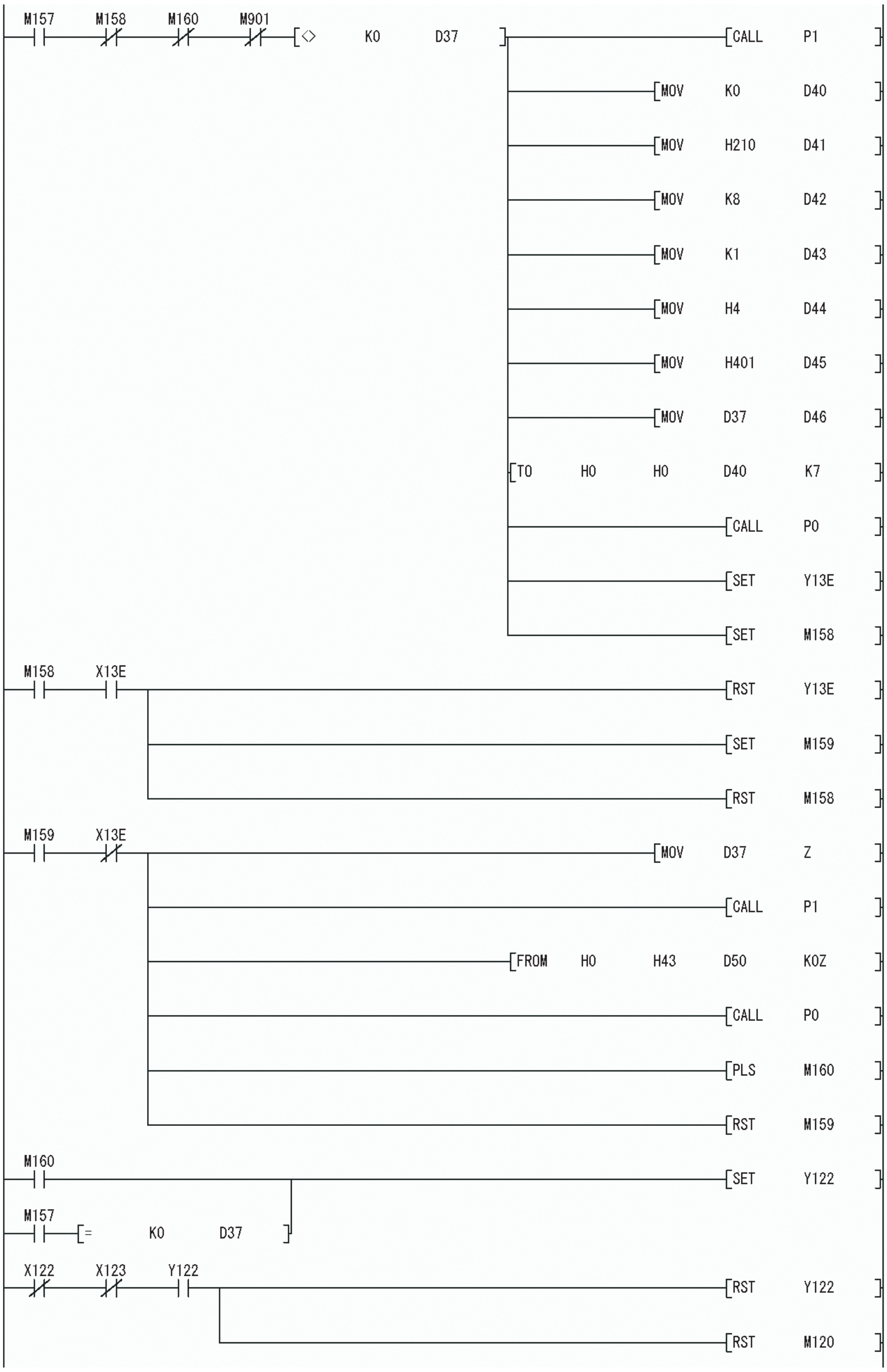


Switches master module buffer memory to bank 1 (Refer to Section 8.2.3 (2)(a))

Dummy area

Station No. and request code

No. of send buffer write data (in byte units)

Quantity (Fixed value)

Access code and attribute code

Receive data area address

No. of read points (in word units)

Writes to master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Intelligent device station access request signal

Turns ON TO instruction executed flag

Resets Intelligent device station access request signal

Turns ON Intelligent device station access request completion flag

Resets TO instruction executed flag

No. of receive data (in word units)

Switches master module buffer memory to bank 1 (Refer to Section 8.2.3 (2)(a))

Reads from master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Read request completion flag

Resets Intelligent device station access request completion flag

Turns ON Receive data read completion signal

Resets Receive data read completion signal

Resets Buffer memory access exclusion check flag

Figure 8.17 Program example (Continued)

☒Point

When receiving data of 481 words or more from the external device using the FROM/TO instruction, divide the receive data into parts with 480 words or less and read them from the AJ65BT-R2N.
With the FROM/TO instructions, data of 481 words or more cannot be read from the AJ65BT-R2N at one time.

8.5.2 For the buffer memory auto-refresh function

(1) Overview of program example

When the AJ65BT-R2N receives data from the external device, the received data are read out to the master station word device (D200).

(2) Processing in the program example

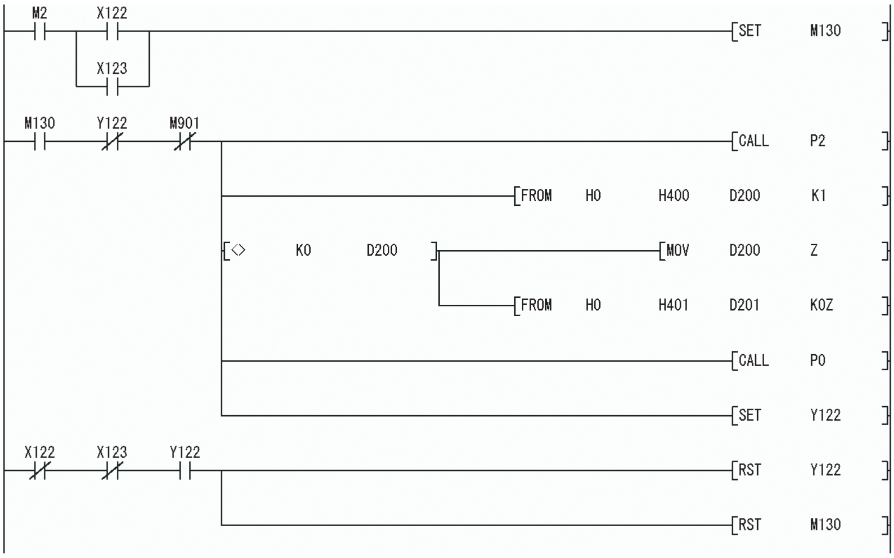
1) No. of receive data is read from Receive data size specification area ($\boxed{\text{R2N}}$ 400_H) to the master station word device (D200).
2) The receive data are read from Receive data area ($\boxed{\text{R2N}}$ 401_H) to the master station word device (D201 or later).
3) Receive data read completion signal (Y122) is turned ON → OFF to terminate the reception.

(3) Devices used in the program example

Table 8.22 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X122	Normal receive data read request signal	—	—
X123	Error receive data read request signal	—	—
Y122	Receive data read completion signal	Section 8.5.2	—
M2	Operation complete flag	—	Section 8.3.2
M130	Receiving flag	Section 8.5.2	—
M901	Other station data link status (Station No.2)	—	—
D200	No. of receive data	—	—
D201 or later	Receive data	—	—
Z	No. of receive data	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P2	Switching to bank 2 (executing sample program in Section 8.2.3 (2)(a))	—	—

(4) Program example



Turns ON Receiving flag

Switches master module buffer memory to bank 2 (Refer to Section 8.2.3 (2)(a))

Reads No. of receive data (in word units) and receive data from master module receive area

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Receive data read completion signal

Resets Receive data read completion signal

Resets Receiving flag

Figure 8.18 Program example

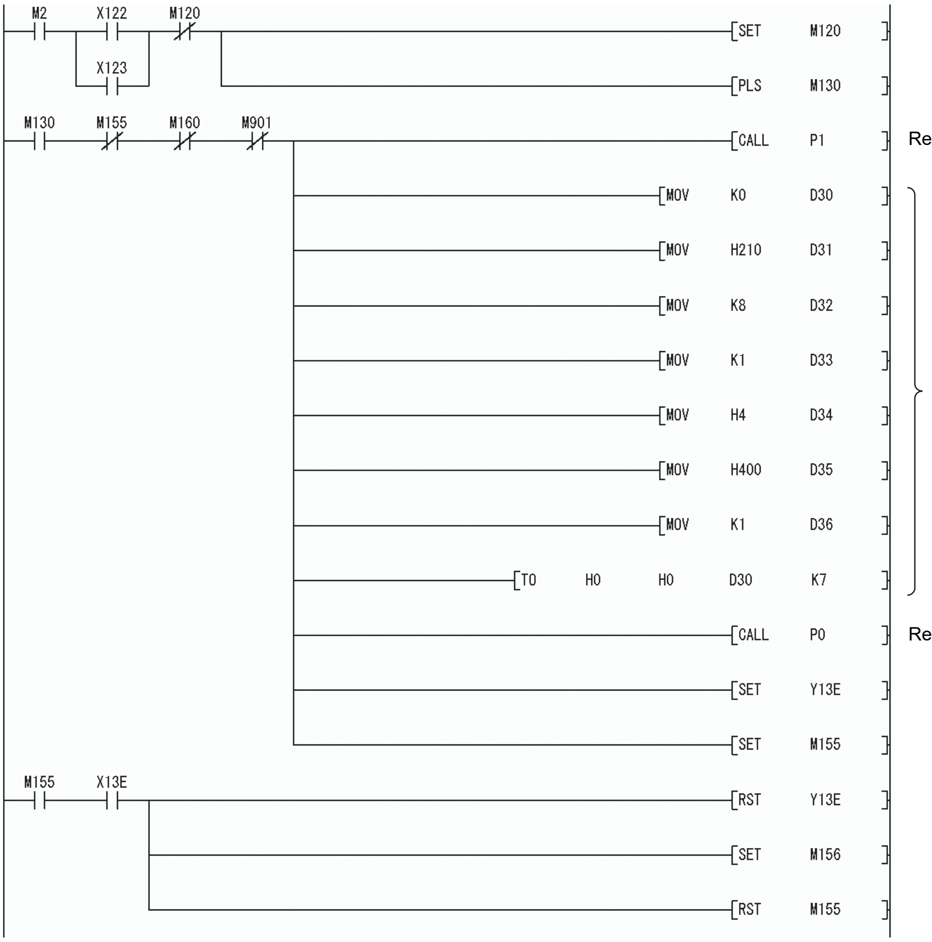
8.5.3 Precautions when receiving data from external device

(1) Precautions for specification in byte units

The setting in Word/byte specification (R2N 102H) influences the number of the data handled by the following buffer memory areas.

- No. of receive end data (R2N 111H)
- No. of actual send data (R2N 1B4H)
- No. of data stored in OS reception area (R2N 1B6H)
- Send data size specification area (R2N 200H (at default))
- Receive data size specification area (R2N 400H (at default))

In the case of byte specification, to use any of the above memory values as set data of the FROM/TO instruction, the byte data must be changed to word data as shown below.



Refer to Section 8.2.3 (2)(a).

Reads No. of receive data (in byte units)

Refer to Section 8.2.3 (2)(a).

Figure 8.19 Receive program example in the case of byte specification

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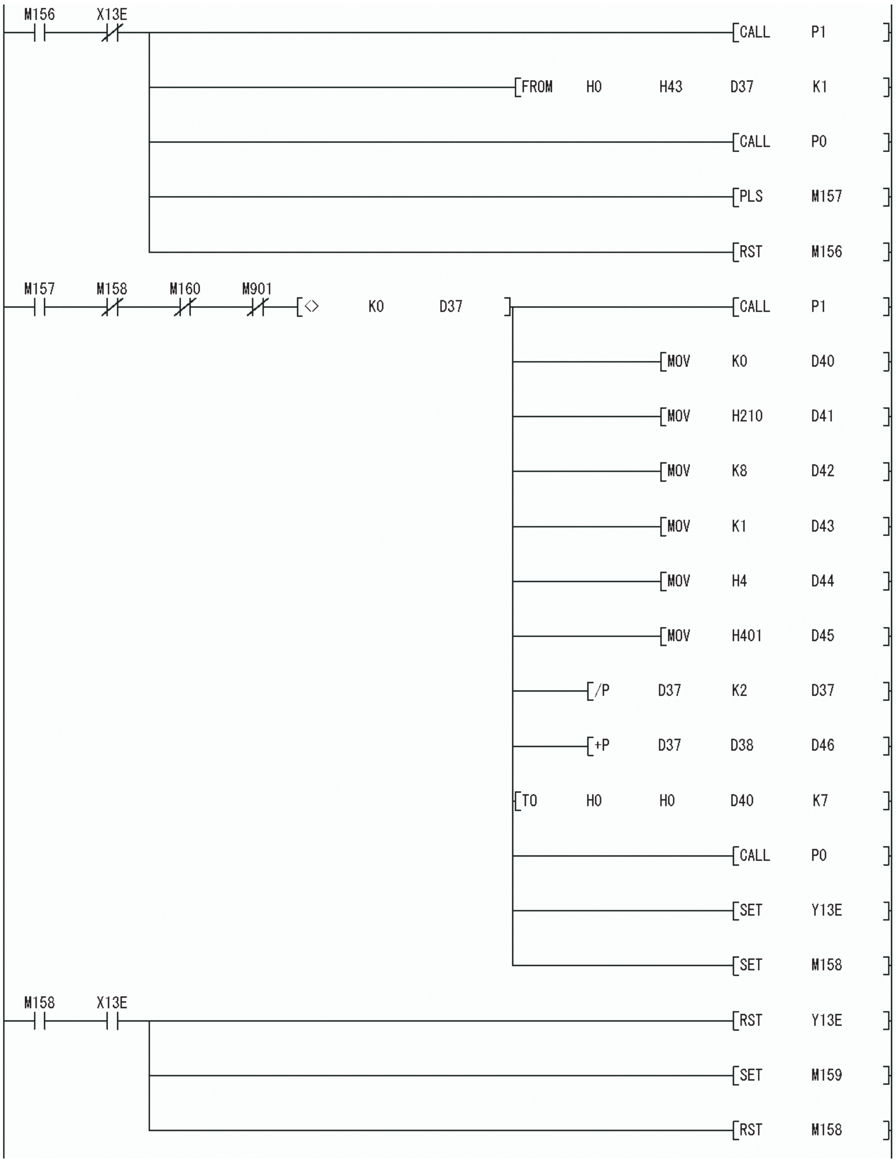

Refer to Section 8.2.3 (2)(a).

Refer to Section 8.2.3 (2)(a).

Refer to Section 8.2.3 (2)(a).

Changes No. of receive data (in byte units) to word units (fractions rounded up) and specifies as No. of read points in TO instruction

Refer to Section 8.2.3 (2)(a).

Figure 8.19 Receive program example in the case of byte specification (Continued)

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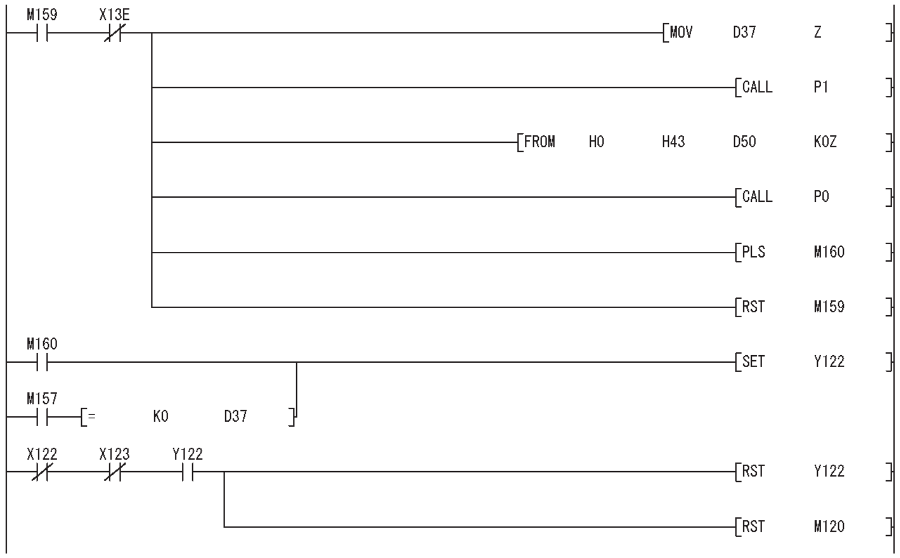

Refer to Section 8.2.3 (2)(a).

Refer to Section 8.2.3 (2)(a).

Figure 8.19 Receive program example in the case of byte specification (Continued)

8.6 Error Handling of AJ65BT-R2N

8.6.1 For the send/receive buffer communication function

(1) Overview of program example

1) When an error occurs during initialization setting or data transfer, an error code will be read out from the AJ65BT-R2N to the master module if Error code read flag (X23) is turned ON.
2) The error is canceled when Error clear flag (X24) is turned ON after the cause of the error has been eliminated.

(2) Program example processing description

1) If any of the signals below are turned ON and Error code read flag (X23) is turned ON, an error code will be read out from the AJ65BT-R2N to the master module.
    - Send failed signal (X121)
    - Error receive data read request signal (X123)
    - Initialization failed signal (X125)
    - E^2PROM function failed signal (X128)
2) If Error clear flag (X24) is turned ON after the cause of the error has been eliminated, Error reset request signal (RY(n+1)A) will be turned ON and the error will be cleared.
3) This turns off the ERR.LED, and error handling is complete when Error code storage area (R2N 1A8H to 1B2H) is cleared.

(3) Devices used in the program example

Table 8.23 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X23	Error code read flag	—	—
X24	Error clear flag	—	—
X121	Send failed signal	—	Section 8.4.1
X123	Error receive data read request signal	—	—
X125	Initialization failed signal	—	Section 8.3.1
X128	E^2PROM function failed signal	—	—
X13A	Error status signal	Section 8.6.1	—
X13E	Intelligent device station access completion signal	Section 8.6.1	Section 8.3.1, Section 8.4.1, Section 8.5.1
Y13A	Error reset request signal	Section 8.6.1	—
Y13E	Intelligent device station access request signal	Section 8.6.1	Section 8.3.1, Section 8.4.1, Section 8.5.1
M3	Operation failed flag	Section 8.6.1	—
M20	AJ65BT-R2N initial setting start flag	—	—
M30	Operation failed pulse signal	Section 8.6.1	—

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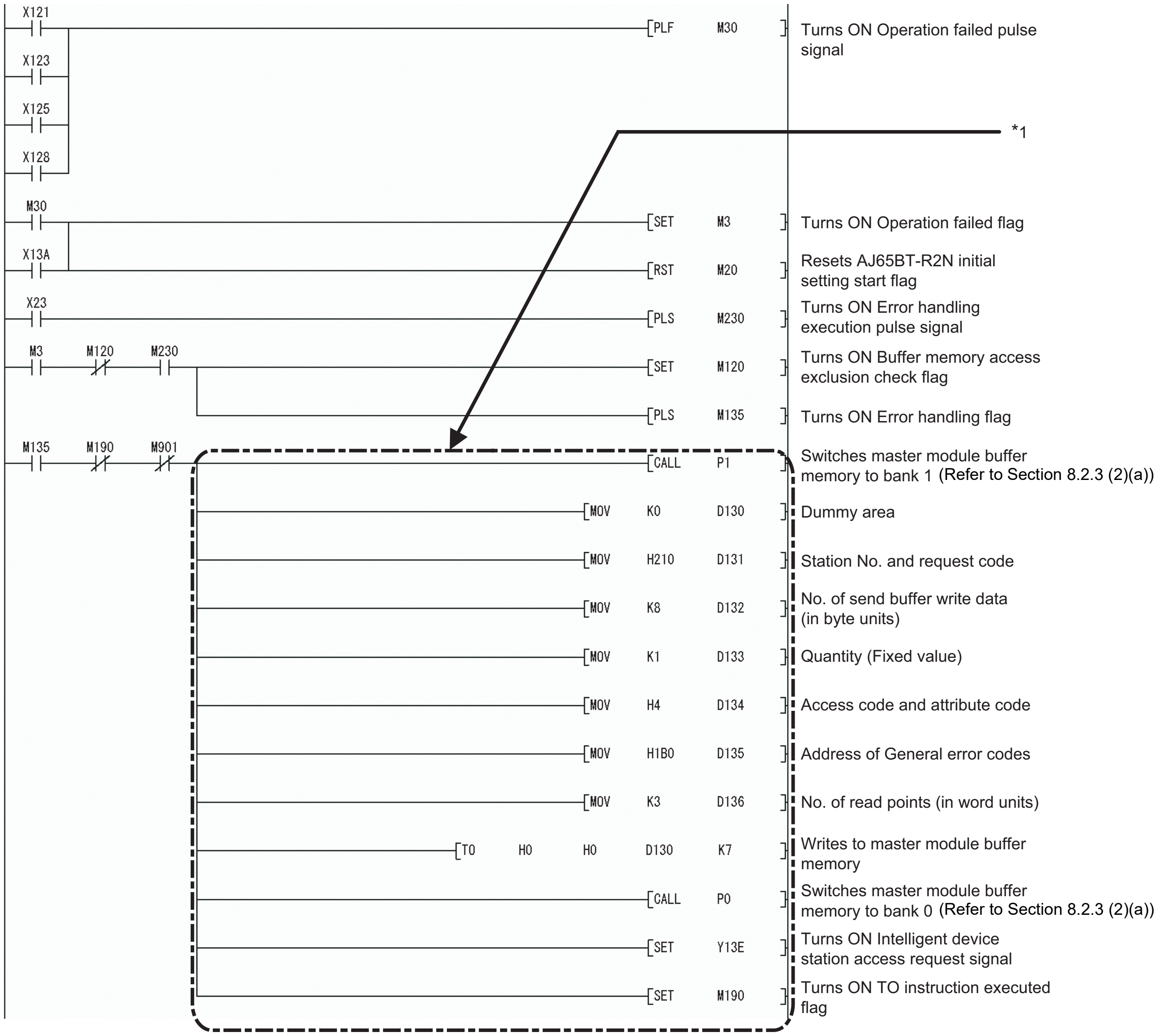
Table 8.23 Devices used in the program example (Continued)

Device	Description	Reference section	
		This program	Other programs
M120	Buffer memory access exclusion check flag	Section 8.6.1	Section 8.4.1, Section 8.5.1
M135	Error handling flag	Section 8.6.1	—
M190	TO instruction executed flag	Section 8.6.1	—
M191	Intelligent device station access request completion flag	Section 8.6.1	—
M230	Error handling execution pulse signal	Section 8.6.1	—
M901	Other station data link status (Station No.2)	—	—
D130 to D136	Control data of TO instruction	—	—
D137 to D139	AJ65BT-R2N error code	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P1	Switching to bank 1 (executing sample program in Section 8.2.3 (2)(a))	—	—

(4) Program example



*1 Modify this according to the system being used and processing executed, etc.

Figure 8.20 Program example

(Continued to next page)

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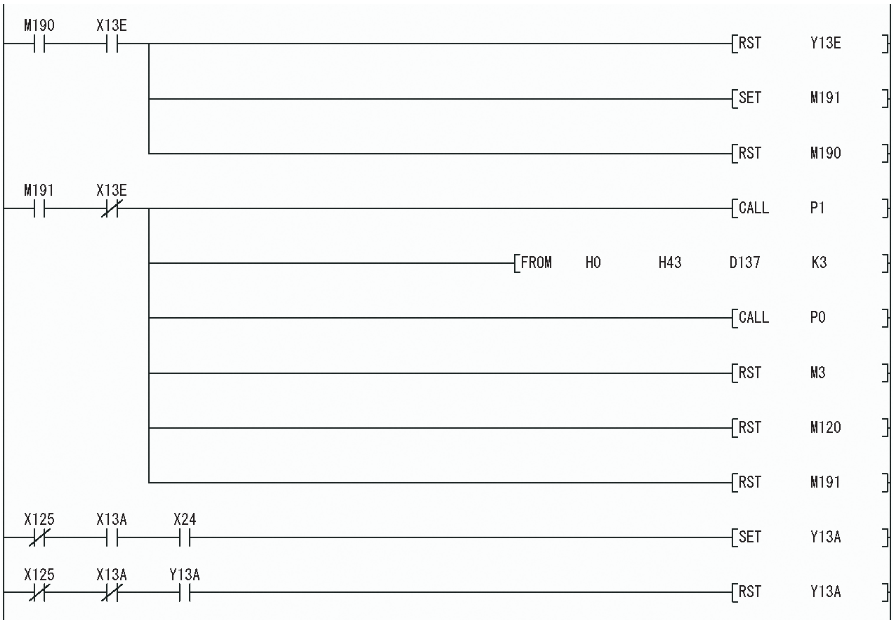


Resets Intelligent device station access request signal

Turns ON Intelligent device station access request completion flag

Resets TO instruction executed flag

Switches master module buffer memory to bank 1 (Refer to Section 8.2.3 (2)(a))

Reads from master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Resets Operation failed flag

Resets Buffer memory access exclusion check flag

Resets Intelligent device station access request completion flag

Turns ON Error reset request signal

Resets Error reset request signal

Figure 8.20 Program example (Continued)

8.6.2 For the buffer memory auto-refresh function

(1) Overview of program example

1) When an error occurs during initialization setting or data transfer, an error code will be read out from the AJ65BT-R2N to the master module if Error code read flag (X23) is turned ON.

2) The error is canceled when Error clear flag (X24) is turned ON after the cause of the error has been eliminated.

(2) Processing in the program example

1) If any of the signals below are turned ON and Error code read flag (X23) is turned ON, an error code will be read out from the AJ65BT-R2N to the master module.
   - Send failed signal (X121)
   - Error receive data read request signal (X123)
   - Initialization failed signal (X125)
   - E^{2}PROM function failed signal (X128)

2) If Error clear flag (X24) is turned ON after the cause of the error has been eliminated, Error reset request signal (RY(n+1)A) will be turned ON and the error will be cleared.

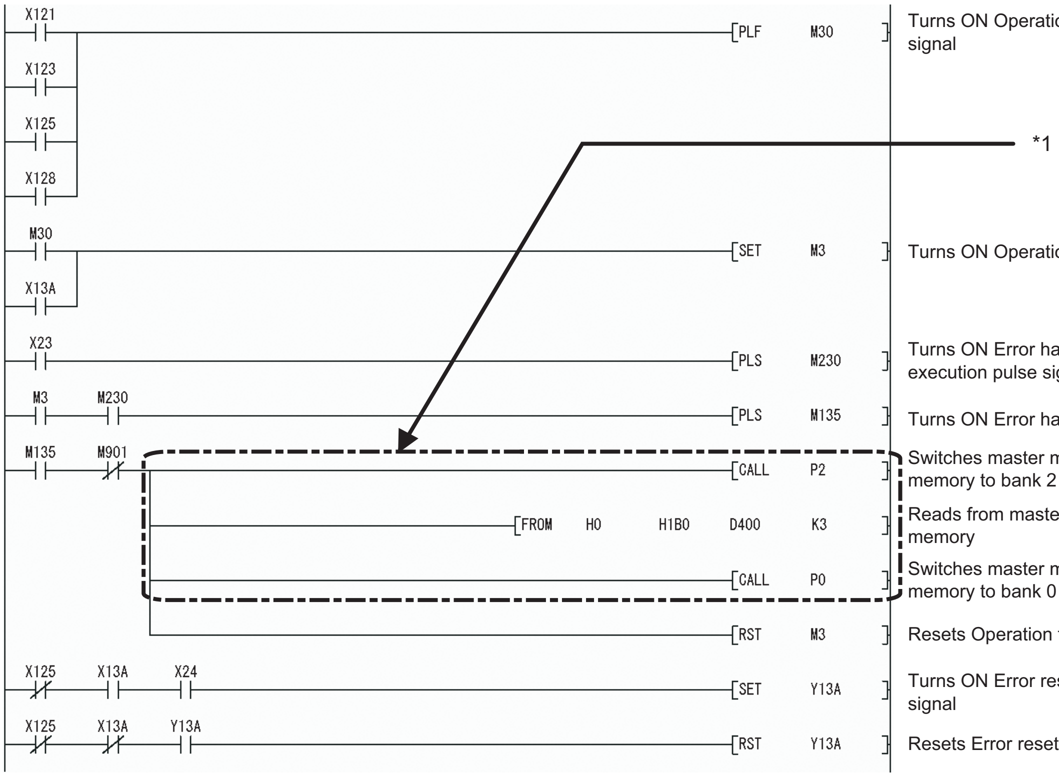
3) This turns off the ERR.LED, and error handling is complete when Error code storage area (R2N 1A8$_H$ to 1B2$_H$) is cleared.

(3) Devices used in the program example

Table 8.24 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X23	Error code read flag	—	—
X24	Error clear flag	—	—
X121	Send failed signal	—	Section 8.4.2
X123	Error receive data read request signal	—	—
X125	Initialization failed signal	—	Section 8.3.2
X128	E^{2}PROM function failed signal	—	—
X13A	Error status signal	Section 8.6.2	—
Y13A	Error reset request signal	Section 8.6.2	—
M3	Operation failed flag	Section 8.6.2	—
M30	Operation failed pulse signal	Section 8.6.2	—
M135	Error handling flag	Section 8.6.2	—
M230	Error handling execution pulse signal	Section 8.6.2	—
M901	Other station data link status (Station No.2)	—	—
D400 to D402	AJ65BT-R2N error code	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P2	Switching to bank 2 (executing sample program in Section 8.2.3 (2)(a))	—	—

(4) Program example



Turns ON Operation failed pulse signal

Turns ON Operation failed flag

Turns ON Error handling execution pulse signal

Turns ON Error handling flag

Switches master module buffer memory to bank 2 (Refer to Section 8.2.3 (2)(a))

Reads from master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Resets Operation failed flag

Turns ON Error reset request signal

Resets Error reset request signal

*1 Modify this according to the system being used and processing executed, etc.

Figure 8.21 Program example

8.7 Initial Settings for Other Functions

This section explains programs for the initial setting of the functions listed below.

Table 8.25 List of other functions

Function	Reference section
Initial setting for the frame function	Section 8.7.1
Initial setting for the monitoring-based transmission function	Section 8.7.2
Initial setting for the flow control function	Section 8.7.3
Initial setting for the ASCII-binary conversion function	Section 8.7.4
Initial setting for the RW refresh function	Section 8.7.5

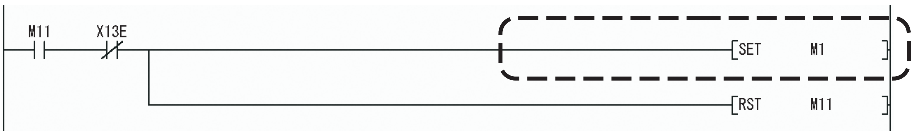
Only the initial setting program is extracted for each function.
When using each function, apply the extracted program to the program given in the following section.

☞ Section 8.3 Initial Setting for AJ65BT-R2N

Remark

(1) When using more than one of the above functions during use of the send/receive buffer communication function, modify the program as follows:

- Modify the program so that the following devices will not be duplicated.
  - (a) Initial setting write completion flag (M1, M50, M53, M56)
  - (b) TO instruction executed flag (M10, M51, M54, M57)
  - (c) Intelligent device station access request completion flag (M11, M52, M55, M58)
- At the end of initial setting, turn ON Initial setting write completion flag (M1).



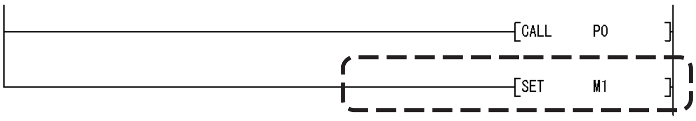
Turns ON Initial setting write completion flag

Resets Intelligent device station access request completion flag

Figure 8.22 Program executed only at the end of initial setting

(2) When using more than one of the above functions during use of the buffer memory auto-refresh function, modify the program as follows:

- Have the program part enclosed as shown below, which is included in each program, executed one time at the end of all initial setting procedures.



Switches master module buffer memory to bank 0

Turns ON Intelligent device station access request completion flag

Figure 8.23 Program executed only at the end of initial setting

8.7.1 Initial setting for the frame function

(1) For the send/receive buffer communication function

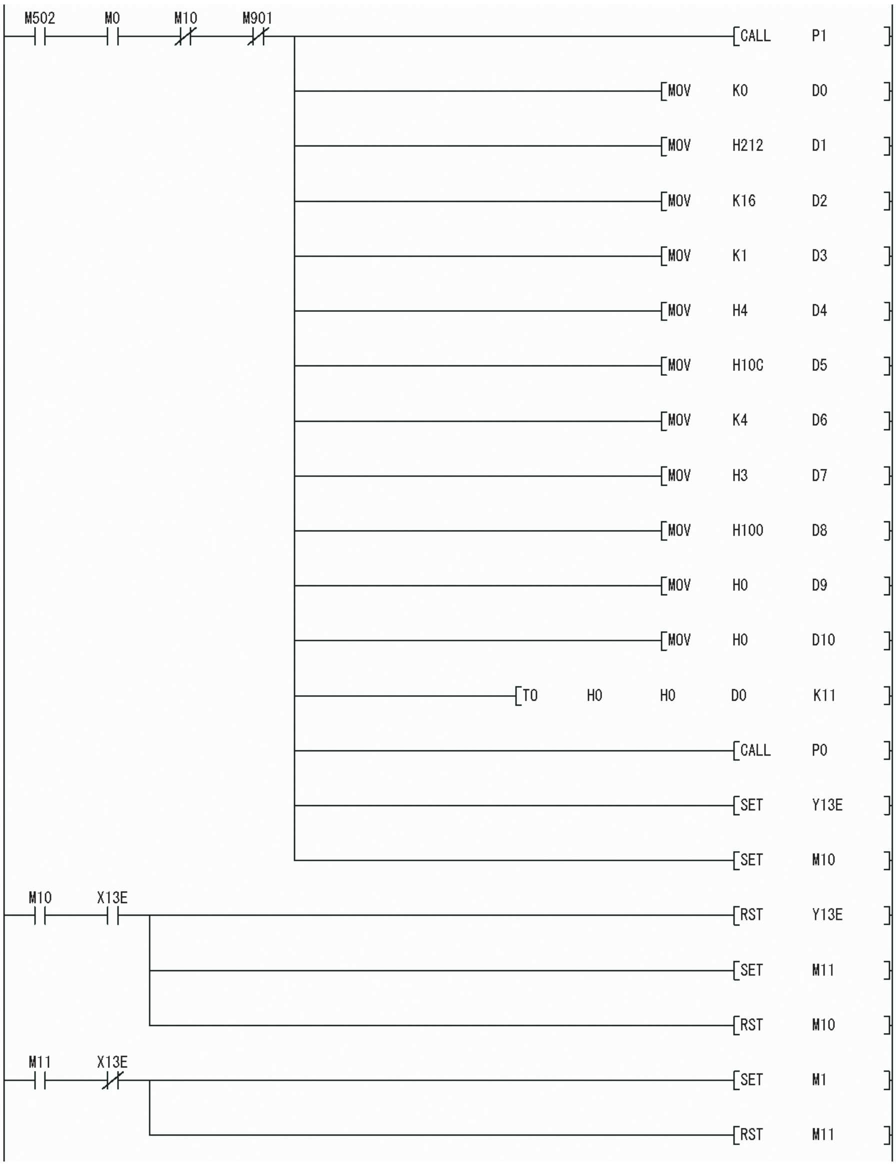
(a) Overview of program example
Reception is completed when ETX(03H) or NUL(00H) is received.

