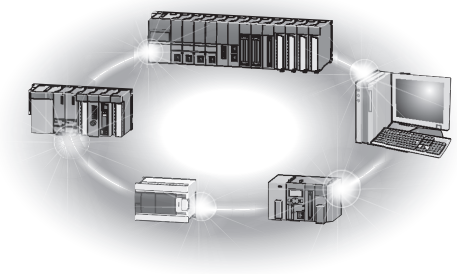
MITSUBISHI ELECTRIC

Programmable Controller

CC-Link System RS-232 Interface Module User's Manual (MELSOFT Connection 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 classified into two levels: "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 (3.94 inch) 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.

[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.

[Wiring Precautions]

⚠CAUTION

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

- 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.

- 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.

- Do not install/remove the terminal block more than 50 times after the first use of the product.
  (IEC 61131-2 compliant)

- 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 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) Mitsubishi 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 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'S USER, 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 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 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 representative in your region.

REVISIONS

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

Print Date	* Manual Number	Revision
Jul., 2007	SH(NA)-080687ENG-A	First edition
Sep., 2008	SH(NA)-080687ENG-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, 4.2.1, 5.1.1, 5.2, 6.1.3, 6.2.3 Added Section 2.4
Oct., 2014	SH(NA)-080687ENG-C	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, Chapter 1, Section 1.1, 2.1 to 2.3, 3.1 to 3.4, 3.5.1, 3.7.1, 3.7.3, 4.1, 4.2, 4.2.1, 5.1.1, 5.2, 5.4, Chapter 6, Section 6.1, Chapter 7, Section 7.1, Appendix 1.1, 1.2 Added Section 2.5, 6.1, Appendix 3 Change Section 6.1→6.2, Section 6.2→6.3
Jan., 2020	SH(NA)-080687ENG-D	Partially revised Section 5.2, 7.1

Japanese Manual Version SH-080686-E

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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.

CONTENTS

ABOUT MANUALS

The following manuals are also related to this product.
Please purchase it if necessary.

Related manuals

Manual name	Manual number (Model code)
CC-Link System RS-232 Interface Module User's Manual (Nonprocedural Protocol Mode) Nonprocedural protocol mode of the AJ65BT-R2N (Sold separately)	SH-080685ENG (13JZ00)
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 (Sold separately)	SH-081269ENG (13JX10)
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 (Sold separately)	SH-081270ENG (13JX19)
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 (Sold separately)	SH-080394E (13JR64)
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 (Sold separately)	SH-080895ENG (13JZ41)
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 (Sold separately)	IB-66722 (13J873)
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 (Sold separately)	IB-66721 (13J872)
MELSEC iQ-R Programming Manual (Instructions, Standard Functions/Function Blocks) Instructions for the CPU module, dedicated instructions for the intelligent function modules, and standard functions/function blocks (Sold separately)	SH-081266ENG (-)
QnACPU Programming Manual (Special Function Module) Dedicated instructions for the special function module of the QnA series programmable controller CPU (Sold separately)	SH-4013 (13JF56)
Type AnSHCPU/AnACPU/AnUCPU/QCPU-A (A Mode) Programming Manual (Dedicated Instructions) Instructions extended for the AnSHCPU/AnACPU/AnUCPU (Sold separately)	IB-66251 (13J742)

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

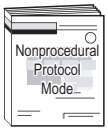
To ensure that this product maintains EMC and Low Voltage Directives, please refer to one of the manuals listed under (1).

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.

	 (Packed)		
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 codes •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 Preparatory Procedures and Setting

(f) How to configure the MELSOFT connection mode settings

☞Section 6.1 Setting When LCPU is Used
Section 6.2 Setting When QCPU (Q mode)/QnACPU is Used
Section 6.3 Setting When ACPU/QCPU (A mode) is Used

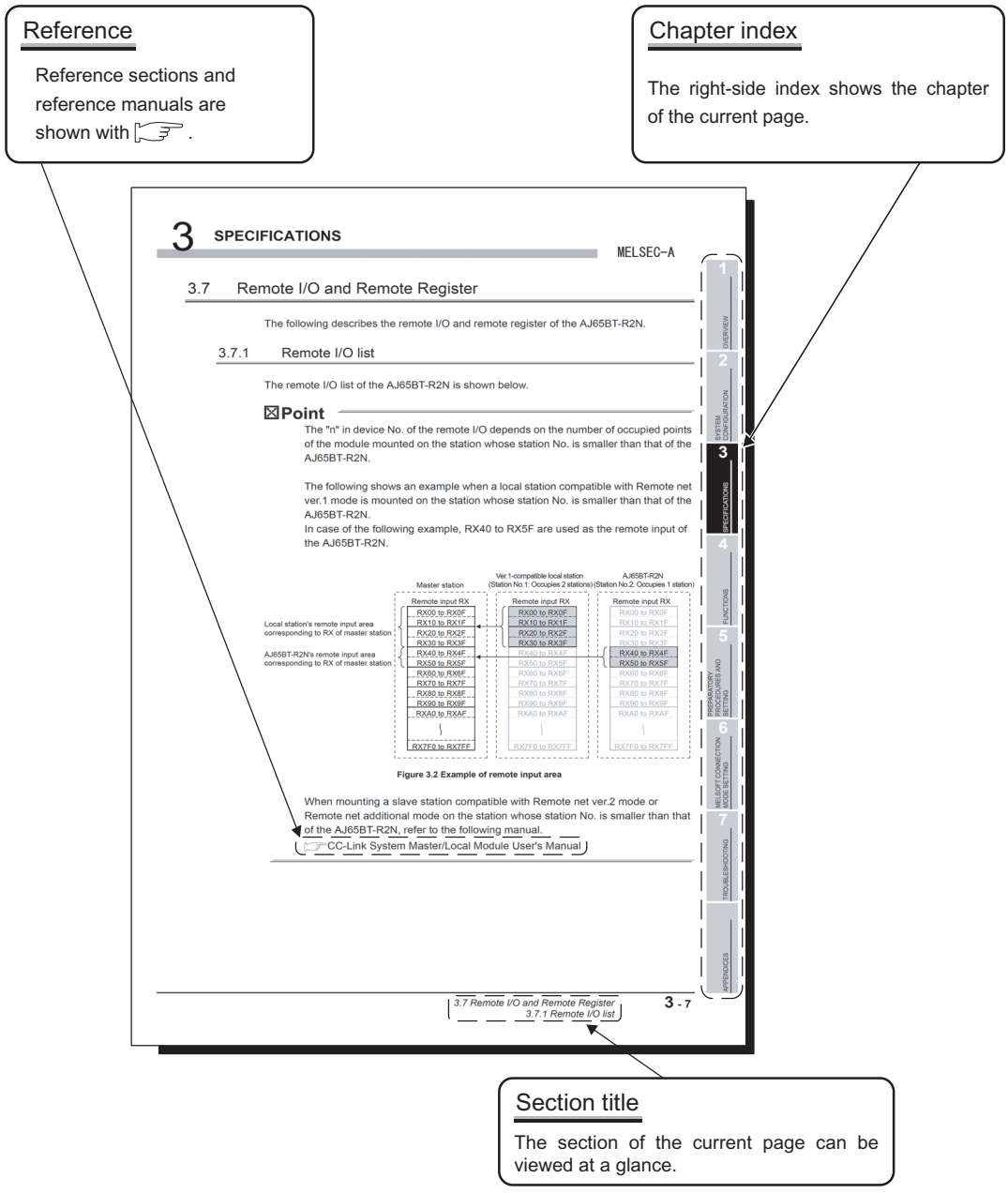
(g) How to solve the error that has occurred

☞Section 7.1 Troubleshooting When Using the MELSOFT Connection Function
Section 7.2 Error Code List

(h) Differences between the AJ65BT-R2N and AJ65BT-G4-S3

☞Appendix 1 Differences between AJ65BT-R2N and AJ65BT-G4-S3

(3) Page layout



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
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

(Continued to the next page)

(From previous page)

Generic term/ abbreviation	Description
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 118H to 119H 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 120H to 185H 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 access a programmable controller CPU by connecting a personal computer running the engineering tool.

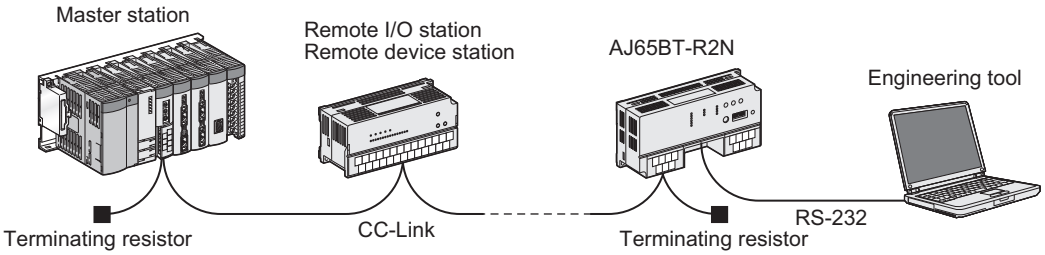


Figure 1.1 When connecting the engineering tool

Remark

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

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

1.1 Features

This section explains the features of the AJ65BT-R2N.

(1) 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.

☞Section 4.2 MELSOFT Connection Function

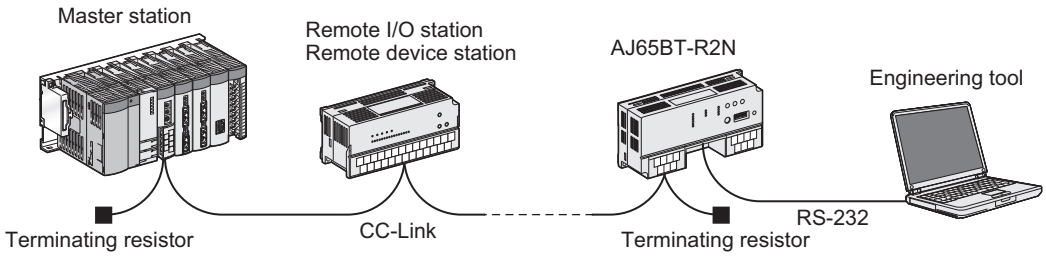


Figure 1.2 Connection with the engineering tool

(2) 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.

For details of Nonprocedural protocol mode, refer to the following manual.

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

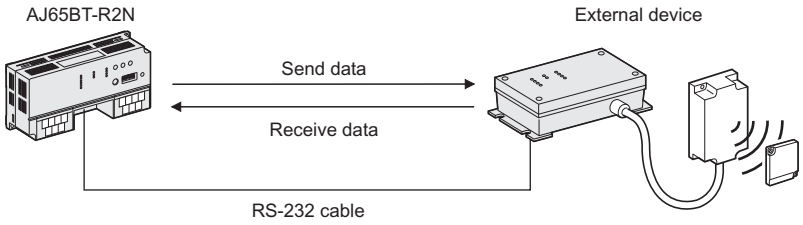


Figure 1.3 Nonprocedural communication function

(3) 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

For details of Nonprocedural protocol mode, refer to the following manual.

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

(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.

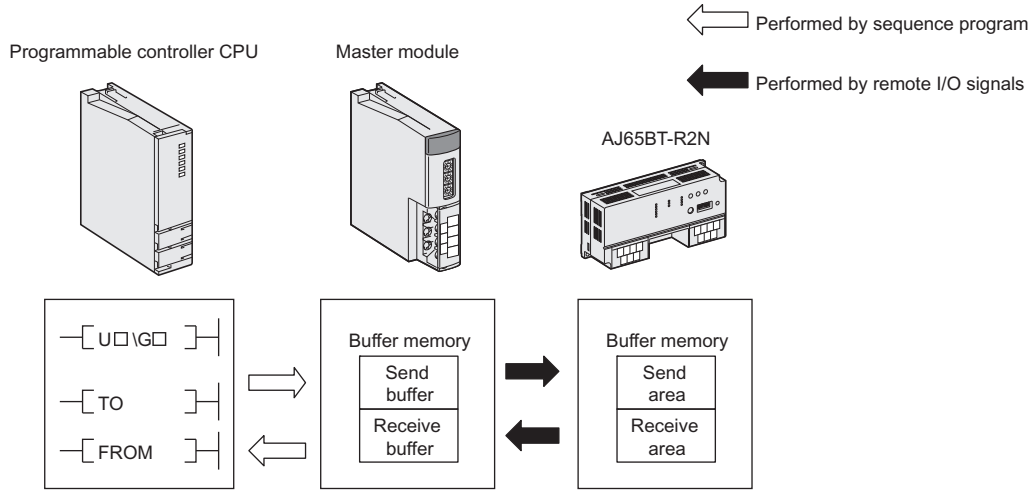


Figure 1.4 Send/receive buffer communication function

(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.

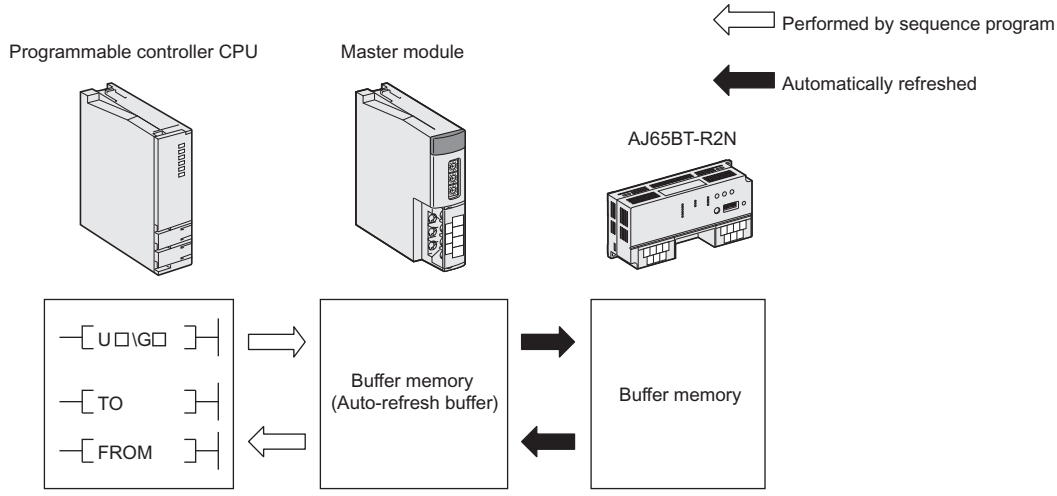


Figure 1.5 Buffer memory auto-refresh function

(4) 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^2PROM.
For details of Nonprocedural protocol mode, refer to the following manual.
☞CC-Link System RS-232 Interface Module User's Manual (Nonprocedural Protocol Mode)

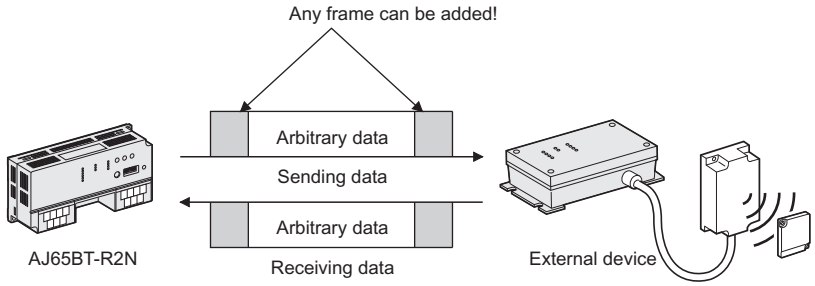


Figure 1.6 User registration frame function

(5) 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.
For details of Nonprocedural protocol mode, refer to the following manual.
☞CC-Link System RS-232 Interface Module User's Manual (Nonprocedural Protocol Mode)

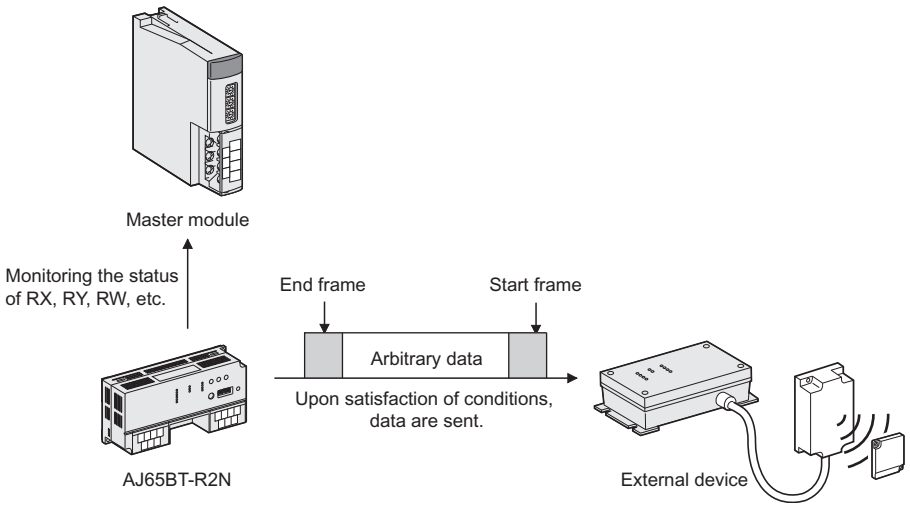


Figure 1.7 Monitoring-based transmission function

(6) 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.

For details of Nonprocedural protocol mode, refer to the following manual.

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

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

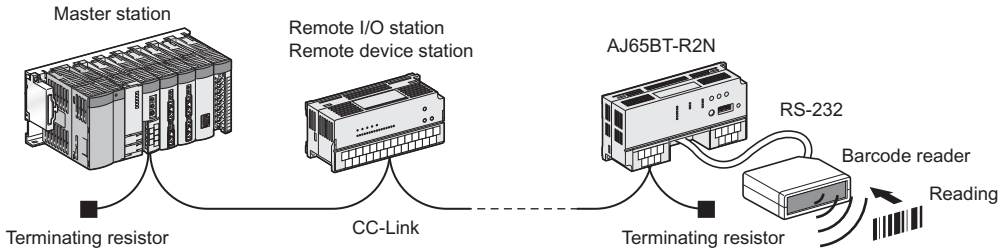


Figure 2.1 When connecting a barcode reader

(b) When connecting an ID controller

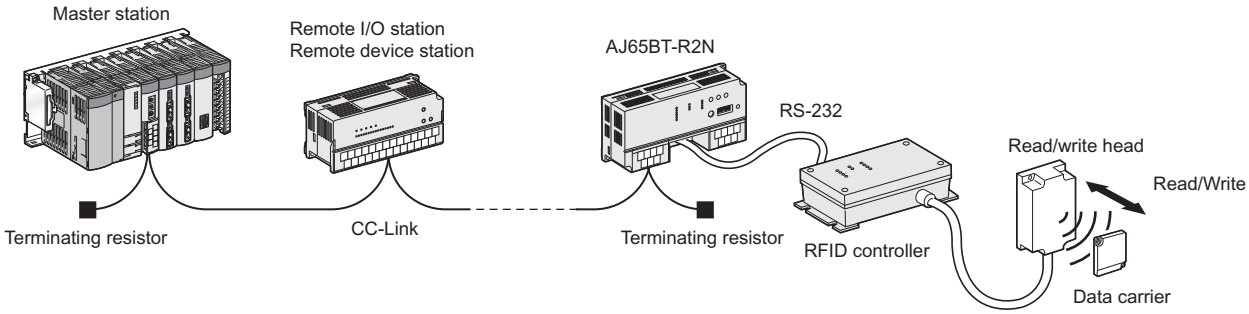


Figure 2.2 When connecting an ID controller

(2) System configuration example when using MELSOFT connection mode

(a) When connecting the engineering tool

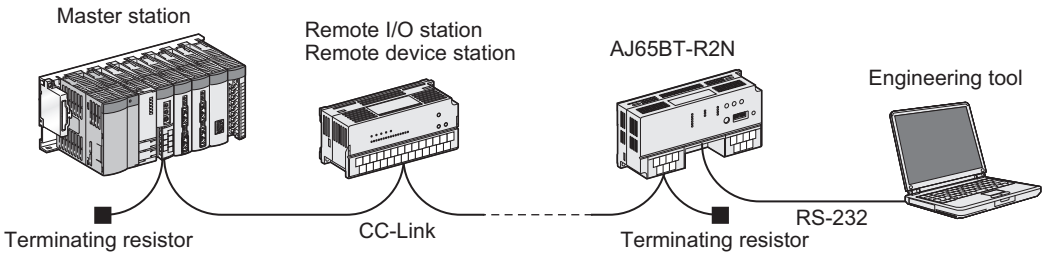


Figure 2.3 When connecting the engineering tool

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	FX2N-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) 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.

☞Section 4.2.1 Accessible range

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.

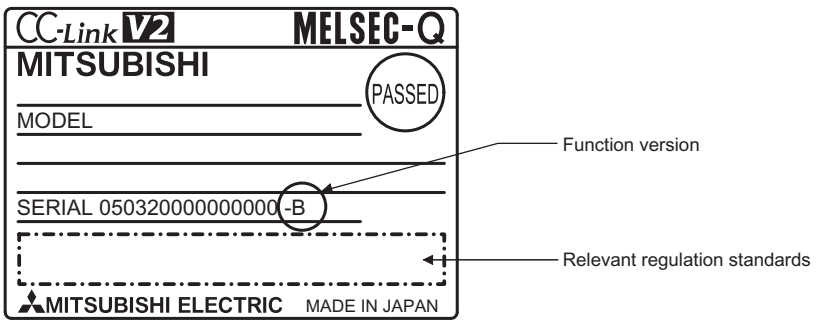


Figure 2.4 Rating plate

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]

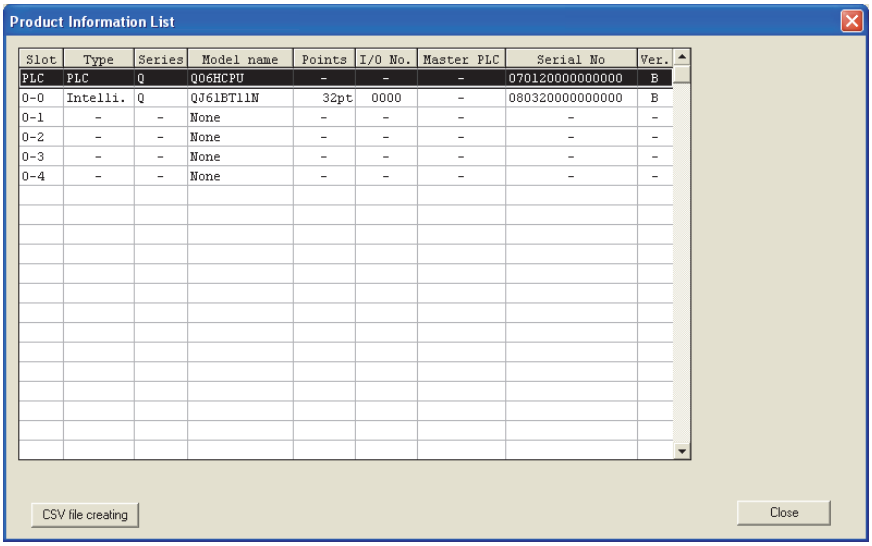


Figure 2.5 Product Information List

[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]

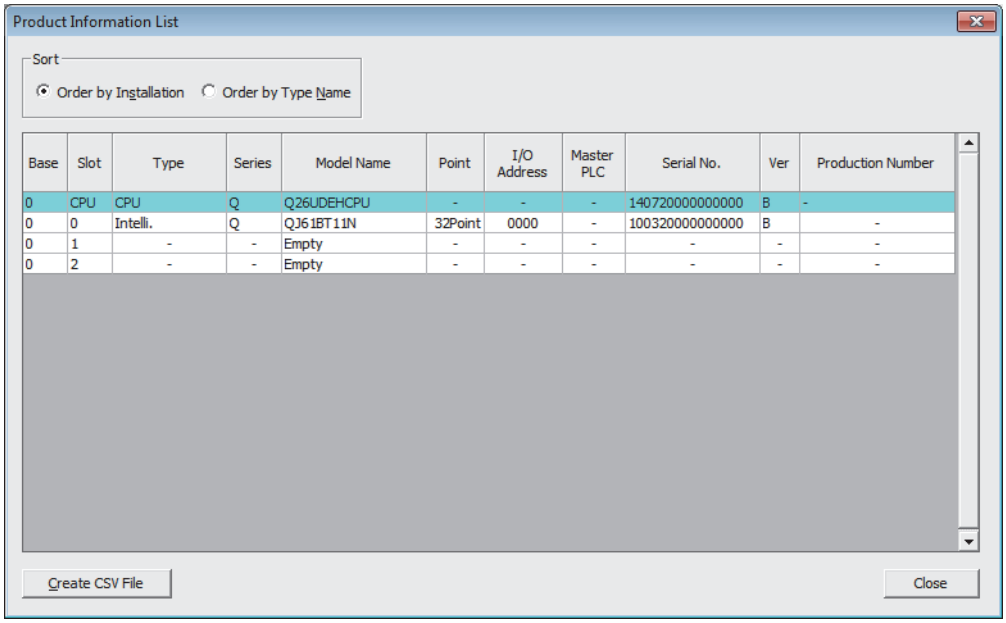


Figure 2.6 Product Information List

[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.

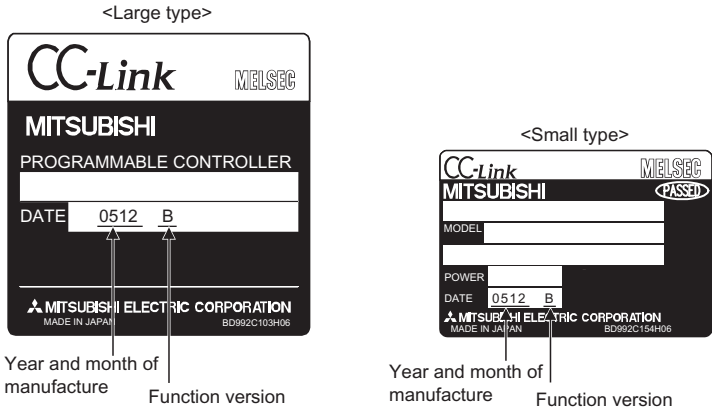


Figure 2.7 Rating plate

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.