(b) Devices used in the program example

Table 8.26 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X13E	Intelligent device station access completion signal	Section 8.7.1	Section 8.3.1, Section 8.4.1, Section 8.5.1, Section 8.6.1
Y13E	Intelligent device station access request signal	Section 8.7.1	Section 8.3.1, Section 8.4.1, Section 8.5.1, Section 8.6.1
M0	Operation start request flag	—	Section 8.3.1
M1	Initial setting write completion flag	Section 8.7.1	Section 8.3.1
M10	TO instruction executed flag	Section 8.7.1	Section 8.3.1
M11	Intelligent device station access request completion flag	Section 8.7.1	Section 8.3.1
M502	AJ65BT-R2N mode normal flag	—	Section 8.2.1 (3) 3
M901	Other station data link status (Station No.2)	—	—
D0 to D10	Control data of TO instruction and Receive end frame No.1 to 4	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P1	Switching to bank 1 (executing sample program in Section 8.2.3 (2)(a))	—	—

(c) Program example



```
[CALL P1]             Switches master module buffer memory to bank 1 (Refer to Section 8.2.3 (2)(a))
[MOV K0 D0]           Dummy area
[MOV H212 D1]         Station No. and request code
[MOV K16 D2]          No. of send buffer write data (in byte units)
[MOV K1 D3]           Quantity (Fixed value)
[MOV H4 D4]           Access code and attribute code
[MOV H10C D5]         Receive end frame No. address
[MOV K4 D6]           No. of write points (in word units)
[MOV H3 D7]           Specifies default registration frame 03H(ETX)
[MOV H100 D8]         Specifies default registration frame 100H (NUL(00H))
[MOV H0 D9]           No frame specification
[MOV H0 D10]          No frame specification
[TO H0 H0 D0 K11]     Writes to master module buffer memory
[CALL P0]             Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))
[SET Y13E]            Turns ON Intelligent device station access request signal
[SET M10]             Turns ON TO instruction executed flag
[RST Y13E]            Resets Intelligent device station access request signal
[SET M11]             Turns ON Intelligent device station access request completion flag
[RST M10]             Resets TO instruction executed flag
[SET M1]              Turns ON Initial setting write completion flag
[RST M11]             Resets Intelligent device station access request completion flag
```

Figure 8.24 Program example

(2) For the buffer memory auto-refresh function

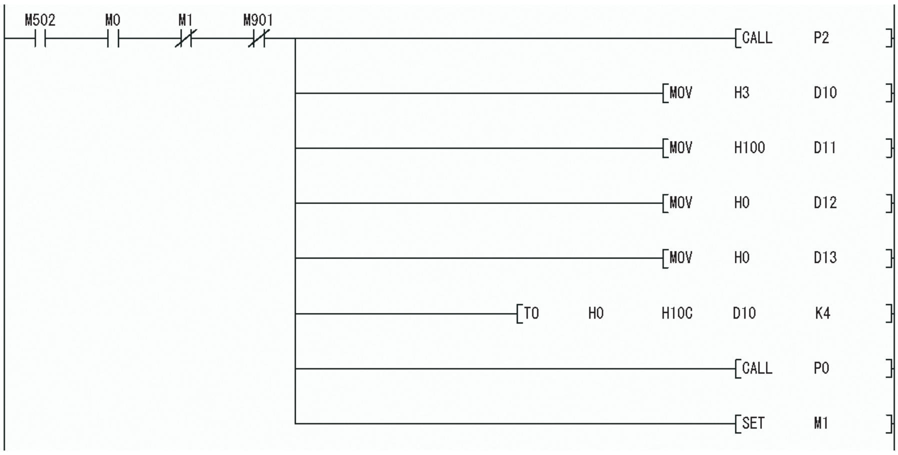
(a) Overview of program example
Reception is completed when ETX(03H) or NUL(00H) is received.

(b) Devices used in the program example

Table 8.27 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 8.3.2
M1	Intelligent device station access request completion flag	Section 8.7.1	Section 8.3.2
M502	AJ65BT-R2N mode normal flag	—	Section 8.2.2 (3) 3
M901	Other station data link status (Station No.2)	—	—
D10 to D13	Receive end frame No.1 to 4	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P2	Switching to bank 2 (executing sample program in Section 8.2.3 (2)(a))	—	—

(c) Program example



Switches master module buffer memory to bank 2 (Refer to Section 8.2.3 (2)(a))

Specifies default registration frame 03H(ETX)

Specifies default registration frame 100H (NUL(00H))

No frame specification

No frame specification

Writes to master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Intelligent device station access request completion flag

Figure 8.25 Program example

8.7.2 Initial setting for the monitoring-based transmission function

(1) For the send/receive buffer communication function

(a) Overview of program example

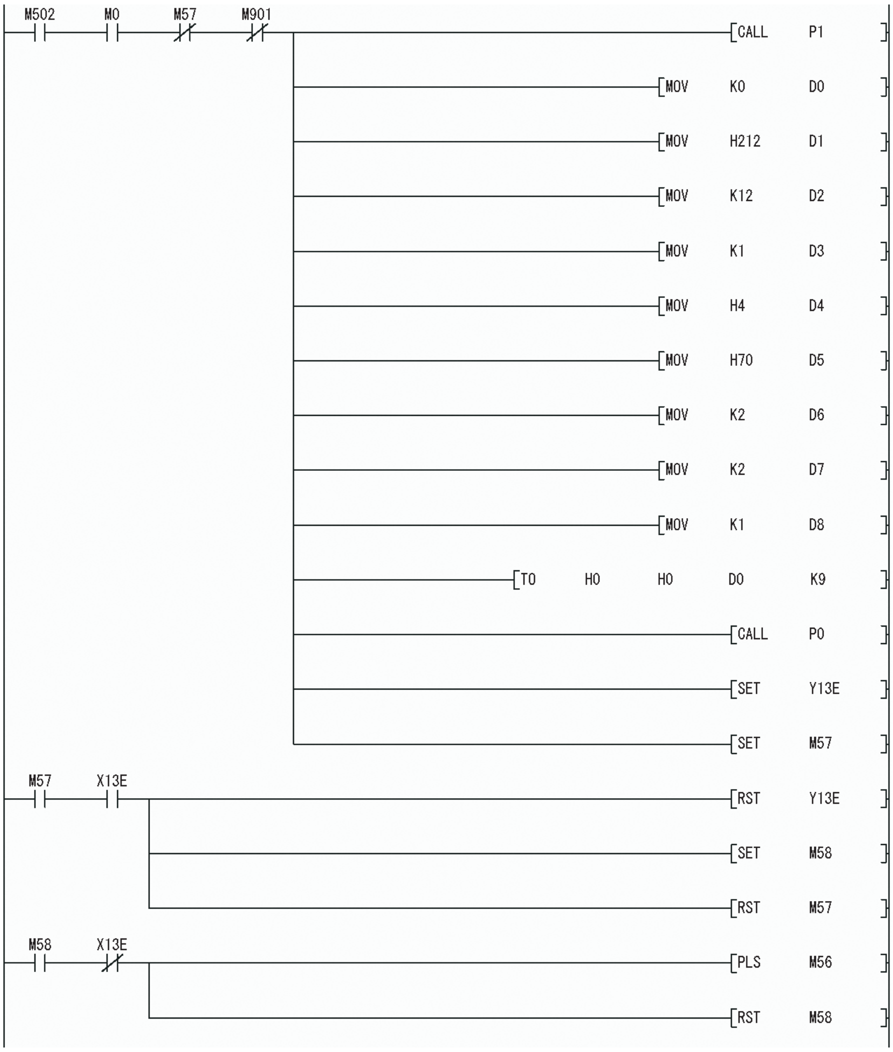
- The monitoring interval is set to 200ms and the send timeout time is set to 500ms.
- Data are sent when RX5 of the module of station No.1 turns ON.
- STX (02H) + User registration frame (3E8H) + ETX (03H) is set as the send data.

(b) Devices used in the program example

Table 8.28 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X13E	Intelligent device station access completion signal	Section 8.7.2	Section 8.3.1, Section 8.4.1, Section 8.5.1, Section 8.6.1
Y13E	Intelligent device station access request signal	Section 8.7.2	Section 8.3.1, Section 8.4.1, Section 8.5.1, Section 8.6.1
M0	Operation start request flag	—	Section 8.3.1
M1	Initial setting write completion flag	Section 8.7.2	Section 8.3.1
M10	TO instruction executed flag	Section 8.7.2	Section 8.3.1
M11	Intelligent device station access request completion flag	Section 8.7.2	Section 8.3.1
M50	Initial setting write completion flag	Section 8.7.2	—
M51	TO instruction executed flag	Section 8.7.2	—
M52	Intelligent device station access request completion flag	Section 8.7.2	—
M53	Initial setting write completion flag	Section 8.7.2	—
M54	TO instruction executed flag	Section 8.7.2	—
M55	Intelligent device station access request completion flag	Section 8.7.2	—
M56	Initial setting write completion flag	Section 8.7.2	—
M57	TO instruction executed flag	Section 8.7.2	—
M58	Intelligent device station access request completion flag	Section 8.7.2	—
M502	AJ65BT-R2N mode normal flag	—	Section 8.2.1 (3) 3
M901	Other station data link status (Station No.2)	—	—
D0 to D11	Control data of TO instruction and Monitoring-based transmission function set values	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P1	Switching to bank 1 (executing sample program in Section 8.2.3 (2)(a))	—	—

(c) Program example



Switches master module buffer memory to bank 1 (Refer to Section 8.2.3 (2)(a))

Dummy area

Station No. and request code

No. of send buffer write data (in byte units)

Quantity (Fixed value)

Access code and attribute code

Monitoring interval specification address

No. of write points (in word units)

Specifies 200ms for Monitoring interval specification

Specifies 1 for No. of monitoring settings

Writes to master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Intelligent device station access request signal

Turns ON TO instruction executed flag

Resets Intelligent device station access request signal

Turns ON Intelligent device station access request completion flag

Resets TO instruction executed flag

Turns ON Initial setting write completion flag

Resets Intelligent device station access request completion flag

Figure 8.26 Program example

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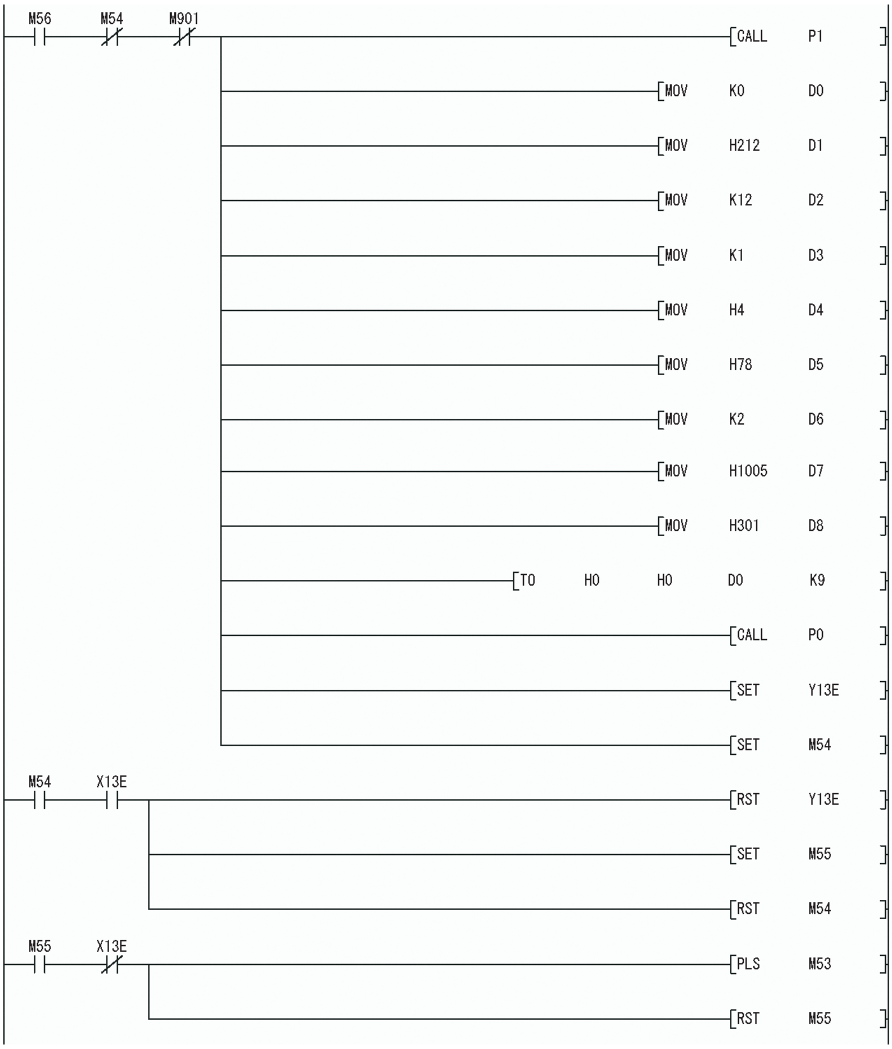

Switches master module buffer memory to bank 1 (Refer to Section 8.2.3 (2)(a))

Dummy area

Station No. and request code

No. of send buffer write data (in byte units)

Quantity (Fixed value)

Access code and attribute code

Monitoring target address

No. of write points (in word units)

Specifies RX5 of station No.1 as monitoring target

Specifies start number (1) and No. of transmission tables (3) for send data specification

Writes to master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Intelligent device station access request signal

Turns ON TO instruction executed flag

Resets Intelligent device station access request signal

Turns ON Intelligent device station access request completion flag

Resets TO instruction executed flag

Turns ON Initial setting write completion flag

Resets Intelligent device station access request completion flag

Figure 8.26 Program example (Continued)

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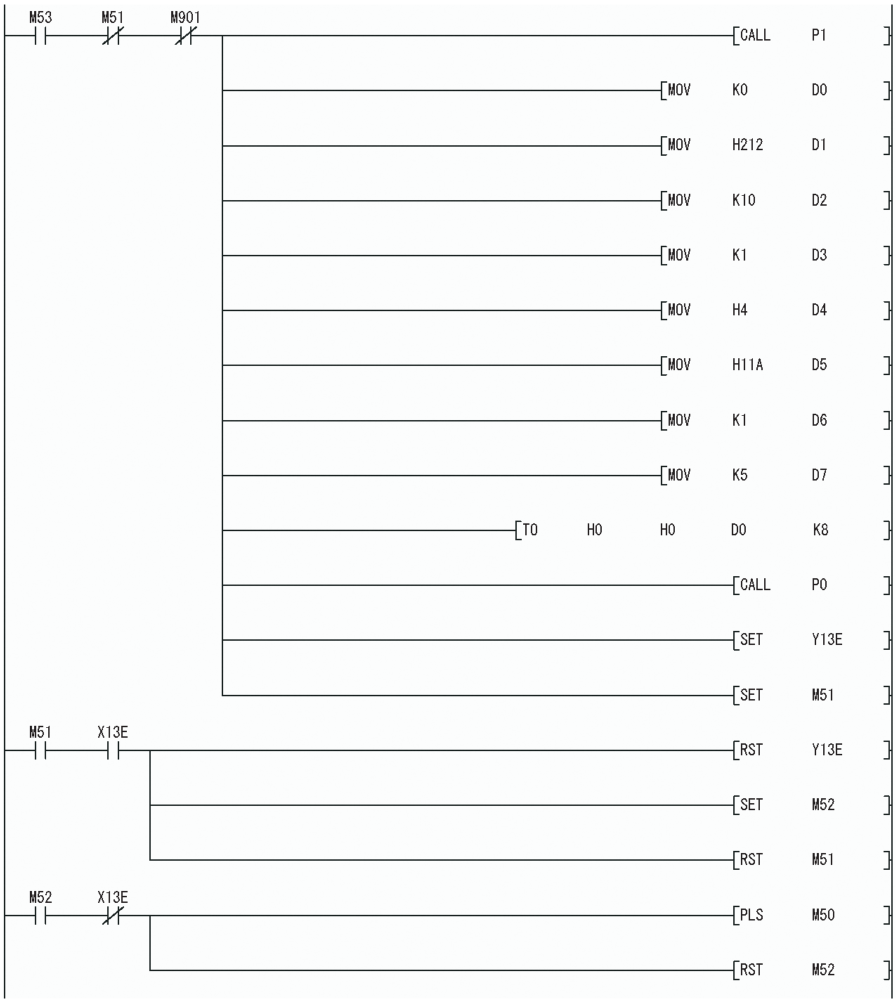

Switches master module buffer memory to bank 1 (Refer to Section 8.2.3 (2)(a))

Dummy area

Station No. and request code

No. of send buffer write data (in byte units)

Quantity (Fixed value)

Access code and attribute code

Send timeout time specification

No. of write points (in word units)

Specifies 500ms for Send timeout time specification

Writes to master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Intelligent device station access request signal

Turns ON TO instruction executed flag

Resets Intelligent device station access request signal

Turns ON Intelligent device station access request completion flag

Resets TO instruction executed flag

Turns ON Initial setting write completion flag

Resets Intelligent device station access request completion flag

Figure 8.26 Program example (Continued)

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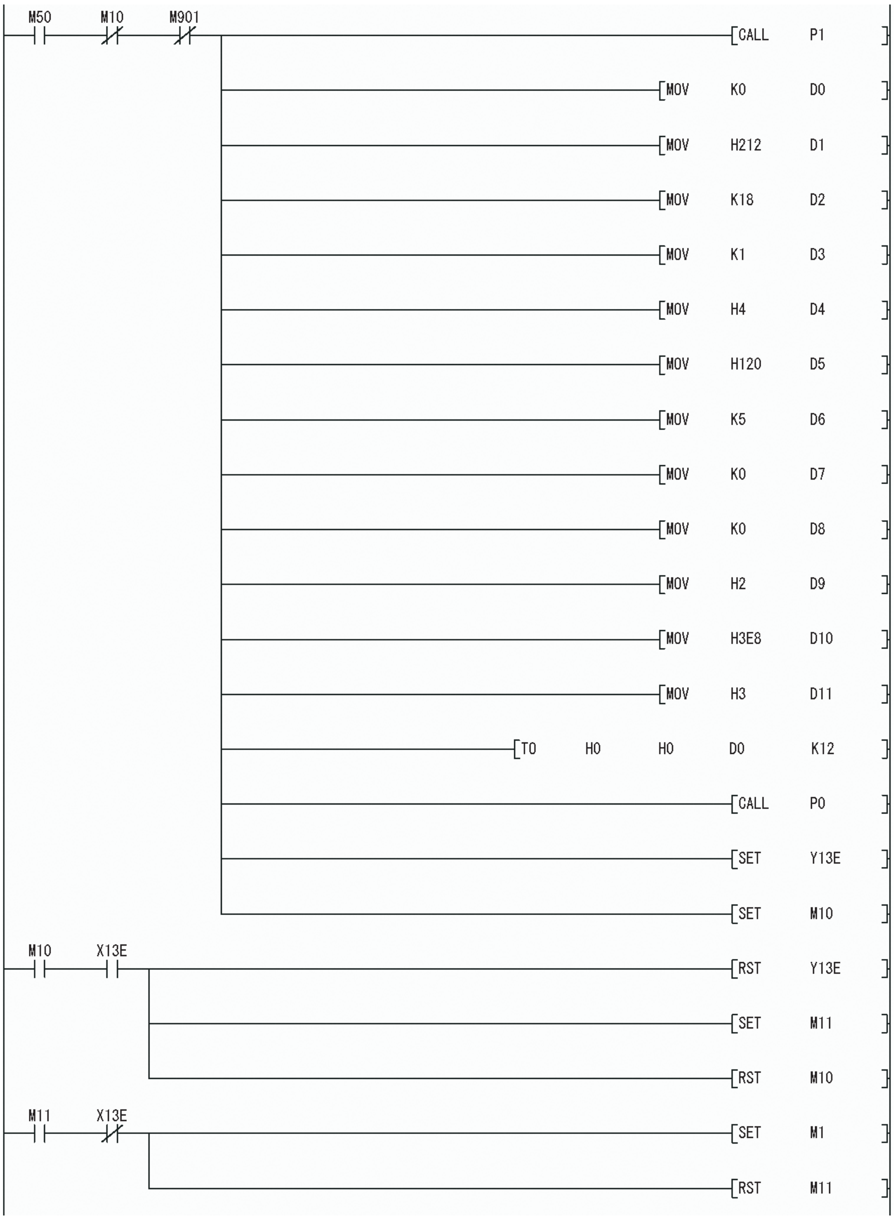


M50 M10 M901	[CALL P1]	Switches master module buffer memory to bank 1 (Refer to Section 8.2.3 (2)(a))
	[MOV K0 D0]	Dummy area
	[MOV H212 D1]	Station No. and request code
	[MOV K18 D2]	No. of send buffer write data (in byte units)
	[MOV K1 D3]	Quantity (Fixed value)
	[MOV H4 D4]	Access code and attribute code
	[MOV H120 D5]	Transmission table start No. specification address
	[MOV K5 D6]	No. of write points (in word units)
	[MOV K0 D7]	Specifies 0 for Transmission table start No. specification
	[MOV K0 D8]	Specifies 0 for No. of transmission tables
	[MOV H2 D9]	Specifies STX(2H) for transmission table No.1
	[MOV H3E8 D10]	Specifies User registration frame (3E8H) for transmission table No.2
	[MOV H3 D11]	Specifies ETX(3H) for transmission table No.3
	[TO H0 H0 D0 K12]	Writes to master module buffer memory
	[CALL P0]	Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))
	[SET Y13E]	Turns ON Intelligent device station access request signal
	[SET M10]	Turns ON TO instruction executed flag
M10 X13E	[RST Y13E]	Resets Intelligent device station access request signal
	[SET M11]	Turns ON Intelligent device station access request completion flag
	[RST M10]	Resets TO instruction executed flag
M11 X13E	[SET M1]	Turns ON Initial setting write completion flag
	[RST M11]	Resets Intelligent device station access request completion flag

Figure 8.26 Program example (Continued)

(2) For the buffer memory auto-refresh function

(a) Overview of program example

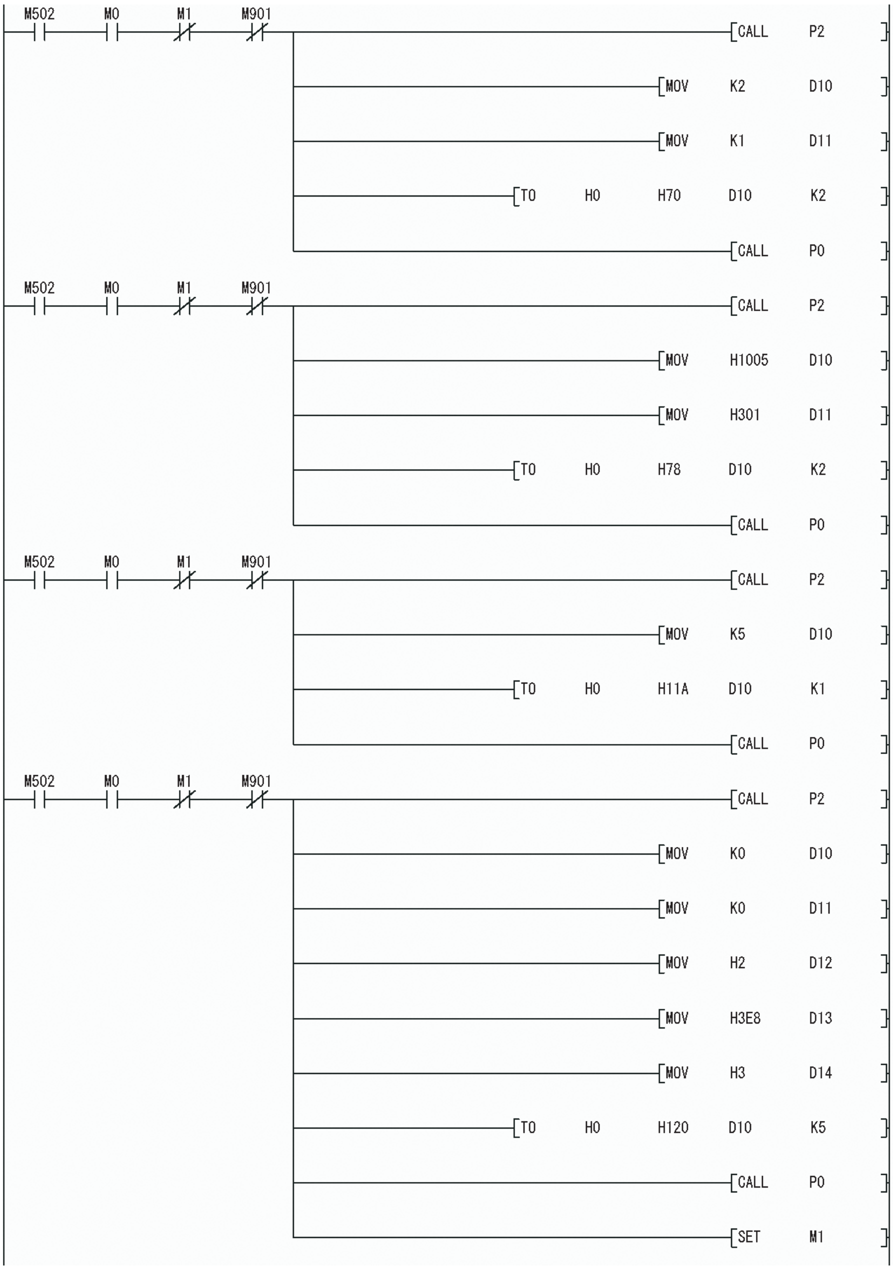
- The monitoring interval is set to 200ms and the send timeout time is set to 500ms.
- Data are sent when RX5 of the module of station No.1 turns ON.
- STX (02H) + User registration frame (3E8H) + ETX (03H) is set as the send data.

(b) Devices used in the program example

Table 8.29 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 8.3.2
M1	Intelligent device station access request completion flag	Section 8.7.2	Section 8.3.2
M502	AJ65BT-R2N mode normal flag	—	Section 8.2.2 (3) 3
M901	Other station data link status (Station No.2)	—	—
D10 to D14	Monitoring-based transmission function set values	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P2	Switching to bank 2 (executing sample program in Section 8.2.3 (2)(a))	—	—

(c) Program example



Switches master module buffer memory to bank 2 (Refer to Section 8.2.3 (2)(a))

Specifies 200ms for Monitoring interval specification

Specifies 1 for No. of monitoring settings

Writes to master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Switches master module buffer memory to bank 2 (Refer to Section 8.2.3 (2)(a))

Specifies RX5 of station No.1 as monitoring target

Specifies start number (1) and No. of transmission tables (3) for Send data specification

Writes to master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Switches master module buffer memory to bank 2 (Refer to Section 8.2.3 (2)(a))

Specifies 500ms for Send timeout time specification

Writes to master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Switches master module buffer memory to bank 2 (Refer to Section 8.2.3 (2)(a))

Specifies 0 for Transmission table start No. specification

Specifies 0 for No. of transmission tables

Specifies STX(2_H) for transmission table No.1

Specifies User registration frame ($3E8_H$) for transmission table No.2

Specifies ETX(3_H) for transmission table No.3

Writes to master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Intelligent device station access request completion flag

Figure 8.27 Program example

8.7.3 Initial setting for the flow control function

(1) For the send/receive buffer communication function

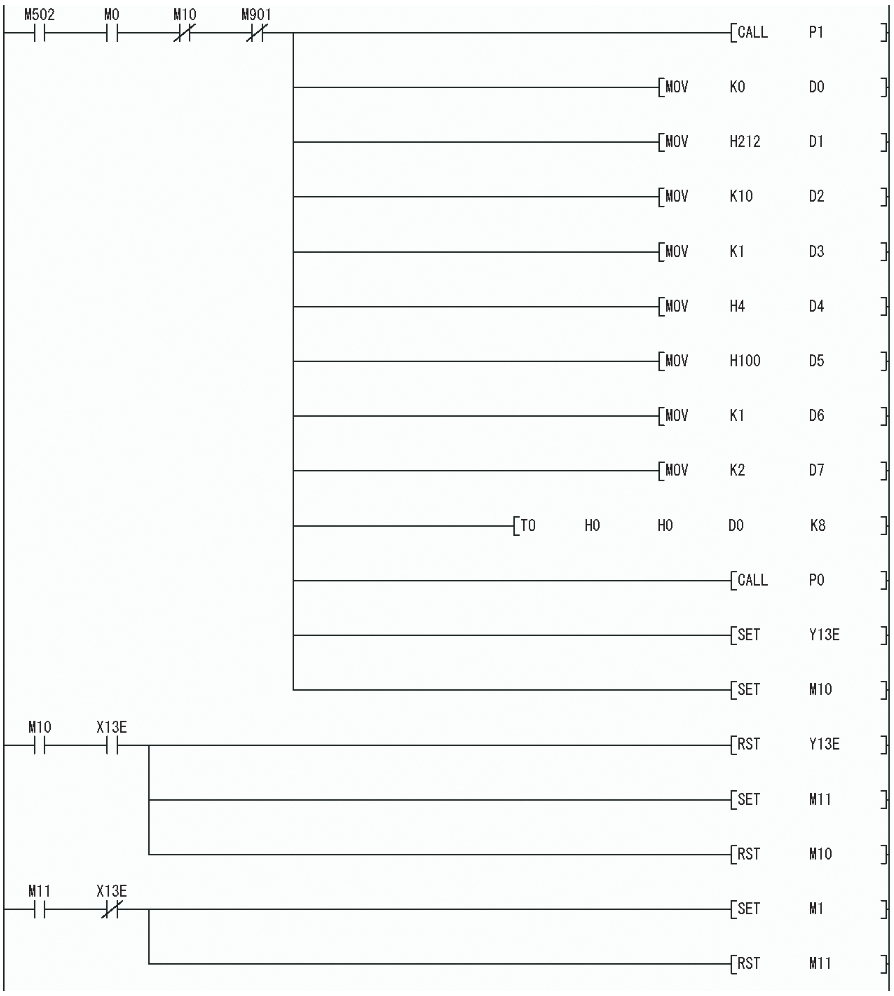
(a) Overview of program example
The flow control is performed by the DC code control.

(b) Devices used in the program example

Table 8.30 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X13E	Intelligent device station access completion signal	Section 8.7.3	Section 8.3.1, Section 8.4.1, Section 8.5.1, Section 8.6.1
Y13E	Intelligent device station access request signal	Section 8.7.3	Section 8.3.1, Section 8.4.1, Section 8.5.1, Section 8.6.1
M0	Operation start request flag	—	Section 8.3.1
M1	Initial setting write completion flag	Section 8.7.3	Section 8.3.1
M10	TO instruction executed flag	Section 8.7.3	Section 8.3.1
M11	Intelligent device station access request completion flag	Section 8.7.3	Section 8.3.1
M502	AJ65BT-R2N mode normal flag	—	Section 8.2.1 (3) 3
M901	Other station data link status (Station No.2)	—	—
D0 to D7	Control data of TO instruction and the flow control function set value	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P1	Switching to bank 1 (executing sample program in Section 8.2.3 (2)(a))	—	—

(c) Program example



Switches master module buffer memory to bank 1 (Refer to Section 8.2.3 (2)(a))

Dummy area

Station No. and request code

No. of send buffer write data (in byte units)

Quantity (Fixed value)

Access code and attribute code

Flow control specification address

No. of write points (in word units)

Specifies 2 for Flow control specification

Writes to master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Intelligent device station access request signal

Turns ON TO instruction executed flag

Resets Intelligent device station access request signal

Turns ON Intelligent device station access request completion flag

Resets TO instruction executed flag

Turns ON Initial setting write completion flag

Resets Intelligent device station access request completion flag

Figure 8.28 Program example

(2) For the buffer memory auto-refresh function

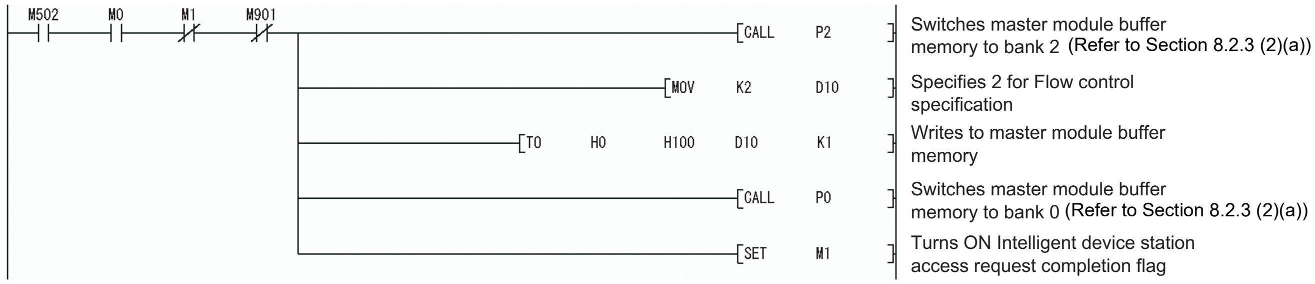
(a) Overview of program example
The flow control is performed by the DC code control.

(b) Devices used in the program example

Table 8.31 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 8.3.2
M1	Intelligent device station access request completion flag	Section 8.7.3	Section 8.3.2
M502	AJ65BT-R2N mode normal flag	—	Section 8.2.2 (3) 3
M901	Other station data link status (Station No.2)	—	—
D10	Flow control function set value	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P2	Switching to bank 2 (executing sample program in Section 8.2.3 (2)(a))	—	—

(c) Program example



Switches master module buffer memory to bank 2 (Refer to Section 8.2.3 (2)(a))

Specifies 2 for Flow control specification

Writes to master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Intelligent device station access request completion flag

Figure 8.29 Program example

8.7.4 Initial setting for the ASCII-binary conversion function

(1) For the send/receive buffer communication function

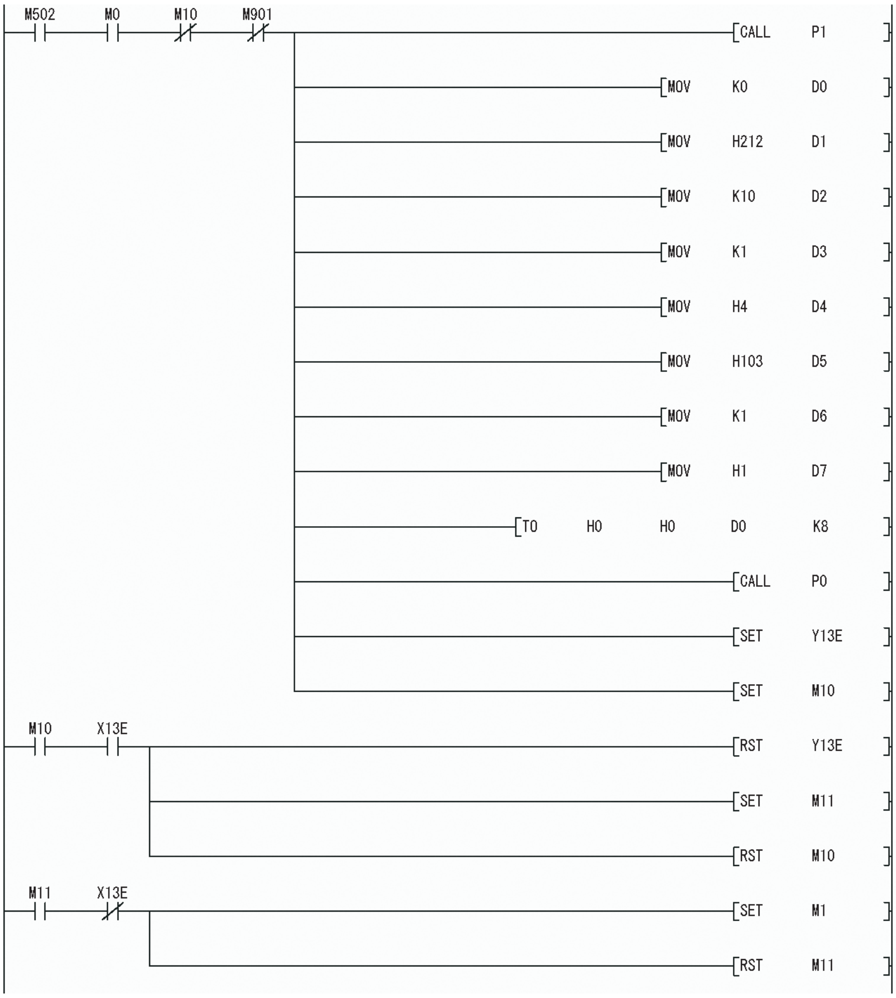
(a) Overview of program example
The ASCII-binary conversion function is used.