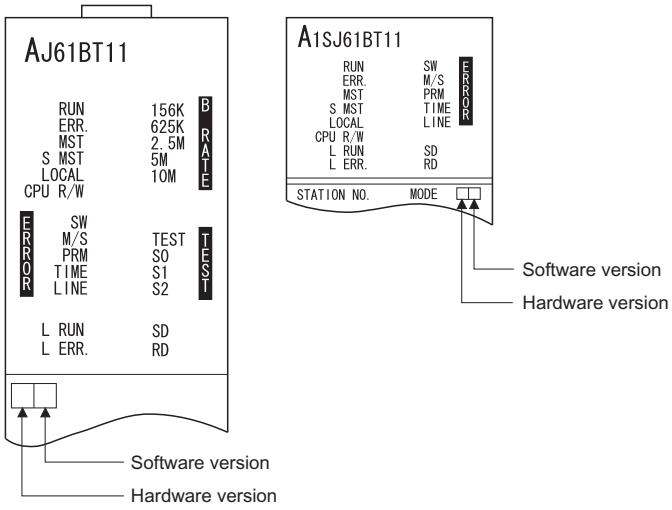


Figure 2.8 Module version label

(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 infromation" screen of GX Developer.
[Operation procedure]
[Help] → [Product information]

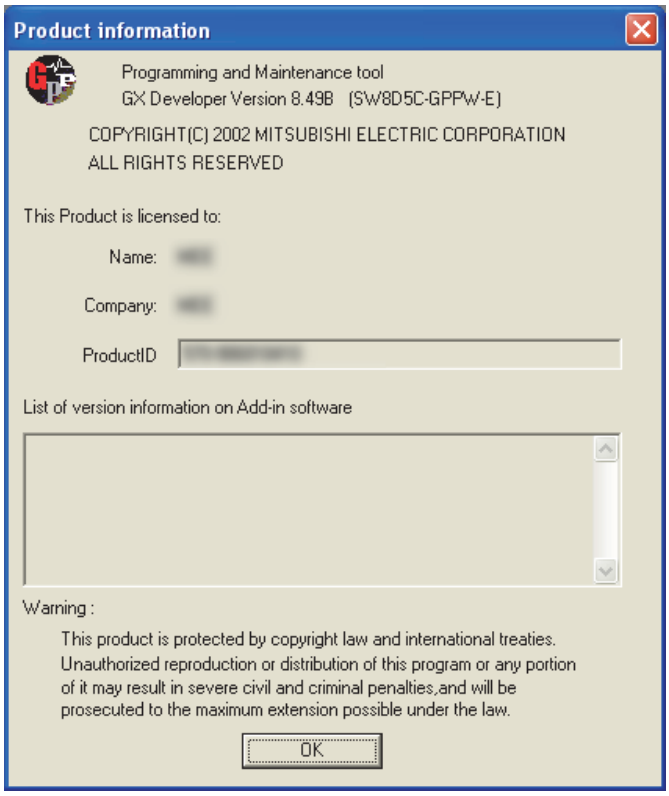


Figure 2.9 Product information

2.4 Checking the Hardware Version

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

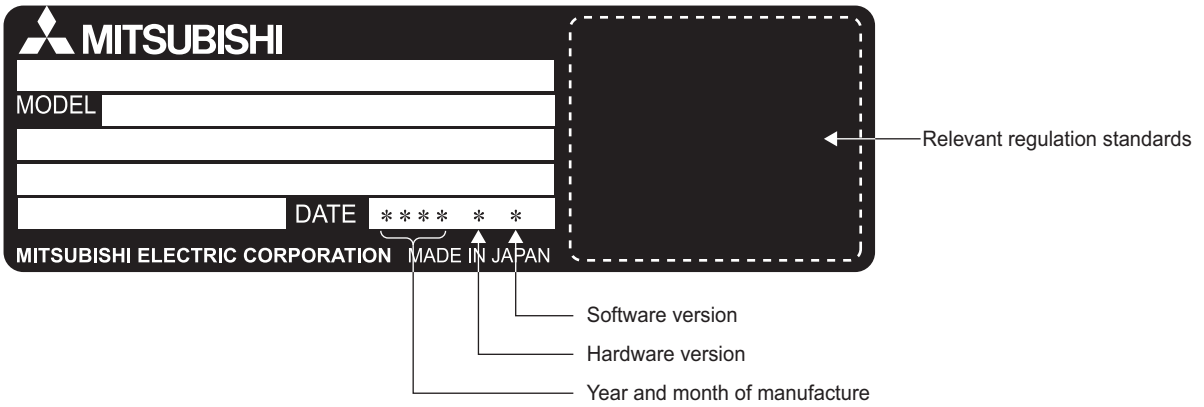


Figure 2.10 Hardware version

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.

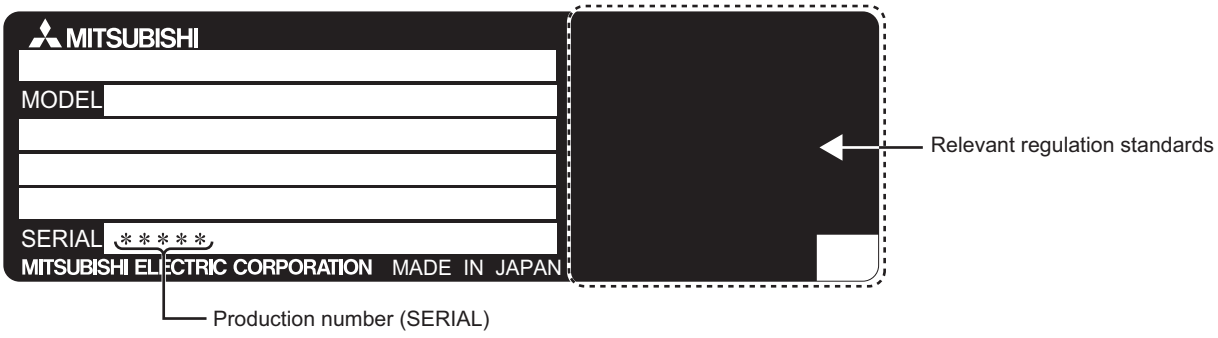


Figure 2.11 Production number

CHAPTER 3 SPECIFICATIONS

3.1 General Specifications

This section describes general specifications of the AJ65BT-R2N.

Table 3.1 General Specifications

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

* 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			Specification
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
	Exclusive station count		1 station (RX/RY: 32 points each, RWw/RWr: 4 points each)
No. of writes to E^2PROM			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 1 μs 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 (BB23H) 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		—	*1
	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.	
	Buffer memory auto-refresh function	Automatically refreshes a buffer memory between the AJ65BT-R2N and the master station in a timing set by the AJ65BT-R2N.	
	AJ65BT-R2N initialization function	Performs the following processings. •Stop the processing in execution •Initialize the AJ65BT-R2N •Enable the setting written to a buffer memory	
	User registration frame function	Sends the data with adding the specific data, and receives the data where the specific data from the external device is added.	
	Monitoring-based transmission function	Sends data specified in the send table if the send condition specified by the user is met.	
	Send cancel function	Cancels the send processing which has already been requested to the AJ65BT-R2N from the master module.	
	Forced receive completion function	Forcibly completes data reception from the external device, and reads the received data if the data reception is not completed.	
	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.	
	ASCII-binary conversion function	Sends/receives data in ASCII code when data is communicated between the AJ65BT-R2N and the external device.	
	RW refresh function	Assigns a part of a buffer memory of the AJ65BT-R2N to the remote register (RW), and monitors the buffer memory.	
	OS reception area clear function	Clears data in the OS reception area of the AJ65BT-R2N.	
	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.	
	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.	
MELSOFT connection mode		—	—
	MELSOFT connection function	Accesses the programmable controller CPU when connecting the AJ65BT-R2N to the engineering tool.	Section 4.2

* 1 For details of Nonprocedural protocol mode, refer to the following manual.
☞ CC-Link System RS-232 Interface Module User's Manual (Nonprocedural Protocol 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.

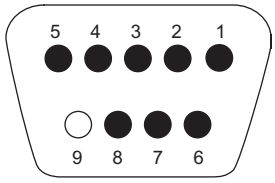


Figure 3.1 RS-232 connector

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) 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 3.
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

For general-purpose I/O specifications of the AJ65BT-R2N, refer to the following manual.

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

3.7 Remote I/O and Remote Register

The following 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.

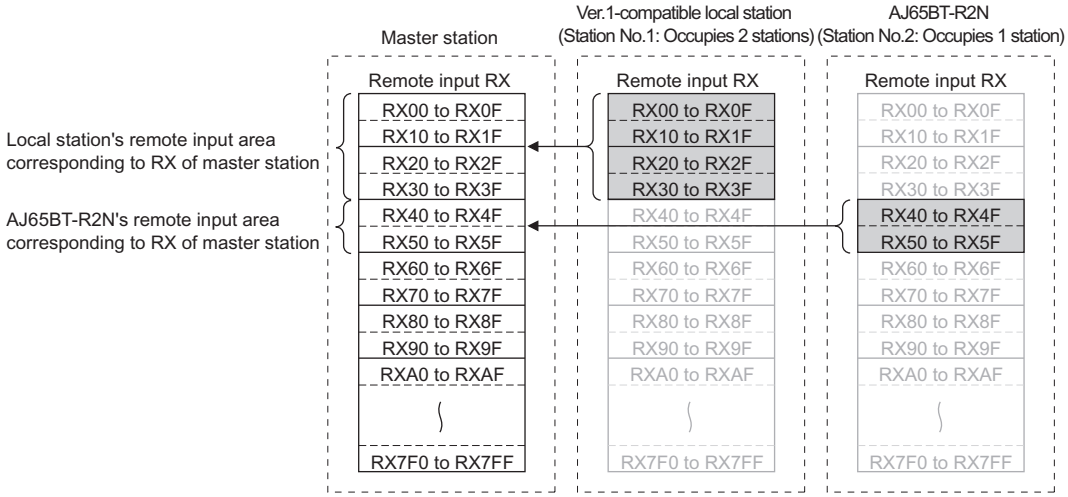


Figure 3.2 Example of remote input area

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.
☞User's manual for the master module used

(1) Remote I/O list

The remote I/O list describes the remote I/O used in MELSOFT connection mode only.

For the remote I/O used in Nonprocedural protocol mode, refer to the following manual.

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

Table 3.5 I/O signal list in 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*1		RYn0	Use prohibited*1
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*1		RY(n+1)8	
RX(n+1)9			RY(n+1)9	Use prohibited*1
RX(n+1)A			RY(n+1)A	
RX(n+1)B			RY(n+1)B	Use prohibited
RX(n+1)C	Use prohibited		RY(n+1)C	
RX(n+1)D			RY(n+1)D	
RX(n+1)E	Use prohibited*1		RY(n+1)E	Use prohibited*1
RX(n+1)F	Use prohibited		RY(n+1)F	Use prohibited

* 1 Available when Nonprocedural protocol mode is used.

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.
Only the remote I/O used in MELSOFT connection mode is described.
For the remote I/O used in Nonprocedural protocol mode, refer to the following manual.
☞CC-Link System RS-232 Interface Module User's Manual (Nonprocedural Protocol Mode)

(1) Signal status: CS (CTS) signal (RXn9), DSR (DR) signal (RXnA), and CD signal (RXnB)
Signal status is used to check the status of the control signals (CS (CTS) signal, DSR (DR) signal, and CD signal) in RS-232 communication.

(2) 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.

(3) 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.

(4) 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 3.6 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

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.

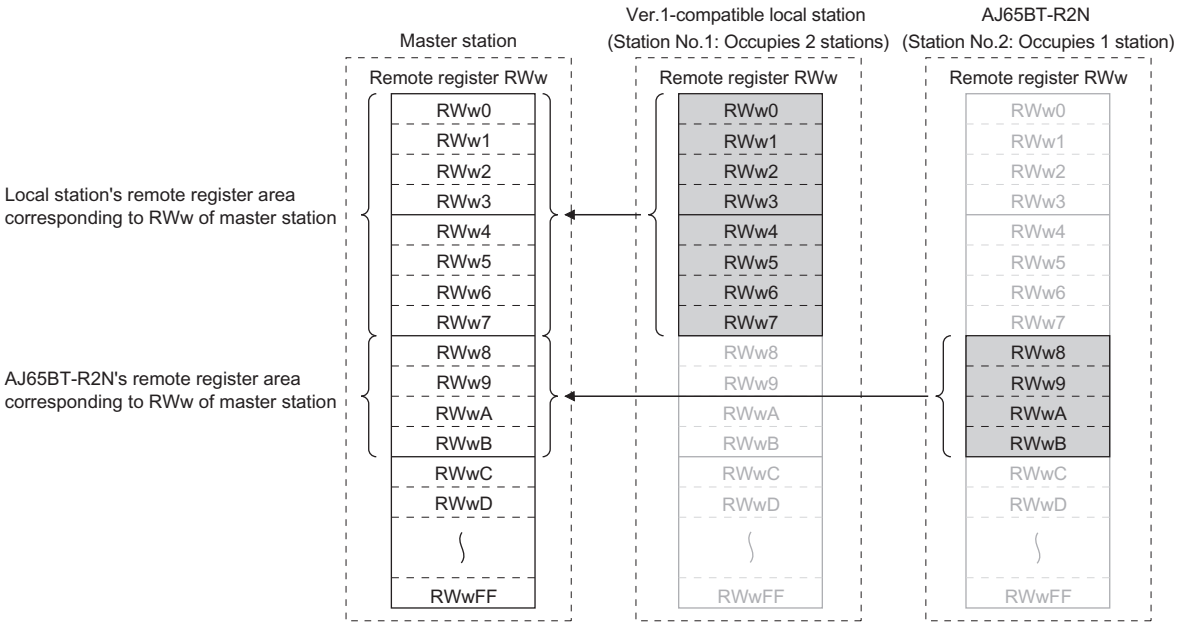


Figure 3.3 Example of remote register area

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.

☞User's manual for the master module used

(1) Remote register list

The remote register list describes the remote register used in MELSOFT connection mode only.

For the remote register used in Nonprocedural protocol mode, refer to the following manual.

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

Table 3.7 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 set 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 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.
For details, refer to the following manual.

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

(1) How buffer memory list is organized

The following shows how buffer memory list is organized.

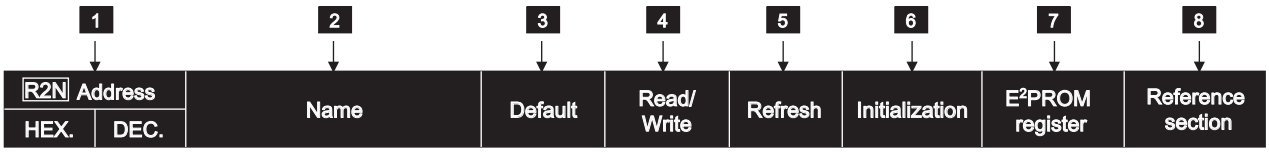


Figure 3.4 Organization of list

Table 3.8 Organization of list

No.	Name	Description
1	R2N Address	The address of buffer memory of the AJ65BT-R2N in hexadecimal or decimal.
2	Name	The name of buffer memory of the AJ65BT-R2N.
3	Default	The value at factory default setting of the AJ65BT-R2N.
4	Read/Write	Applicability of reading/writing. •R: Readable only •W: Writable only •R/W: Readable and writable
5	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
6	Initialization	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
7	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
8	Reference section	Chapter and section of the detailed description.

(2) Buffer memory list

The buffer memory list describes the buffer memory used in MELSOFT connection mode only.

For the buffer memory used in Nonprocedural protocol mode, refer to the following manual.

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

Table 3.9 Buffer memory list

R2N Address HEX.	R2N Address DEC.	Name	Default	Read/ Write	Refresh	Initialization	E^2PROM register	Reference section
1A0H	416	Station No. setting switch	0*1	R	R2N	Not needed	N/A	Section 5.4
1A1H	417	Data link transmission speed setting switch	156*1					
1A2H	418	Mode setting switch	0H*1					
1A7H	423	Buffer memory default setting status storage	0H					—
1BFH	447	Software version storage	*2					—

* 1 The switch setting status at factory default setting.
* 2 Varies depending on software version.

CHAPTER 4 FUNCTIONS

4.1 Selecting Mode and Function(s)

This section explains how to select the mode and function(s) of the AJ65BT-R2N.

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.
☞CC-Link System RS-232 Interface Module User's Manual (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.
☞Section 4.2 MELSOFT Connection Function

(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

4.2 MELSOFT Connection Function

The MELSOFT connection function allows the AJ65BT-R2N to access a programmable controller CPU by connecting a personal computer running the engineering tool.
When this function is active, the RS-232 transmission speed is the speed set in the engineering tool.

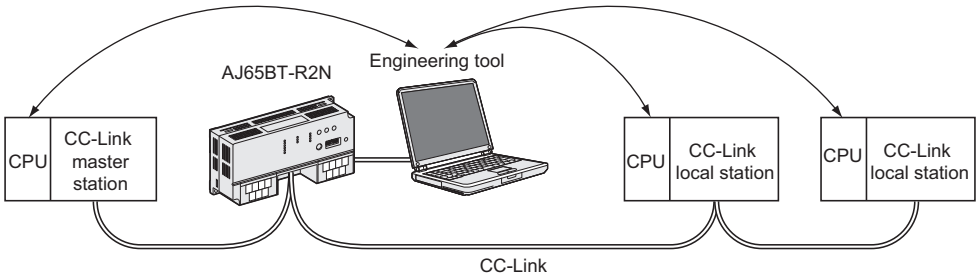


Figure 4.1 MELSOFT connection function

(1) MELSOFT connection function setting method

The following explains how to set the MELSOFT connection function.

(a) Set the AJ65BT-R2N switches as shown below.
- Mode setting switch: 5
- RS-232 transmission setting switches (SW1 to SW8): All OFF

☞Section 5.4 Part Names and Settings

(b) Reapply power to or reset the AJ65BT-R2N to change the mode to MELSOFT connection mode.

Remark

In MELSOFT connection mode, the sequence program on the master station side and buffer memory setting of the AJ65BT-R2N are not required.
For setting examples, refer to the following.

☞CHAPTER 6 MELSOFT CONNECTION MODE SETTING

(2) Accessible range

For the accessible range of the AJ65BT-R2N, refer to the following.

☞Section 4.2.1 Accessible range

(3) Precautions for use of the MELSOFT connection function

(a) Buffer memory access method in MELSOFT connection mode
Since the buffer memory auto-refresh function does not work in MELSOFT connection mode, the auto-refresh buffer of the master station is not refreshed with data in the AJ65BT-R2N buffer memory.
In addition, only reading the AJ65BT-R2N buffer memory (e.g. RIRD instruction) is allowed.
Writing (e.g. RIWT instruction) will cause an error (BB41H: Command error).

(b) Precautions for online operation

1) An online operation from an external device via the AJ65BT-R2N must be started after the L RUN LED of the AJ65BT-R2N turns ON.
No online operations can be performed while the L RUN LED is OFF.
Upon completion of the initial communication on the CC-Link, the L RUN LED of the AJ65BT-R2N turns ON.

2) When accessing a programmable controller CPU through the following CC-Link system, the access time is approx. 40 seconds.

Table 4.1 Standard access time

Item	Description
CC-Link system	Connection of master station and AJ65BT-R2N only
Access target CPU	Q12HCPU (STOP status) on master station
Data transmission speed	•CC-Link system: 10Mbps •Between AJ65BT-R2N and external device: 19200bps (Using the engineering tool)
Access	Reading or writing sequence program (10k steps)

When accessing a programmable controller CPU on a heterogeneous network, a delay may occur depending on the number of accessing stations and access conditions.

(c) Precautions for using the AJ61BT11 or A1SJ61BT11
When using the AJ61BT11 or A1SJ61BT11, a "communication error" can occur in the external device connected to the AJ65BT-R2N in rare cases.
Check the following and take corrective actions.

1) Cause
The programmable controller CPU may have frequently executed FROM/TO instructions to the buffer memory of the AJ61BT11 or A1SJ61BT11.
- Access from a programmable controller CPU takes priority.
Therefore, frequent access to the buffer memory will not only increase the scan time of the programmable controller CPU but also cause a "communication error" due to a delay in the processing of the AJ61BT11 or A1SJ61BT11.

2) Corrective action
In the case of access to the buffer memory of the AJ61BT11 or A1SJ61BT11, add a contact to the FROM/TO instruction so that the input signal (XnC) to the module is OFF.
(XnC: FROM/TO enable/disable signal, when XnC is OFF, execution of the FROM/TO instruction is enabled.)
By adding the contact by which XnC remains OFF, data communication can be performed normally.

4.2.1 Accessible range

This section shows a system that is configured within the accessible range of the AJ65BT-R2N, and whether each target CPU can be accessed or not.

(1) System configuration

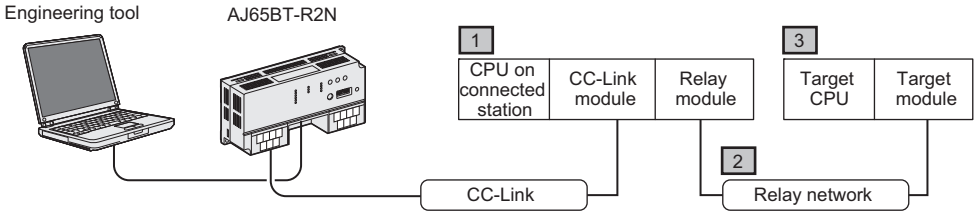


Figure 4.2 Accessible range

(2) Accessible range

The accessible range is shown below.

Access can be made to any CPU on the connected station 1 .

Table 4.2 Accessible range

1 : CPU on connected station	2 : Relay network	3 : Target CPU					
		RCPU	LCPU	QCPU (Q mode)	QnACPU	QCPU (A mode), AnUCPU	AnACPU, AnNCPU
RCPU	CC-Link IE Field Network	×	○	○	—	—	—
	CC-Link IE Controller Network	×	—	○	—	—	—
	MELSECNET(II)	—	—	—	—	—	—
	Ethernet	×	○	○	×	×	×
	Computer link	×	×	×	×	×	×
QCPU (Q mode)	CC-Link IE Field Network	×	○	○	—	—	—
	CC-Link IE Controller Network	×	—	○	—	—	—
	MELSECNET/H	—	—	○	—	—	—
	MELSECNET/10	—	—	○	×	×	×
	MELSECNET(II)	—	—	—	—	—	—
	Ethernet	×	○	○	×	×	×
	Computer link	×	×	×	×	×	×
LCPU	CC-Link IE Field Network	×	○	○	—	—	—
	MELSECNET(II)	—	—	—	—	—	—
	Ethernet	×	○	○	×	×	×
	Computer link	×	×	×	×	×	×
QnACPU	MELSECNET/10	—	—	×	○	×	×
	MELSECNET(II)	—	—	—	×	×	×
	Ethernet	×	×	×	○	×	×
	Computer link	×	×	×	○	×	×

1 : CPU on connected station	2 : Relay network	3 : Target CPU					
		RCPU	LCPU	QCPU (Q mode)	QnACPU	QCPU (A mode), AnUCPU	AnACPU, AnNCPU
QCPU (A mode), AnUCPU	MELSECNET/10	—	—	×	×	○	○
	MELSECNET(II)	—	—	—	×	×	×
	Ethernet	×	×	×	×	×	×
	Computer link	×	×	×	×	×	×
AnACPU, AnNCPU	MELSECNET/10	—	—	×	×	×	×
	MELSECNET(II)	—	—	—	×	×	×
	Ethernet	×	×	×	×	×	×
	Computer link	×	×	×	×	×	×

○ : Accessible, × : Not accessible, — : N/A

CHAPTER 5 PREPARATORY PROCEDURES AND SETTING

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)

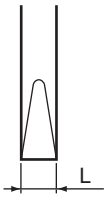
(2) When using the DIN rail adapter, pay attention to the following.

(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) For the operation of the station number setting switch, data link transmission speed setting switch, and mode setting switch, use the screwdriver that meets the following recommended screwdriver dimensions. Failure to do so may result in damage to the switch.

Recommended screwdriver dimensions	
Blade edge width (L)	2.0 to 2.4mm
Blade edge thickness (W)	0.5 to 0.6mm



Front view of blade edge

Side view of blade edge

5.2 Preparatory Procedures and Setting

This section describes the preparatory procedures of the AJ65BT-R2N.