(b) Devices used in the program example

Table 8.32 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X13E	Intelligent device station access completion signal	Section 8.7.4	Section 8.3.1, Section 8.4.1, Section 8.5.1, Section 8.6.1
Y13E	Intelligent device station access request signal	Section 8.7.4	Section 8.3.1, Section 8.4.1, Section 8.5.1, Section 8.6.1
M0	Operation start request flag	—	Section 8.3.1
M1	Initial setting write completion flag	Section 8.7.4	Section 8.3.1
M10	TO instruction executed flag	Section 8.7.4	Section 8.3.1
M11	Intelligent device station access request completion flag	Section 8.7.4	Section 8.3.1
M502	AJ65BT-R2N mode normal flag	—	Section 8.2.1 (3) 3
M901	Other station data link status (Station No.2)	—	—
D0 to D7	Control data of TO instruction and ASCII-binary conversion function set value	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P1	Switching to bank 1 (executing sample program in Section 8.2.3 (2)(a))	—	—

(c) Program example



Switches master module buffer memory to bank 1 (Refer to Section 8.2.3 (2)(a))

Dummy area

Station No. and request code

No. of send buffer write data (in byte units)

Quantity (Fixed value)

Access code and attribute code

ASCII-binary conversion specification address

No. of write points (in word units)

Specifies 1 for ASCII-binary conversion specification

Writes to master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Intelligent device station access request signal

Turns ON TO instruction executed flag

Resets Intelligent device station access request signal

Turns ON Intelligent device station access request completion flag

Resets TO instruction executed flag

Turns ON Initial setting write completion flag

Resets Intelligent device station access request completion flag

Figure 8.30 Program example

(2) For the buffer memory auto-refresh function

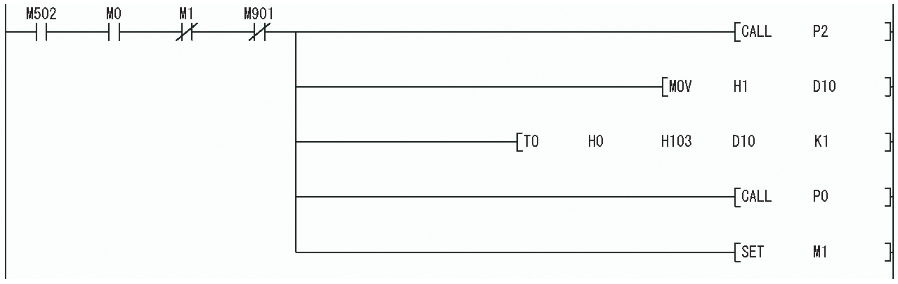
(a) Overview of program example
The ASCII-binary conversion function is used.

(b) Devices used in the program example

Table 8.33 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 8.3.2
M1	Intelligent device station access request completion flag	Section 8.7.4	Section 8.3.2
M502	AJ65BT-R2N mode normal flag	—	Section 8.2.2 (3) 3
M901	Other station data link status (Station No.2)	—	—
D10	ASCII-binary conversion function set value	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P2	Switching to bank 2 (executing sample program in Section 8.2.3 (2)(a))	—	—

(c) Program example



Switches master module buffer memory to bank 2 (Refer to Section 8.2.3 (2)(a))

Specifies 1 for ASCII-binary conversion specification

Writes to master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Intelligent device station access request completion flag

Figure 8.31 Program example

8.7.5 Initial setting for the RW refresh function

(1) For the send/receive buffer communication function

(a) Overview of program examples

- The remote register (RW) assignments are changed to those listed below so that the assigned buffer memories can be monitored.

Table 8.34 Devices used in the program example

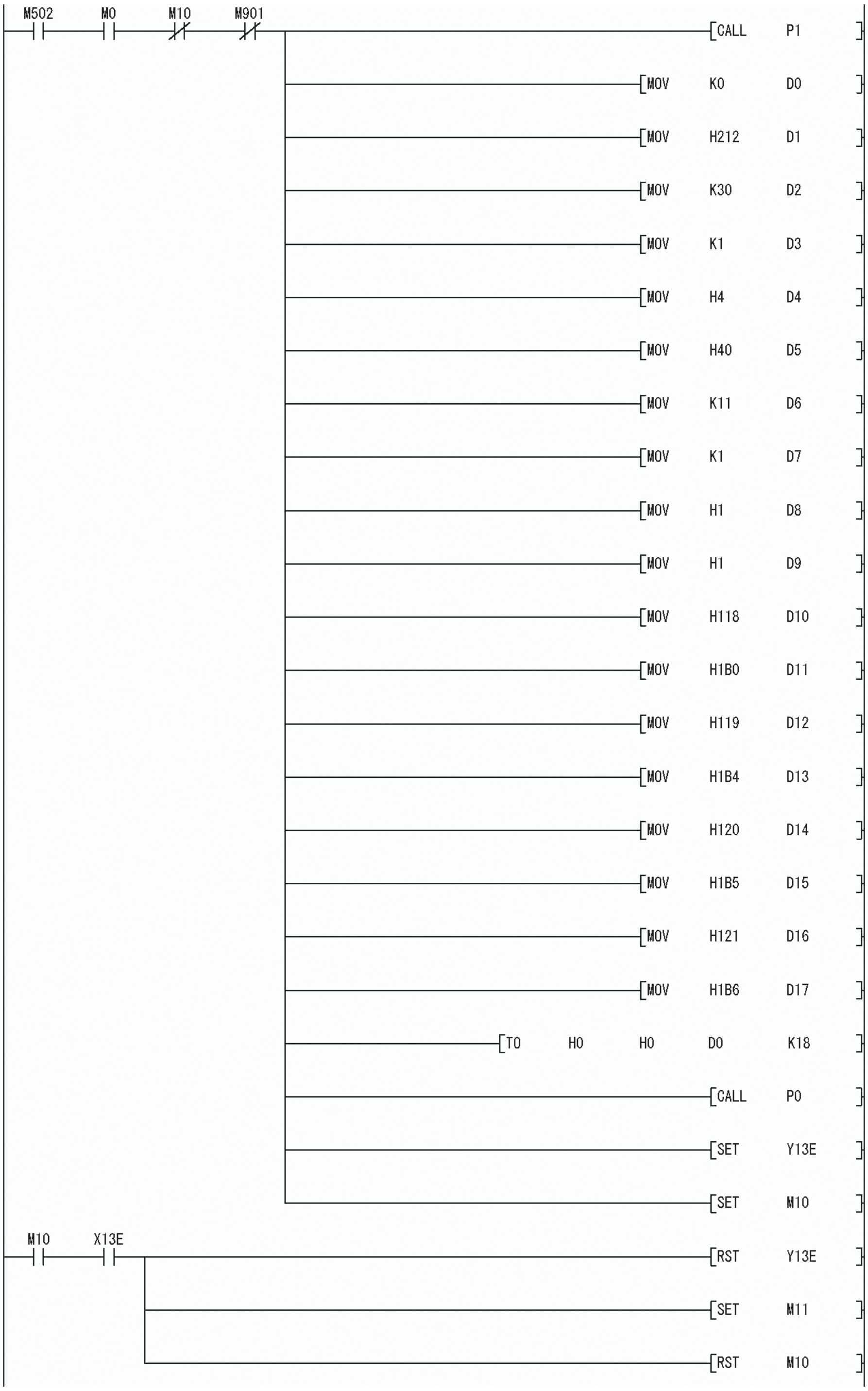
Device	Buffer memory	Device	Buffer memory
RWrm	General error codes (R2N 1B0H)	RWwm	Send start frame No. (R2N 118H)
RWr(m+1)	No. of actual send data (R2N 1B4H)	RWw(m+1)	Send end frame No. (R2N 119H)
RWr(m+2)	Receive frame index No. storage (R2N 1B5H)	RWw(m+2)	Transmission table start No. specification (R2N 120H)
RWr(m+3)	No. of data stored in OS reception area (R2N 1B6H)	RWw(m+3)	No. of transmission tables (R2N 121H)

(b) Devices used in the program example

Table 8.35 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X13E	Intelligent device station access completion signal	Section 8.7.5	Section 8.3.1, Section 8.4.1, Section 8.5.1, Section 8.6.1
Y13E	Intelligent device station access request signal	Section 8.7.5	Section 8.3.1, Section 8.4.1, Section 8.5.1, Section 8.6.1
M0	Operation start request flag	—	Section 8.3.1
M1	Initial setting write completion flag	Section 8.7.5	Section 8.3.1
M10	TO instruction executed flag	Section 8.7.5	Section 8.3.1
M11	Intelligent device station access request completion flag	Section 8.7.5	Section 8.3.1
M502	AJ65BT-R2N mode normal flag	—	Section 8.2.1 (3) 3
M901	Other station data link status (Station No.2)	—	—
D0 to D17	Control data of TO instruction and RW refresh function set value	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P1	Switching to bank 1 (executing sample program in Section 8.2.3 (2)(a))	—	—

(c) Program example



Switches master module buffer memory to bank 1 (Refer to Section 8.2.3 (2)(a))

Dummy area

Station No. and request code

No. of send buffer write data (in byte units)

Quantity (Fixed value)

Access code and attribute code

RW refresh interval specification address

No. of write points (in word units)

Specifies 100ms for RW refresh interval specification

Specifies Enable for RWw refresh enable/disable setting

Specifies Enable for RWr refresh enable/disable setting

Specifies Send start frame No. ($\boxed{\text{R2N}}$118H) for RWwm

Specifies General error codes ($\boxed{\text{R2N}}$1B0H) for RWrm

Specifies Send end frame No. ($\boxed{\text{R2N}}$119H) for RWw(m+1)

Assigns No. of actual send data ($\boxed{\text{R2N}}$1B4H) to RWr(m+1)

Specifies Transmission table start No. specification ($\boxed{\text{R2N}}$120H) for RWw(m+2)

Assigns Receive frame index No. storage ($\boxed{\text{R2N}}$1B5H) to RWr(m+2)

Specifies No. of transmission tables ($\boxed{\text{R2N}}$121H) for RWw(m+3)

Specifies No. of data stored in OS reception area ($\boxed{\text{R2N}}$1B6H) for RWr(m+3)

Writes to master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Intelligent device station access request signal

Turns ON TO instruction executed flag

Resets Intelligent device station access request signal

Turns ON Intelligent device station access request completion flag

Resets TO instruction executed flag

Figure 8.32 Program example

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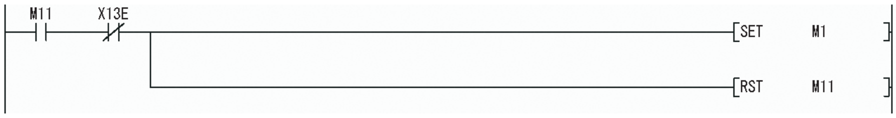


Turns ON Initial setting write completion flag

Resets Intelligent device station access request completion flag

Figure 8.32 Program example (Continued)

(2) For the buffer memory auto-refresh function

(a) Overview of program example

- The remote register (RW) assignments are changed to those listed below so that the assigned buffer memories can be monitored.

Table 8.36 Devices used in the program example

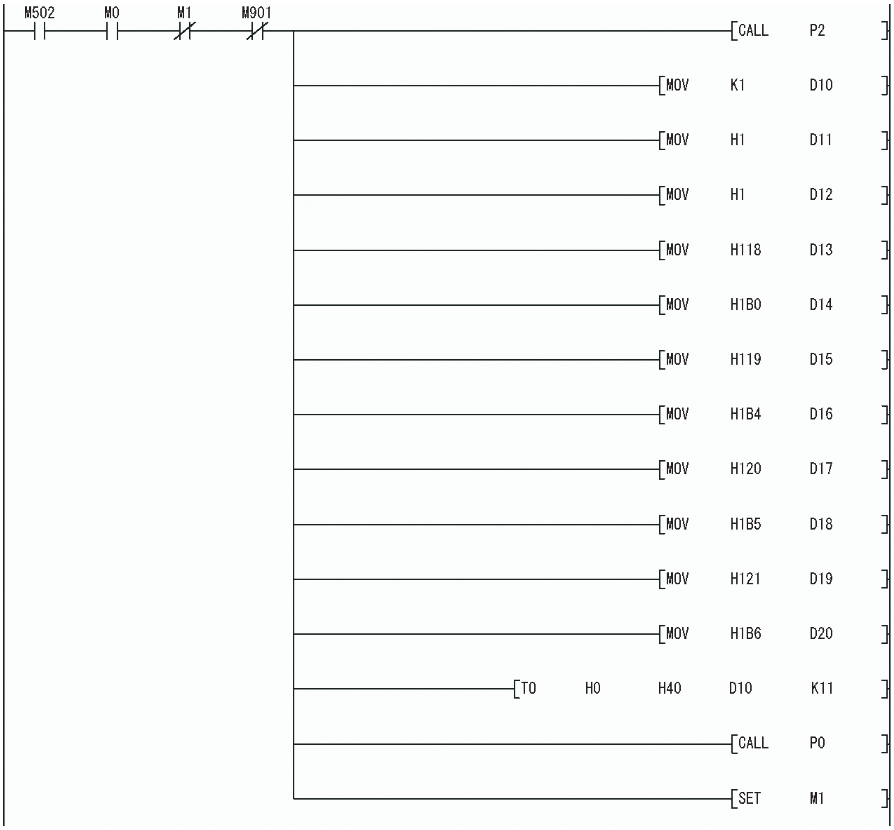
Device	Buffer memory	Device	Buffer memory
RWrm	General error codes (R2N 1B0$_H$)	RWwm	Send start frame No. (R2N 118$_H$)
RWr(m+1)	No. of actual send data (R2N 1B4$_H$)	RWw(m+1)	Send end frame No. (R2N 119$_H$)
RWr(m+2)	Receive frame index No. storage (R2N 1B5$_H$)	RWw(m+2)	Transmission table start No. specification (R2N 120$_H$)
RWr(m+3)	No. of data stored in OS reception area (R2N 1B6$_H$)	RWw(m+3)	No. of transmission tables (R2N 121$_H$)

(b) Devices used in the program example

Table 8.37 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
M0	Operation start request flag	—	Section 8.3.2
M1	Intelligent device station access request completion flag	Section 8.7.5	Section 8.3.2
M502	AJ65BT-R2N mode normal flag	—	Section 8.2.2 (3) 3
M901	Other station data link status (Station No.2)	—	—
D10 to D20	RW refresh function set value	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P2	Switching to bank 2 (executing sample program in Section 8.2.3 (2)(a))	—	—

(c) Program example



[CALL P2]	Switches master module buffer memory to bank 2 (Refer to Section 8.2.3 (2)(a))
[MOV K1 D10]	Specifies 100ms for RW refresh interval specification
[MOV H1 D11]	Specifies Enable for RWw refresh enable/disable setting
[MOV H1 D12]	Specifies Enable for RWr refresh enable/disable setting
[MOV H118 D13]	Specifies Send start frame No. (R2N 118H) for RWwm
[MOV H1B0 D14]	Specifies General error codes (R2N 1B0H) for RWrm
[MOV H119 D15]	Specifies Send end frame No. (R2N 119H) for RWw(m+1)
[MOV H1B4 D16]	Assigns No. of actual send data (R2N 1B4H) to RWr(m+1)
[MOV H120 D17]	Specifies Transmission table start No. specification (R2N 120H) for RWw(m+2)
[MOV H1B5 D18]	Assigns Receive frame index No. storage (R2N 1B5H) to RWr(m+2)
[MOV H121 D19]	Specifies No. of transmission tables (R2N 121H) for RWw(m+3)
[MOV H1B6 D20]	Specifies No. of data stored in OS reception area (R2N 1B6H) for RWr(m+3)
[TO H0 H40 D10 K11]	Writes to master module buffer memory
[CALL P0]	Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))
[SET M1]	Turns ON Intelligent device station access request completion flag

Figure 8.33 Program example

8.8 Other Functions

This section explains programs for executing the functions below.
Execute each program in this section after AJ65BT-R2N initialization.

Table 8.38 List of other functions

Function	Reference section
Send cancel function	Section 8.8.1
Forced receive completion function	Section 8.8.2
OS reception area clear function	Section 8.8.3
E^{2}PROM function setting	Section 8.8.4

8.8.1 Send cancel function

The same program example can be used for the send/receive buffer communication function and buffer memory auto-refresh function.

(1) Overview of program example

Transmission is canceled when Send cancel execute flag (X25) is turned ON after a send request and before send completion.

(2) Processing in the program example

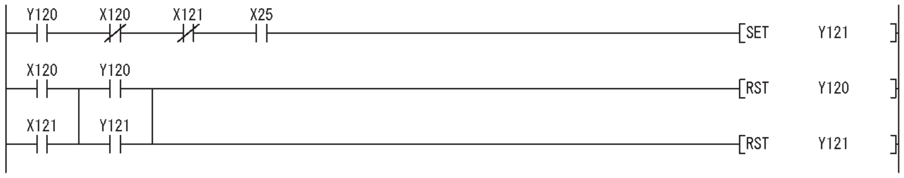
1) After turn-ON of Send request signal (Y120), Send cancel request signal (Y121) is turned ON before Send complete signal (X120) or Send failed signal (X121) turns ON.
2) Send request signal (Y120) and Send cancel request signal (Y121) are turned OFF after turn-ON of Send complete signal (X120) or Send failed signal (X121).

(3) Devices used in the program example

Table 8.39 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X25	Send cancel execute flag	—	—
X120	Send complete signal	Section 8.8.1	Section 8.4.1
X121	Send failed signal	Section 8.8.1	Section 8.4.1
Y120	Send request signal	—	Section 8.4.1
Y121	Send cancel request signal	Section 8.8.1	—

(4) Program example



Turns ON Send cancel request signal

Resets Send request signal

Resets Send cancel request signal

Figure 8.34 Program example

8.8.2 Forced receive completion function

(1) For the send/receive buffer communication function

(a) Overview of program example
When Forced receive completion execute flag (X26) turns ON before reception completion, the receive processing is forcibly completed at the point and data that have been received are read out.

(b) Program example processing description

1) Forced receive completion request signal (Y123) is turned ON to forcibly terminate reception.
2) Received data are read from Receive data size specification area (R2N 400H) and Receive data area (R2N 401H) to the master station word devices (areas starting from D39).
3) Receive data read completion signal (Y122) is turned OFF to terminate the reception.

(c) Devices used in the program example

Table 8.40 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X26	Forced receive completion execute flag	—	—
X122	Normal receive data read request signal	Section 8.8.2	—
X123	Error receive data read request signal	Section 8.8.2	—
X13E	Intelligent device station access completion signal	Section 8.8.2	Section 8.3.1, Section 8.4.1, Section 8.5.1, Section 8.6.1
Y122	Receive data read completion signal	Section 8.8.2	Section 8.5.1
Y123	Forced receive completion request signal	Section 8.8.2	—
Y13E	Intelligent device station access request signal	Section 8.8.2	Section 8.3.1, Section 8.4.1, Section 8.5.1, Section 8.6.1
M2	Operation complete flag	—	Section 8.3.1
M120	Buffer memory access exclusion check flag	Section 8.8.2	Section 8.4.1, Section 8.5.1, Section 8.6.1
M130	Receiving flag	Section 8.8.2	Section 8.5.1
M131	Forced reception start pulse signal	Section 8.8.2	—
M155	TO instruction executed flag	Section 8.8.2	Section 8.5.1
M156	Intelligent device station access request completion flag	Section 8.8.2	Section 8.5.1
M157	Read request completion flag	Section 8.8.2	Section 8.5.1
M158	TO instruction executed flag	Section 8.8.2	Section 8.5.1
M159	Intelligent device station access request completion flag	Section 8.8.2	Section 8.5.1
M160	Read request completion flag	Section 8.8.2	Section 8.5.1
M901	Other station data link status (Station No.2)	—	—
D30 to D36	Control data of TO instruction	—	—
D37	No. of receive data	—	—

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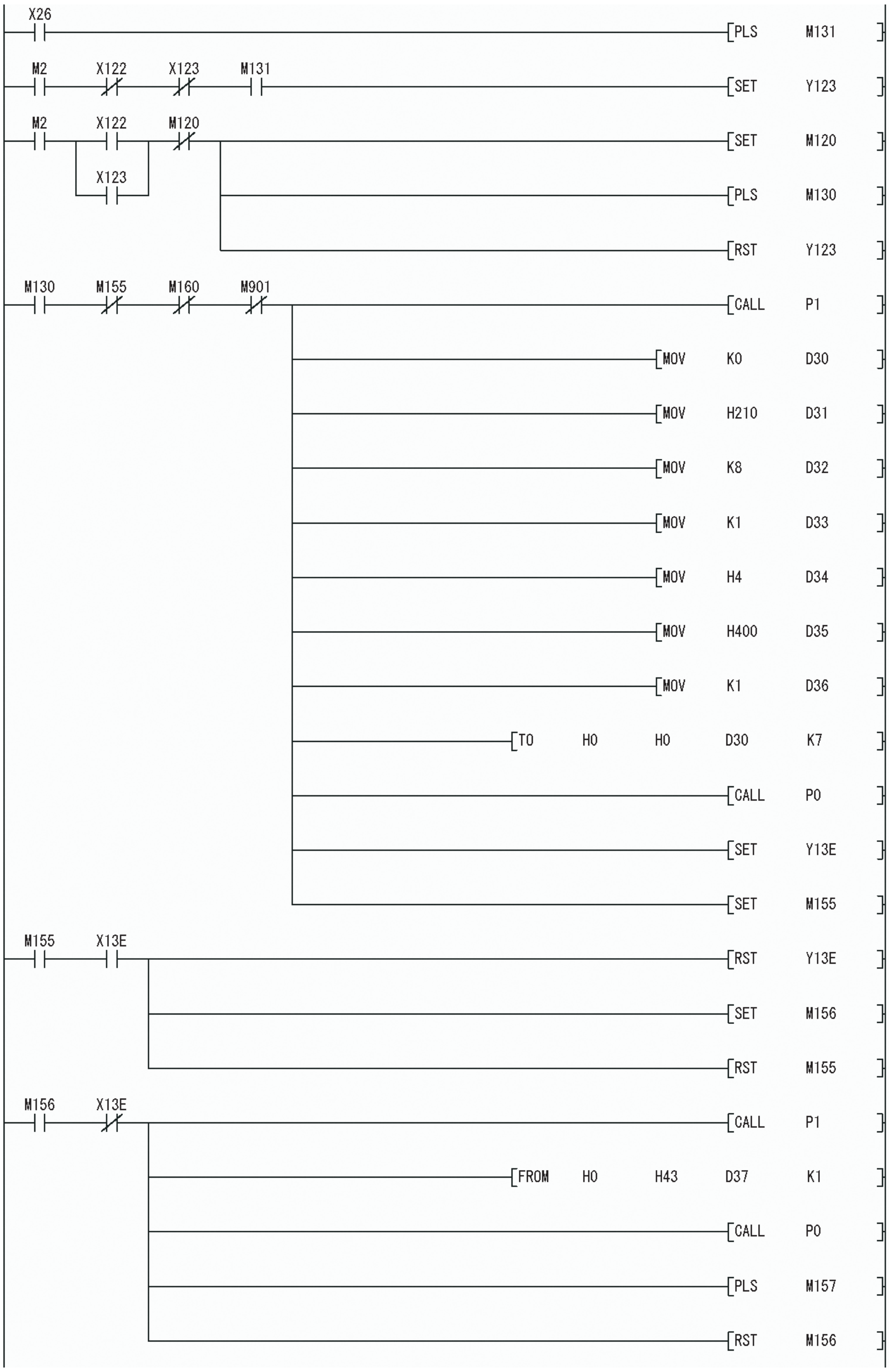
Table 8.40 Devices used in the program example (Continued)

Device	Description	Reference section	
		This program	Other programs
D40 to D46	Control data of TO instruction	—	—
D50 or later	Receive data	—	—
Z	No. of receive data	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P1	Switching to bank 1 (executing sample program in Section 8.2.3 (2)(a))	—	—

(d) Program example



Turns ON Forced reception start pulse signal

Turns ON Forced receive completion request signal

Turns ON Buffer memory access exclusion check flag

Turns ON Receiving flag

Resets Forced receive completion request signal

Switches master module buffer memory to bank 1 (Refer to Section 8.2.3 (2)(a))

Dummy area

Station No. and request code

No. of send buffer write data (in byte units)

Quantity (Fixed value)

Access code and attribute code

Receive data size specification area (in words units) address

No. of read points (in word units)

Writes to master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Intelligent device station access request signal

Turns ON TO instruction executed flag

Resets Intelligent device station access request signal

Turns ON Intelligent device station access request completion flag

Resets TO instruction executed flag

Switches master module buffer memory to bank 1 (Refer to Section 8.2.3 (2)(a))

Reads from master module buffer memory

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Read request completion flag

Resets Intelligent device station access request completion flag

Figure 8.35 Program example

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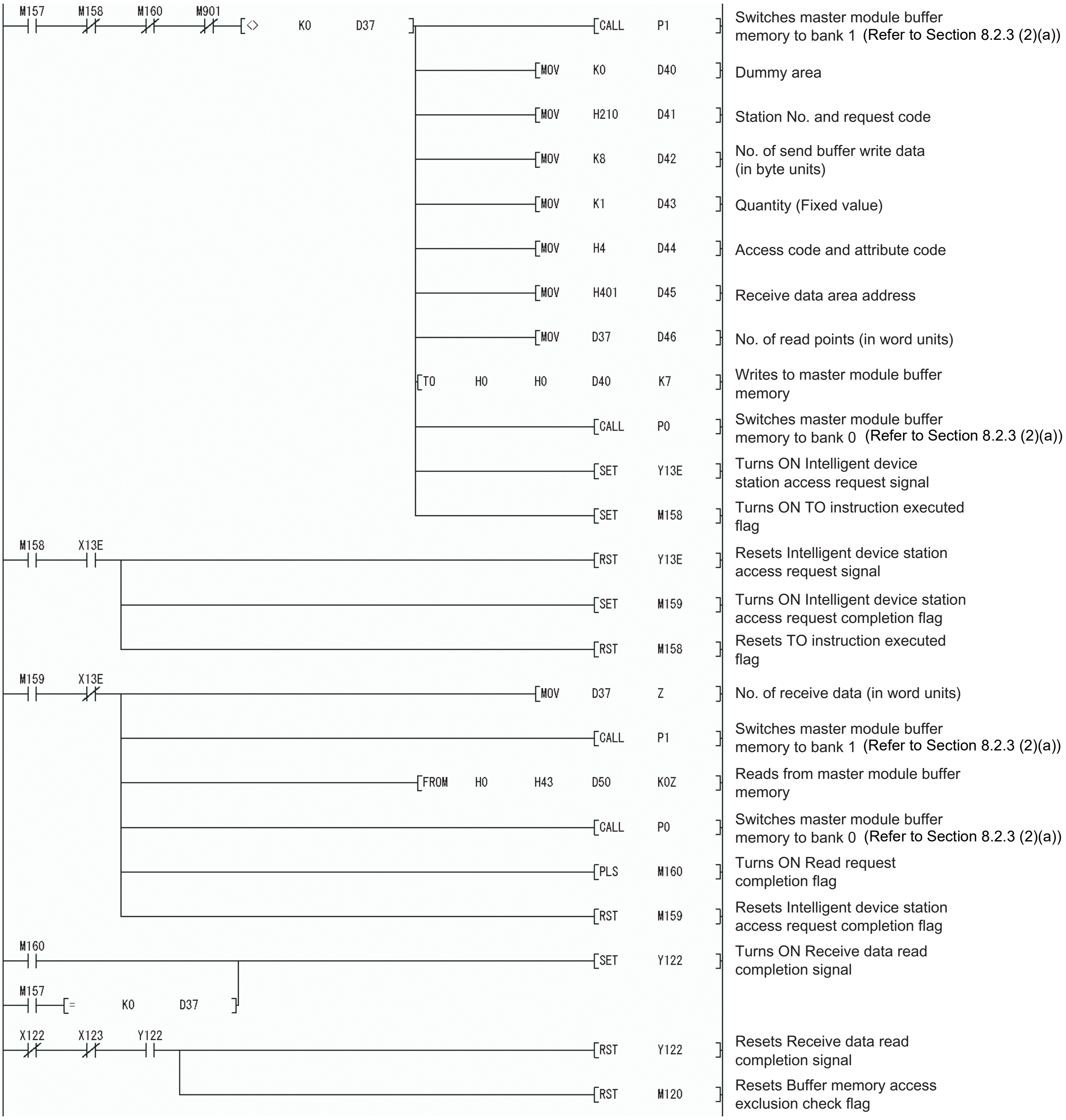


Figure 8.35 Program example (Continued)

(2) For the buffer memory auto-refresh function

(a) Overview of program example
When Forced receive completion execute flag (X26) turns ON before reception completion, the receive processing is forcibly completed at the point and data that have been received are read out.

(b) Processing in the program example

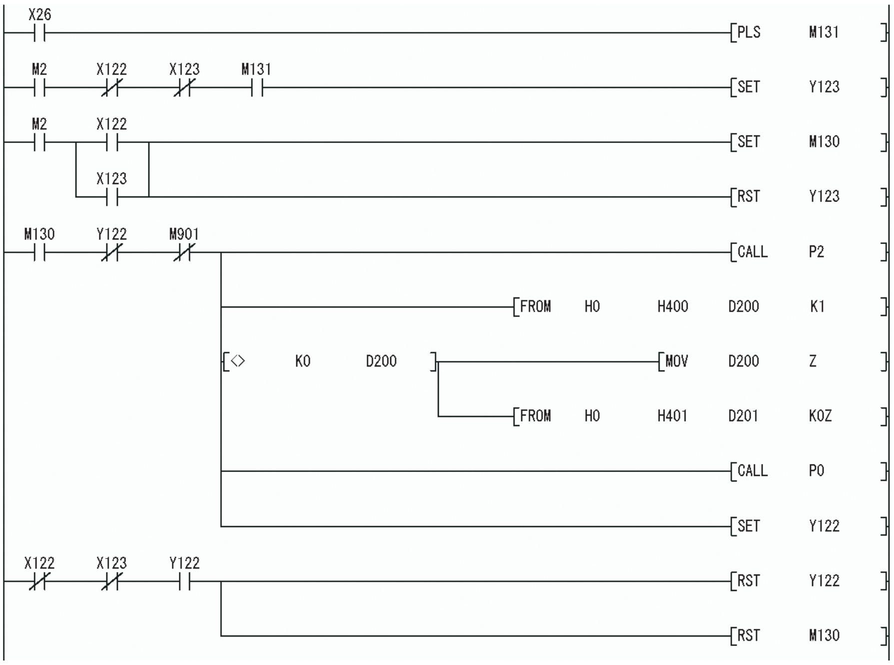
1) Forced receive completion request signal (Y123) is turned ON to forcibly terminate reception.
2) Received data are read from Receive data size specification area ($\boxed{\text{R2N}}$ 400H) and Receive data area ($\boxed{\text{R2N}}$ 401H) to the master station word device (D200).
3) Receive data read completion signal (Y122) is turned OFF to terminate the reception.

(c) Devices used in the program example

Table 8.41 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X26	Forced receive completion execute flag	—	—
X122	Normal receive data read request signal	Section 8.8.2	—
X123	Error receive data read request signal	Section 8.8.2	—
Y122	Receive data read completion signal	Section 8.8.2	Section 8.5.2
Y123	Forced receive completion request signal	Section 8.8.2	—
M2	Operation complete flag	—	Section 8.3.2
M130	Receiving flag	Section 8.8.2	Section 8.5.2
M131	Forced reception start pulse signal	Section 8.8.2	—
M901	Other station data link status (Station No.2)	—	—
D200	No. of receive data	—	—
D201 or later	Receive data	—	—
Z	No. of receive data	—	—
P0	Switching to bank 0 (executing sample program in Section 8.2.3 (2)(a))	—	—
P2	Switching to bank 2 (executing sample program in Section 8.2.3 (2)(a))	—	—

(d) Program example



Turns ON Forced reception start pulse signal

Turns ON Forced receive completion request signal

Turns ON Receiving flag

Resets Forced receive completion request signal

Switches master module buffer memory to bank 2 (Refer to Section 8.2.3 (2)(a))

Reads No. of receive data (in word units) and receive data from master module receive area

Switches master module buffer memory to bank 0 (Refer to Section 8.2.3 (2)(a))

Turns ON Receive data read completion signal

Resets Receive data read completion signal

Resets Receiving flag

Figure 8.36 Program example

8.8.3 OS reception area clear function

The same program example can be used for the send/receive buffer communication function and buffer memory auto-refresh function.

(1) Overview of program example

The OS reception area is cleared when the AJ65BT-R2N fails to receive data from the external device.

(2) Processing in the program example

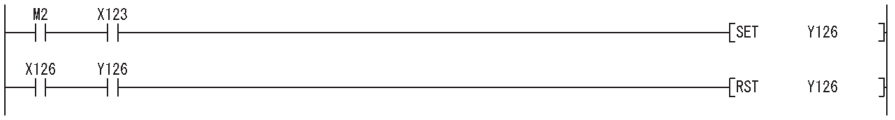
When Error receive data read request signal (X123) is ON, OS reception area clear request signal (Y126) is turned ON to clear the OS reception area.

(3) Devices used in the program example

Table 8.42 Devices used in the program example

Device	Description	Reference section	
		This program	Other programs
X123	Error receive data read request signal	—	—
X126	OS reception area cleared signal	Section 8.8.3	—
Y126	OS reception area clear request signal	Section 8.8.3	—
M2	Operation complete flag	—	Section 8.3.1

(4) Program example



Turns ON OS reception area clear request signal

Resets OS reception area clear request signal

Figure 8.37 Program example

8.8.4 E^2PROM function setting

☒**Point**

(1) Do not execute registration to E^2PROM each time the AJ65BT-R2N is started up.

Doing so may cause the maximum number of writes to E^2PROM (service life) to be reached earlier.

(2) Execute the E^2PROM function after initialization of the AJ65BT-R2N is normally completed.

For E^2PROM function sample programs, refer to the following.

☞ Section 8.9.1 Program example for changing auto-refresh buffer assignments

8.9 Program Example

This section gives program examples for the following processing.

Table 8.43 Program example

Description	Reference section
Program example for changing auto-refresh buffer assignments	Section 8.9.1
Program example for receiving data when a receive timeout occurs	Section 8.9.2

8.9.1 Program example for changing auto-refresh buffer assignments

(1) Overview of program example

- When Operation start request flag (M0) is turned ON, the assignments are changed so that the AJ65BT-R2N auto-refresh buffer size is 80H, and they are registered to the E^{2}PROM.
  When the auto-refresh buffer size changes to 80H, the buffer memory auto-refresh function can be used with up to 20 AJ65BT-R2Ns connected.
- The AJ65BT-R2N operates with the auto-refresh buffer size setting changed to 80H after restart.

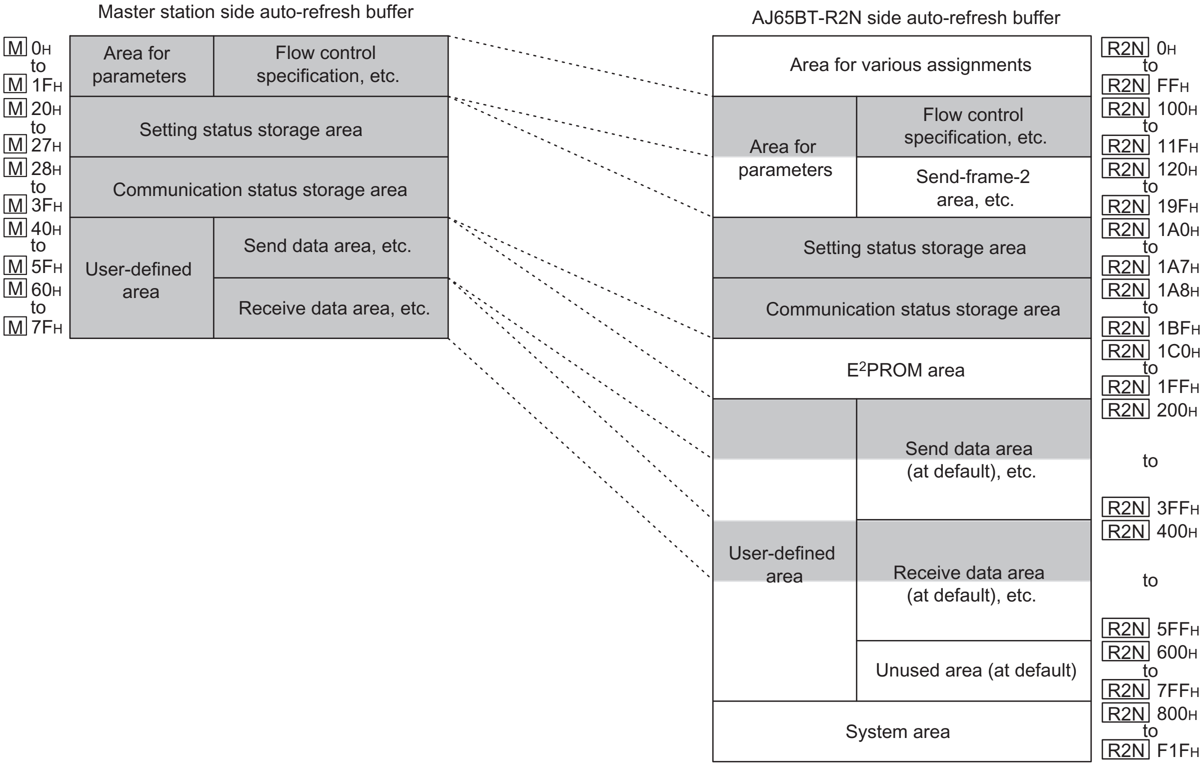


Figure 8.38 Auto-refresh buffer after assignment change

(2) For the send/receive buffer communication function

(a) Devices used in the program example

Table 8.44 Devices used in the program example

Device	Description	Device	Description
X0	Module error (Master station)	M4	E^{2}PROM function failed signal
X1	Own station data link status (Master station)	M10	RIWT subroutine output completion flag
X6	Data link start by parameters in buffer memory normally completed (Master station)	M15	RIWT subroutine output completion flag
X7	Data link start by parameters in buffer memory failed (Master station)	M20	AJ65BT-R2N initial setting start flag
X0F	Module ready (Master station)	M22	Operation complete pulse signal
X23	Error code read flag	M27	E^{2}PROM function execution start pulse signal
X24	Error clear flag	M28	E^{2}PROM function complete pulse signal
X27	E^{2}PROM function execute flag	M29	E^{2}PROM function execute completion pulse signal
K4X120	Remote input (X120 to X12F)	M30	Operation failed pulse signal
X124	Initialization complete signal	M90	RIWT subroutine execute flag
X125	Initialization failed signal	M91	RIWT subroutine execute flag
X127	E^{2}PROM function complete signal	M92	RIWT subroutine execute flag
X128	E^{2}PPROM function failed signal	M100	Master station parameter setting start pulse signal
K1X134	Mode setting switch status signal (X134 to X137)	M120	Buffer memory access exclusion check flag
X13A	Error status signal	M135	Error handling flag
X13B	Remote station ready signal	M190	TO instruction executed flag
X13E	Intelligent device station access completion signal	M191	Intelligent device station access request completion flag
Y0	Refresh instruction (Master station)	M200	RIWT subroutine output completion flag
Y6	Request for data link start by parameters in buffer memory (Master station)	M202	RIWT subroutine in-execution flag
K4Y18	Output (Y18 to Y27) (Master station)	M203	RIWT completion status read start flag
Y1C	Buffer memory bank switching specification (Master station)	M204	RIWT completion status read end flag
Y1D		M230	Error handling execution pulse signal
K4Y120	Remote output (Y120 to Y12F)	M502	AJ65BT-R2N mode normal flag
Y120	Send request signal	M503	AJ65BT-R2N mode error flag
Y121	Send cancel request signal	M504	E^{2}PROM function setting start pulse signal
Y122	Receive data read completion signal	K4M900	Other station data link status (SW0080)
Y123	Forced receive completion request signal	M901	Other station data link status (Station No.2)
Y124	Initialization request signal	M9036	Always ON
Y126	OS reception area clear request signal	M9052	SEG instruction switching
Y127	E^{2}PROM function request signal	D0 to D39	Control data of RIWT subroutine, set values, and E^{2}PROM function set value
Y139	Initial data read request signal	D100 to D106	Network parameters of master station
Y13A	Error reset request signal	D107	Error code in Network parameters setting
Y13E	Intelligent device station access request signal	D130 to D137	Control data of RIRD instruction and error code of AJ65BT-R2N
M0	Operation start request flag	D200 to D207	Devices for TO instruction in RIWT subroutine
M1	RIWT subroutine output completion flag	P0	Switching to bank 0
M2	Operation complete flag	P1	RIWT subroutine
M3	Operation failed flag	—	

(b) Program example

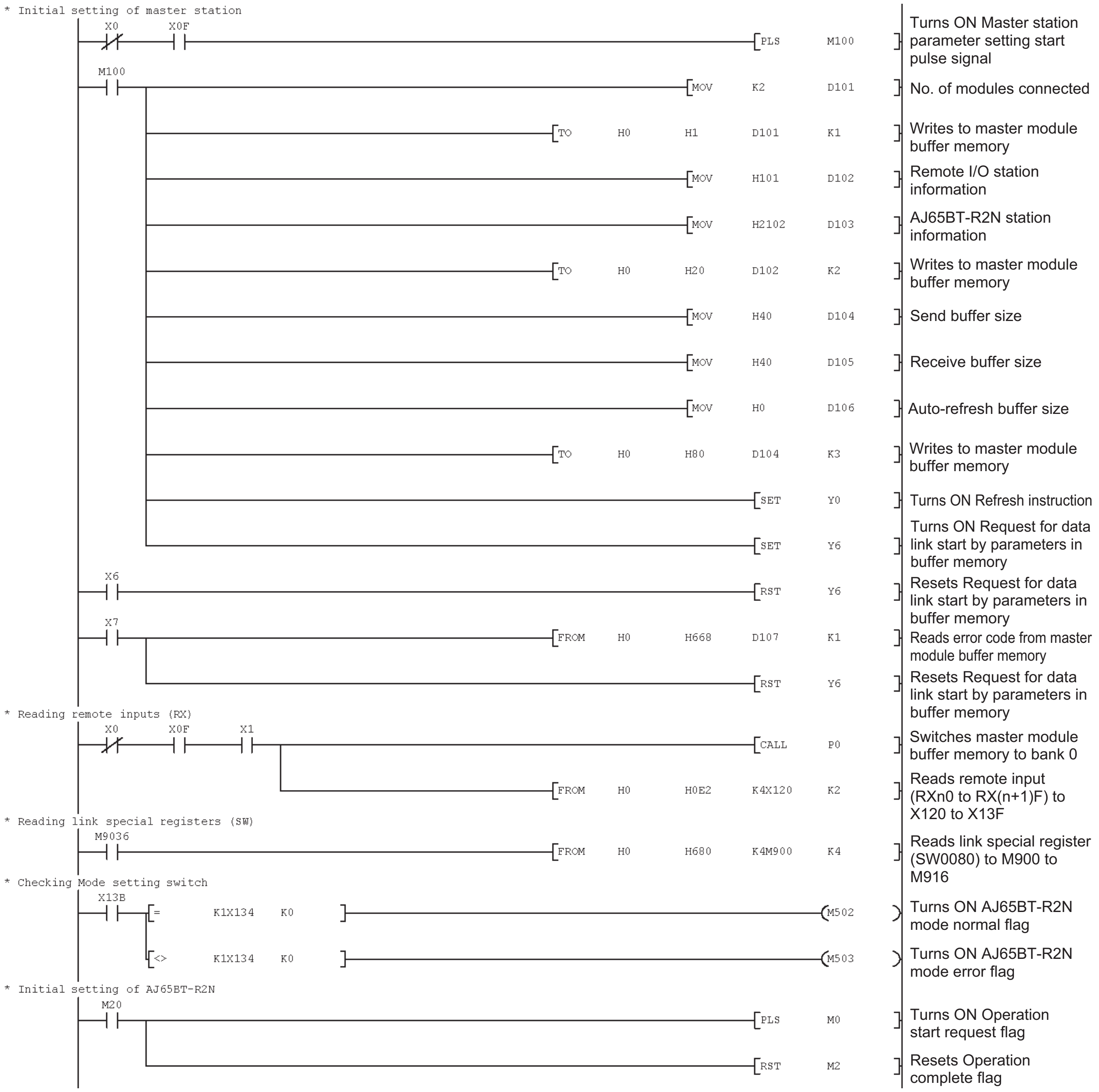


Figure 8.39 Program example for changing auto-refresh buffer assignments

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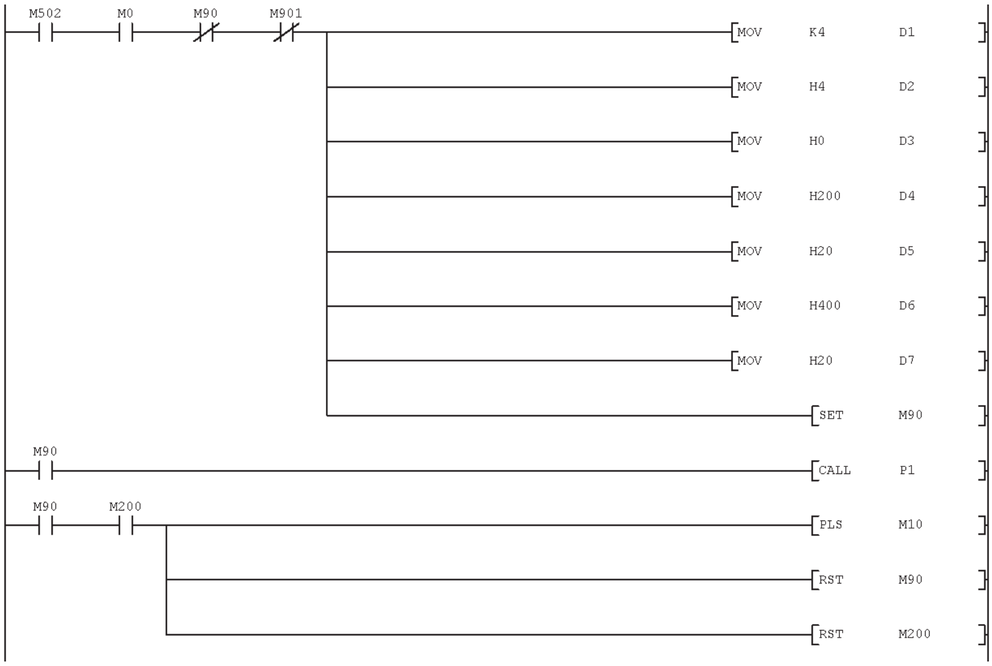

No. of write points

Access code and attribute code

Start address specification area address

Specifies 200H for Send area, start address specification

Specifies 20H for Send area size specification

Specifies 400H for Receive area, start address specification

Specifies 20H for Receive area size specification

Turns ON RIWT subroutine execute flag

Executes RIWT subroutine

Turns ON RIWT subroutine output completion flag

Resets RIWT subroutine execution completion flag

Resets RIWT subroutine output completion flag

Figure 8.39 Program example for changing auto-refresh buffer assignments (Continued)

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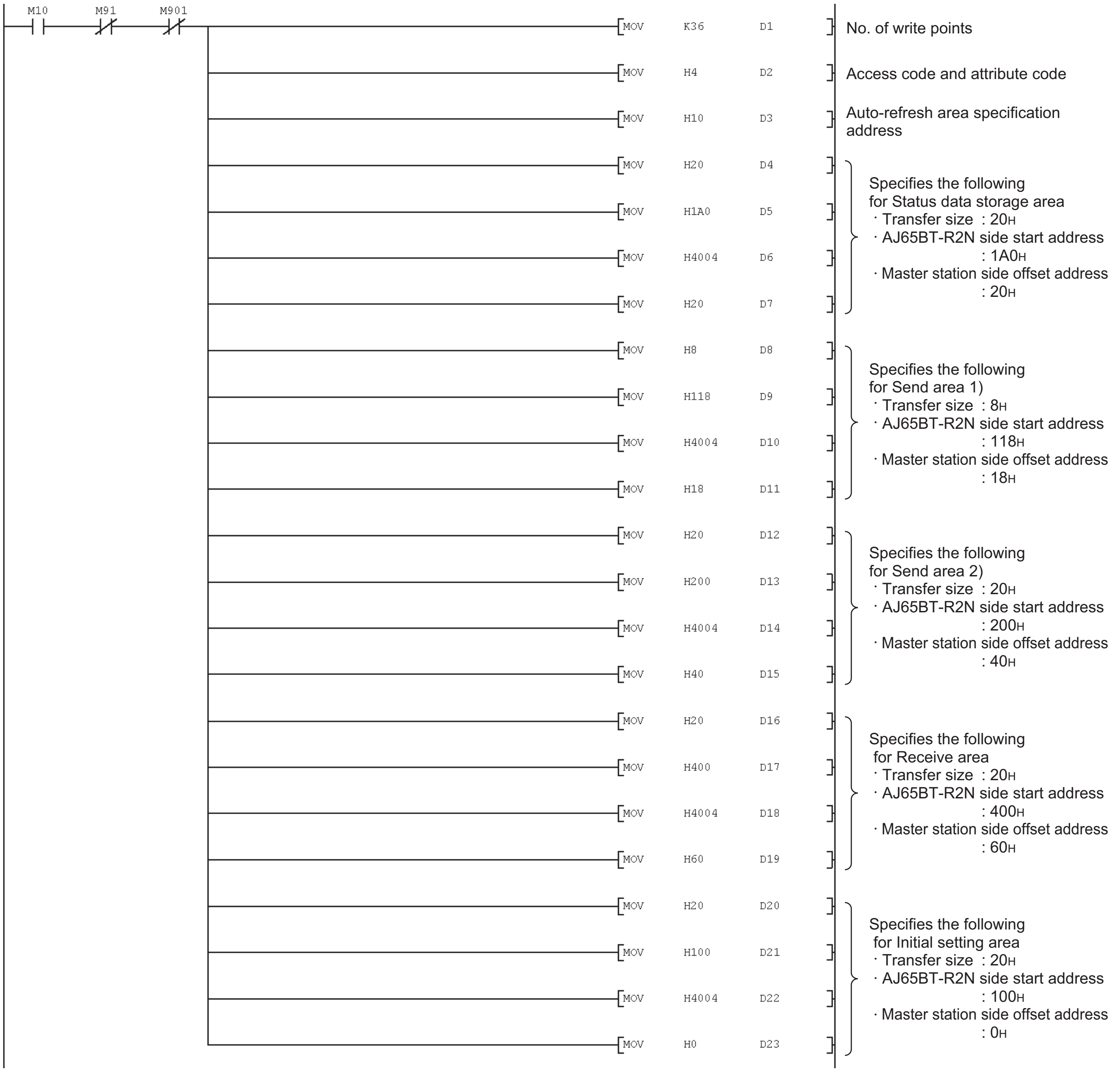

```
M10  M91  M901
-| |--|/|--|/|--[MOV K36   D1 ]
               [MOV H4    D2 ]
               [MOV H10   D3 ]
               [MOV H20   D4 ]
               [MOV H1A0  D5 ]
               [MOV H4004 D6 ]
               [MOV H20   D7 ]
               [MOV H8    D8 ]
               [MOV H118  D9 ]
               [MOV H4004 D10]
               [MOV H18   D11]
               [MOV H20   D12]
               [MOV H200  D13]
               [MOV H4004 D14]
               [MOV H40   D15]
               [MOV H20   D16]
               [MOV H400  D17]
               [MOV H4004 D18]
               [MOV H60   D19]
               [MOV H20   D20]
               [MOV H100  D21]
               [MOV H4004 D22]
               [MOV H0    D23]
```

No. of write points

Access code and attribute code

Auto-refresh area specification address

Specifies the following for Status data storage area
- Transfer size : 20H
- AJ65BT-R2N side start address : 1A0H
- Master station side offset address : 20H

Specifies the following for Send area 1)
- Transfer size : 8H
- AJ65BT-R2N side start address : 118H
- Master station side offset address : 18H

Specifies the following for Send area 2)
- Transfer size : 20H
- AJ65BT-R2N side start address : 200H
- Master station side offset address : 40H

Specifies the following for Receive area
- Transfer size : 20H
- AJ65BT-R2N side start address : 400H
- Master station side offset address : 60H

Specifies the following for Initial setting area
- Transfer size : 20H
- AJ65BT-R2N side start address : 100H
- Master station side offset address : 0H

Figure 8.39 Program example for changing auto-refresh buffer assignments (Continued)

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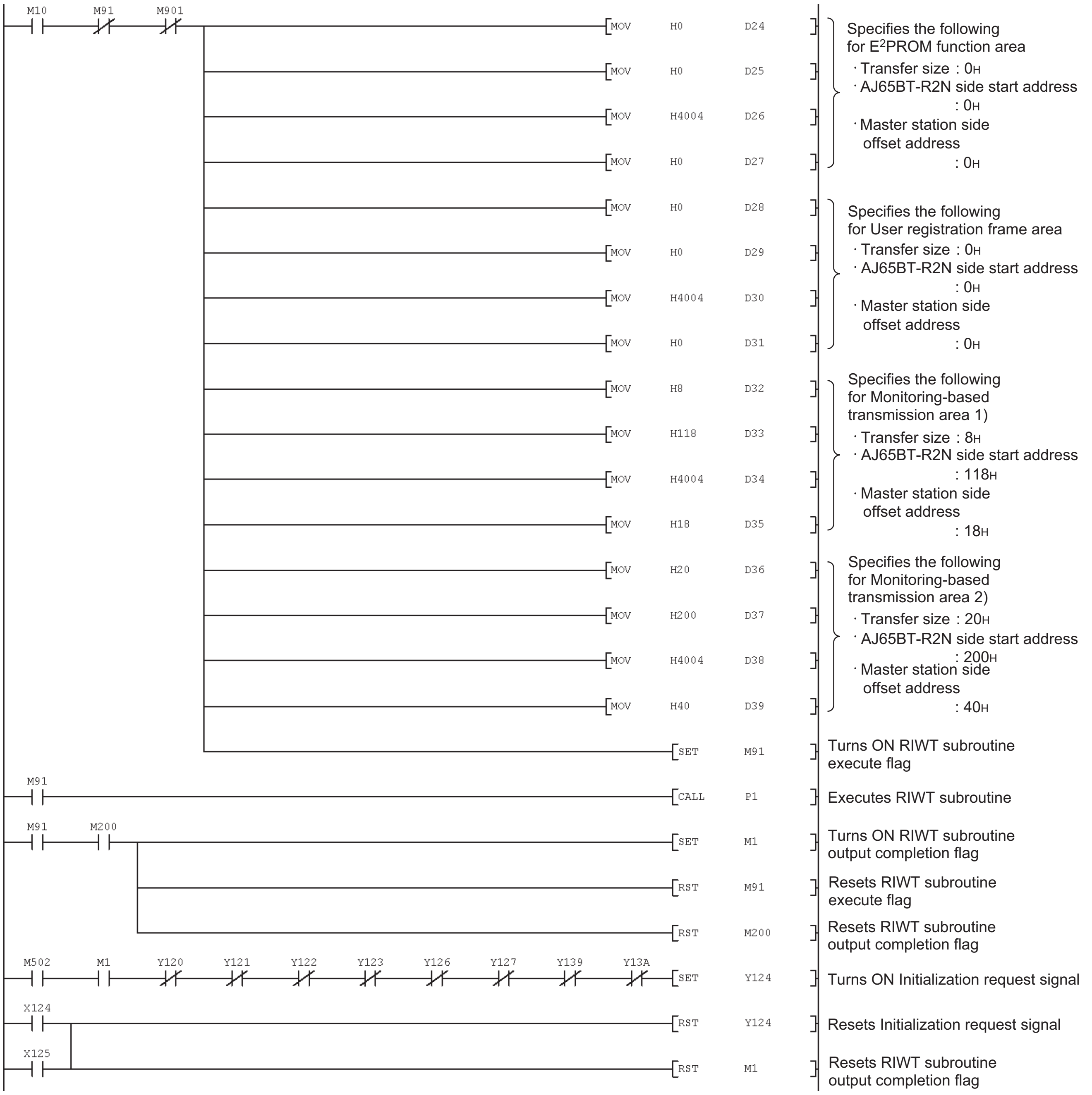

```
M10  M91(b)  M901(b)
  MOV  H0     D24
  MOV  H0     D25
  MOV  H4004  D26
  MOV  H0     D27
  MOV  H0     D28
  MOV  H0     D29
  MOV  H4004  D30
  MOV  H0     D31
  MOV  H8     D32
  MOV  H118   D33
  MOV  H4004  D34
  MOV  H18    D35
  MOV  H20    D36
  MOV  H200   D37
  MOV  H4004  D38
  MOV  H40    D39
  SET  M91
M91
  CALL P1
M91  M200
  SET  M1
  RST  M91
  RST  M200
M502  M1  Y120(b)  Y121(b)  Y122(b)  Y123(b)  Y126(b)  Y127(b)  Y139(b)  Y13A(b)
  SET  Y124
X124
  RST  Y124
X125
  RST  M1
```

D24 to D27: Specifies the following for E²PROM function area
- Transfer size : 0H
- AJ65BT-R2N side start address : 0H
- Master station side offset address : 0H

D28 to D31: Specifies the following for User registration frame area
- Transfer size : 0H
- AJ65BT-R2N side start address : 0H
- Master station side offset address : 0H

D32 to D35: Specifies the following for Monitoring-based transmission area 1)
- Transfer size : 8H
- AJ65BT-R2N side start address : 118H
- Master station side offset address : 18H

D36 to D39: Specifies the following for Monitoring-based transmission area 2)
- Transfer size : 20H
- AJ65BT-R2N side start address : 200H
- Master station side offset address : 40H

SET M91: Turns ON RIWT subroutine execute flag

CALL P1: Executes RIWT subroutine

SET M1: Turns ON RIWT subroutine output completion flag

RST M91: Resets RIWT subroutine execute flag

RST M200: Resets RIWT subroutine output completion flag

SET Y124: Turns ON Initialization request signal

RST Y124: Resets Initialization request signal

RST M1: Resets RIWT subroutine output completion flag

Figure 8.39 Program example for changing auto-refresh buffer assignments (Continued)

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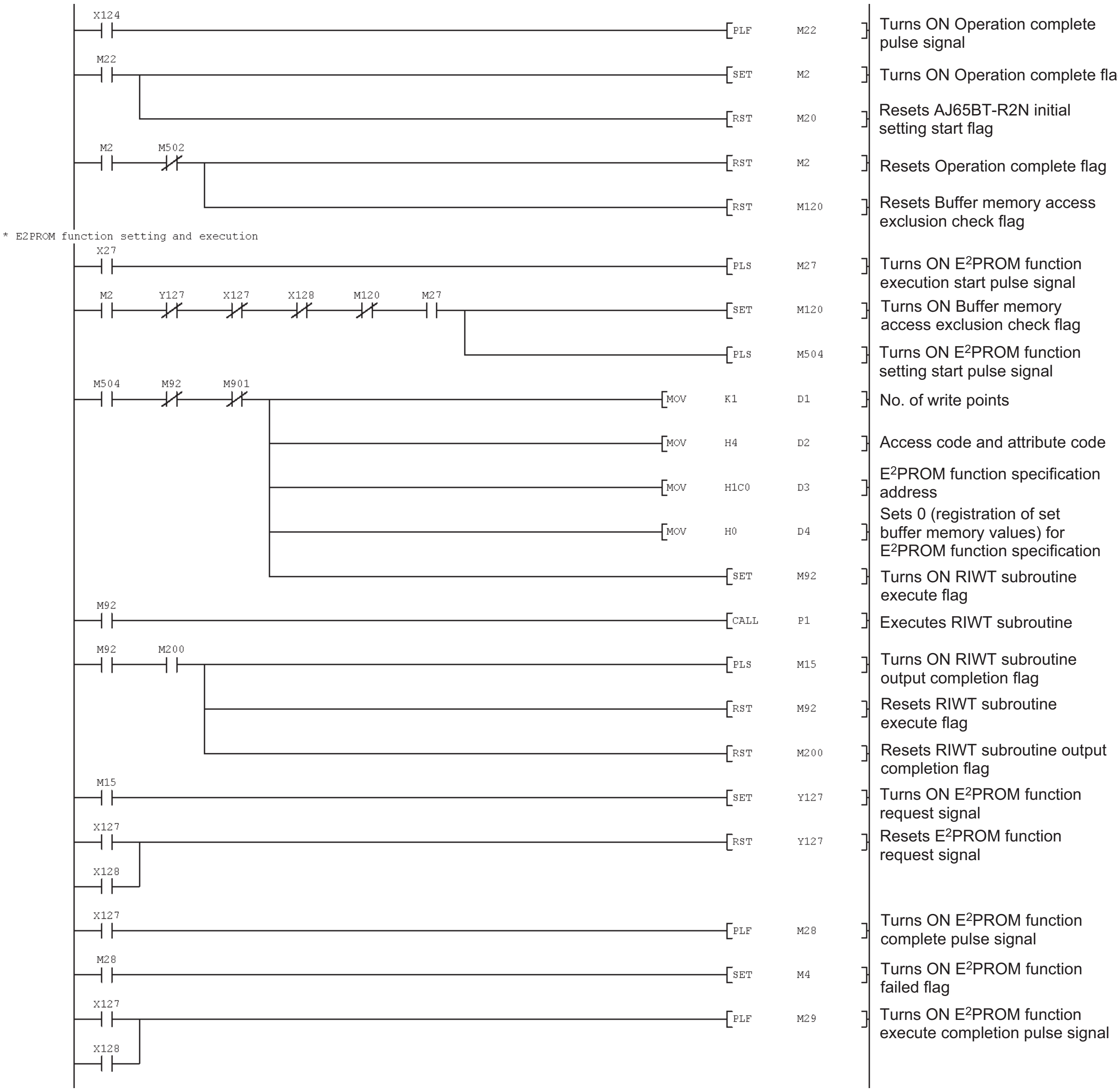

Figure 8.39 Program example for changing auto-refresh buffer assignments (Continued)

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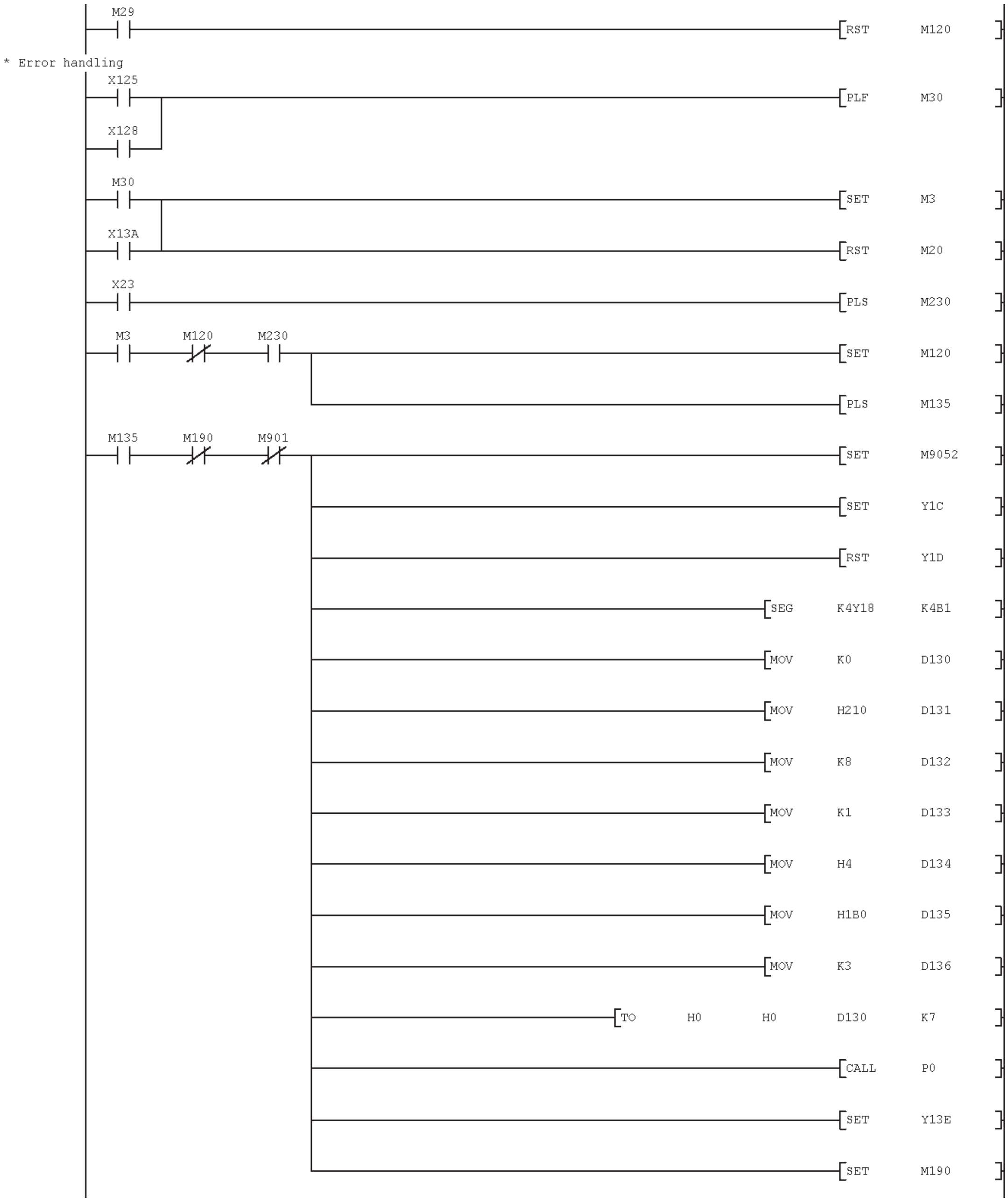

Resets Buffer memory access exclusion check flag

Turns ON Operation failed pulse signal

Turns ON Operation failed flag

Resets AJ65BT-R2N initial setting start flag

Turns ON Error handling execution pulse signal

Turns ON Buffer memory access exclusion check flag

Turns ON Error handling flag

Switches master module buffer memory to bank 1

Dummy area

Station No. and request code

No. of send buffer write data (in byte units)

Quantity (Fixed value)

Access code and attribute code

Address of General error codes

No. of read points (in word units)

Writes to master module buffer memory

Switches master module buffer memory to bank 0

Turns ON Intelligent device station access request signal

Turns ON TO instruction executed flag

Figure 8.39 Program example for changing auto-refresh buffer assignments (Continued)

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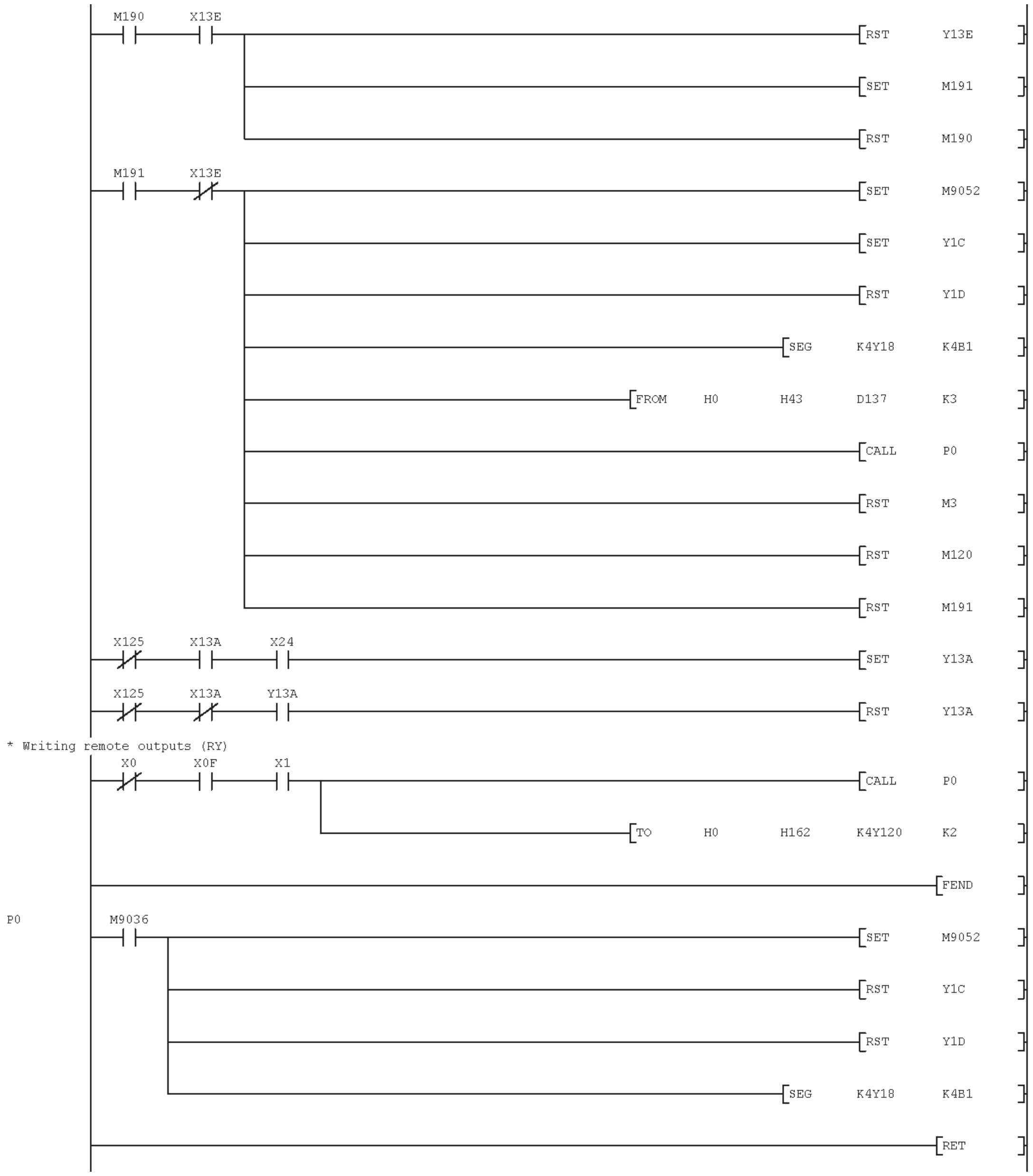

Resets Intelligent device station access request signal

Turns ON Intelligent device station access request completion flag

Resets TO instruction executed flag

Switches master module buffer memory to bank 1

Reads from master module buffer memory

Switches master module buffer memory to bank 0

Resets Operation failed flag

Resets Buffer memory access exclusion check flag

Resets Intelligent device station access request completion flag

Turns ON Error reset request signal

Resets Error reset request signal

Switches master module buffer memory to bank 0

Writes Y120 to Y13F to remote output (RYn0 to RY(n+1)F)

Switches master module buffer memory to bank 0

Figure 8.39 Program example for changing auto-refresh buffer assignments (Continued)

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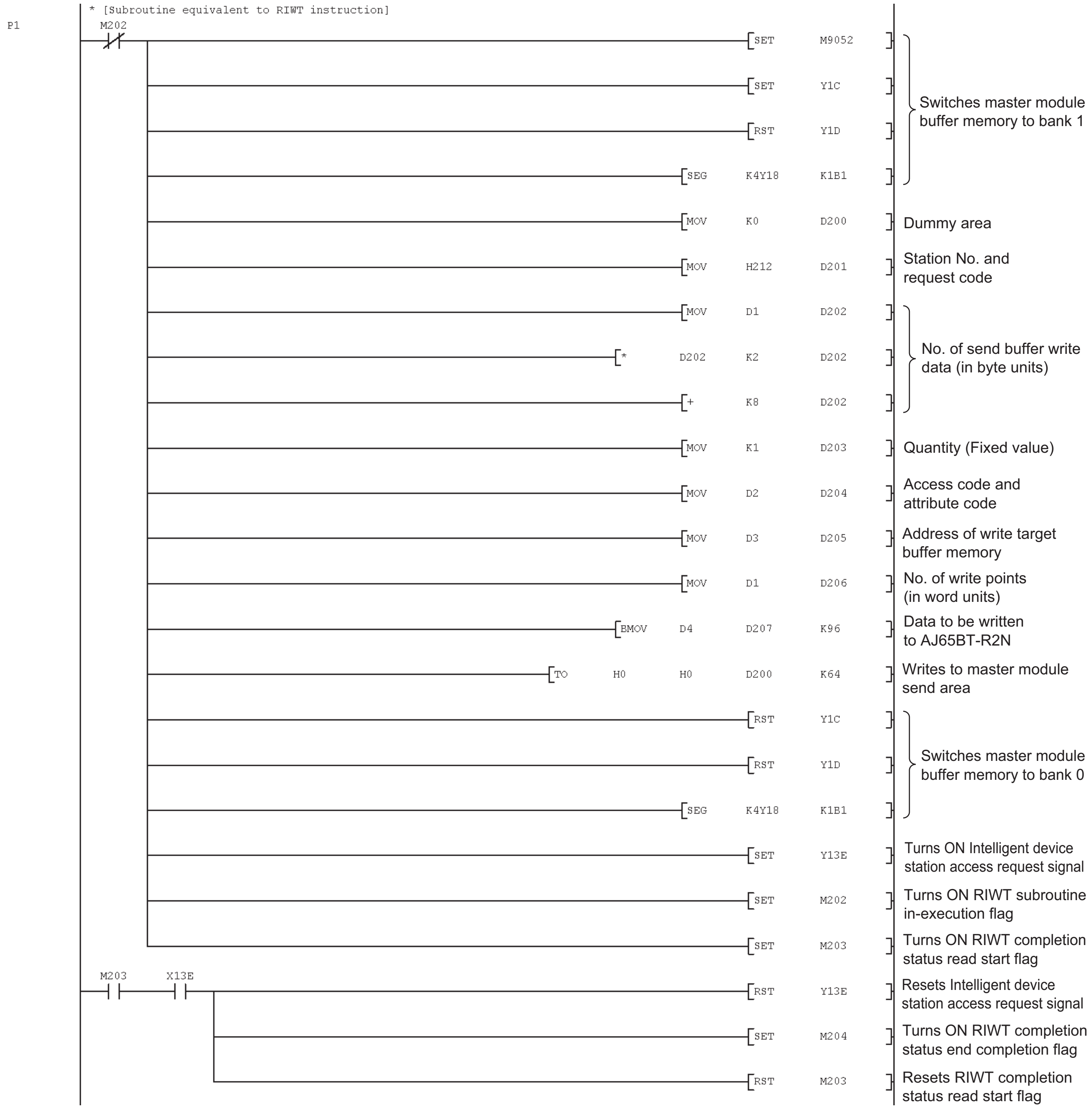