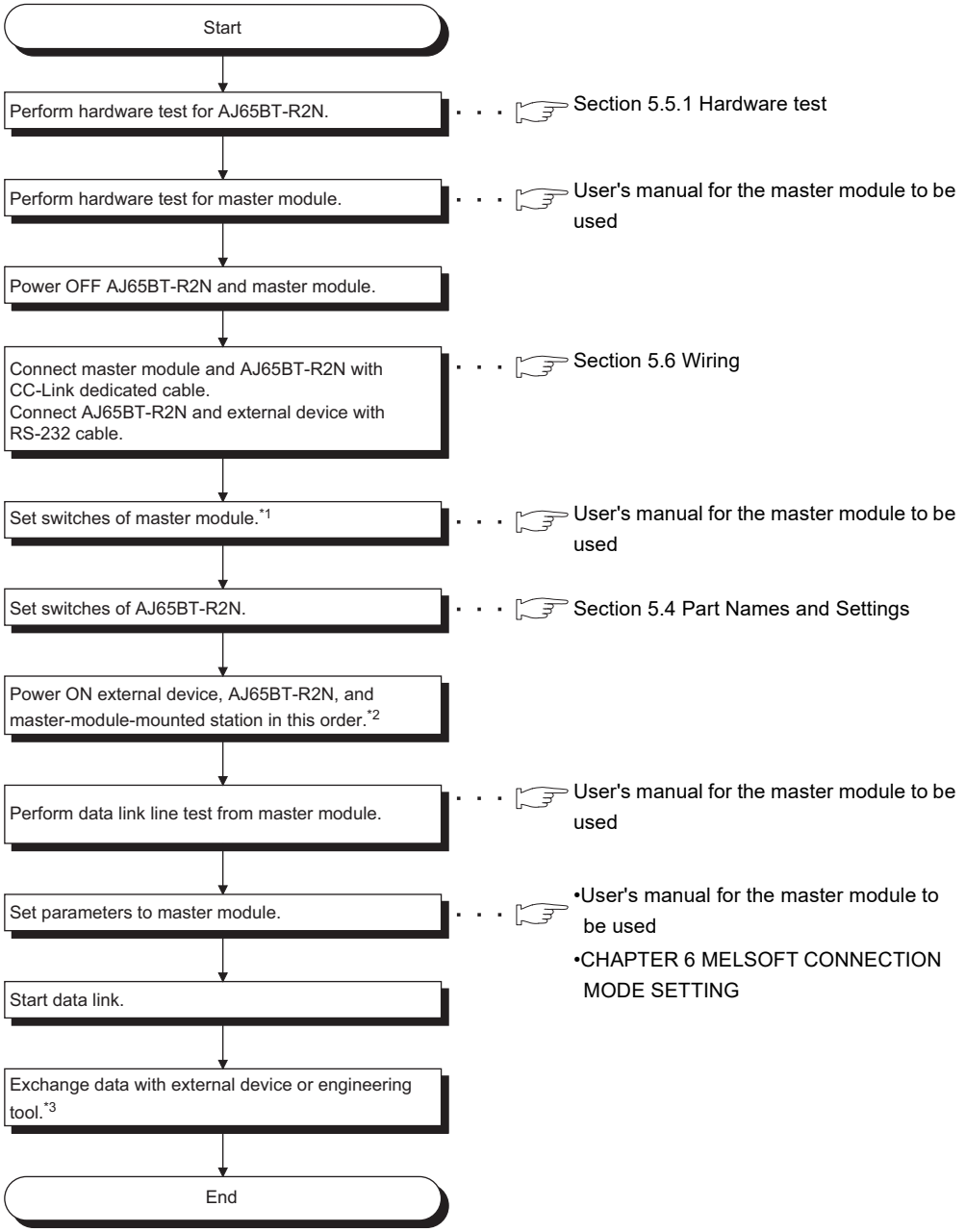


Figure 5.1 Preparatory procedures and setting

* 1 When the AJ61BT11 or A1SJ61BT11 is used, set the condition setting switch SW8 to be OFF (Intelli. mode).
* 2 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.
* 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.

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.

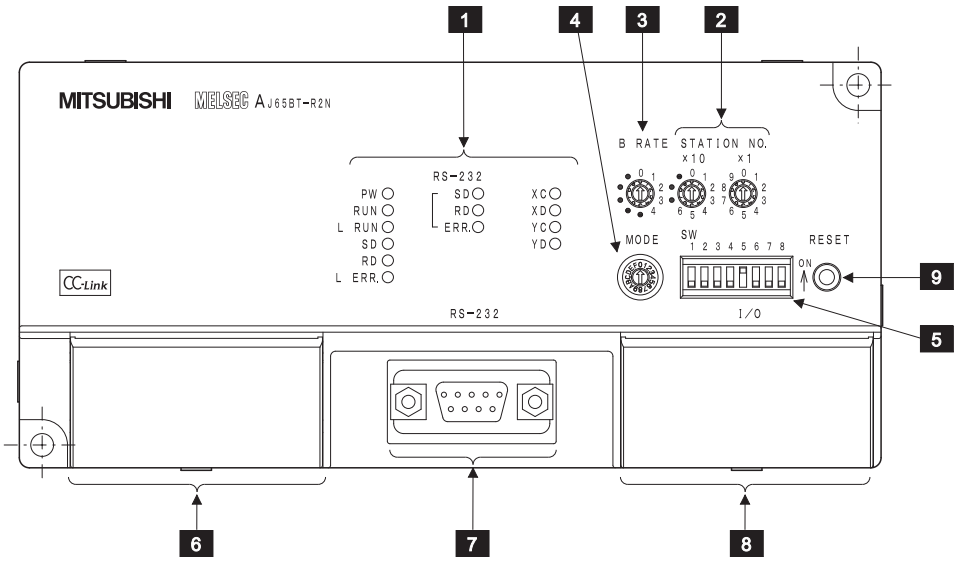
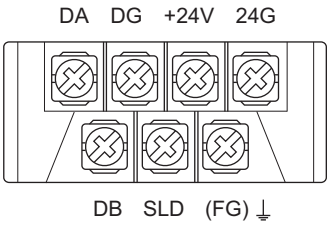


Figure 5.2 Appearance of the AJ65BT-R2N

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

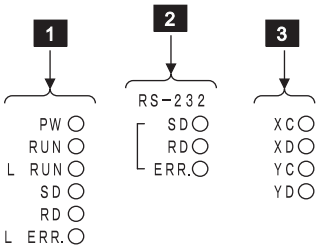


Figure 5.3 Indicator LEDs

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

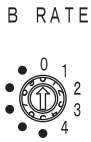


Figure 5.4 Data link transmission speed setting switch

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

When MELSOFT connection mode is used, set Mode setting switch to 5 (MELSOFT connection mode).

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	
2			Mode 2	Communications are performed in Nonprocedural protocol mode. Set this when using the buffer memory auto-refresh function.
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

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.

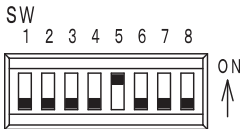


Figure 5.6 RS-232 transmission setting switches

Table 5.6 RS-232 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

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.

(5) Checking switch status with buffer memory

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	Not used for MELSOFT connection mode. R2N 1A3H to 1A6H are used for Nonprocedural protocol mode. ☞CC-Link System RS-232 Interface Module User's Manual (Nonprocedural Protocol Mode)
1A4H	RS-232 data bit length	
1A5H	RS-232 parity bit	
1A6H	RS-232 stop bit length	

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.

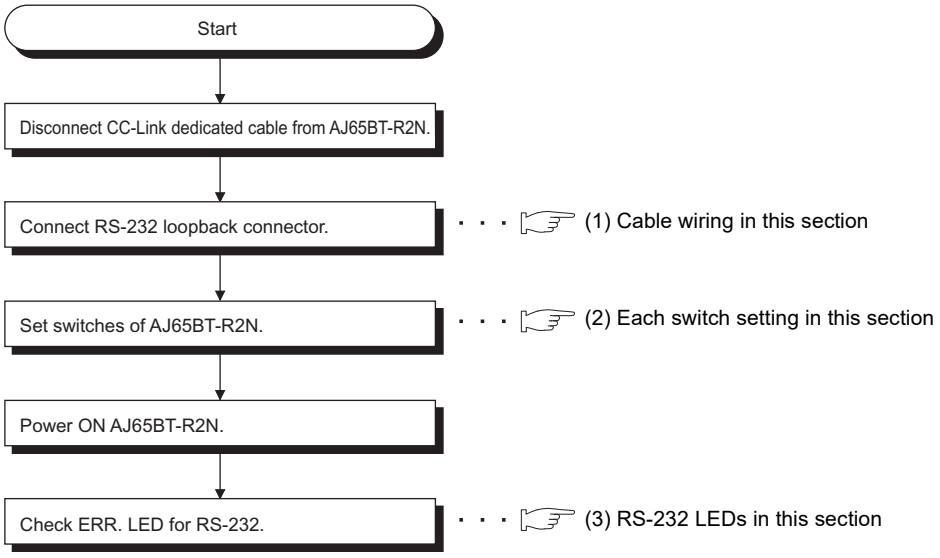
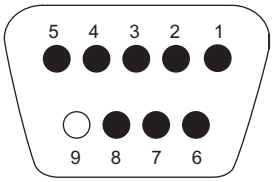
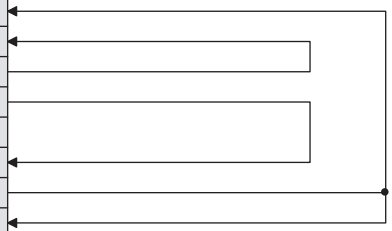


Figure 5.7 Hardware test procedure

(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 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 the AJ65BT-R2N switches 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.

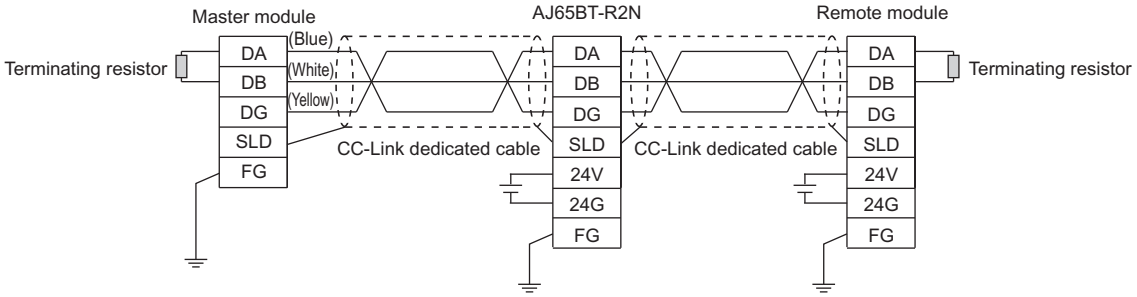


Figure 5.8 Connection between AJ65BT-R2N and master module

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 method

When connecting the AJ65BT-R2N and the external device, connect them as shown below.

Table 5.12 Connection method

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 5.13 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.
Shield	Connected to the screw clamp of the AJ65BT-R2N side connector. (Not connected to external device)	•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.

(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.

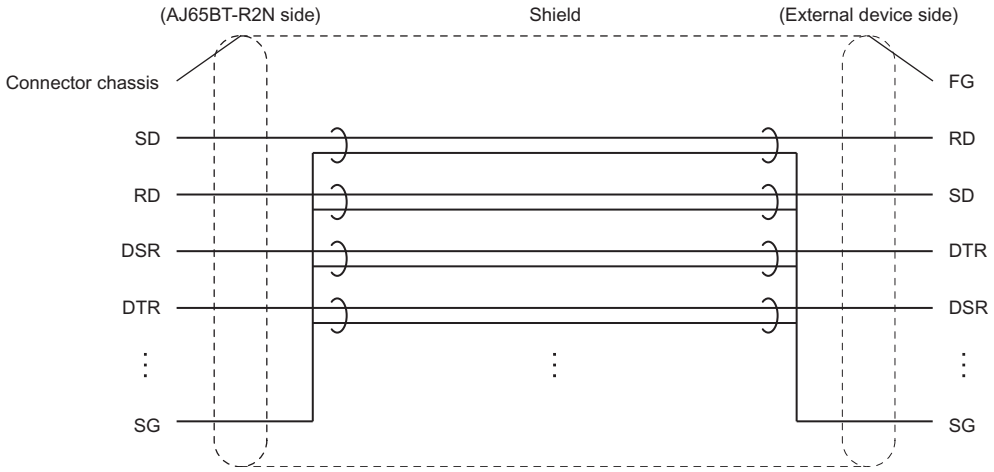


Figure 5.9 Precautions for connection

(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 MELSOFT CONNECTION MODE SETTING

This chapter describes the setting example per programmable controller CPU of the master station when the MELSOFT connection mode is used.
The following shows the system configuration of the setting example described in this chapter.

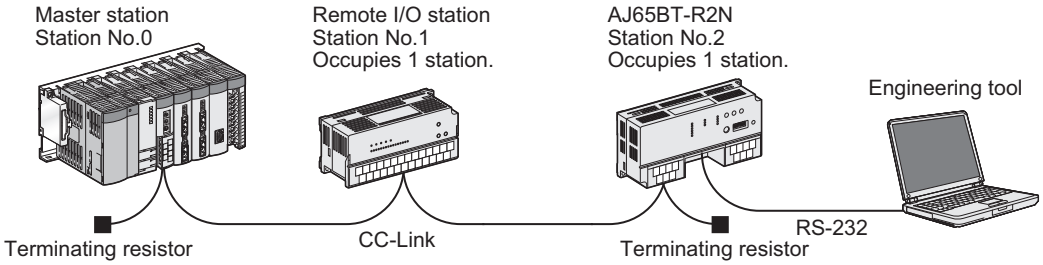


Figure 6.1 System configuration

(a) Master station

Table 6.1 Information of master station

Item	Description
Station No.	0
Transmission speed of data link	156kbps
CC-Link version	Ver. 1
Start I/O No.	Mounting position of master module
All connect count	2

(b) Remote I/O station

Table 6.2 Information of remote I/O station

Item	Description
Station No.	1
Transmission speed of data link	156kbps
CC-Link version	Ver. 1
No. of occupied stations	Occupies 1 station

(c) AJ65BT-R2N

Table 6.3 Information of AJ65BT-R2N

Item	Description
Station No.	2
Transmission speed of data link	156kbps
CC-Link version	Ver. 1
No. of occupied stations	Occupies 1 station
Mode setting switch	5 (MELSOFT connection mode)

6.1 Setting When LCPU is Used

This section describes the setting example when the programmable controller CPU of the master station is the LCPU.