Figure 8.39 Program example for changing auto-refresh buffer assignments (Continued)

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Figure 8.39 Program example for changing auto-refresh buffer assignments (Continued)

(3) For the buffer memory auto-refresh function

(a) Devices used in the program example

Table 8.45 Devices used in the program example

Device	Description	Device	Description
X0	Module error (Master station)	Y13A	Error reset request signal
X1	Own station data link status (Master station)	M0	Operation start request flag
X6	Data link start by parameters in buffer memory normally completed (Master station)	M1	Intelligent device station access request completion flag
X7	Data link start by parameters in buffer memory failed (Master station)	M2	Operation complete flag
X0F	Module ready (Master station)	M3	Operation failed flag
X23	Error code read flag	M4	E^{2}PROM function failed signal
X24	Error clear flag	M22	Operation complete pulse signal
X27	E^{2}PROM function execute flag	M27	E^{2}PROM function execution start pulse signal
K4X120	Remote input (X120 to X12F)	M28	E^{2}PROM function complete pulse signal
X124	Initialization complete signal	M29	E^{2}PROM function execute completion pulse signal
X125	Initialization failed signal	M30	Operation failed pulse signal
X127	E^{2}PROM function complete signal	M100	Master station parameter setting start pulse signal
X128	E^{2}PROM function failed signal	M111	Initial data read completion pulse signal
K1X134	Mode setting switch status signal (X134 to X137)	M135	Error handling flag
X139	Initial data read completion signal	M230	Error handling execution pulse signal
X13A	Error status signal	M270	E^{2}PROM function in-execution flag
X13B	Remote station ready signal	M500	AJ65BT-R2N initial data read complete flag
Y0	Refresh instruction (Master station)	M501	AJ65BT-R2N initial data reading flag
Y6	Request for data link start by parameters in buffer memory (Master station)	M502	AJ65BT-R2N mode normal flag
K4Y18	Output (Y18 to Y27) (Master station)	M503	AJ65BT-R2N mode error flag
Y1C	Buffer memory bank switching specification (Master station)	M504	E^{2}PROM function setting start pulse signal
Y1D		K4M900	Other station data link status (SW0080)
K4Y120	Remote output (Y120 to Y12F)	M901	Other station data link status (Station No.2)
Y120	Send request signal	M9036	Always ON
Y121	Send cancel request signal	M9052	SEG instruction switching
Y122	Receive data read completion signal	D10 to D45	Set value
Y123	Forced receive completion request signal	D100 to D106	Network parameters of master station
Y124	Initialization request signal	D107	Error code in Network parameters setting
Y126	OS reception area clear request signal	D400 to D402	AJ65BT-R2N error code
Y127	E^{2}PROM function request signal	P0	Switching to bank 0
Y139	Initial data read request signal	P2	Switching to bank 2

(b) Program example

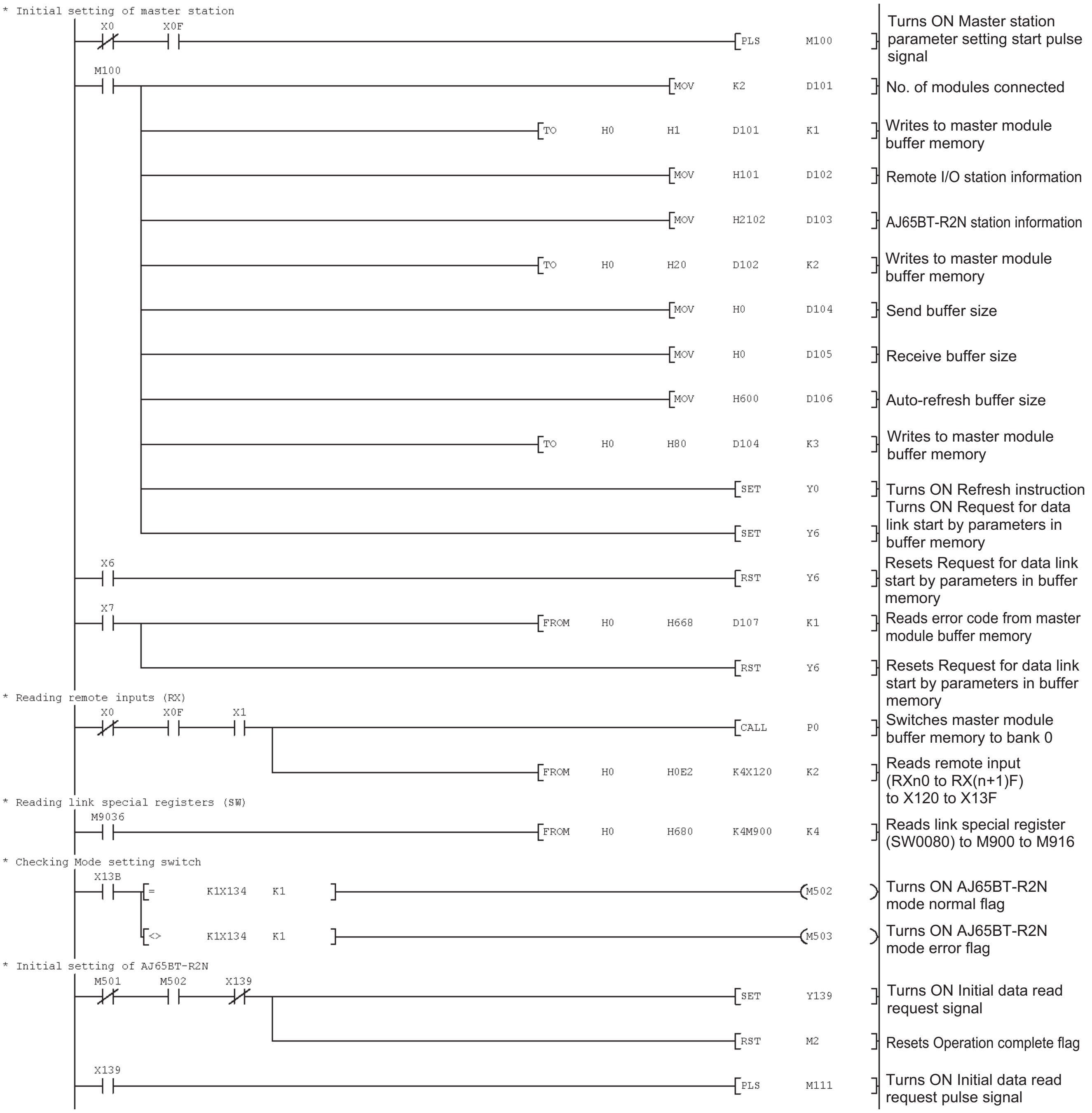

Figure 8.40 Program example for changing auto-refresh buffer assignments

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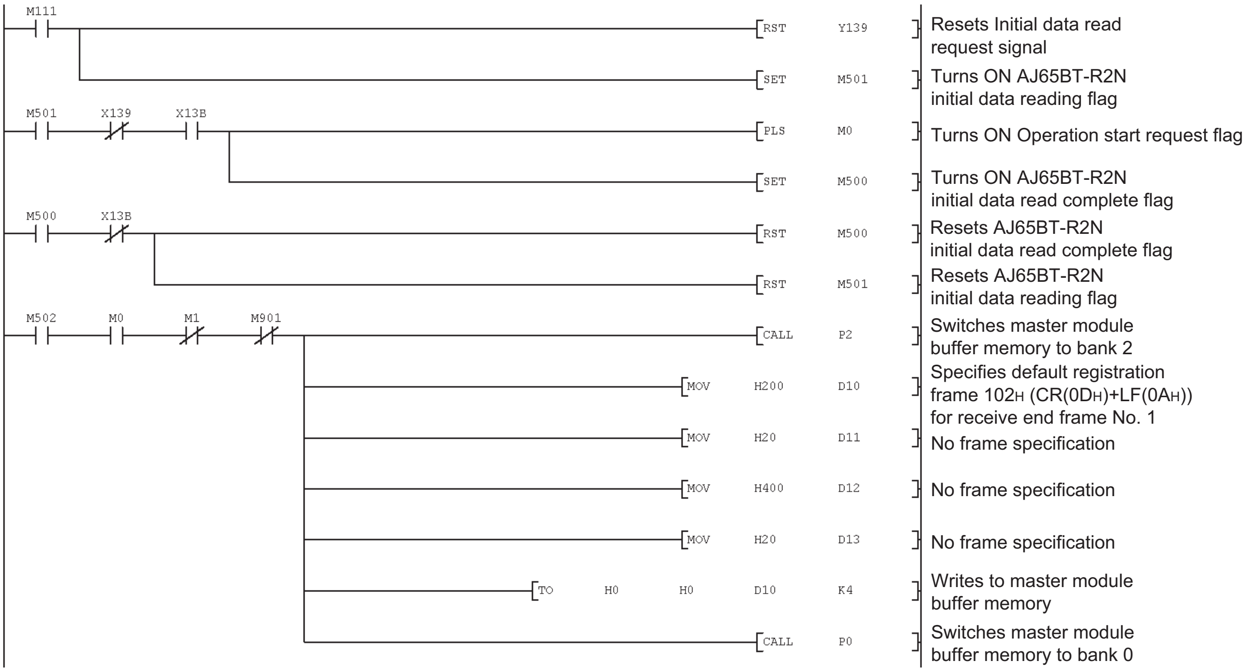

Figure 8.40 Program example for changing auto-refresh buffer assignments (Continued)

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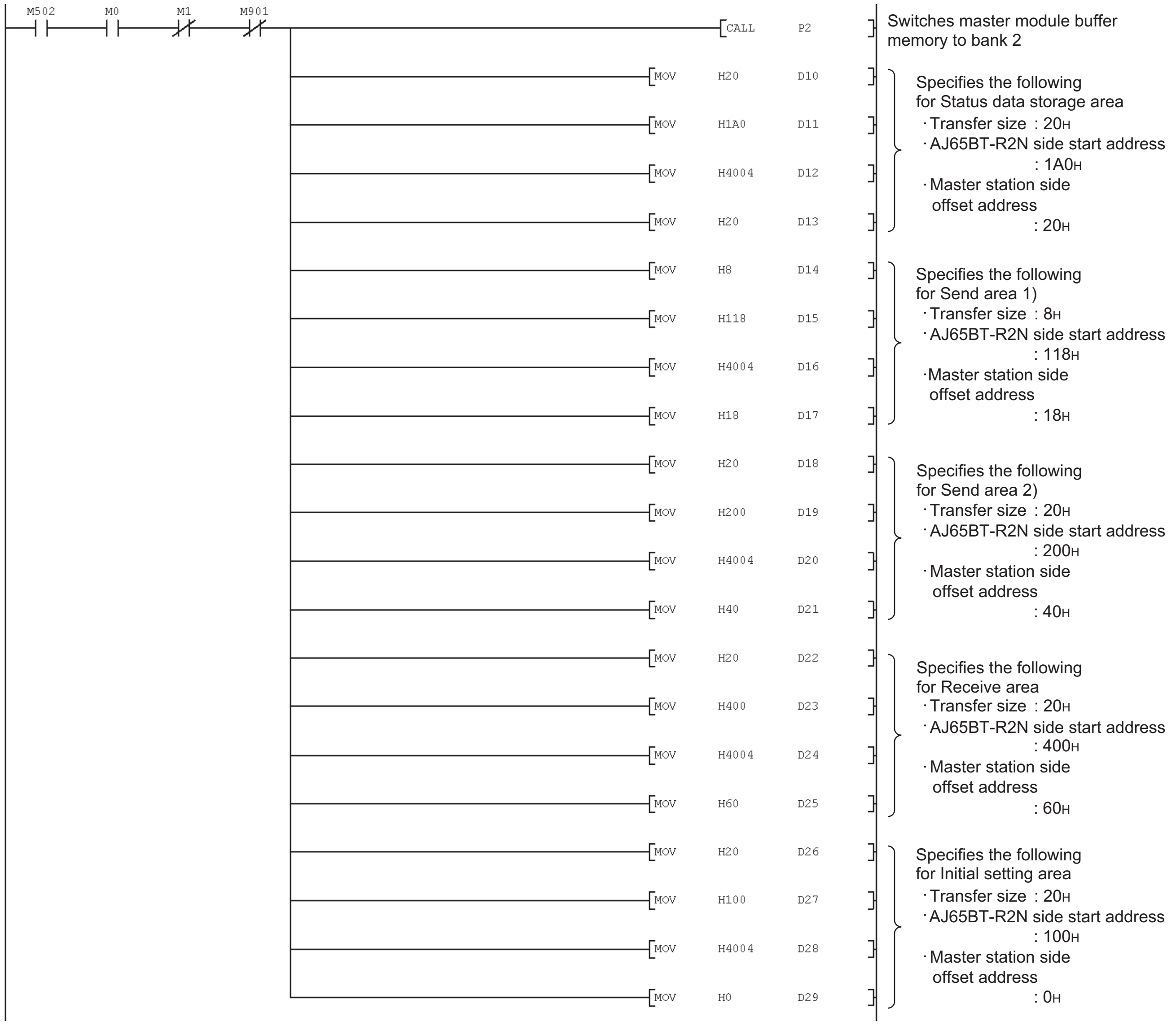

```
M502  M0   M1   M901
-| |--| |--|/|--|/|--+-------------[CALL  P2   ]
                     |
                     +------------[MOV   H20    D10 ]
                     +------------[MOV   H1A0   D11 ]
                     +------------[MOV   H4004  D12 ]
                     +------------[MOV   H20    D13 ]
                     +------------[MOV   H8     D14 ]
                     +------------[MOV   H118   D15 ]
                     +------------[MOV   H4004  D16 ]
                     +------------[MOV   H18    D17 ]
                     +------------[MOV   H20    D18 ]
                     +------------[MOV   H200   D19 ]
                     +------------[MOV   H4004  D20 ]
                     +------------[MOV   H40    D21 ]
                     +------------[MOV   H20    D22 ]
                     +------------[MOV   H400   D23 ]
                     +------------[MOV   H4004  D24 ]
                     +------------[MOV   H60    D25 ]
                     +------------[MOV   H20    D26 ]
                     +------------[MOV   H100   D27 ]
                     +------------[MOV   H4004  D28 ]
                     +------------[MOV   H0     D29 ]
```

Switches master module buffer memory to bank 2

Specifies the following for Status data storage area
- Transfer size : 20H
- AJ65BT-R2N side start address : 1A0H
- Master station side offset address : 20H

Specifies the following for Send area 1)
- Transfer size : 8H
- AJ65BT-R2N side start address : 118H
- Master station side offset address : 18H

Specifies the following for Send area 2)
- Transfer size : 20H
- AJ65BT-R2N side start address : 200H
- Master station side offset address : 40H

Specifies the following for Receive area
- Transfer size : 20H
- AJ65BT-R2N side start address : 400H
- Master station side offset address : 60H

Specifies the following for Initial setting area
- Transfer size : 20H
- AJ65BT-R2N side start address : 100H
- Master station side offset address : 0H

Figure 8.40 Program example for changing auto-refresh buffer assignments (Continued)

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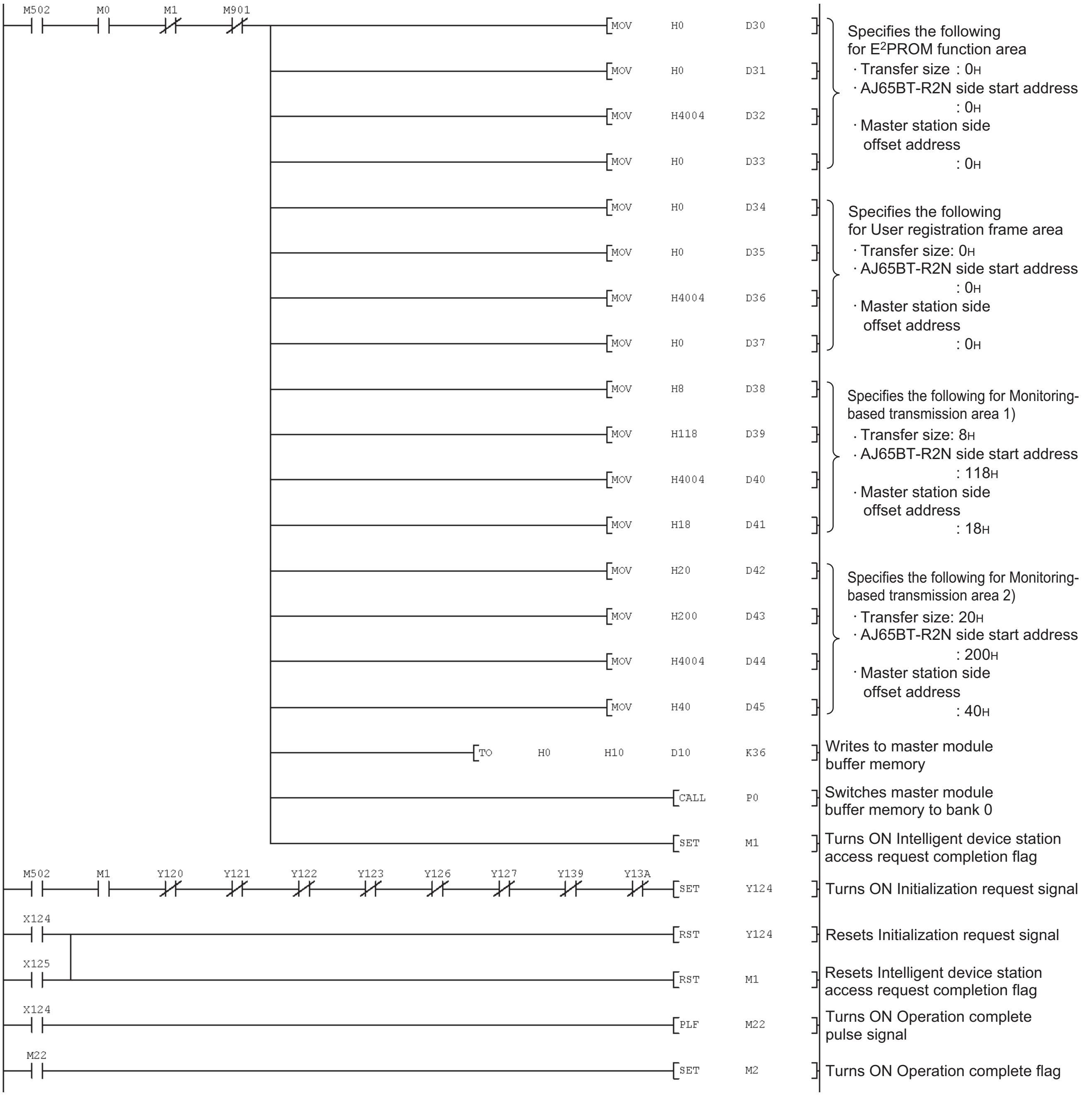

Specifies the following for E^2PROM function area
- Transfer size : 0_H
- AJ65BT-R2N side start address : 0_H
- Master station side offset address : 0_H

Specifies the following for User registration frame area
- Transfer size: 0_H
- AJ65BT-R2N side start address : 0_H
- Master station side offset address : 0_H

Specifies the following for Monitoring-based transmission area 1)
- Transfer size: 8_H
- AJ65BT-R2N side start address : 118_H
- Master station side offset address : 18_H

Specifies the following for Monitoring-based transmission area 2)
- Transfer size: 20_H
- AJ65BT-R2N side start address : 200_H
- Master station side offset address : 40_H

Writes to master module buffer memory

Switches master module buffer memory to bank 0

Turns ON Intelligent device station access request completion flag

Turns ON Initialization request signal

Resets Initialization request signal

Resets Intelligent device station access request completion flag

Turns ON Operation complete pulse signal

Turns ON Operation complete flag

Figure 8.40 Program example for changing auto-refresh buffer assignments (Continued)

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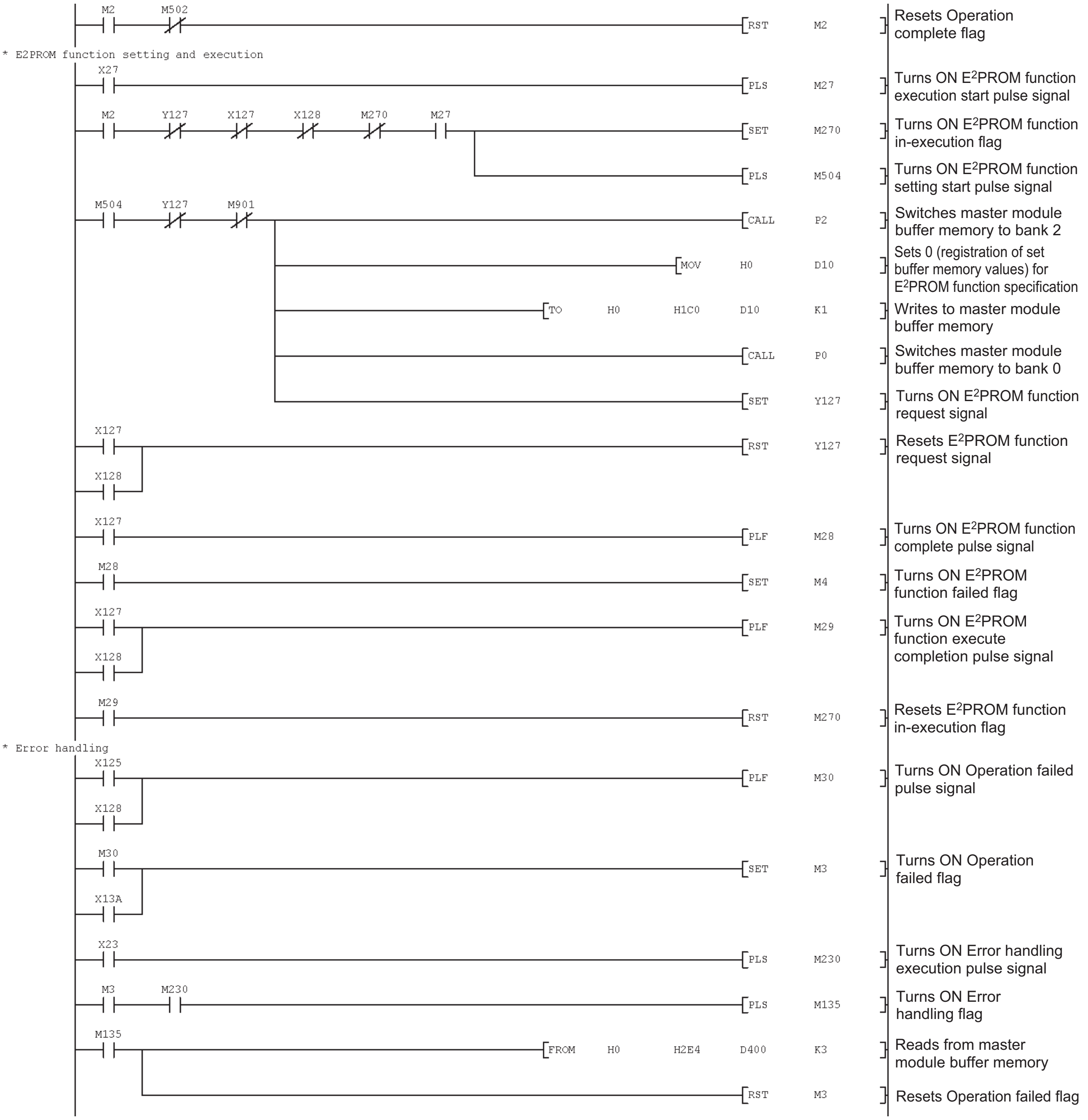

Figure 8.40 Program example for changing auto-refresh buffer assignments (Continued)

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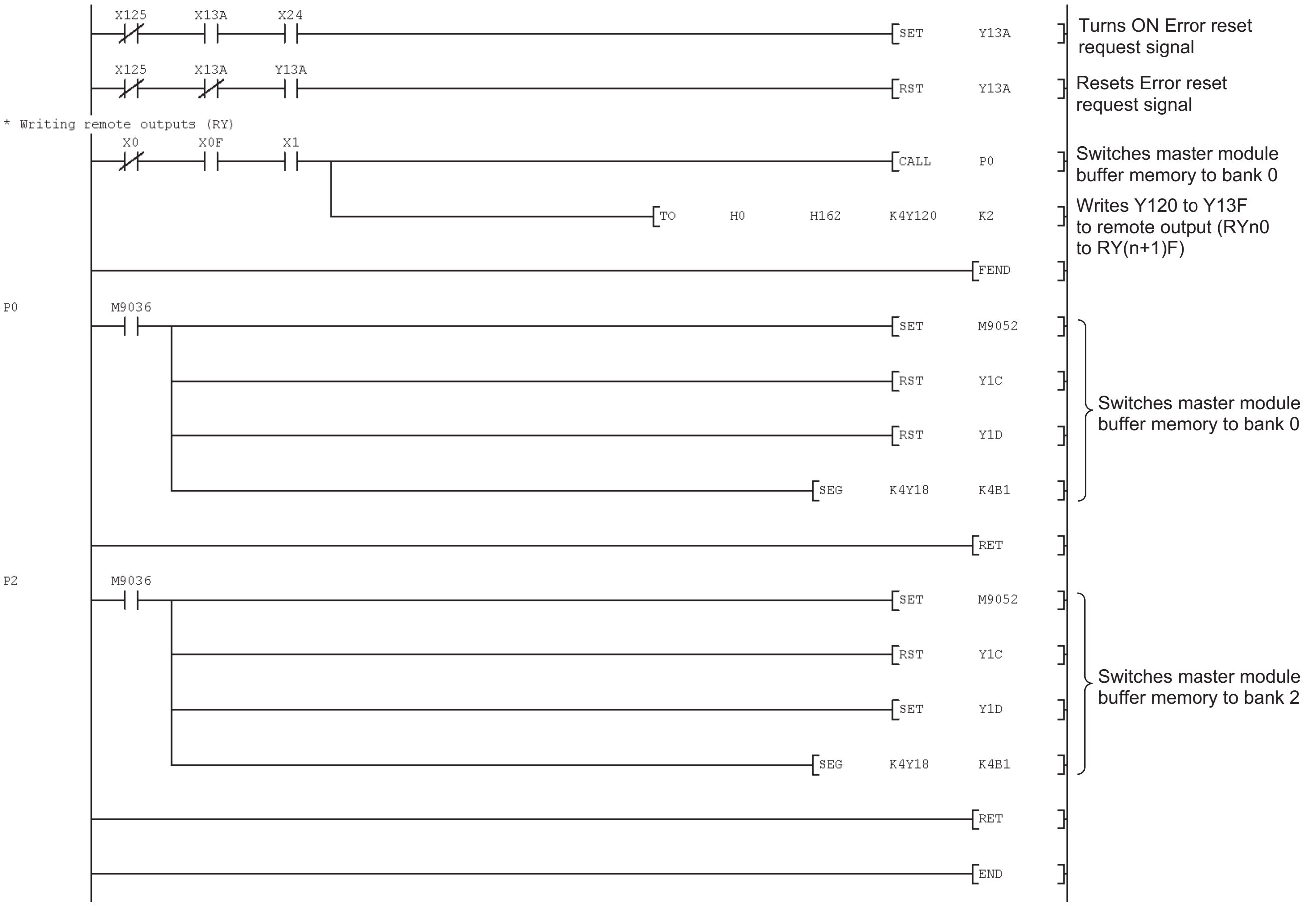

Turns ON Error reset request signal

Resets Error reset request signal

Switches master module buffer memory to bank 0

Writes Y120 to Y13F to remote output (RYn0 to RY(n+1)F)

Switches master module buffer memory to bank 0

Switches master module buffer memory to bank 2

Figure 8.40 Program example for changing auto-refresh buffer assignments (Continued)

8.9.2 Program example for receiving data when a receive timeout occurs

(1) Overview of program example

- The receive timeout time is set to 200ms.
- If a receive timeout error (BB21H) occurs, data received up to that point are read out from the AJ65BT-R2N buffer memory to word devices of the master station.
- After reading is completed, the error is cleared.

(2) For the send/receive buffer communication function

(a) Devices used in the program example

Table 8.46 Devices used in the program example

Device	Description	Device	Description
X0	Module error (Master station)	Y139	Initial data read request signal
X1	Own station data link status (Master station)	Y13A	Error reset request signal
X6	Data link start by parameters in buffer memory normally completed (Master station)	Y13E	Intelligent device station access request signal
X7	Data link start by parameters in buffer memory failed (Master station)	M0	Operation start request flag
X0F	Module ready (Master station)	M1	Intelligent device station access request completion flag
X23	Error code read flag	M2	Operation complete flag
X24	Error clear flag	M3	Operation failed flag
K4X120	Remote input (X120 to X12F)	M6	Received error code read request
X122	Normal receive data read request signal	M10	Sending flag
X123	Error receive data read request signal	M20	AJ65BT-R2N initial setting start flag
X124	Initialization complete signal	M22	Error clear request
X125	Initialization failed signal	M24	Operation complete pulse signal
K1X134	Mode setting switch status signal (X134 to X137)	M30	Operation failed pulse signal
X13A	Error status signal	M90	RIWT subroutine execute flag
X13B	Remote station ready signal	M91	RIWT subroutine execute flag
X13E	Intelligent device station access completion signal	M92	RIRD subroutine execute flag
Y0	Refresh instruction (Master station)	M93	RIRD subroutine execute flag
Y6	Request for data link start by parameters in buffer memory (Master station)	M100	Master station parameter setting start pulse signal
K4Y18	Output (Y18 to Y27) (Master station)	M120	Buffer memory access exclusion check flag
Y1C	Buffer memory bank switching specification (Master station)	M135	Error handling flag
Y1D		M190	TO instruction executed flag
K4Y120	Remote output (Y120 to Y12F)	M191	Intelligent device station access request completion flag
Y120	Send request signal	M200	RIWT subroutine output completion flag
Y121	Send cancel request signal	M202	Subroutine in-execution flag
Y122	Receive data read completion signal	M203	RIWT completion status read start flag
Y123	Forced receive completion request signal	M204	RIWT completion status read end flag
Y124	Initialization request signal	M230	Error handling execution pulse signal
Y126	OS reception area clear request signal	M300	RIRD subroutine output completion flag
Y127	E^{2}PROM function request signal	M301	RIRD subroutine output failed flag

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Table 8.46 Devices used in the program example (Continued)

Device	Description	Device	Description
M303	RIRD completion status read start flag	D100 to D106	Network parameters of master station
M304	RIRD completion status read end flag	D107	Error code in Network parameters setting
M502	AJ65BT-R2N mode normal flag	D130 to D137	Control data of RIRD instruction and error code of AJ65BT-R2N
M503	AJ65BT-R2N mode error flag	D201 or later	Devices for TO instruction in RIWT subroutine
K4M900	Other station data link status (SW0080)	D300 or later	Devices for TO instruction in RIRD subroutine
M901	Other station data link status (Station No.2)	D340	Completion status of receive processing
M9036	Always ON	D400	Error codes generated when receiving
M9052	SEG instruction switching	P0	Switching to bank 0
D1 to D3	Control data of the RIWT subroutine or RIRD subroutine	P1	RIWT subroutine
D4 or later	Set values or receive data	P2	RIRD subroutine
D34	Receive data	—	

(b) Program example

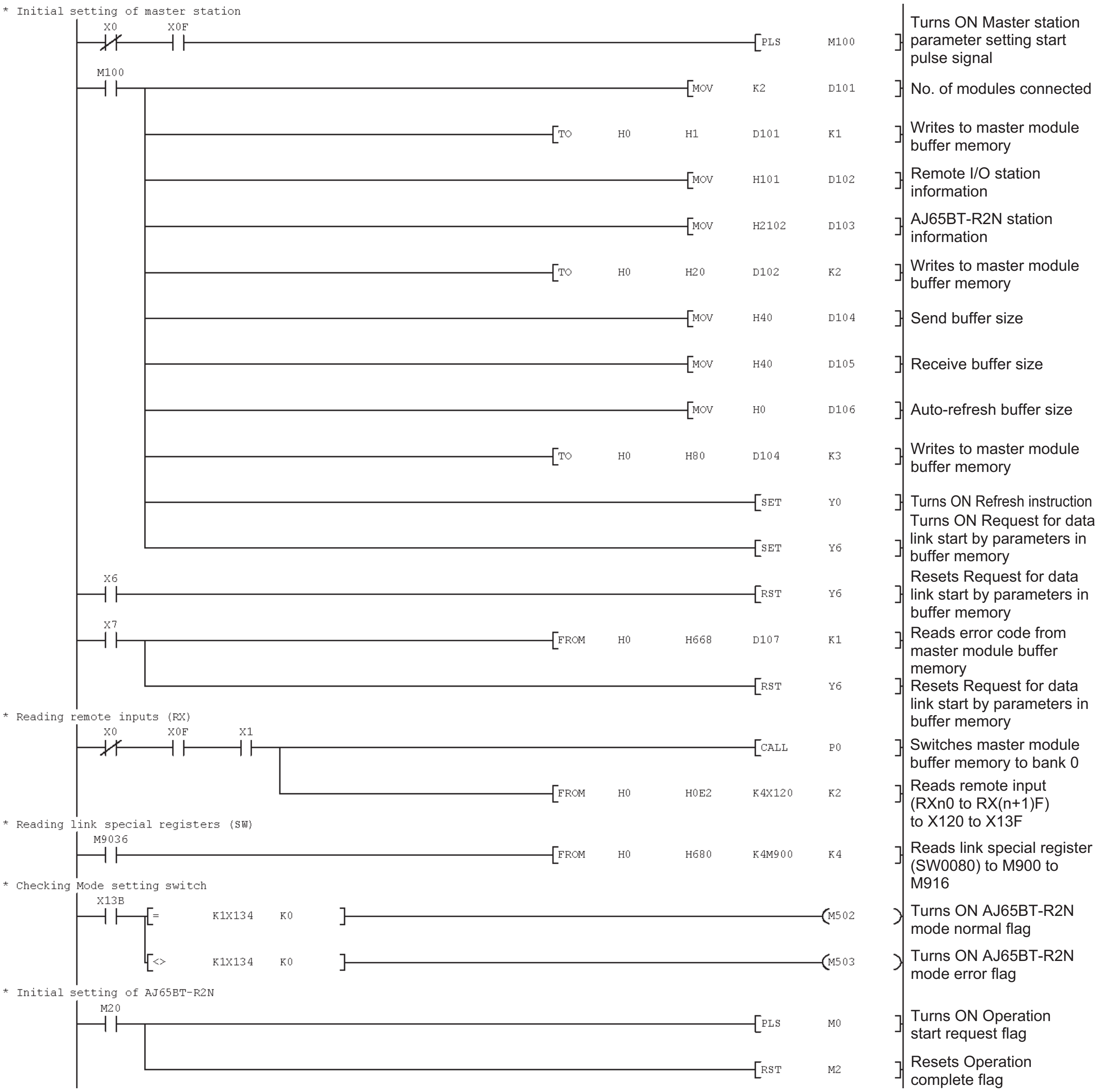

Figure 8.41 Program example for receiving data when a receive timeout occurs

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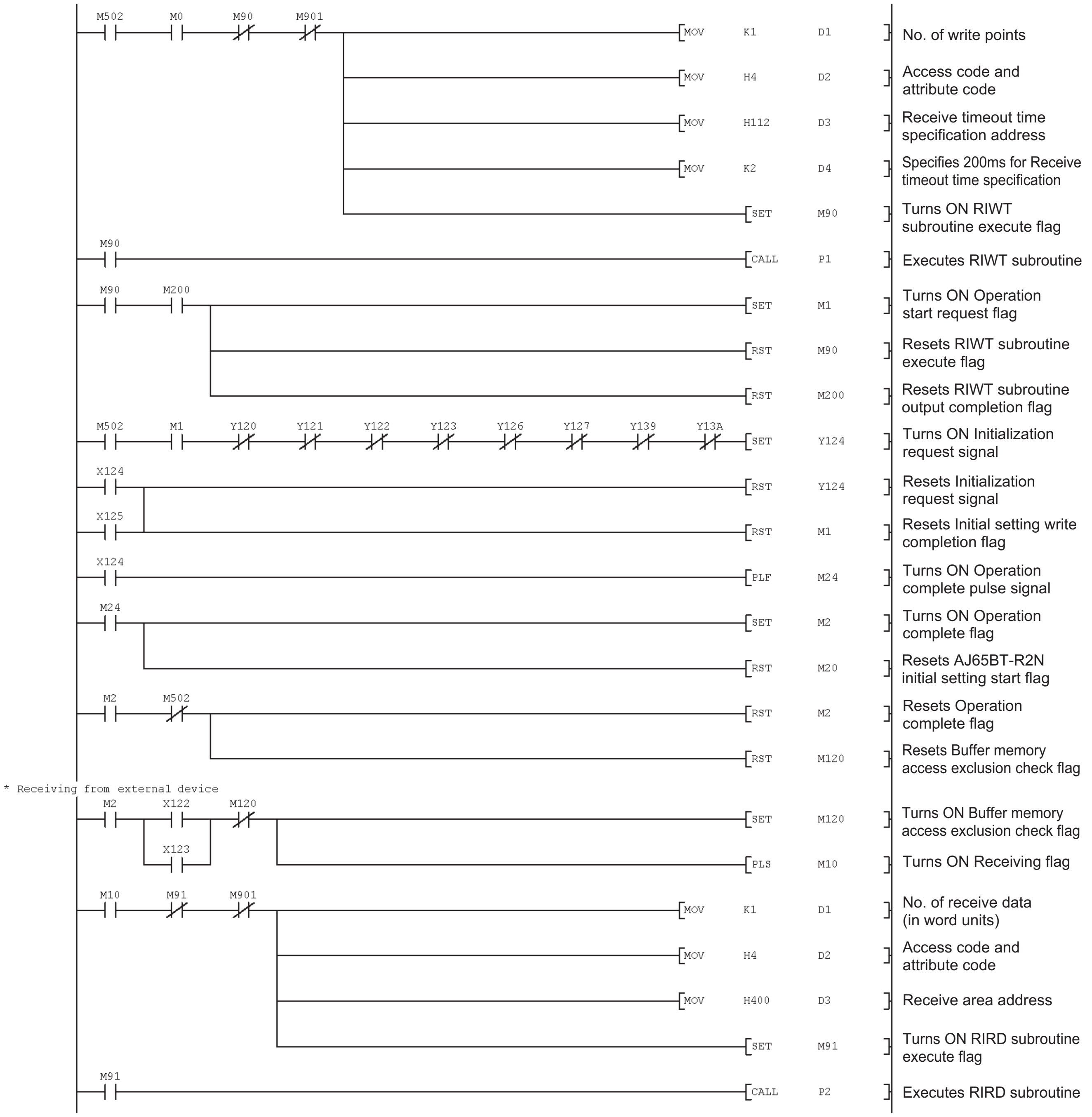