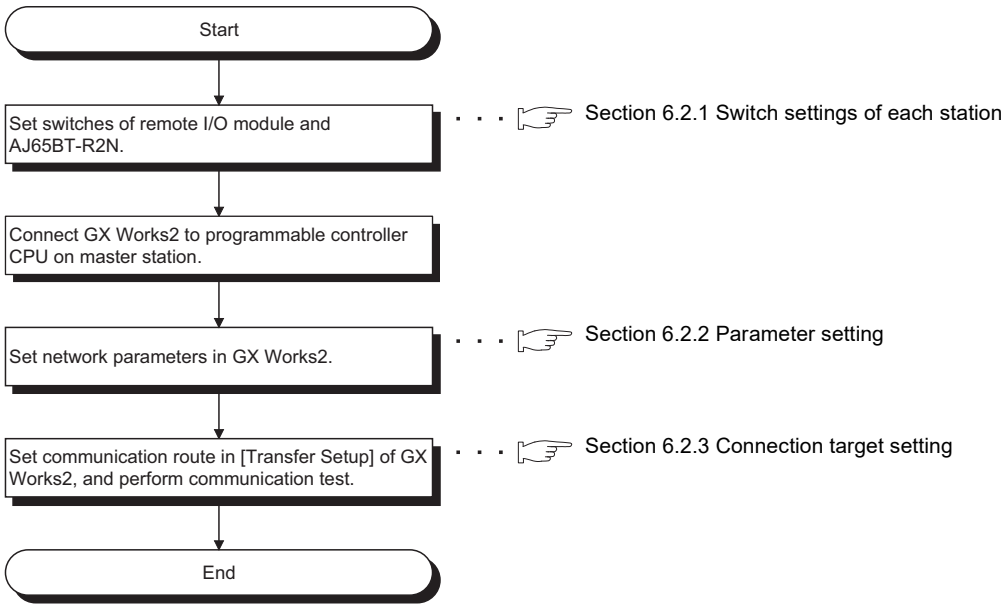


Figure 6.2 Setting procedure

6.1.1 Switch settings of each station

(1) Switch setting of remote I/O station

For how to set switch setting, refer to the manual for the remote I/O station.

Table 6.4 Switch setting of remote I/O station

Item	Description
Station No.	Station No.1
Transmission speed	156kbps

(2) Switch setting of AJ65BT-R2N

Set each switch setting of the AJ65BT-R2N.

Table 6.5 Switch setting of AJ65BT-R2N

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		MELSOFT connection mode	5 (Fixed)
RS-232 transmission setting switches	SW1 to SW8	Set all to OFF	OFF (Fixed)

(3) Precautions for switch setting

(a) Set the station No. setting switch of the AJ65BT-R2N within the following range.

1) When accessing to the master station or local station connected to the CC-link system

Set the station No. setting switch of the AJ65BT-R2N within the range of 1 to 64.

2) When accessing to the programmable controller CPU connected to the other network system

Access can be made to the programmable controller CPU connected to the other network system via the master station or local station in the CC-Link system where the AJ65BT-R2N is connected.

- When the programmable controller CPU of the access destination is Q series

  Set the station No. setting switch of the AJ65BT-R2N within the range of 1 to 64.
- When the programmable controller CPU of the access destination is QnA series

  Set the station No. setting switch of the AJ65BT-R2N within the range of 1 to 63.

(b) As for the RS-232 transmission setting switches of the AJ65BT-R2N, set SW1 to SW8 to OFF.

6.1.2 Parameter setting

Set the parameter setting by [Network parameters] of GX Works2.

(1) Network parameter setting

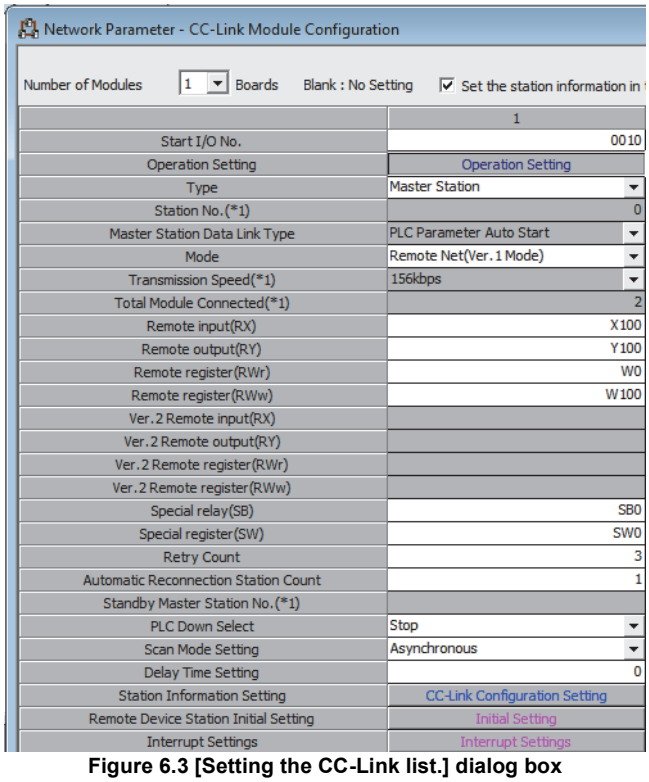


Figure 6.3 [Setting the CC-Link list.] dialog box

(a) Operational setting

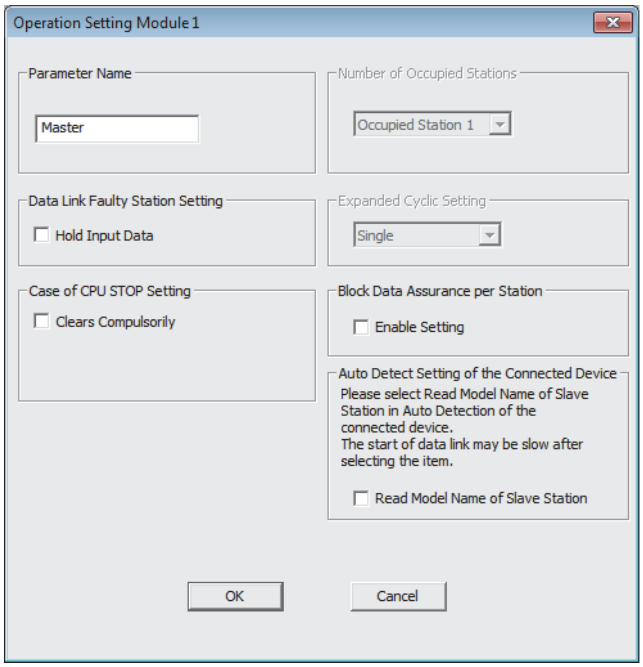


Figure 6.4 [Operational settings module 1] dialog box

(b) CC-Link configuration setting

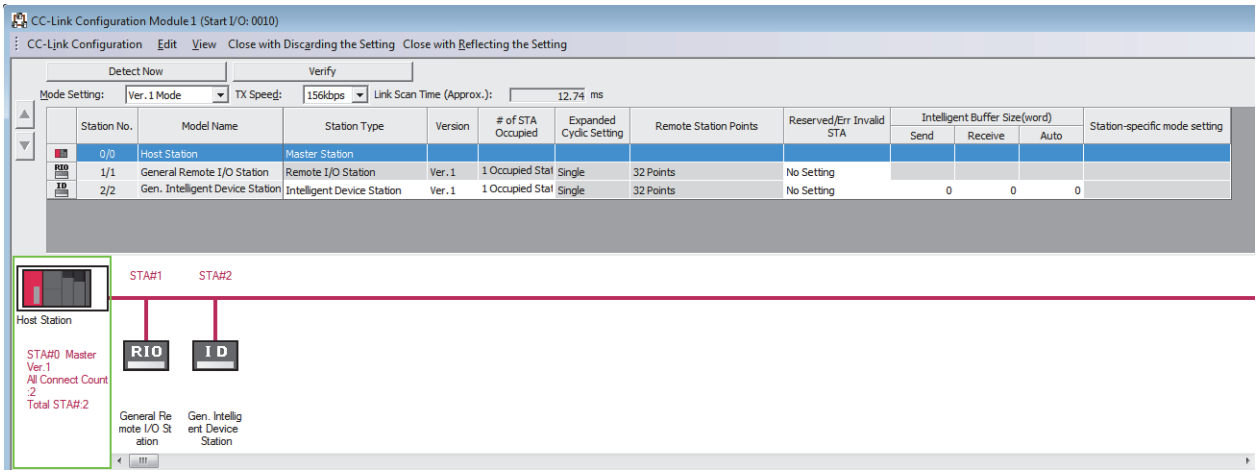


Figure 6.5 [CC-Link Configuration Module 1] dialog box

6.1.3 Connection target setting

Set the connection target by [Transfer Setup] of GX Works2.

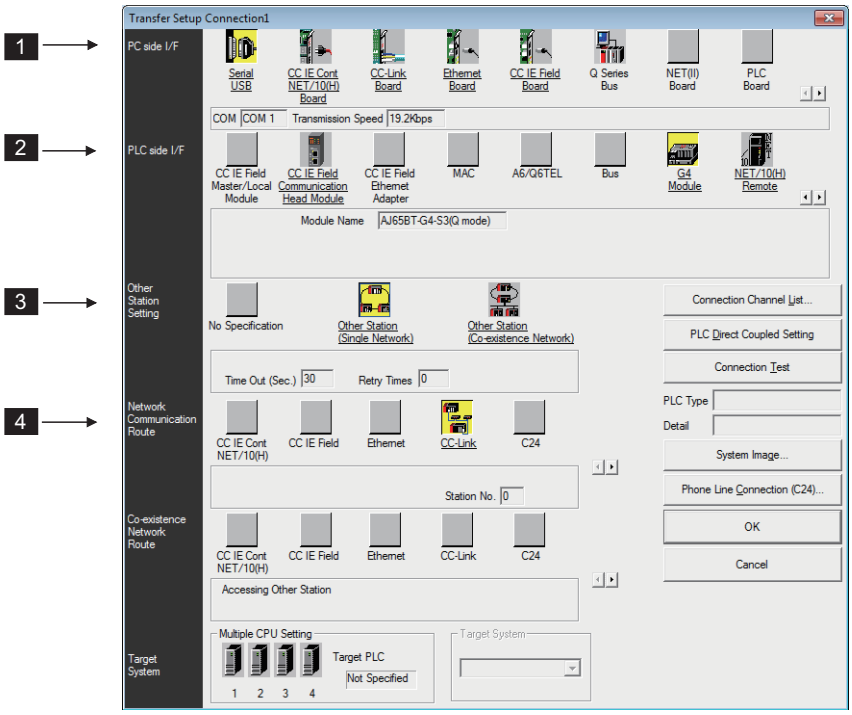


Figure 6.6 [Transfer Setup] dialog box

Table 6.6 Connection target setting

No.	Setting item	Setting	Detailed setting
1	PC side I/F	Serial	PC-side IF Serial setting •COM port: COM1 •Transmission speed: 19.2kbps
2	PLC side I/F	G4 module	PLC side I/F detailed setting of G4 module •Model (mode): AJ65BT-G4-S3 (Q mode)
3	Other station specification	Other station (Single network)	Other station Detailed setting •Check at communication time: 30 seconds •Retry times: 0 time
4	Network route	CC-Link	Network communication route Detailed setting of CC-Link •Station No.: 0

Point

Be sure to select AJ65BT-G4-S3 (Q mode) for the model of [PLC side I/F detailed setting of G4 module].

6.2 Setting When QCPU (Q mode)/QnACPU is Used

This section describes the setting example when the programmable controller CPU of the master station is the QCPU (Q mode) or the QnACPU.

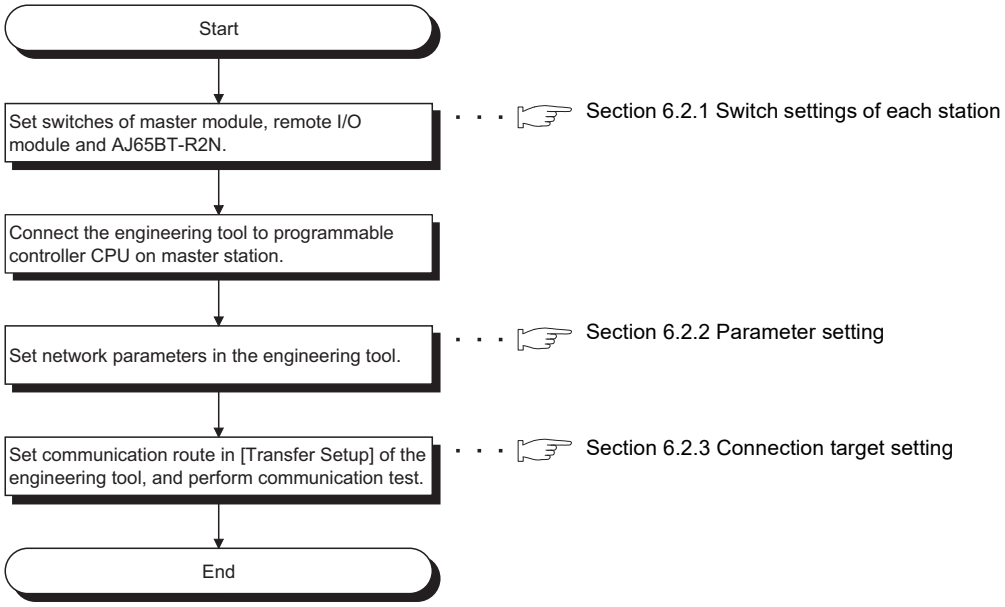


Figure 6.7 Setting procedure

6.2.1 Switch settings of each station

(1) Switch setting of master station

Set the switch setting of the master station by each switch of the master module.

(a) When the master module is the QJ61BT11N or QJ61BT11

Table 6.7 Switch setting in case of QJ61BT11N or QJ61BT11

Item	Description	Set value
Station No. setting switch	Master station	× 10:0 × 1:0
Transmission speed/mode setting switch	Transmission speed156kbps (Online mode)	0

(b) When the master module is the AJ61QBT11 or A1SJ61QBT11

Table 6.8 Switch setting in case of AJ61QBT11 or A1SJ61QBT11

Item		Description	Set value
Station No. setting switch		Master station	× 10:0 × 1:0
Mode setting switch		Online mode (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) Switch setting of remote I/O station

For how to set switch setting, refer to the manual for the remote I/O station.

Table 6.9 Switch setting of remote I/O station

Item	Description
Station No.	Station No.1
Transmission speed	156kbps

(3) Switch setting of AJ65BT-R2N

Set each switch setting of the AJ65BT-R2N.

Table 6.10 Switch setting of AJ65BT-R2N

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		MELSOFT connection mode	5 (Fixed)
RS-232 transmission setting switches	SW1 to SW8	Set all to OFF	OFF (Fixed)

(4) Precautions for switch setting

(a) Set the station No. setting switch of the AJ65BT-R2N within the following range.

1) When accessing to the master station or local station connected to the CC-link system
Set the station No. setting switch of the AJ65BT-R2N within the range of 1 to 64.

2) When accessing to the programmable controller CPU connected to the other network system
Access can be made to the programmable controller CPU connected to the other network system via the master station or local station in the CC-Link system where the AJ65BT-R2N is connected.
- When access target programmable controller CPU is the Q series
Set the station No. setting switch of the AJ65BT-R2N within the range of 1 to 64.
- When access target programmable controller CPU is the QnA series
Set the station No. setting switch of the AJ65BT-R2N within the range of 1 to 63.

(b) As for the RS-232 transmission setting switches of the AJ65BT-R2N, set SW1 to SW8 to OFF.

6.2.2 Parameter setting

(1) When the master module is the QJ61BT11N or QJ61BT11

Set the parameter setting by 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

(a) Network parameter setting

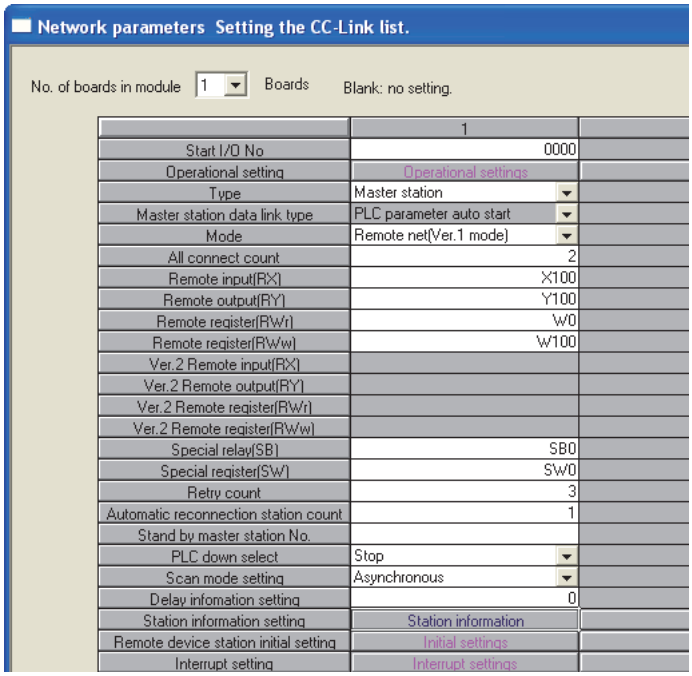


Figure 6.8 [Setting the CC-Link list.] dialog box

(b) Operational setting

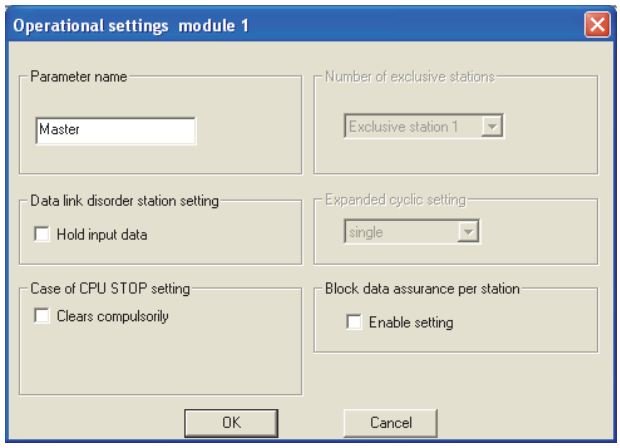


Figure 6.9 [Operational settings module 1] dialog box

(c) Station information setting

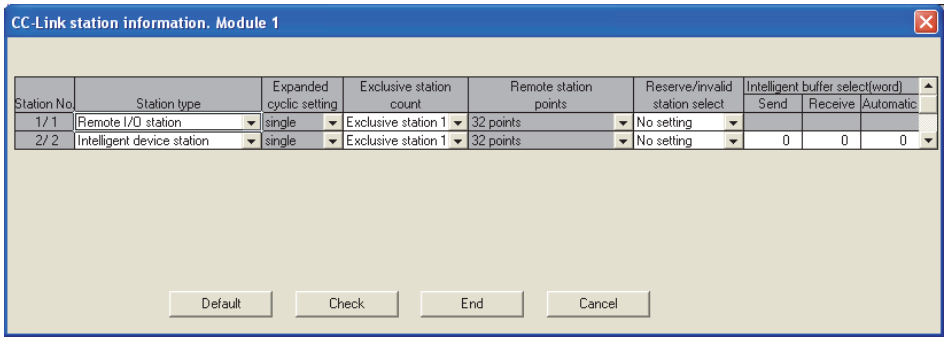


Figure 6.10 [Station information. Module 1] dialog box

(2) When the master module is the AJ61QBT11N or A1SJ61QBT11

(a) Network parameter setting

Set the parameter setting by [Network parameters] of GX Developer.

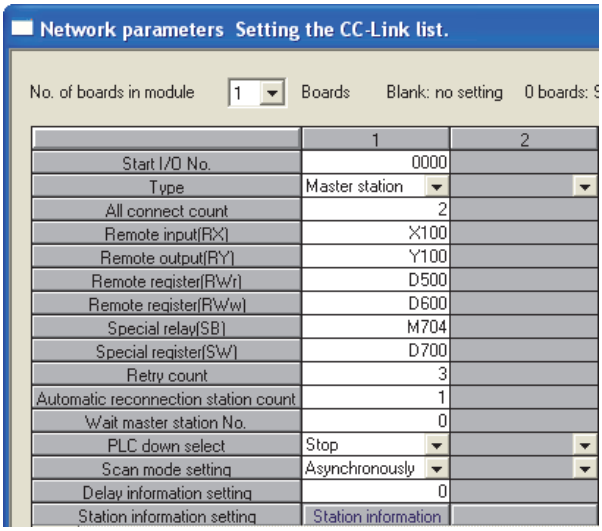


Figure 6.11 [Setting the CC-Link list.] dialog box

(b) Station information setting

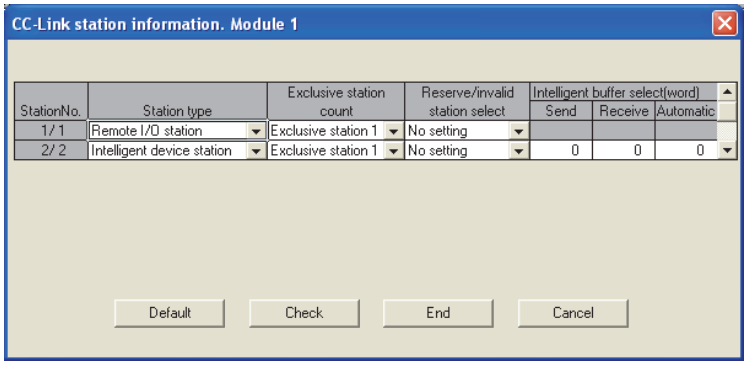


Figure 6.12 [Station information. Module 1] dialog box

6.2.3 Connection target setting

Set the connection target by [Transfer Setup] of the engineering tool.

(1) For GX Developer

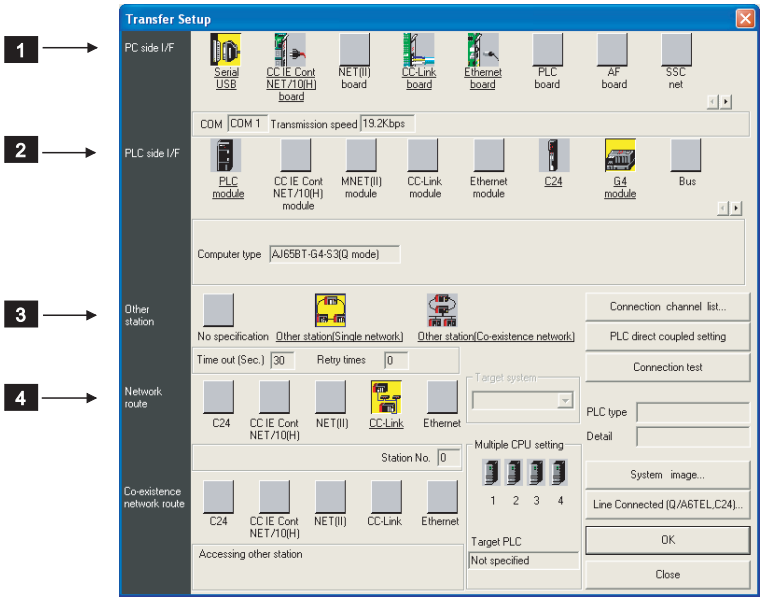


Figure 6.13 [Transfer Setup] dialog box

Table 6.11 Connection target setting

No.	Setting item	Setting	Detailed setting
1	PC side I/F	Serial	PC-side IF Serial setting •COM port: COM1 •Transmission speed: 19.2kbps
2	PLC side I/F	G4 module	PLC side I/F detailed setting of G4 module •Model (mode): AJ65BT-G4-S3 (Q mode)
3	Other station specification	Other station (Single network)	Other station Detailed setting •Check at communication time: 30 seconds •Retry times: 0 time
4	Network route	CC-Link	Network communication route Detailed setting of CC-Link •Station No.: 0

Point

Be sure to select AJ65BT-G4-S3 (Q mode) for the model of [PLC side I/F detailed setting of G4 module].

(2) For GX Works2

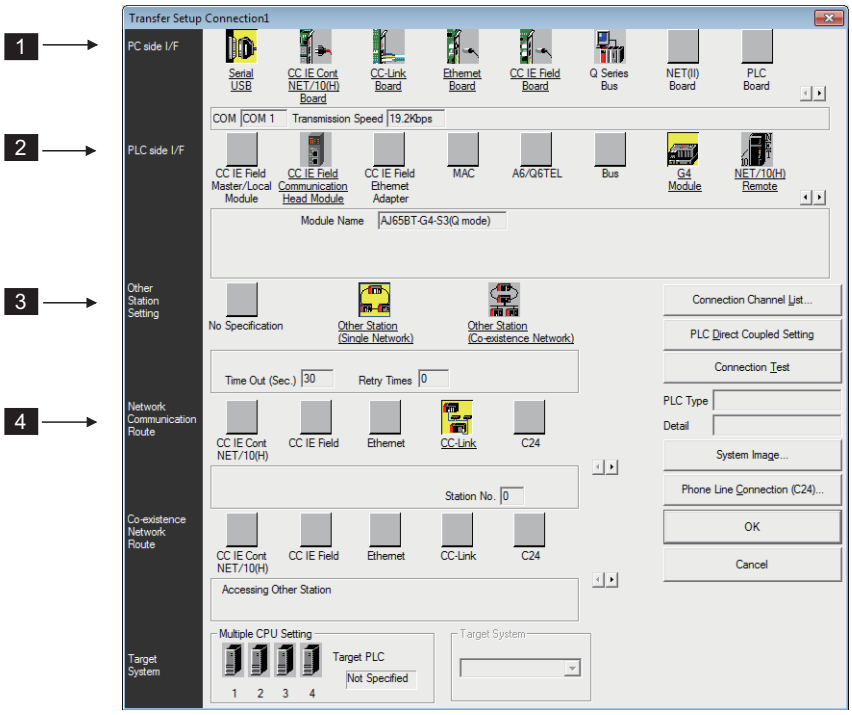


Figure 6.14 [Transfer Setup] dialog box

Table 6.12 Connection target setting

No.	Setting item	Setting	Detailed setting
1	PC side I/F	Serial	PC-side IF Serial setting •COM port: COM1 •Transmission speed: 19.2kbps
2	PLC side I/F	G4 module	PLC side I/F detailed setting of G4 module •Model (mode): AJ65BT-G4-S3 (Q mode)
3	Other station specification	Other station (Single network)	Other station Detailed setting •Check at communication time: 30 seconds •Retry times: 0 time
4	Network route	CC-Link	Network communication route Detailed setting of CC-Link •Station No.: 0

Point

Be sure to select AJ65BT-G4-S3 (Q mode) for the model of [PLC side I/F detailed setting of G4 module].