Figure 8.41 Program example for receiving data when a receive timeout occurs (Continued)

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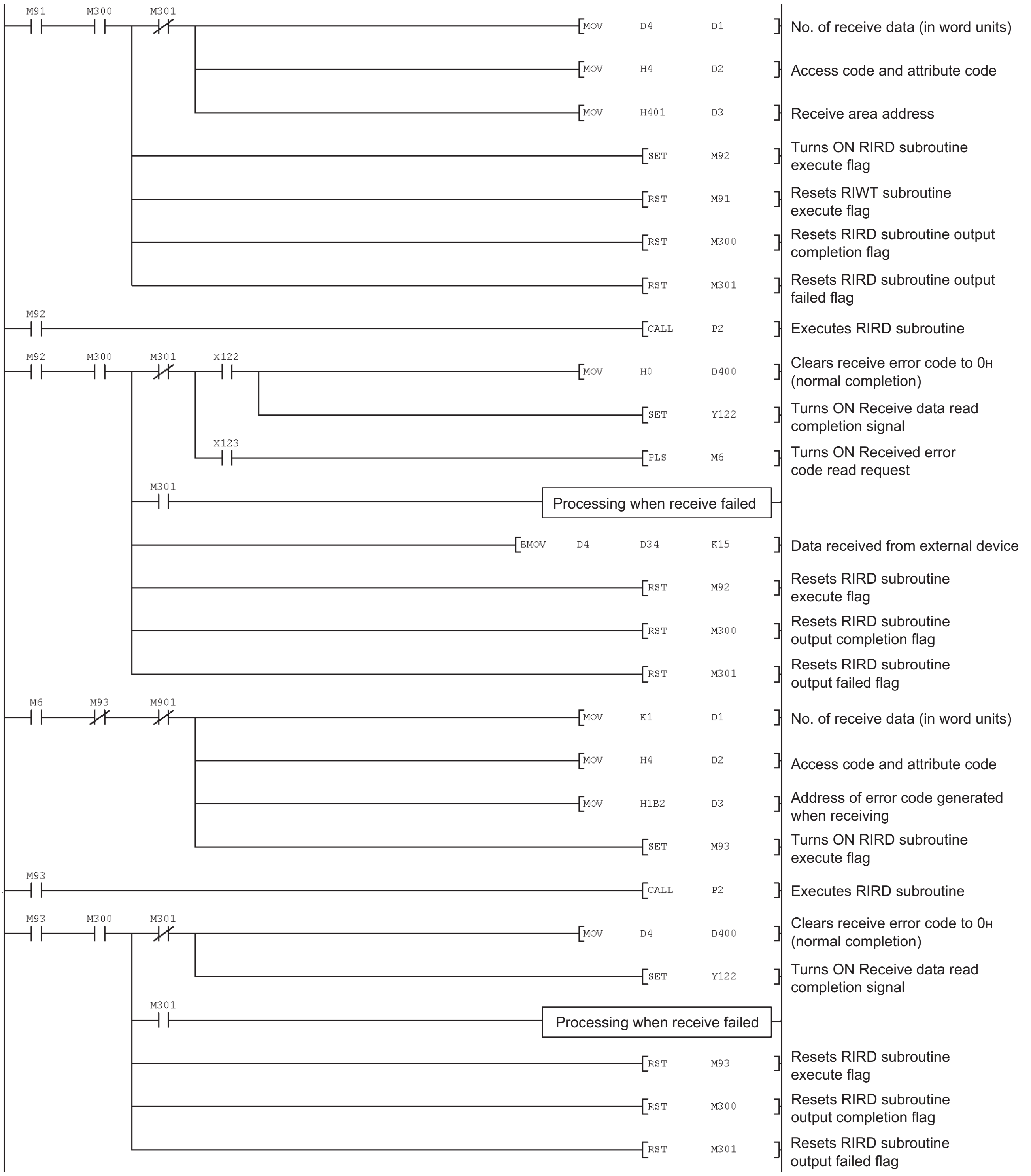

Figure 8.41 Program example for receiving data when a receive timeout occurs (Continued)

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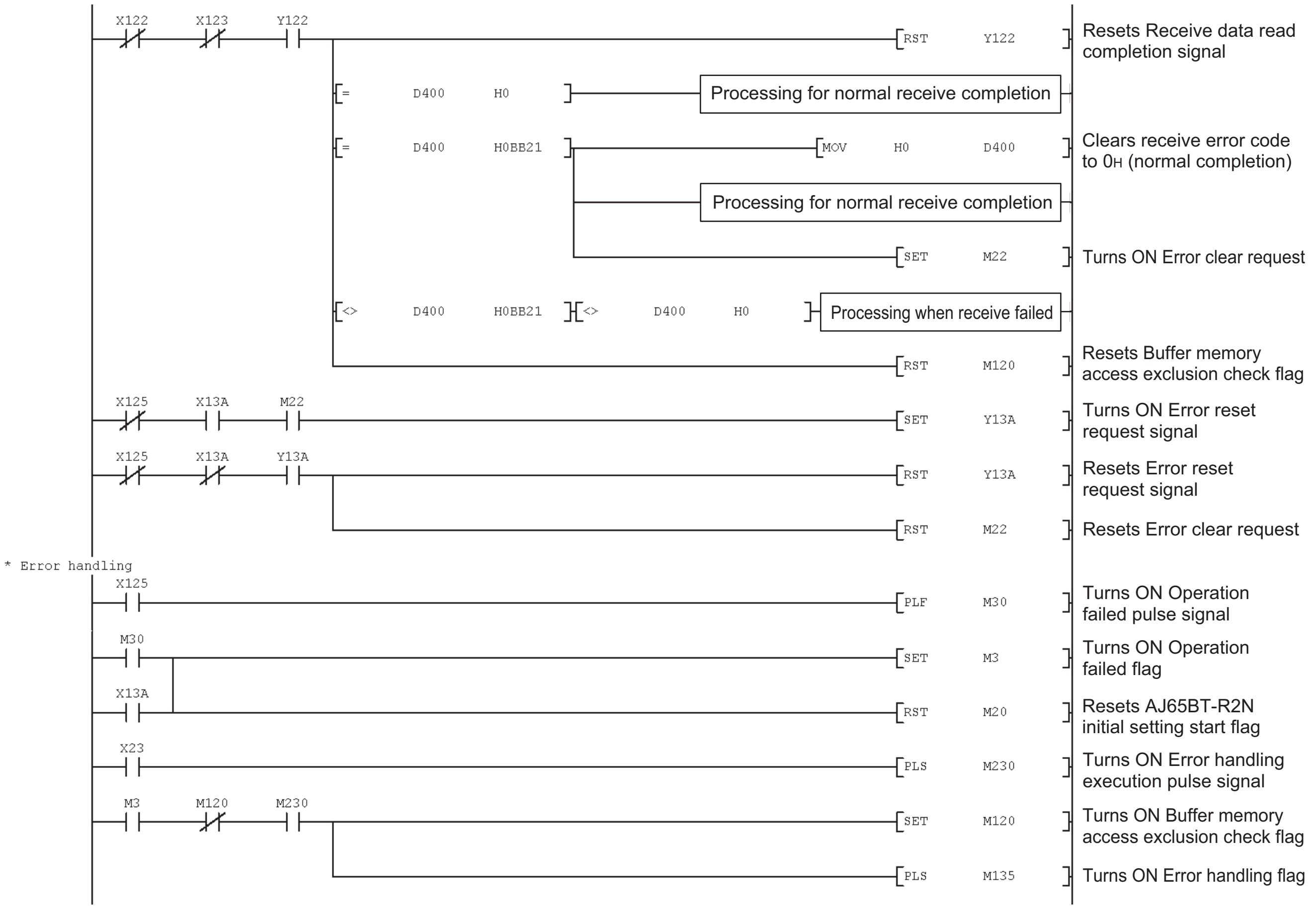

Figure 8.41 Program example for receiving data when a receive timeout occurs (Continued)

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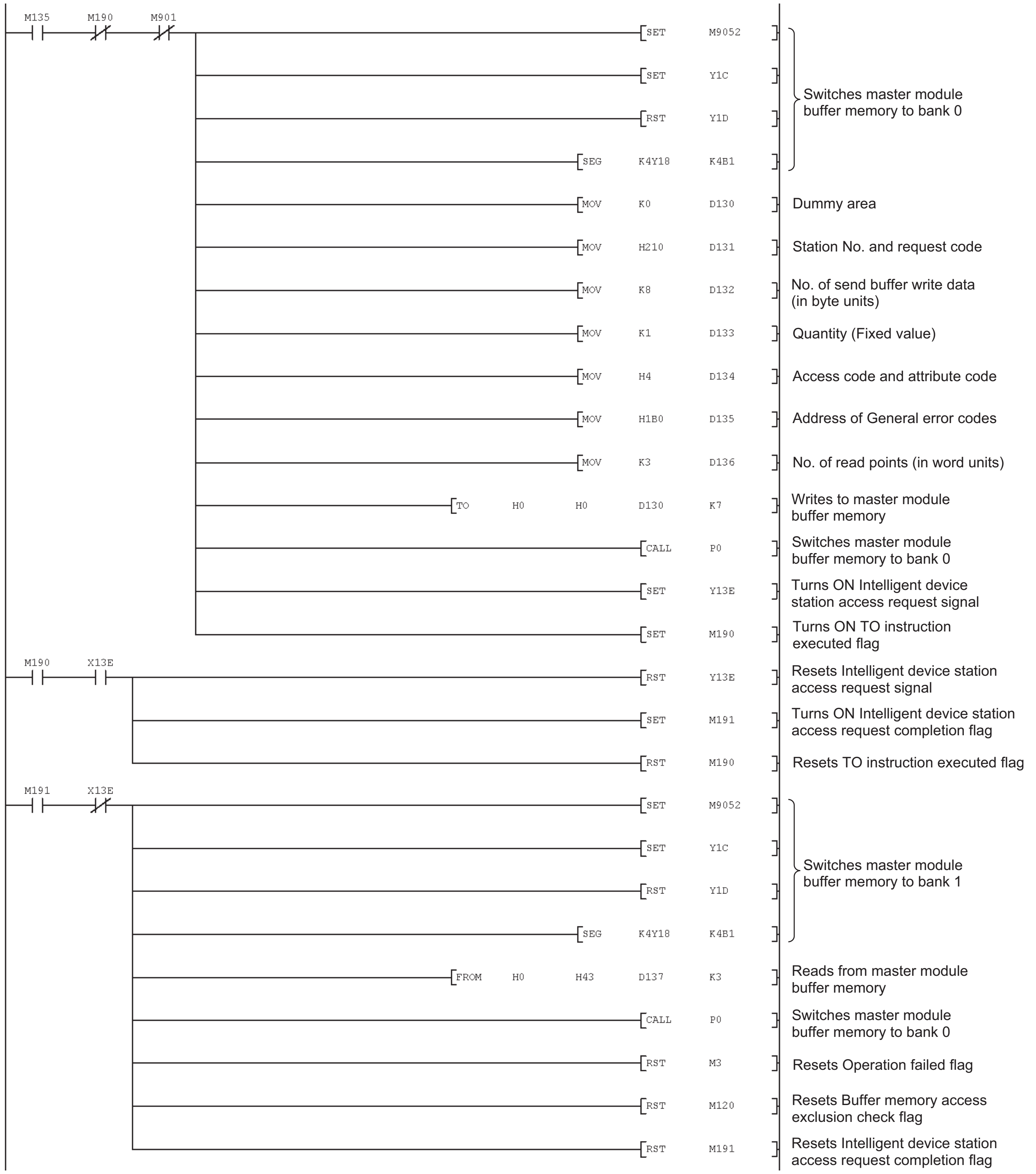

Figure 8.41 Program example for receiving data when a receive timeout occurs (Continued)

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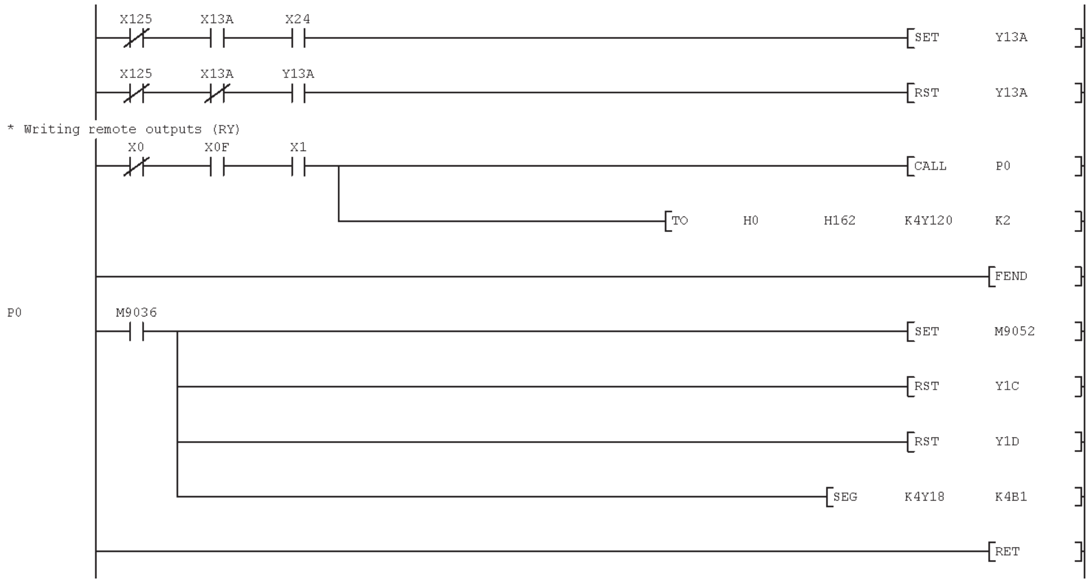

Turns ON Error reset request signal

Resets Error reset request signal

Switches master module buffer memory to bank 0

Writes Y120 to Y13F to remote output (RYn0 to RY(n+1)F)

Switches master module buffer memory to bank 0

Figure 8.41 Program example for receiving data when a receive timeout occurs (Continued)

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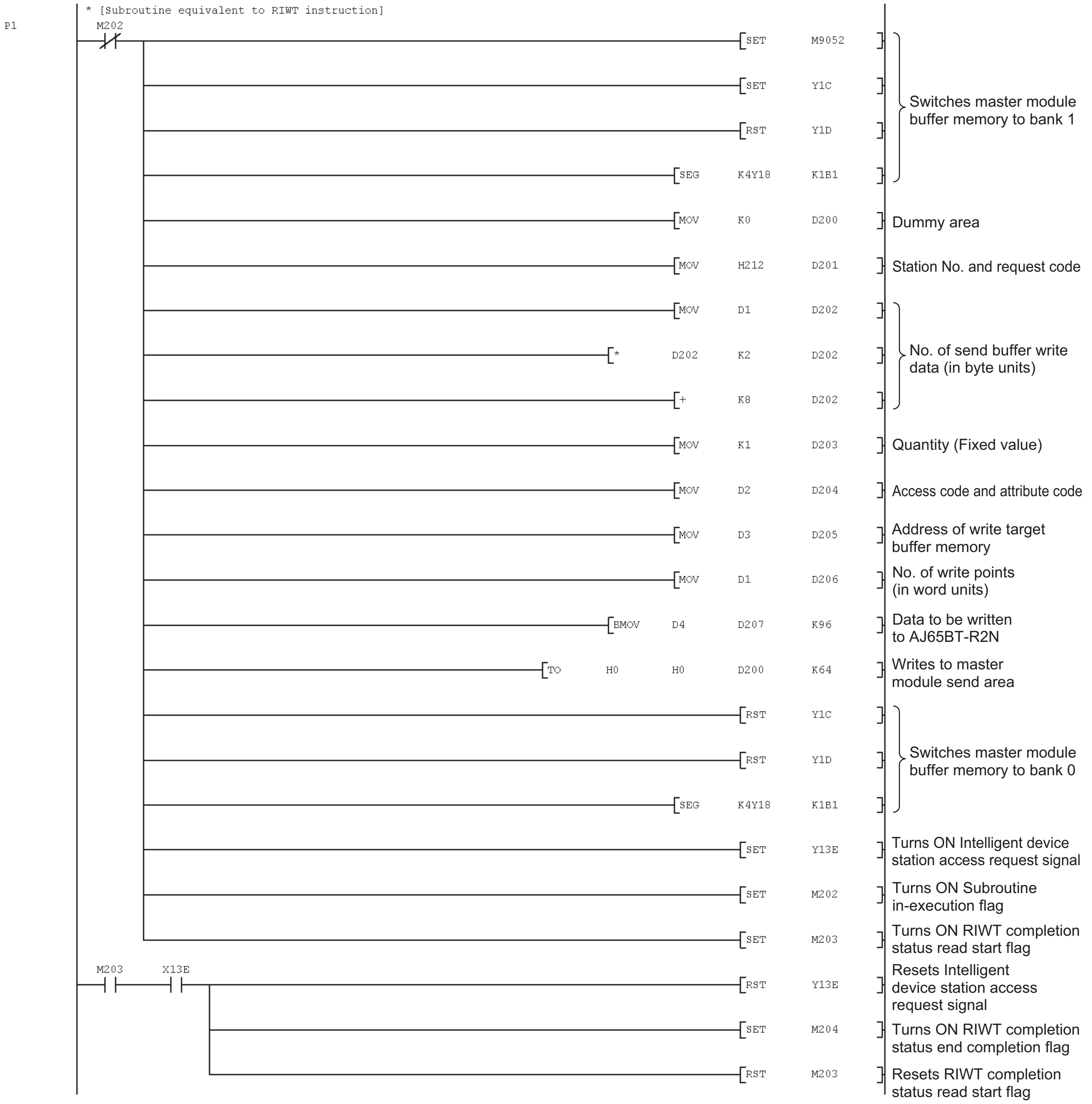

Figure 8.41 Program example for receiving data when a receive timeout occurs (Continued)

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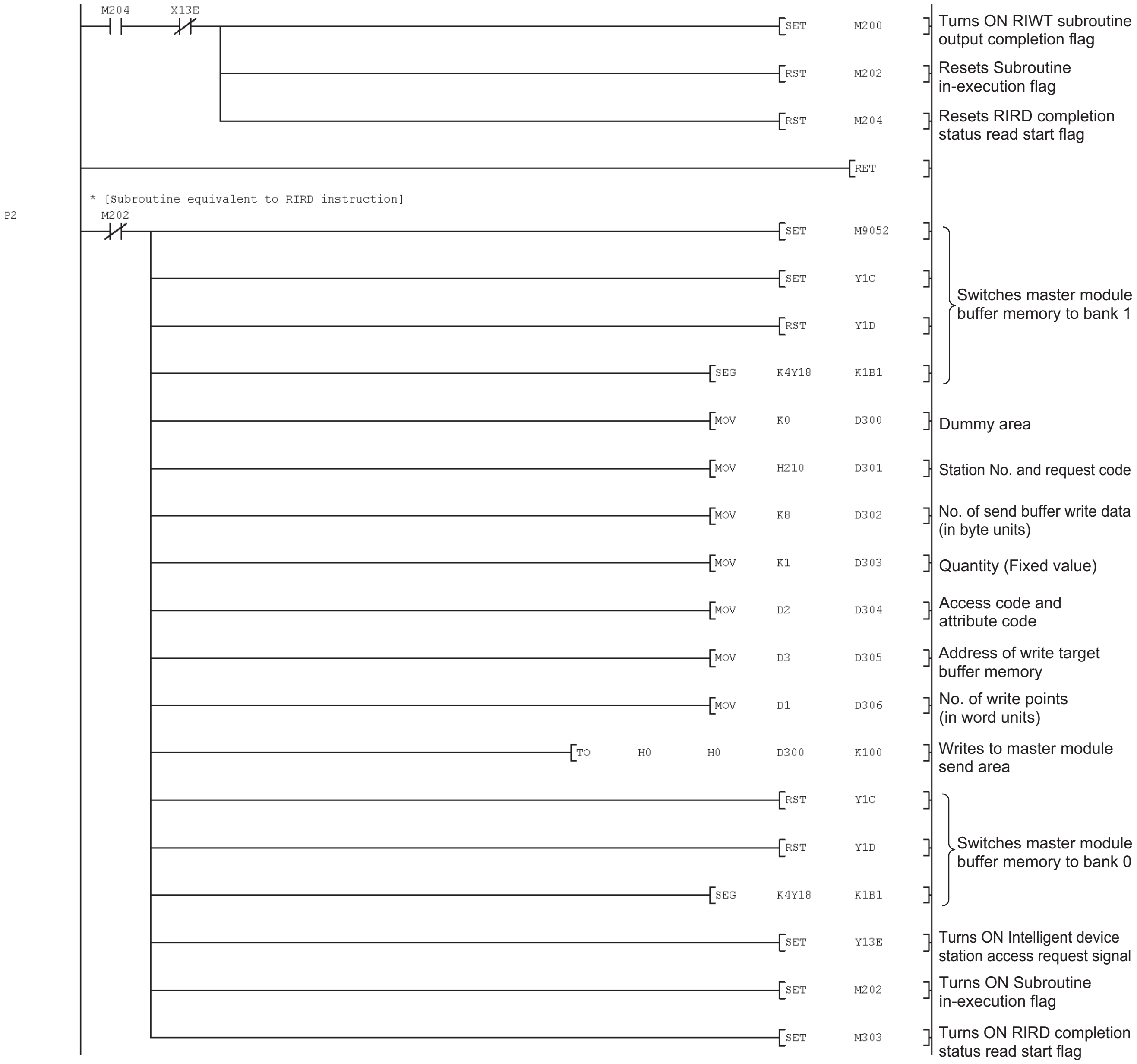

Figure 8.41 Program example for receiving data when a receive timeout occurs (Continued)

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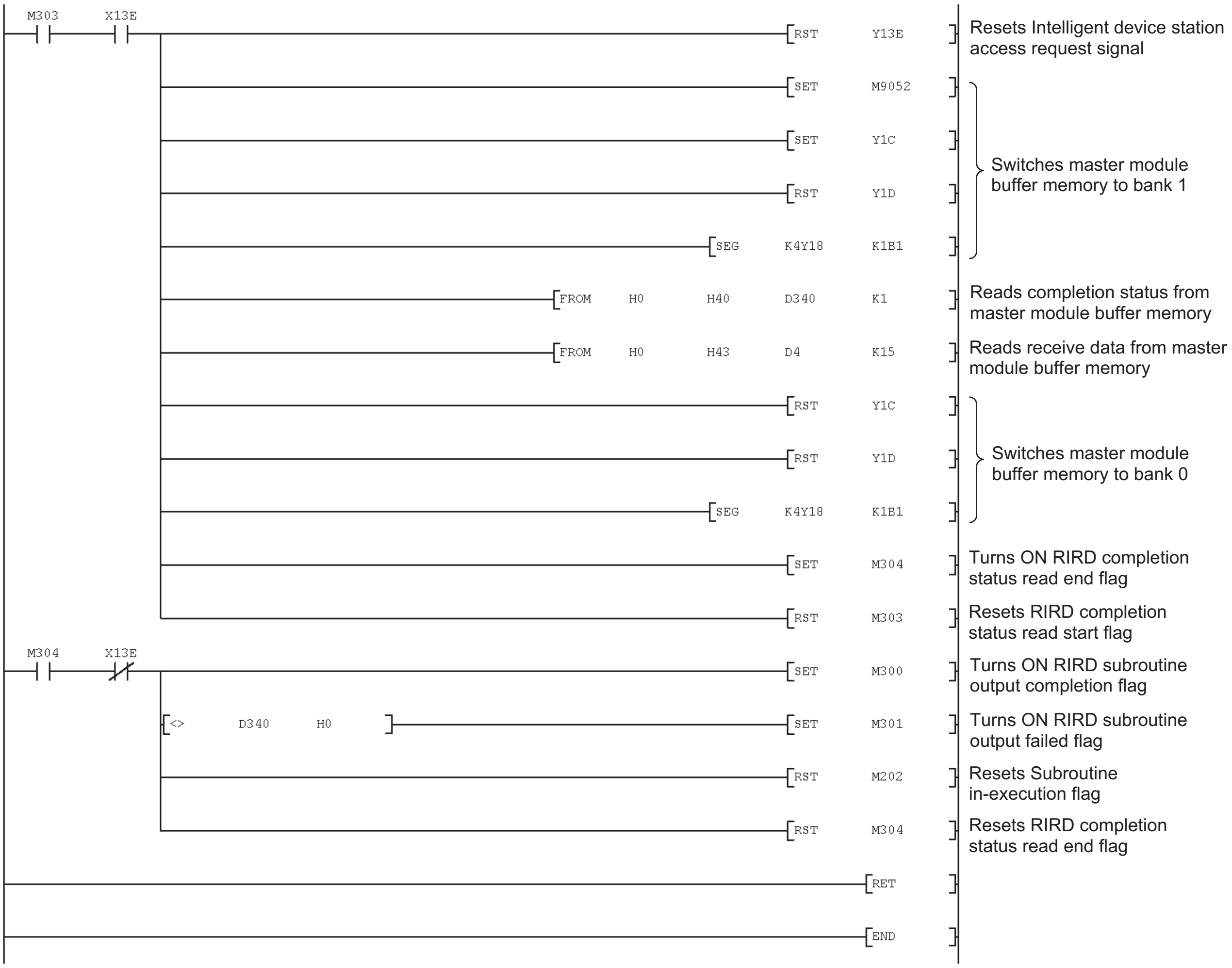

Resets Intelligent device station access request signal

Switches master module buffer memory to bank 1

Reads completion status from master module buffer memory

Reads receive data from master module buffer memory

Switches master module buffer memory to bank 0

Turns ON RIRD completion status read end flag

Resets RIRD completion status read start flag

Turns ON RIRD subroutine output completion flag

Turns ON RIRD subroutine output failed flag

Resets Subroutine in-execution flag

Resets RIRD completion status read end flag

Figure 8.41 Program example for receiving data when a receive timeout occurs (Continued)

(3) For the buffer memory auto-refresh function

(a) Devices used in the program example

Table 8.47 Devices used in the program example

Device	Description	Device	Description
X0	Module error (Master station)	Y13A	Error reset request signal
X1	Own station data link status (Master station)	M0	Operation start request flag
X6	Data link start by parameters in buffer memory normally completed (Master station)	M1	Initial setting write completion flag
X7	Data link start by parameters in buffer memory failed (Master station)	M2	Operation complete flag
X0F	Module ready (Master station)	M3	Operation failed flag
X23	Error code read flag	M22	Error clear request
X24	Error clear flag	M24	Operation complete pulse signal
K4X120	Remote input (X120 to X12F)	M30	Operation failed pulse signal
X122	Normal receive data read request signal	M100	Master station parameter setting start pulse signal
X123	Error receive data read request signal	M111	Initial data read completion pulse signal
X124	Initialization complete signal	M135	Error handling flag
X125	Initialization failed signal	M230	Error handling execution pulse signal
X139	Initial data read completion signal	M500	AJ65BT-R2N initial data read complete flag
X13A	Error status signal	M501	AJ65BT-R2N initial data reading flag
X13B	Remote station ready signal	M502	AJ65BT-R2N mode normal flag
Y0	Refresh instruction (Master station)	M503	AJ65BT-R2N mode error flag
Y6	Request for data link start by parameters in buffer memory (Master station)	K4M900	Other station data link status (SW0080)
K4Y18	Output (Y18 to Y27) (Master station)	M901	Master station setting complete flag
Y1C	Buffer memory bank switching specification (Master station)	M9036	Always ON
Y1D		M9052	SEG instruction switching
K4Y120	Remote output (Y120 to Y12F)	D10	Set value
Y120	Send request signal	D101 to D106	Master station network parameters
Y121	Send cancel request signal	D107	Error code in Network parameters setting
Y122	Receive data read completion signal	D201 or later	No. of receive data
Y123	Forced receive completion request signal	D201	Receive data
Y124	Initialization request signal	D400	AJ65BT-R2N error code
Y126	OS reception area clear request signal	P0	Switching to bank 0
Y127	E^{2}PROM function request signal	P2	Switching to bank 2
Y139	Initial data read request signal	—	

(b) Program example

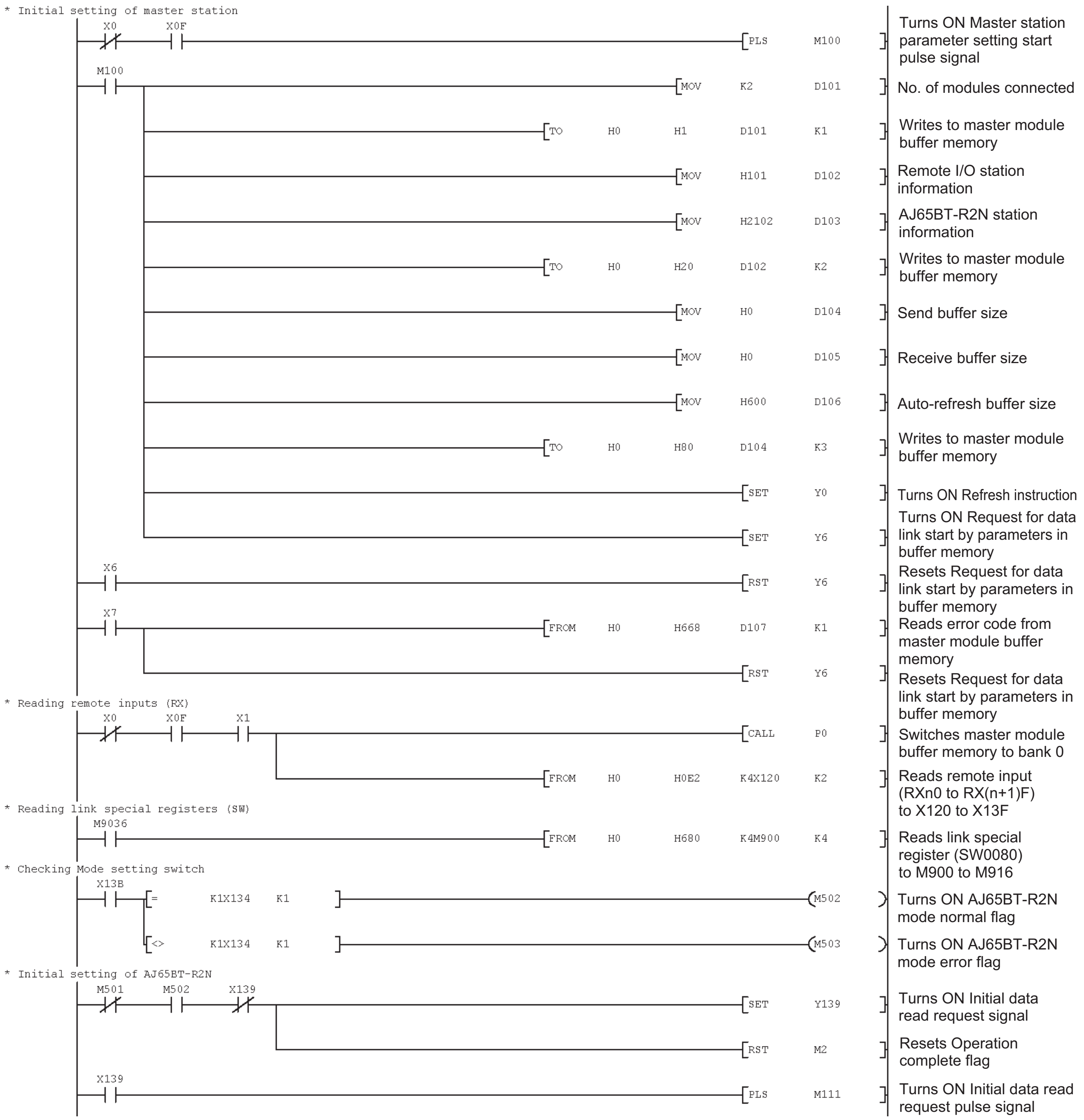

Figure 8.42 Program example for receiving data when a receive timeout occurs

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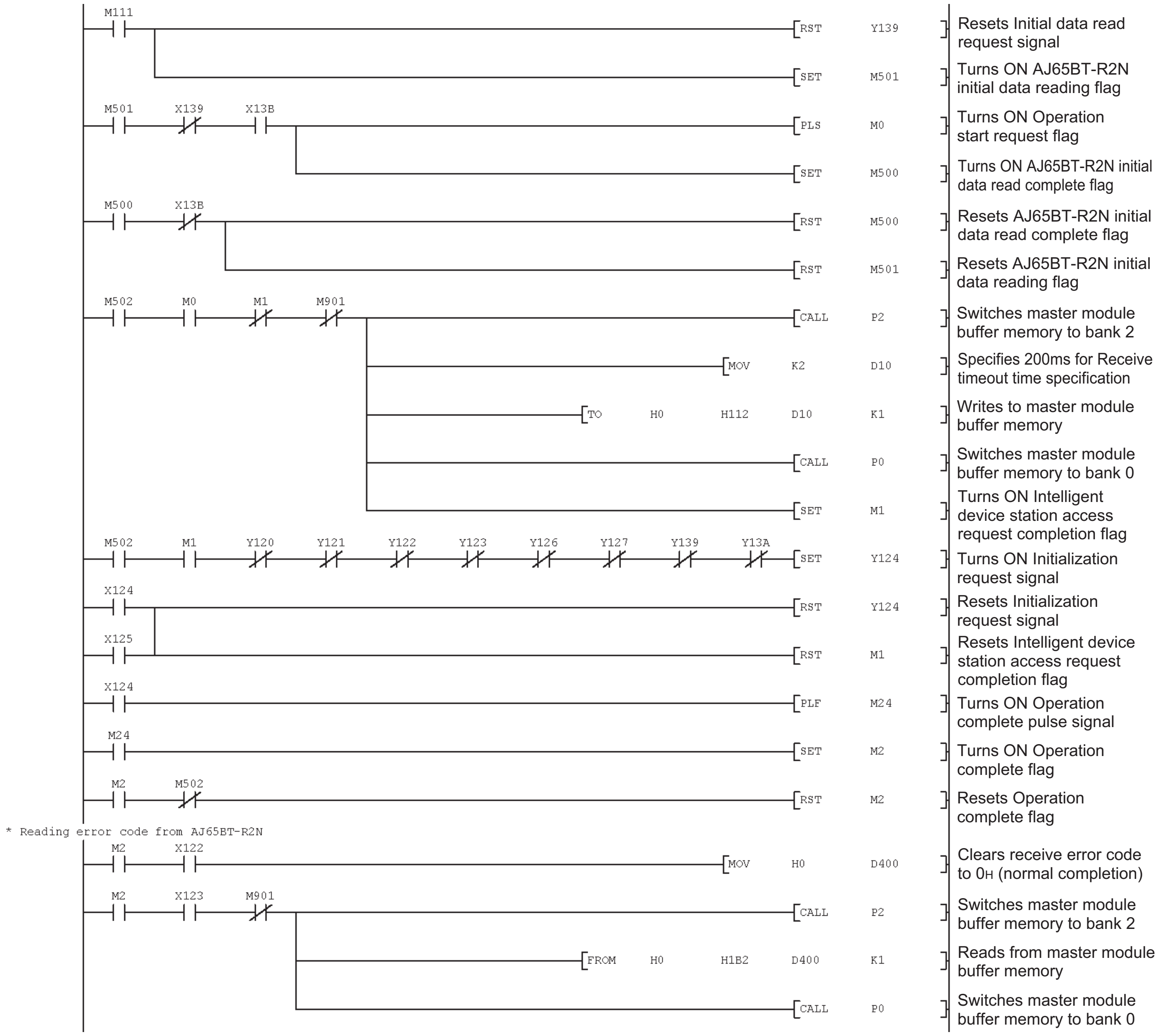

Figure 8.42 Program example for receiving data when a receive timeout occurs (Continued)

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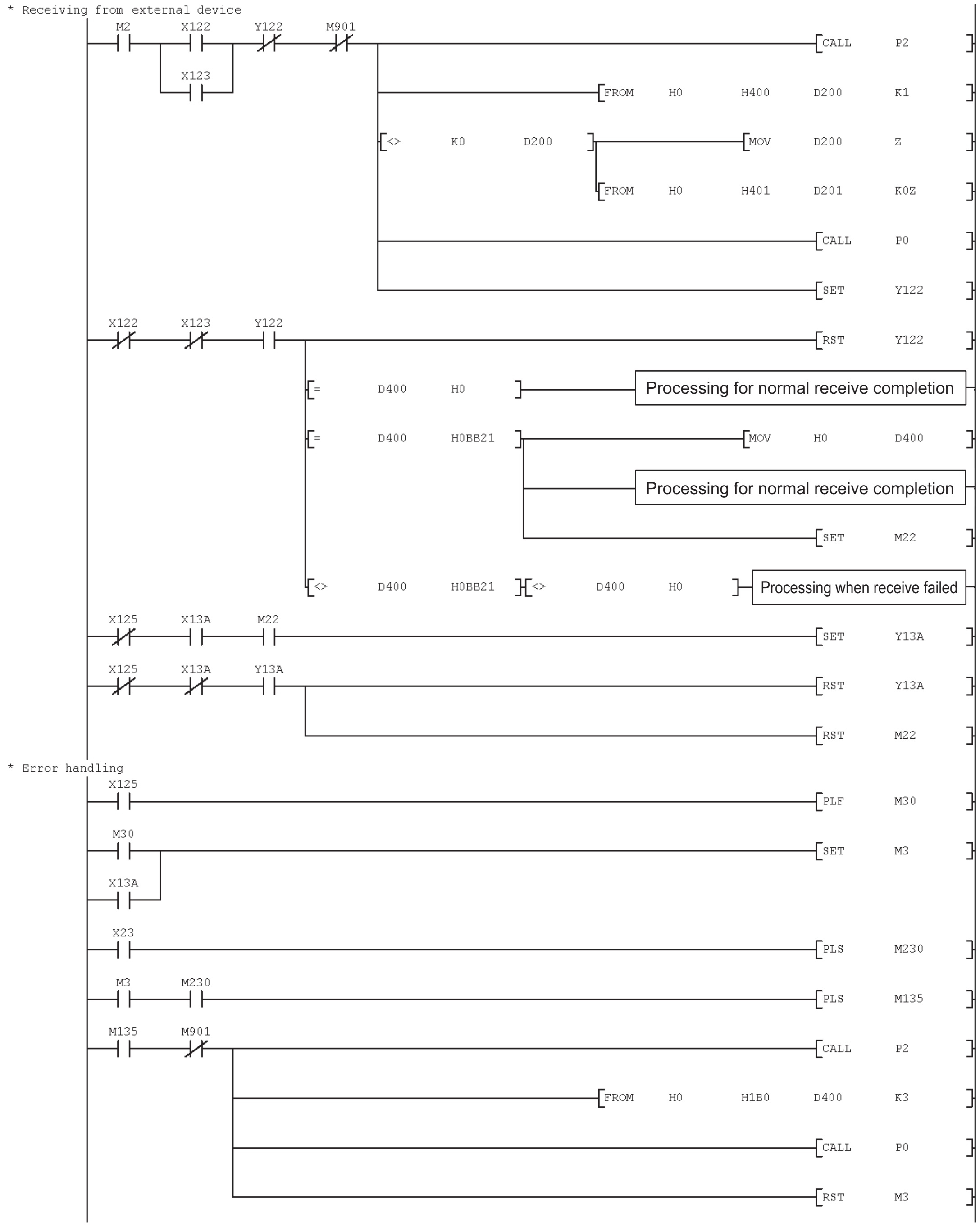

Switches master module buffer memory to bank 2

Reads No. of receive data (in word units) and receive data from master module receive area

Switches master module buffer memory to bank 0

Turns ON Receive data read completion signal

Resets receive data read completion handshake request

Clears receive error code to 0H (normal completion)

Turns ON Error clear request

Turns ON Error reset request signal

Resets Error reset request signal

Resets Error clear request

Turns ON Operation failed pulse signal

Turns ON Operation failed flag

Turns ON Error handling execution pulse signal

Turns ON Error handling flag

Switches master module buffer memory to bank 2

Reads from master module buffer memory

Switches master module buffer memory to bank 0

Resets Operation failed flag

Figure 8.42 Program example for receiving data when a receive timeout occurs (Continued)

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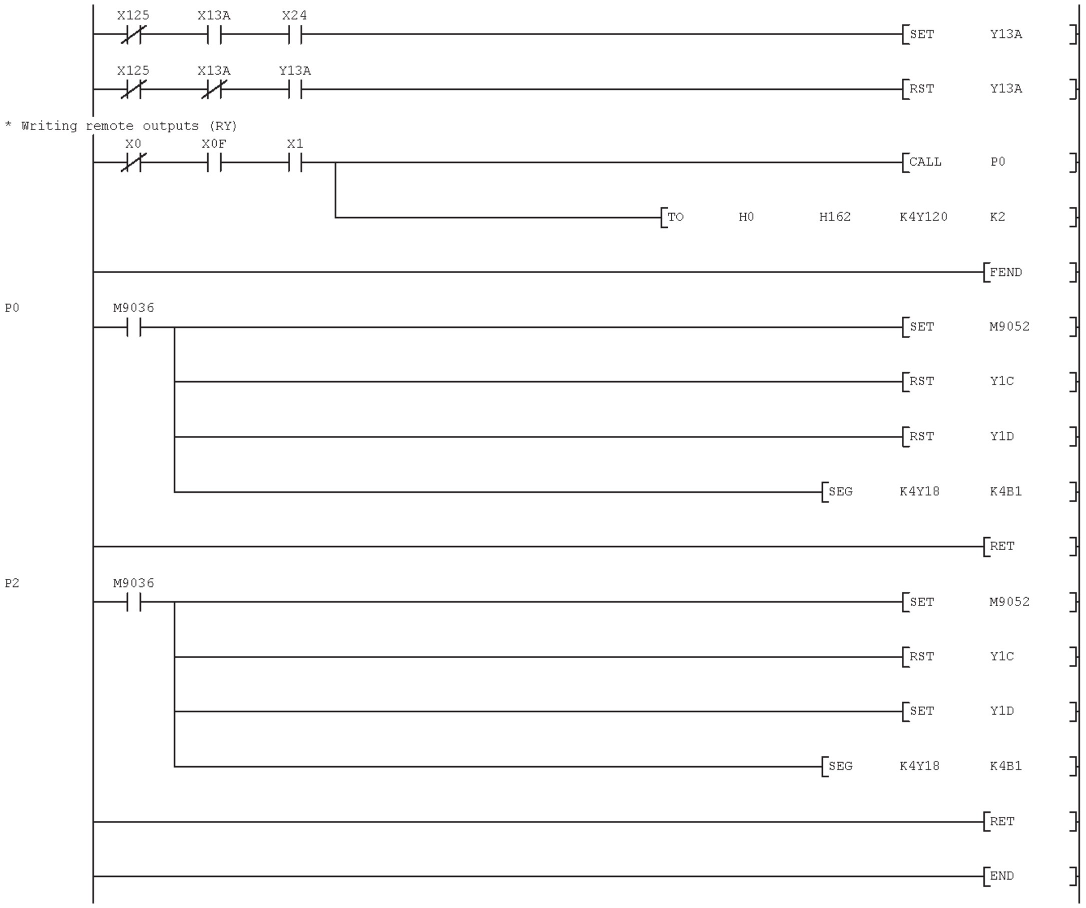

Turns ON Error reset request signal

Resets Error reset request signal

Switches master module buffer memory to bank 0

Writes Y120 to Y13F to remote output (RYn0 to RY(n+1)F)

Switches master module buffer memory to bank 0

Switches master module buffer memory to bank 2

Figure 8.42 Program example for receiving data when a receive timeout occurs (Continued)

CHAPTER 9 TROUBLESHOOTING

This chapter describes the troubleshooting procedures and error codes of the AJ65BT-R2N.

9.1 Troubleshooting in Nonprocedural Protocol Mode

(1) Troubleshooting lists

The troubleshooting lists for the AJ65BT-R2N are shown in this section.

If a problem arises, check the AJ65BT-R2N status, identify the symptom listed in the following tables, and take corrective actions.

For an error related to the programmable controller CPU, refer to the user's manual for the programmable controller CPU used.

For an error related to the master module, refer to the user's manual for the master module used.

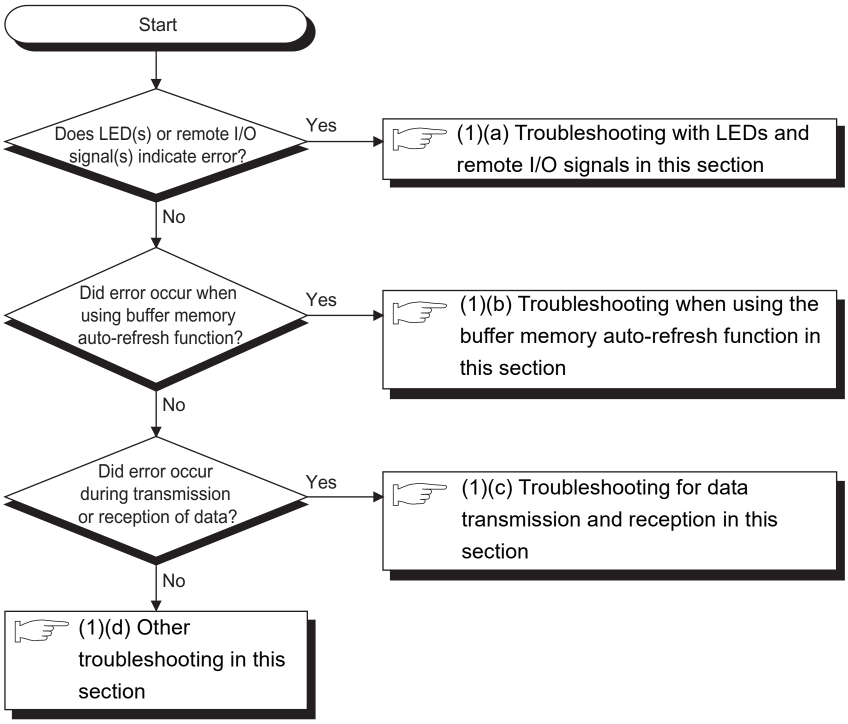

Figure 9.1 Troubleshooting flowchart

(a) Troubleshooting with LEDs and remote I/O signals

Table 9.1 Troubleshooting with LEDs and remote I/O signals

Symptom	Cause	Action
RUN LED turned OFF.	Incorrect switch setting	•Correct the switch setting. ☞Section 5.4 Part Names and Settings
	A watchdog timer error has occurred.	•Reapply power to or reset the AJ65BT-R2N. •If the RUN LED does not turn ON even after that, check the following. (1) Check the conditions of the AJ65BT-R2N installation, terminal block, and wiring. (2) Check if the system is used in an environment that satisfies the general specifications. (3) Check if power capacity is sufficient (4) The hardware may be faulty. Check if the hardware of the AJ65BT-R2N is normal, according to this manual. ☞Section 5.5.1 Hardware test Or, replace the module and check the operation. If the problem persists, the hardware of the AJ65BT-R2N may be faulty. Please consult your local Mitsubishi representative, explaining a detailed description of the problem.
L RUN LED turned OFF.	A watchdog timer error has occurred.	•Reapply power to or reset the AJ65BT-R2N. •If the L RUN LED does not turn ON even after that, check the following. (1) Check the conditions of the AJ65BT-R2N installation, terminal block, and wiring. (2) Check if the system is used in an environment that satisfies the general specifications. (3) Check if power capacity is sufficient. (4) The hardware may be faulty. Check if the hardware of the AJ65BT-R2N is normal, according to this manual. ☞Section 5.5.1 Hardware test Or, replace the module and check the operation. •If the problem persists, the hardware of the AJ65BT-R2N may be faulty. Please consult your local Mitsubishi representative, explaining a detailed description of the problem.
	The CC-Link dedicated cable is disconnected or shorted.	•Check the CC-Link dedicated cable and correct the wiring.
	Master station has stopped data link.	•Check the master station for an error.
	24V power is not supplied to the AJ65BT-R2N. Or, the voltage is insufficient.	•Check the voltage of the 24V power supply.
	The station No. is duplicated.	•Change the station No. setting of the module whose station No. is duplicated, and reapply power to or reset the AJ65BT-R2N.
	The Station No. setting switches are set to 0 or 65 or more, or the Data link transmission speed setting switch is set to other than 0 to 4.	•Correct the setting of the Station No. setting switches and/or the Data link transmission speed setting switch, and reapply power to or reset the AJ65BT-R2N.

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Table 9.1 Troubleshooting with LEDs and remote I/O signals (Continued)

Symptom	Cause	Action
L ERR. LED is flashing at regular intervals.	The setting of the Station No. setting switches or the transmission speed setting switch has been changed during normal operation.	•Set the station No. or transmission speed back to the setting before the change, and then reapply power to or reset the AJ65BT-R2N. •If the L RUN LED does not turn ON even after that, the hardware of the AJ65BT-R2N may be faulty. Please consult your local Mitsubishi representative, explaining a detailed description of the problem.
	The Station No. setting switches or the transmission speed setting switch is faulty.	•If the L ERR. LED started flashing while any of the switch settings has not been changed during normal operation, the hardware of the AJ65BT-R2N may be faulty. Please consult your local Mitsubishi representative, explaining a detailed description of the problem.
L ERR. LED is flashing irregularly.	No terminating resistor is connected.	•Connect a terminating resistor, and reapply power or reset the module.
	AJ65BT-R2N or CC-Link dedicated cable is affected by noise.	•Ground both ends of the shield wire of the CC-Link dedicated cable through SLD and FG of respective modules. •Securely ground the FG terminal of the AJ65BT-R2N. •When using pipes for wiring, securely ground the pipes.
L ERR. LED turned ON.	An error occurred during communication between the master station and AJ65BT-R2N.	•Check the error code stored in the AJ65BT-R2N buffer memory, set correct data, and then reapply power to or reset the AJ65BT-R2N. ☞Section 9.2 Error code list
	The Station No. setting switches are set to 0 or 65 or more, or the Data link transmission speed setting switch is set to other than 0 to 4.	•Correct the setting of the Station No. setting switches and/or the Data link transmission speed setting switch, and reapply power to or reset the AJ65BT-R2N.
Although a send request was made, nothing is sent. SD LED does not flash.	Transmission has been stopped because the CS (CTS) signal was turned OFF.	•Check the status of the CS (CTS) signal (RXn9) and DSR (DR) signal (RXnA). •Correct the RS-232 cable connection. •When the signal has been turned to OFF by the external device, check if the external device can receive data or not. If not, place the external device in the ready-to-receive status, and turn ON the signal. •Check the flow control specifications of the external device, and change the flow control to DC code control or disable it.
	In the DTR/DSR (ER/DR) control, transmission has been stopped because the DSR (DR) signal was turned OFF.	
	In the DC code control, transmission from the AJ65BT-R2N has been stopped because DC3 was sent from the external device to the AJ65BT-R2N.	•Check if the external device can receive data or not. If DC3 was sent with the external device placed not in the ready-to-receive status, place it in the ready-to-receive status. •Check the flow control specifications of the external device, and change the flow control to DTR/DSR (ER/DR) control or disable it.

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Table 9.1 Troubleshooting with LEDs and remote I/O signals (Continued)

Symptom	Cause	Action
Although a send request was made, nothing is sent. SD LED does not flash.	A send error has occurred.	•Check the RS-232 ERR. LED, Send failed signal (RXn1) and Error status signal (RX(n+1)A). If an error has occurred, an error code is stored in Error code history (R2N $1A8_H$ to $1AF_H$) or Error codes generated when sending (R2N $1B1_H$). ☞Section 9.2 Error code list
	The RS-232 cable is faulty.	•Correct the RS-232 cable connection.
	The send request was not made correctly.	•Set a value in Send timeout time specification (R2N $11A_H$), and check if a send timeout error ($BB11_H$) occurs or not. If no send timeout time error ($BB11_H$) is detected, modify the sequence program for the send request.
	A CC-Link communication error has occurred.	•Check the indicator LEDs and take corrective actions. ☞Section 5.4 Part Names and Settings
RD LED does not flash during data transmission from external device.	Incorrect signal line connection	•Check if the SD and RD signal lines of the RS-232 cable are correctly connected between the AJ65BT-R2N and external device.
	The send control signal of the external device is not ON.	•Wire the system so that the AJ65BT-R2N-side send signals such as DSR or CS will turn ON on the external device side.
	In the flow control, free space in the OS reception area of the AJ65BT-R2N has been reduced to 64 bytes or less.	•Perform receive processing.
	The transmission speed setting is not consistent.	•Set the same transmission speed for the AJ65BT-R2N and external device.
Although RD LED flashes during data transmission from external device, Normal receive data read request signal (RXn2) does not turn ON.	Fixed length data have not been received.	•Check if the external device has sent data of the fixed length set on the AJ65BT-R2N side.
	Receive data specified with Receive end frame No. have not been received.	•Check if the end frame was sent during communication using registration frames or not.
	The transmission speed setting, etc. is not consistent.	•Set the same settings such as the transmission speed for the AJ65BT-R2N and external device.
ERR.LED turns ON.	The Mode setting switch or the RS-232 transmission setting switches are set incorrectly.	•Read an error code from the buffer memory, identify the error, and correct the setting.
	The AJ65BT-R2N detected an error during data transmission or reception.	•Read an error code from the buffer memory, and take corrective actions.
When Initialization failed signal (RXn5) is ON, Remote station ready signal (RX(n+1)B) turns OFF. Also, after this, the error is not reset by Error reset request signal (RY(n+1)A).	When Initialization failed signal (RXn5) is ON, the operation is as described in the left.	•Ignore the OFF status of Remote station ready signal (RX(n+1)B), remove the cause of the initialization error, and make the initialization request again. After normal completion of Initialization request signal (RYn4), make an error reset request. ☞Section 3.7.2 (15) Error reset request signal (RY(n+1)A) and Error status signal (RX(n+1)A)

(b) Troubleshooting when using the buffer memory auto-refresh function

Table 9.2 Troubleshooting when using the buffer memory auto-refresh function

Symptom	Cause	Action
Send/receive buffer size setting error (B904$_H$) occurs.	The auto-refresh buffer settings have not been configured in the master station.	•Select the master station in [Network parameters], and correct the auto-refresh buffer settings in [CC-Link station information. Module 1] - [Intelligent buffer select].
	The auto-refresh buffer size is not sufficient for the master station.	
Data cannot be entered into the auto-refresh buffer. Auto-refresh buffer data is 0.	Incorrect reference addresses were set for the auto-refresh buffer.	•For access with the RIFR/RITO instruction, check and correct the address specified for the instruction. ☞Section 3.8.1 Buffer memory list •For access with the FROM/TO instruction, calculate the address as follows: (Auto-refresh buffer start address) + (Start offset assigned to the target station) + (Address specified when accessing with RIFR/RITO) •When accessing the auto-refresh buffer of an A series master module with the FROM/TO instruction, switch the bank.
	The auto-refresh buffer has not been set.	•Select the master station in [Network parameters], and correct the auto-refresh buffer settings in [CC-Link station information. Module 1] - [Intelligent buffer select].
	Initialization data have not been written to the master station.	•Turn ON Initial data read request signal (RY(n+1)9), and write the initialization data to the master station.
	An error occurred while writing the initialization data to the master station.	•Check the RS-232 ERR. LED and Error status signal (RX(n+1)A). If an error occurs, an error code is stored into Error code storage area (R2N 1A8$_H$ to 1B2$_H$). •If a send/receive buffer size setting error (B904$_H$) has occurred, select the master station in [Network parameters], and correct the auto-refresh buffer settings in [CC-Link station information. Module 1] - [Intelligent buffer select]. •For any other errors, refer to the following. ☞Section 9.2 Error code list

(c) Troubleshooting for data transmission and reception

Table 9.3 Troubleshooting for data transmission and reception

Symptom	Cause	Action
AJ65BT-R2N does not receive data sent from the external device.	Receive data of the size specified in No. of receive end data ($\boxed{\text{R2N}}$ 111_{H}) have not been received yet. Or, receive data specified in Receive end frame No. ($\boxed{\text{R2N}}$ $10C_{H}$ to $10F_{H}$) have not been received yet.	•Check the settings of No. of receive end data ($\boxed{\text{R2N}}$ 111_{H}) and Receive end frame No. ($\boxed{\text{R2N}}$ $10C_{H}$ to $10F_{H}$). •If no setting or incorrect setting is identified, set it correctly. The defaults of the AJ65BT-R2N are as follows: •No. of receive end data ($\boxed{\text{R2N}}$ 111_{H}): 0 (Not specified) •Receive end frame No.1 ($\boxed{\text{R2N}}$ $10C_{H}$): $0A_{H}$ (LF), or Receive end frame No.2 ($\boxed{\text{R2N}}$ $10D_{H}$): $0D_{H}$ (CR)
		•When No. of receive data or the last receive data is uncertain, utilize a receive timeout error ($BB21_{H}$) or Forced receive completion request signal (RYn3).
		•Turn ON Forced receive completion request signal to check if the AJ65BT-R2N has received data. •If the AJ65BT-R2N has not received any data, perform the following. (1) Check if the RS-232 RD LED is flashing or not while the external device is sending data. If not, check the external device again for proper transmission. (2) Correct the RS-232 cable connection.
		•Check if the size of the data received from the external device is No. of receive end data or less.
		•Check if the receive end frame is specified in the data received from the external device.
	After writing of No. of receive end data and receive end frame No. from the master station, Initialization request signal (RYn4) has not been turned ON.	•Turn ON Initialization request signal (RYn4) after writing No. of receive end data and receive end frame No. Or, register these set values to E^2PROM, and reapply power to or reset the AJ65BT-R2N before starting data communication.
	When using No. of receive end data, the setting of Word/byte specification ($\boxed{\text{R2N}}$ 102_{H}) is incorrect.	•Change the setting of Word/byte specification ($\boxed{\text{R2N}}$ 102_{H}).
	No data have been received from the external device.	•Check if the RS-232 RD LED is flashing or not while the external device is sending data. If not, check the external device for proper transmission. •Correct the RS-232 cable connection.

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Table 9.3 Troubleshooting for data transmission and reception (Continued)

Symptom	Cause	Action
AJ65BT-R2N does not receive data sent from the external device.	The AJ65BT-R2N has an error.	•Check the RS-232 ERR. LED, Error receive data read request signal (RXn3) and Error status signal (RX(n+1)A). If an error occurs, an error code is stored into Error codes generated when receiving (R2N 1B2$_{H}$). •For a Receive data size exceeded error (BBA2$_{H}$), change the data size so that data can be entered into free space of the receive area. •Any other error ☞Section 9.2 Error code list
	When Receive start frame No. is specified, data corresponding to the receive start frame have not been received yet.	•Check the setting of Receive start frame No. (R2N 108$_{H}$ to 10B$_{H}$). •Check if the head of the data sent from the external device contains the data corresponding to the receive start frame.
	The RS-232 cable is faulty.	•Correct the RS-232 cable connection.
"Data + CR + LF" sent from the external device is divided into two and received by the AJ65BT-R2N as "Data + CR (0D$_{H}$)" and "LF (0A$_{H}$)".	Receive end frame No. (R2N 10C$_{H}$ to 10F$_{H}$) is set to "CR (0D$_{H}$)" or "LF(0A$_{H}$)".	•Change the Receive end frame No. (R2N 10C$_{H}$ to 10F$_{H}$) setting to "CR (0D$_{H}$) + LF (0A$_{H}$)".
Data that cannot be decoded are sent or received.	The parity bit setting is not consistent.	•Make the same parity bit setting for the AJ65BT-R2N and external device.
	The stop bit length setting is not consistent.	•Set the same stop bit length for the AJ65BT-R2N and external device.
	The transmission speed setting is not consistent.	•Set the same transmission speed for the AJ65BT-R2N and external device.
Which module, AJ65BT-R2N or external device, caused communication error is unknown.	—	•To find it out, check the following on the AJ65BT-R2N or master station side. (1) Check the hardware. •Check that the AJ65BT-R2N is installed securely. •Check that the pins of the module are not defective. (2) Perform the AJ65BT-R2N hardware test. ☞Section 5.5.1 Hardware test •Make sure that no error is detected in the AJ65BT-R2N hardware test. (3) Check the CPU status. •Confirm that an error that will cause the operation stop has not been detected in the CPU.

(d) Other troubleshooting

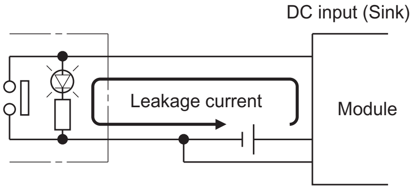
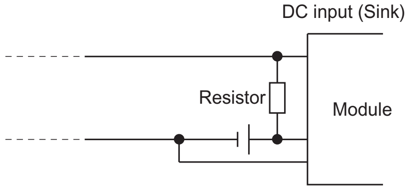
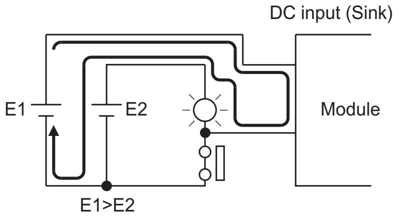
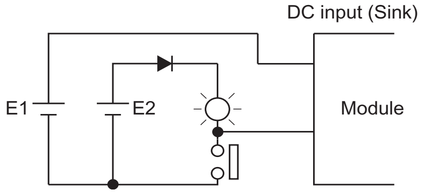
Table 9.4 Other troubleshooting

Symptom	Cause	Action
"OPERATION ERROR" occurs when using dedicated instruction (RIRD/ RIWT/RISEND/RIRCV)	The send/receive buffer settings have not been configured in the master station.	•Select the master station in [Network parameters], and correct the send/receive buffer settings in [CC-Link station information. Module 1] - [Intelligent buffer select].
	The send/receive buffer size is not sufficient for the master station.	
	The syntax or control data of the dedicated instruction has an error.	•Check the syntax or control data of the dedicated instruction. ☞Manual for the master module used
Changed buffer memory values do not become effective for data communication.	After writing of the AJ65BT-R2N buffer memory values from the master station, Initialization request signal (RYn4) has not been turned ON.	•Check if initialization is required or not after changing the buffer memory value(s). ☞Section 3.8.1 Buffer memory list •After writing the AJ65BT-R2N buffer memory values from the master station, turn ON Initialization request signal (RYn4). Or, register the set values to E^2PROM, reapply power to or reset the AJ65BT-R2N before starting data communication.
Although buffer memory values were changed and registered to E^2PROM, they are not updated even after reapplication of power or resetting.	After writing of the AJ65BT-R2N buffer memory values from the master station, Initialization request signal (RYn4) has not been turned ON.	•After writing the AJ65BT-R2N buffer memory values from the master station, turn ON Initialization request signal (RYn4), and then register them to the E^2PROM.
Communication is unstable.	Poor contact in the signal cable wiring	•Replace the cable, or secure the connections.
An external device detects a communication error at powering on the AJ65BT-R2N.	RS-232 communications of the AJ65BT-R2N may be unstable immediately after powering on the AJ65BT-R2N.	•Power on the order of the AJ65BT-R2N and external device.

(2) Troubleshooting of the general-purpose input circuit

This section describes an error example of the general-purpose input circuit and corrective measures.

Table 9.5 An error example of the general-purpose input circuit

No.	Symptom	Cause	Corrective action
Example 1	Input signal does not turn OFF.	•Driven by the switch with LED indicator 	•Connect a proper resistor as shown below so that a voltage across the input terminal and COM1 will be higher than the OFF voltage. 
Example 2		•Writing by using two power supplies 	•Reduce the two power supplies to one. •Connect a reverse-current preventive diode as shown below. 

(a) Calculation for Example 1

A switch with LED indicator is connected to the AJ65BT-R2N, where leakage current of 4mA flows when 24V DC power is applied.

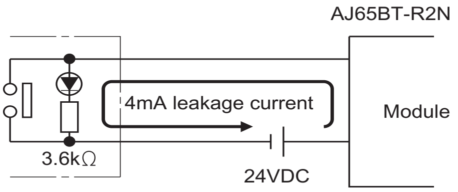


Figure 9.2 Example 1

1) Since the specified OFF current value of 1.7mA is not satisfied, the AJ65BT-R2N does not turn OFF.
Therefore, connect a resistor as illustrated below.

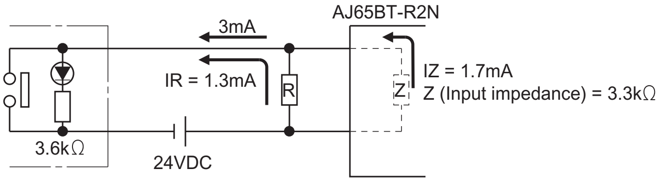


Figure 9.3 Connecting a resistor

2) The specified OFF current of 1.7mA for the AJ65BT-R2N is satisfied if a resistor (R), where a current of 1.3mA or more will flow, is connected. Therefore, a value for the resistor (R) can be calculated by the following formulas.

$I_R : I_Z = Z$ (Input impedance) : R (Resistance)

$$R \leqq I_Z/I_R \times Z = 1.7/1.3 \times 3.3 \times 10^3 = 4.3\ [k\Omega]$$
$$R < 4.3\ [k\Omega]$$

When the resistance R is 3.9kΩ, power consumption W of the resistor (R) is obtained from the following.

$$\begin{aligned} W &= (\text{Input voltage})^2 \div R \\ &= 28.8^2 \div 3900 \\ &= 0.2\ [W] \end{aligned}$$

3) Determine a power capacity of the resistor three to five times as much as the actual current consumption.
As a result, a resistor of 3.9 [kΩ] and 1.0 [W] is to be connected to the terminal in question.

(3) Troubleshooting when the master station's ERR. LED flashes

The following explains how to troubleshoot the system when the master station's ERR. LED flashes.

(a) Master station side troubleshooting

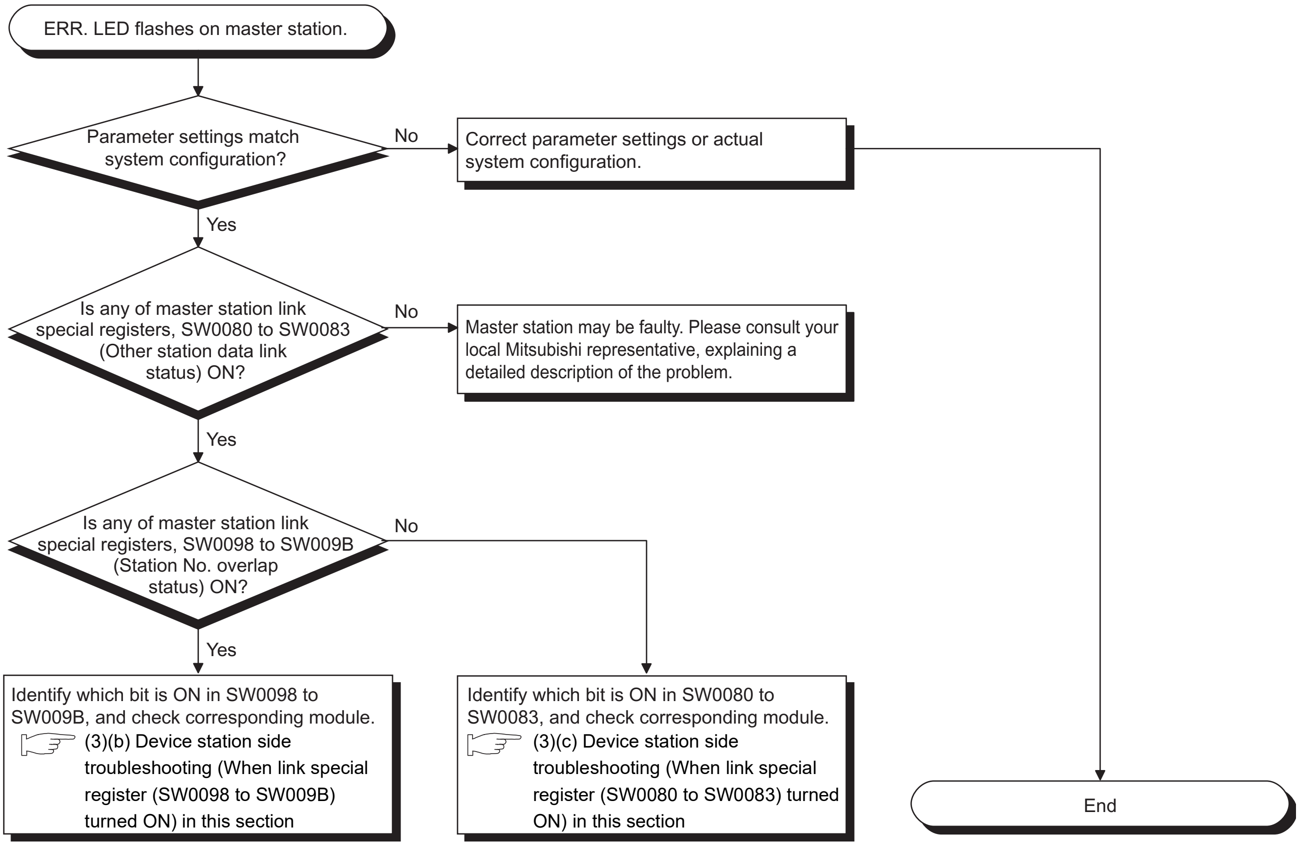


Figure 9.4 Troubleshooting when the master station's ERR. LED flashes

(b) Device station side troubleshooting (When link special register (SW0098 to SW009B) turned ON)

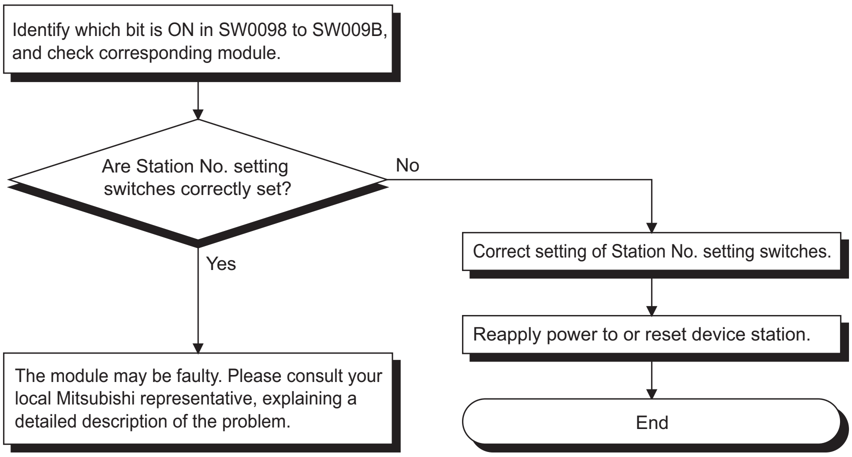


Figure 9.5 When link special register (SW0098 to SW009B) turned ON

(c) Device station side troubleshooting (When link special register (SW0080 to SW0083) turned ON)

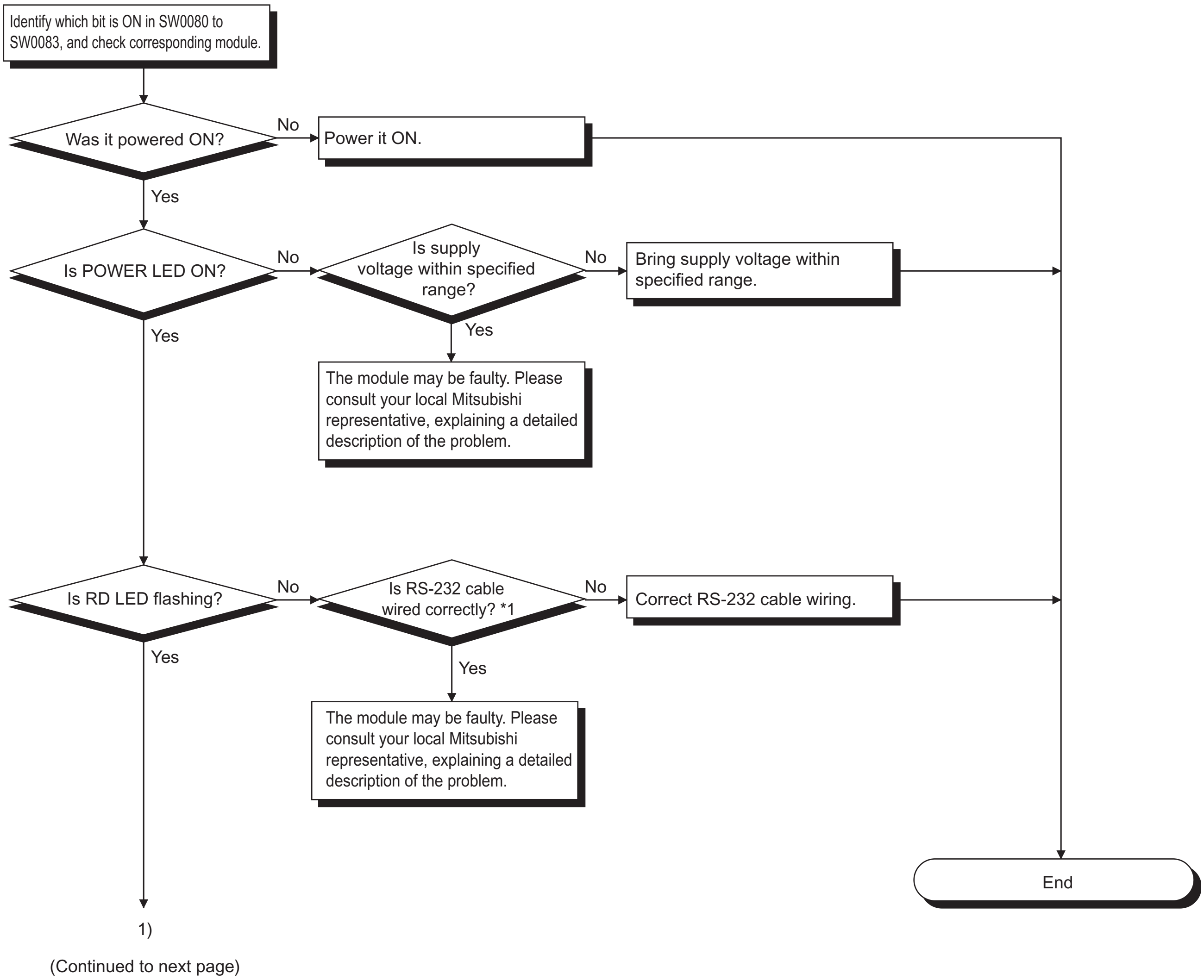
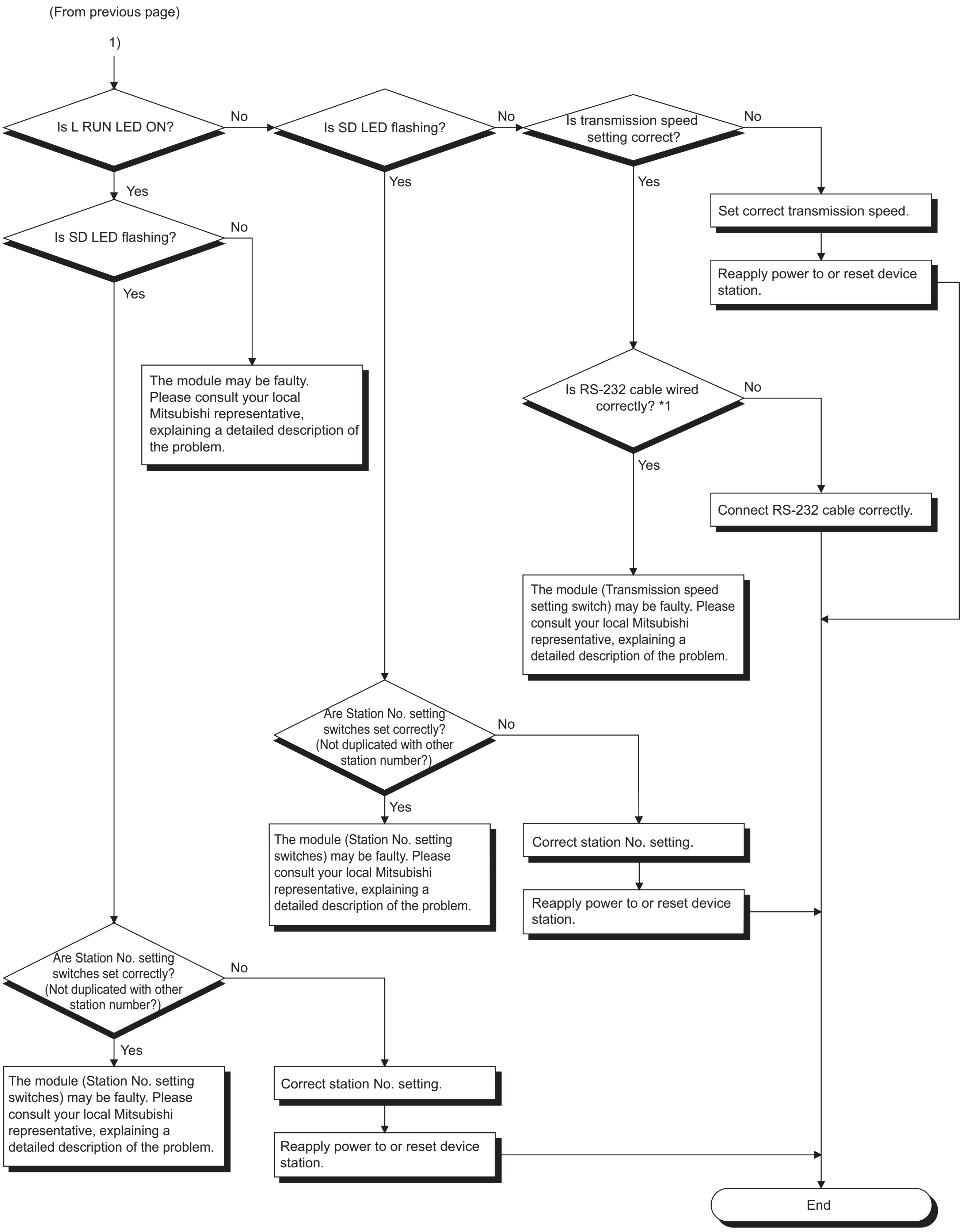


Figure 9.6 When link special register (SW0080 to SW0083) turned ON



*1 Check for short circuit, reverse connection, disconnection, terminating resistor, FG connection, overall cable distance, and block distance.

Figure 9.6 When link special register (SW0080 to SW0083) turned ON (Continued)

9.2 Error code list

(1) Error code storage area

When an error occurs in the AJ65BT-R2N, programmable controller CPU or master module, an error code is stored in the Error code storage area of the AJ65BT-R2N, which is classified by function, and the ERR. LED turns ON.

Also, up to eight error codes generated in the past are stored in Error code history (R2N 1A8$_H$ to 1AF$_H$) in chronologic order.

When the RW refresh function is set to the default, error codes can be checked with the remote register.

Table 9.6 Error code storage area

R2N Address	Name	Error code storage buffer memory	Remote register
1A8$_H$ to 1AF$_H$	Error code history	Up to eight error codes are stored in chronologic order from R2N 1A8$_H$. Since error codes for the ninth and later errors are not stored, error clear operation is needed. ☞(2) Clearing errors in this section	—
1B0$_H$	General error codes	An error code is stored in the following cases. •When Initialization failed signal (RXn5) turns ON •When E^{2}PROM function failed signal (RXn8) turns ON Error codes in any other cases are stored in Error codes generated when sending (R2N 1B1$_H$) and Error codes generated when receiving (R2N 1B2$_H$).	RWrm
1B1$_H$	Error codes generated when sending	An error code generated when Send failed signal (RXn1) turns ON is stored. Error codes (BB11$_H$, BB92$_H$ to BB98$_H$) that occurred in the programmable controller CPU and master module will be stored.	RWr(m+1)
1B2$_H$	Error codes generated when receiving	An error code generated when Error receive data read request signal (RXn3) turns ON is stored. Error codes (BB21$_H$, BB23$_H$ to BB2A$_H$, BBA2$_H$) that occurred in the programmable controller CPU and master module will be stored.	RWr(m+2)

(2) Clearing errors

By turning ON Error reset request signal (RY(n+1)A), the ERR. LED is turned OFF and the Error code storage area is cleared.

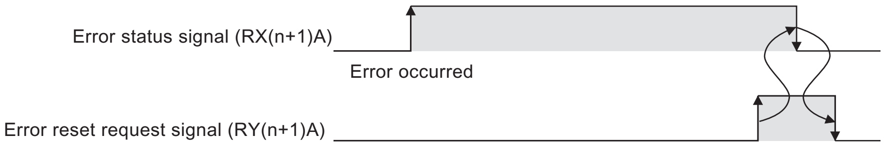


Figure 9.7 Error reset request signal (RY(n+1)A) and Error status signal (RX(n+1)A)

☒ Point

Once Initialization failed signal (Xn5) has turned ON, even if Error reset request signal (RY(n+1)A) is turned ON, the error will not be reset.

For how to reset the error when Initialization failed signal (RXn5) turned ON, refer to the following.

☞Section 3.7.2 (15)(b) When Initialization failed signal (RXn5) is ON

(3) Error code list

Table 9.7 Error code list

Error code	Error name	Cause	Action
0001H to 4FFFH	Errors detected in the programmable controller CPU ☞User's manual for the programmable controller CPU used		
B000H to B903H	Errors detected in the master module ☞User's manual for the master module used		
B904H	Send/receive buffer size setting error	When the dedicated instruction is executed, the send/receive buffer size of the relevant station is out of range.	•Set the send/receive buffer size of the station within the allowable range.
B905H to BAFFH	Errors detected in the master module ☞User's manual for the master module used		
BB07H	Auto-refresh timeout error	A timeout occurred in the buffer memory auto-refresh function.	•Increase the value set in Transient timeout time specification (R2N 105H).
BB11H	Send timeout error	A send timeout occurred.	•Check the flow control status, Flow control specification (R2N 100H), and the flow control specification of the external device. •Correct the RS-232 cable connection. •Increase the value set in Send timeout time specification (R2N 11AH).
BB21H	Receive timeout error	A receive timeout occurred.	•Check the flow control status, Flow control specification (R2N 100H), and the flow control specification of the external device. •Correct the RS-232 cable connection. •Increase the value set in Receive timeout time specification (R2N 112H). •Reduce the value set in No. of receive end data (R2N 111H).
BB23H	RS-232 receive overrun error	An overrun error occurred during RS-232 reception.	•When 57600bps or 115200bps is used in Nonprocedural protocol mode, provide a communication method to prevent concurrent transmissions from the AJ65BT-R2N and external device. •Set the transmission speed to 38400bps or less. •Noise can be a cause of the error. If so, take measures against noise.
BB24H	RS-232 receive framing error	A framing error occurred during RS-232 reception.	•Check if the transmission specifications of the AJ65BT-R2N is the same as those of the external device. •Noise can be a cause of the error. If so, take measures against noise.
BB25H	RS-232 receive parity error	A parity error occurred during RS-232 reception.	
BB26H	OS reception area overflow error	The OS reception area overflowed.	•Perform the flow control between the AJ65BT-R2N and external device. •Check Flow control specification (R2N 100H) and the flow control specification of the external device. •Correct the RS-232 cable connection.

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Table 9.7 Error code list (Continued)

Error code	Error name	Cause	Action
BB28$_H$	Sum check error	The received sum check value is erroneous.	•Check the sum check code value in the user registration frame. •Check if a sum check code value of data received from the external device is correct or not. •Noise can be a cause of the error. If so, take measures against noise.
BB29$_H$	Special character error	An unusable special character was specified in the start or end frame in frame reception.	•Check if any unusable special character is specified in Receive start frame No. (R2N 108$_H$ to 10B$_H$) and Receive end frame No. (R2N 10C$_H$ to 10F$_H$).
BB2A$_H$	ASCII-binary conversion error	Data that cannot be converted from ASCII to binary were received.	•Check if data received from the external device can be converted from ASCII to binary data. •Noise can be a cause of the error. If so, take measures against noise.
BB41$_H$	Command error	A command (frame) that the AJ65BT-R2N does not support was used.	•Check if the set value is of a usable command (frame).
BB42$_H$	Receive frame error	Data received at the AJ65BT-R2N are erroneous.	•Check if the settings such as the access code, No. of processing points, or attribute are correct.
BB81$_H$	Start address specification error	An incorrect value is set in Send area, start address specification (R2N 0$_H$) or Receive area, start address specification (R2N 2$_H$).	•Refer to the buffer memory list, and set correct data. ☞Section 3.8.1 Buffer memory list
BB82$_H$	Assignment specification error	An incorrect value is set in Area for various assignments (R2N 0$_H$ to F7$_H$).	
BB83$_H$	Parameter error	An incorrect value is set in Area for parameters (R2N 100$_H$ to 19C$_H$).	
BB88$_H$	E^{2}PROM function specification error	A value other than 0 to 4 was specified in E^{2}PROM function specification (R2N 1C0$_H$).	•Check the value specified in E^{2}PROM function specification (R2N 1C0$_H$).
BB89$_H$	User registration frame No. error	In User registration frame No. (R2N 1C1$_H$), a value other than 3E8$_H$ to 4AF$_H$ (1000 to 1199) was specified.	•Check the value specified in User registration frame No. (R2N 1C1$_H$).
BB8A$_H$	Registration frame byte error	In No. of user registration frame bytes (R2N 1C7$_H$), a value other than 1 to 80 was specified.	•Check the value specified in No. of user registration frame bytes (R2N 1C7$_H$).
BB8B$_H$	Registration frame specification error	The user registration frame contains a special character that cannot be used.	•Check the contents of the user registration frame.
BB8C$_H$	E^{2}PROM write error	An E^{2}PROM write timeout error occurred.	•The hardware of the AJ65BT-R2N may be faulty. Please consult your local Mitsubishi representative, explaining a detailed description of the problem.
BB8D$_H$	User registration frame unregistered	The specified user registration frame No. is unregistered.	•Check if the specified user registration frame No. has been registered.
BB8E$_H$	No. of writes to E^{2}PROM exceeded	Writing to the E^{2}PROM was performed 100 times or more after power-up or reset of the AJ65BT-R2N.	•Check the program for E^{2}PROM writing, and modify it to eliminate any unnecessary writing. •Error resetting and reapplication of power or resetting makes it writable again.
BB92$_H$	Send data size exceeded	The send data exceeded the maximum send data size.	•Reduce the total size of the data to be sent in frame transmission to 2048 bytes or less.

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Table 9.7 Error code list (Continued)

Error code	Error name	Cause	Action
BB93H	Send data size error	No. of send data exceeded the send area size. Or, No. of send data is 0.	•Check the values set in Send data size specification area (R2N 200H at default) and Send area size specification (R2N 1H).
BB94H	Send cancel error	The transmission was canceled by Send cancel request signal (RYn1). Or, at the time of the send request, Send cancel request signal (RYn1) has already been ON.	•Turn OFF Send cancel request signal (RYn1), and then make the send request.
BB95H	User registration frame send error	Unable to send the specified user registration frame.	•Check if the specified user registration frame No. has been registered.
BB96H	Special character error	An unusable special character was specified in the start or end frame in frame transmission.	•Set an appropriate value in Send start frame No. (R2N 118H).
BB97H	Transmission table information error	An invalid data were specified when sending a transmission table.	•Check the data specified in Transmission table specification (R2N 122H to 185H) and Monitoring setting - 1 to - 64 (R2N 78H to F7H).
BB98H	Registration frame transmission error	Data of the specified user registration frame No. contains a special character that cannot be sent.	•Check the registration data of the specified user registration frame No.
BBA2H	Receive data size exceeded	Receive data exceeded the receive area size (R2N 3H).	•Adjust the No. of receive data so that it is appropriate to the set value in Receive area size specification (R2N 3H).
BBC0H to BBE0H	Errors detected in the master module ☞User's manual for the master module used		
BBE1H	System error	The OS of the AJ65BT-R2N detected an error.	•Take the following steps. (1) Check the conditions of the AJ65BT-R2N installation, terminal block, and wiring. (2) Check if the system is used in an environment that satisfies the general specifications. (3) Check if power capacity is sufficient. (4) The hardware may be faulty. Check if the AJ65BT-R2N hardware is normal or not, according to the manual. Or, replace the module and check the operation. (5) If the problem cannot be solved by the above, please consult your local Mitsubishi representative, explaining a detailed description of the problem.
BBE2H to BFFFH	Errors detected in the master module ☞User's manual for the master module used		

APPENDICES

Appendix 1 Differences between AJ65BT-R2N and AJ65BT-R2

This section describes the comparison between the AJ65BT-R2N and the AJ65BT-R2 and how to replace the AJ65BT-R2 with the AJ65BT-R2N.

(1) Function/control signal name changed from the AJ65BT-R2

The following shows the function name and control signal name that are changed from the AJ65BT-R2.

In Appendices, the function/control signal names used in the AJ65BT-R2N are described.

Read this manual replacing the function/control signal name of the AJ65BT-R2 with that of the AJ65BT-R2N.

Table App.1 Function/control signal name changed from the AJ65BT-R2

Kind	AJ65BT-R2N	AJ65BT-R2
Function name	•Nonprocedural protocol mode	•On-line mode
	•Nonprocedural communication function	•Non-procedural communication function
	•Send/receive buffer communication function	•When send/receive buffer used •On-line mode (using transmission/reception buffer)
	•Buffer memory auto-refresh function	•Buffer memory auto-refresh •On-line mode (using buffer memory automatic update function) •Automatic update function
	•User registration frame function	•Frame addition
	•Send cancel function	•Transmission cancellation •Transmission cancel request •Transmission cancel
	•Forced receive completion function	•Forced reception complete •Forced reception complete request
	•Flow control function	•Flow control
	•ASCII-binary conversion function	•ASCII-BIN conversion function •ASCII-BIN conversion •ASCII/binary conversion
	•RW refresh function	•RW update
	•AJ65BT-R2N initialization function	•R2 initialization
	•OS reception area clear function	•OS reception area clear •Initialization of OS reception area
	•E^{2}PROM function	•Registering to EEPROM
	•RS-232 signal control function	•RS-232-C signal control
Control signal name	•DC1/DC3 (XON/XOFF) control	•DC1/DC3 control •DC1/DC3 transmission control •DC1/DC3 reception control
	•DTR/DSR(ER/DR)	•DTR/DSR
	•DTR(ER)	•ER(DTR)
	•DSR(DR)	•DR(DSR)

Appendix 1.1 Specifications comparisons

The following shows performance specifications, general-purpose I/O specifications, and function comparisons between the AJ65BT-R2N and the AJ65BT-R2.

(1) Performance specifications comparisons

The table below shows performance specifications comparisons between the AJ65BT-R2N and the AJ65BT-R2.

Table App.2 Performance specifications comparisons

Item			AJ65BT-R2N	AJ65BT-R2
RS-232			—	
	Interface		RS-232 compliant (D-Sub 9P)	
	Communication method		Full-duplex communication method	
	Synchronization method		Asynchronous method	
	Transmission speed		300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 (bps) (Select with RS-232 transmission setting switches.) (Partially restricted ☞ Section 3.2 Performance Specifications)	300, 600, 1200, 2400, 4800, 9600, 19200 (bps) (Select with RS-232 transmission setting switches.)
	Transmission distance		Up to 15m	
	Data format	Start bit	1	
		Data bit	7/8	
		Parity bit	1(Vertical parity)/None	
		Stop bit	1/2	
	Error detection	Parity check	Checked (even/odd)/Not checked	
	Communication control (Flow control)		DTR/DSR (ER/DR) control DC1/DC3 control	
	OS reception area		5120 bytes	
CC-Link			—	
	Transmission path		Bus (RS-485)	
	CC-Link station type		Intelligent device station	
	Connection cable		CC-Link dedicated cable/CC-Link high-performance cable/CC-Link Ver.1.10-compatible cable	
	No. of occupied stations		1 station (RX/RY: 32 points each, RWw/RWr: 4 points each)	
No. of writes to E^{2}PROM			Up to 100,000 times	
Withstand voltage			One minute at 500VAC between all external DC terminals and ground	
Insulation resistance			500VDC between all external DC terminals and ground, 10MΩ or more with insulation resistance tester	
Noise immunity			DC type noise voltage: 500Vp-p Tested by noise simulator of noise width of 1μs, and noise frequency of 25 to 60Hz	
Module fixing screw			M4 × 0.7mm × 16mm or larger DIN-rail mounting is also possible.	
Applicable DIN rail			TH35-7.5Fe, TH35-7.5Al, TH35-15Fe (Compliant with IEC 60715)	
External power supply			24VDC (Ripple ratio: 5% or less) (Allowable voltage range: 20.4 to 26.4VDC)	
			Current consumption: 0.11A	
Allowable momentary power failure time			1ms	
External dimensions			80(H) × 170(W) × 47(D) [mm]	80(H) × 170(W) × 63.5(D) [mm]
Weight			0.40kg	

(2) General-purpose I/O specifications comparisons

The table below shows general-purpose I/O specifications comparisons between the AJ65BT-R2N and the AJ65BT-R2.

The comparison only describes the differences between the AJ65BT-R2N and the AJ65BT-R2.

(a) General-purpose input specifications

There are no differences between the AJ65BT-R2N and the AJ65BT-R2.

(b) General-purpose output specifications

1) Hardware version B or later, or production number (SERIAL) (first five digits) of "16041" or later

Table App.3 Hardware version B or later, or production number (SERIAL) (first five digits) of "16041" or later

Item		AJ65BT-R2N	AJ65BT-R2
Max. inrush current		0.7A, 10ms or less	0.4A, 10ms or less
Max. voltage drop at ON		0.1VDC(TYP.) 0.1A, 0.2VDC(MAX.) 0.1A	1.5VDC(MAX.) 0.1A
Response time	OFF→ON	1ms or less	2ms or less
	ON→OFF	1ms or less (Resistance load)	2ms or less (Resistance load)
External power supply of output section	Voltage	12/24VDC (Ripple ratio: 5% or less) (Allowable voltage range: 10.2 to 28.8VDC)	
	Current	10mA (at 24VDC) (MAX all points ON)	50mA or less (TYP. 24VDC/common) Excluding external load current
Protective function		Provided •Overheat protective function operates in unit of 1 point. •Overload protective function operates in unit of 1 point.	Not provided

2) Hardware version A

Table App.4 Hardware version A

Item		AJ65BT-R2N	AJ65BT-R2
Terminal No.	TB4	+24V	NC
Max. inrush current		0.7A, 10ms or less	0.4A, 10ms or less
Max. voltage drop at ON		0.1VDC(TYP.) 0.1A, 0.2VDC(MAX.) 0.1A	1.5VDC(MAX.) 0.1A
Response time	OFF→ON	1ms or less	2ms or less
	ON→OFF	1ms or less (Resistance load)	2ms or less (Resistance load)
External power supply of output section	Voltage	12/24VDC (Ripple ratio: 5% or less) (Allowable voltage range: 10.2 to 28.8VDC)	
	Current	10mA (at 24VDC) (MAX all points ON)	50mA or less (TYP. 24VDC/common) Excluding external load current
Protective function		Provided •Overheat protective function operates in unit of 1 point. •Overload protective function operates in unit of 1 point.	Not provided
Power supply input		Present	Absent

(3) Function comparisons

The table below shows function comparisons between the AJ65BT-R2N and the AJ65BT-R2.

Table App.5 Function comparisons

Function		AJ65BT-R2N	AJ65BT-R2	Changes from AJ65BT-R2
Nonprocedural protocol mode		○	○	—
	Nonprocedural communication function	○	○	Communication can be made in 38400bps, 57600bps, 115200bps. (Partially restricted ☞ Section 3.2 Performance Specifications)
	Send/receive buffer communication function	○	○	—
	Buffer memory auto-refresh function	○	○	The buffer memory assignment size can be changed by Mode setting switch.
	AJ65BT-R2N initialization function	○	○	—
	E^{2}PROM function	○	○	—
	User registration frame function	○	○	Special character codes (04H, 5H, 0AH, 0BH, 11H, E5H, EBH) applicable for User registration frame are added.
	Monitoring-based transmission function	○	○	—
	Send cancel function	○	○	—
	Forced receive completion function	○	○	—
	Flow control function	○	○	—
	ASCII-binary conversion function	○	○	—
	RW refresh function	○	○	—
	OS reception area clear function	○	○	—
	RS-232 signal control function	○	○	—
MELSOFT connection mode		○	×	—

○: Function provided, ×: No function

(4) Comparison of remote I/O and remote register

(a) Remote input

The comparison only describes the differences between the AJ65BT-R2N and the AJ65BT-R2.

Table App.6 Comparison of remote input

Item		AJ65BT-R2N	AJ65BT-R2
Nonprocedural protocol mode		—	
	RX(n+1)4	Mode setting switch status signal	Use prohibited
	RX(n+1)5		
	RX(n+1)6		
	RX(n+1)7		

(b) Remote output

There are no differences between the AJ65BT-R2N and the AJ65BT-R2.

(c) Remote register

There are no differences between the AJ65BT-R2N and the AJ65BT-R2.

(5) Comparison of buffer memory

The comparison only describes the differences between the AJ65BT-R2N and the AJ65BT-R2.

Table App.7 Comparison of buffer memory

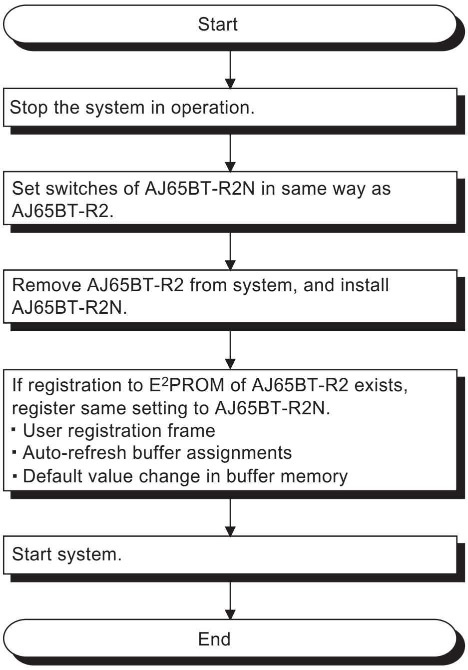
R2N Address	Name			Default		Initialization	
				AJ65BT-R2N	AJ65BT-R2	AJ65BT-R2N	AJ65BT-R2
0H	Start address specification area		Send area, start address specification	*1	200H	Necessary	Necessary
1H			Send area size specification		200H		
2H			Receive area, start address specification		400H		
3H			Receive area size specification		200H		
10H	Auto-refresh area specification	Status data storage area	Transfer size		20H	Necessary	Necessary
11H			AJ65BT-R2N side start address		1A0H		
12H			Fixed value		4004H		
13H			Master station side offset address		1A0H		
14H		Send area 1)	Transfer size		88H		
15H			AJ65BT-R2N side start address		118H		
16H			Fixed value		4004H		
17H			Master station side offset address		118H		
18H		Send area 2)	Transfer size		200H		
19H			AJ65BT-R2N side start address		200H		
1AH			Fixed value		4004H		
1BH			Master station side offset address		200H		
1CH		Receive area	Transfer size		200H		
1DH			AJ65BT-R2N side start address		400H		
1EH			Fixed value		4004H		
1FH			Master station side offset address		400H		
20H		Initial setting area	Transfer size		1A0H		
21H			AJ65BT-R2N side start address		0H		
22H			Fixed value		4004H		
23H			Master station side offset address		0H		
24H		E^{2}PROM function area	Transfer size		30H		
25H			AJ65BT-R2N side start address		1C0H		
26H			Fixed value		4004H		
27H			Master station side offset address		1C0H		
28H		User registration frame area	Transfer size		29H		
29H			AJ65BT-R2N side start address		1C7H		
2AH			Fixed value		4004H		
2BH			Master station side offset address		1C7H		
2CH		Monitoring-based transmission area 1)	Transfer size		88H		
2DH			AJ65BT-R2N side start address		118H		
2EH			Fixed value		4004H		
2FH			Master station side offset address		118H		
30H		Monitoring-based transmission area 2)	Transfer size		200H		
31H			AJ65BT-R2N side start address		200H		
32H			Fixed value		4004H		
33H			Master station side offset address		200H		
102H	Word/byte specification			0H	0H	Not necessary	Necessary

* 1 The default varies depending on mode to be selected.
The default of the AJ65BT-R2 is the same as that of Mode 0 of the AJ65BT-R2N.
For details, refer to the following.

☞Section 3.8.1 (1) Area for various assignments (0H to FFH)

Appendix 1.2 Procedures and precautions for replacing AJ65BT-R2 with AJ65BT-R2N

(1) Procedures for replacing AJ65BT-R2 with AJ65BT-R2N



Stop the system in operation.

Set switches of AJ65BT-R2N in same way as AJ65BT-R2. . . . ☞ Section 5.4 Part Names and Settings

Remove AJ65BT-R2 from system, and install AJ65BT-R2N.

If registration to E^2PROM of AJ65BT-R2 exists, register same setting to AJ65BT-R2N.
- User registration frame
- Auto-refresh buffer assignments
- Default value change in buffer memory

Start system.

Figure App.1 Procedures for replacing AJ65BT-R2 with AJ65BT-R2N

☒Point

(1) There is no need to change the parameter settings of the master station.
(2) The RS-232 cable used in the AJ65BT-R2 is available for the AJ65BT-R2N.
(3) To use a general-purpose output on a module of hardware version A, the ＋24V input terminal must be wired on the general-purpose I/O terminal block.

(2) Precautions for replacing programs

A program created by the AJ65BT-R2 can be used in the AJ65BT-R2N without any changes.

The following describes precautions for using a program created by the AJ65BT-R2 in the AJ65BT-R2N.

(a) Performance at sending data

The performance of the AJ65BT-R2N in sending data is upgraded up to approx. 10% compared with that of the AJ65BT-R2.

Therefore, in some cases, the external device may not respond to the send request from the AJ65BT-R2N due to too early response of the AJ65BT-R2N.

The latent problem of the user side protocol seems to have been revealed.

Review the procedure and timing of the user side protocol.

The following table shows the possible problems and their corrective actions.

Table App.8 Possible problems and their corrective actions

Problem	Cause	Corrective action
Since data is sent from the AJ65BT-R2N to the external device which is not ready to receive it, the external device side cannot deal with it.	The external device cannot respond since sending data starts earlier.	•Review the processing of the external device side so that it can receive data. •Delay the start of sending data by the sequence program.

Appendix 2 Functions Added to and Modified from the Previous Version

This section describes the added and modified functions of the AJ65BT-R2N.

(1) Wiring of general-purpose output

For the hardware version B or later, or production number (SERIAL) (first five digits) of "16041" or later, the +24V wiring on the general-purpose I/O terminal block is not required.

For the specifications of general-purpose output for each version, refer to the following section.

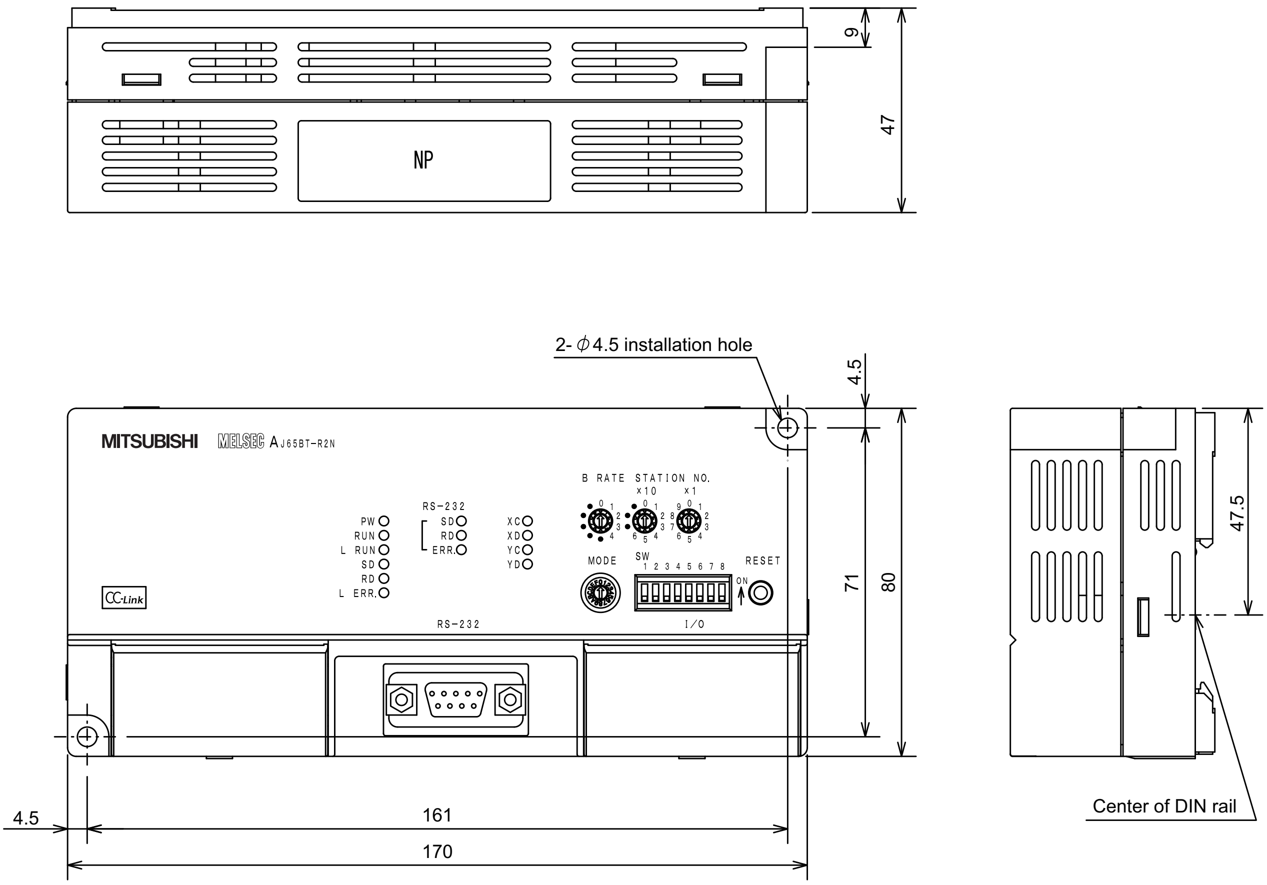
- Hardware version B or later, or production number (SERIAL) (first five digits) of "16041" or later
  Section 3.6.1 (3) General-purpose output specifications
- Hardware version A: Section 3.6.2 (3) General-purpose output specifications

☒ Point

An input of +24V to the NC (terminal block No. TB4) is allowed, just like in hardware version A.

The existing wiring can be used when replacing hardware version A with hardware version B or later, or production number (SERIAL) (first five digits) of "16041" or later.

Appendix 3 External Dimensions



Unit: mm

Figure App.2 External dimensions

Appendix 4 RS-232 Interfaces Used for the AJ65BT-R2N

The connectors listed below are used as RS-232 interface connectors.

Table App.9 RS-232 interfaces used for the AJ65BT-R2N

Module model	Hardware version or production number (SERIAL)	Manufacturer	Model
AJ65BT-R2N	C or earlier	DDK Ltd.	17JE-13090-37(D23A)-FA
	D or later, or production number (SERIAL) (first five digits) of "16041" or later	OMRON Corporation	XM3F-0920-112

INDEX

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.

However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place. Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.

1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.

(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

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

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

(1) Damages caused by any cause found not to be the responsibility of Mitsubishi.

(2) Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products.

(3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products.

(4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

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

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SH(NA)-080685ENG-F(2411)MEE
MODEL: AJ65BT-R2N-U-NPP-E

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