6.3 Setting When ACPU/QCPU (A mode) is Used

This section describes the setting example when the programmable controller CPU of the master station is the ACPU or QCPU (A mode).

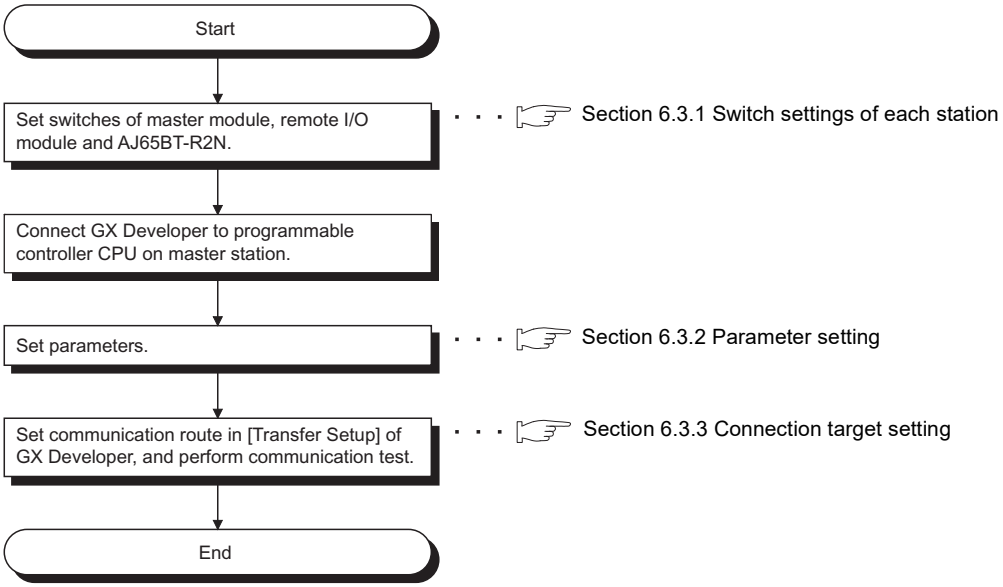


Figure 6.15 Setting procedure

6.3.1 Switch settings of each station

(1) Switch setting of master station

Set the switch setting of the master station by each switch setting.

Table 6.13 Switch setting of master station

Item		Description	Set value
Station No. setting switch		Master station	× 10:0 × 1:0
Mode setting switch		Online mode (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 (Fixed)

(2) Switch setting of remote I/O station

For how to set switch setting, refer to the manual for the remote I/O station.

Table 6.14 Switch setting of remote I/O station

Item	Description
Transmission speed setting switch	156kbps
Station No. setting switch	Station No.1

(3) Switch setting of AJ65BT-R2N

Set each switch setting of the AJ65BT-R2N.

Table 6.15 Switch setting of AJ65BT-R2N

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		MELSOFT connection mode	5 (Fixed)
RS-232 transmission setting switches	SW1 to SW8	Set all to beOFF	OFF (Fixed)

(4) Precautions for switch setting

(a) Set the station No. of the AJ65BT-R2N within the following range.

1) When accessing to the master station or local station connected to the CC-link system
Set the station No. setting switch of the AJ65BT-R2N within the range of 1 to 64.

2) When accessing to the programmable controller CPU connected to the other network system
When accessing to the A series programmable controller CPU via the master station or local station in the CC-Link system connected to the AJ65BT-R2N, set the station No. setting switch of the AJ65BT-R2N within the range of 1 to 63.

(b) Set the condition setting switch SW8 of the master station or local station to OFF (Intelli. mode).

(c) As for the RS-232 transmission setting switches of the AJ65BT-R2N, set SW1 to SW8 to OFF.

6.3.2 Parameter setting

Set the parameter setting by the sequence program.
The following describes devices used in the program example in this section.

Table 6.16 Device used in program example

Device	Description	Device	Description
X0	Module error (Master station)	M100	Master station parameter setting start pulse signal
X6	Data link start by parameters in buffer memory normally completed (Master station)	M101	Device turned ON for one scan after the dedicated instruction is executed
X7	Data link start by parameters in buffer memory failed (Master station)	M102	Device turned ON for one scan when write failed after the dedicated instruction is executed
X0F	Module ready (Master station)	D100 or later	Setting value of master station
Y0	Refresh instruction (Master station)	D107	Error code
Y6	Request for data link start by parameters in buffer memory (Master station)	—	

(1) When using dedicated instruction
The program example using a dedicated instruction is shown below.

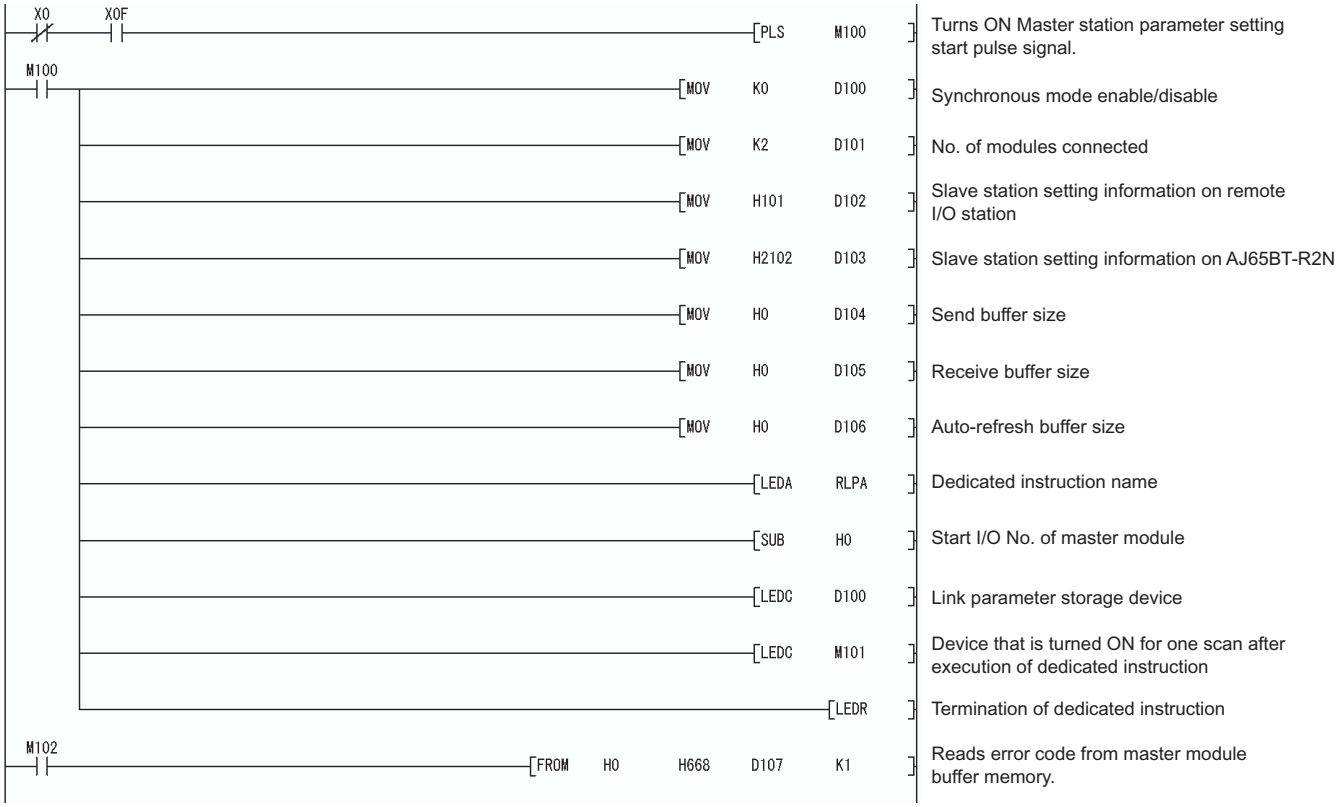


Figure 6.16 Program example when using dedicated instruction

Table 6.17 Parameter setting for using dedicated instruction

Item		Set value		
Synchronous mode valid/invalid		0 (When synchronization invalid)		
Number of stations connected for communication		2		
Slave station setting information		**Slave station information**	**No. of occupied slave stations**	**Station No.**
	Remote I/O station	0 (Remote I/O station)	1	1
	AJ65BT-R2N	2 (Intelligent device station)	1	2

(2) When using FROM/TO instruction

The program example using the FROM/TO instruction is shown below.

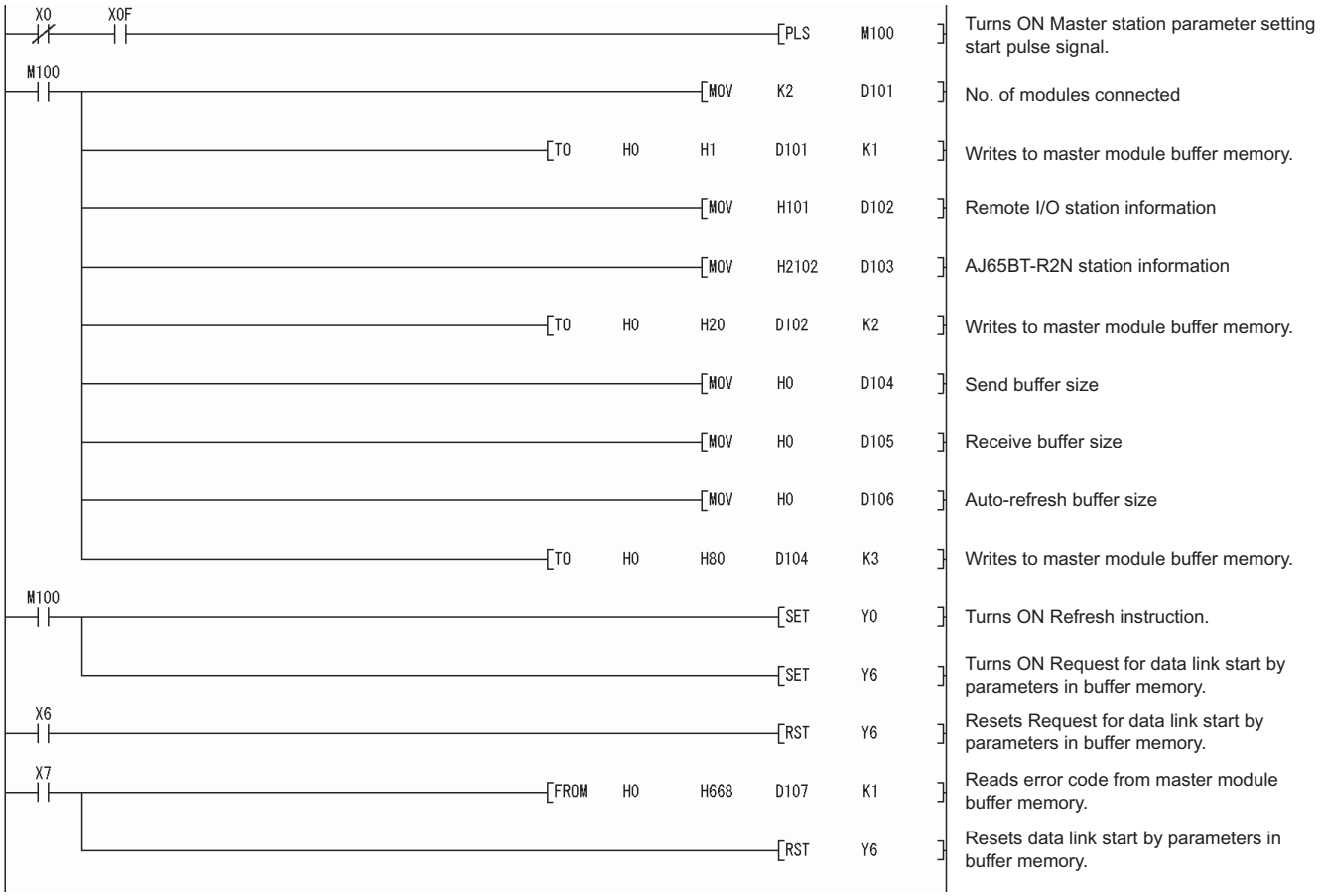


Figure 6.17 Program example when using FROM/TO instruction

Table 6.18 Parameter setting for using FROM/TO instruction

Item		Set value		
Number of stations connected for communication		2		
Slave station setting information		**Slave station information**	**No. of occupied slave stations**	**Station No.**
	Remote I/O station	0 (Remote I/O station)	1	1
	AJ65BT-R2N	2 (Intelligent device station)	1	2

6.3.3 Connection target setting

Set the connection target by [Transfer Setup] of GX Developer.

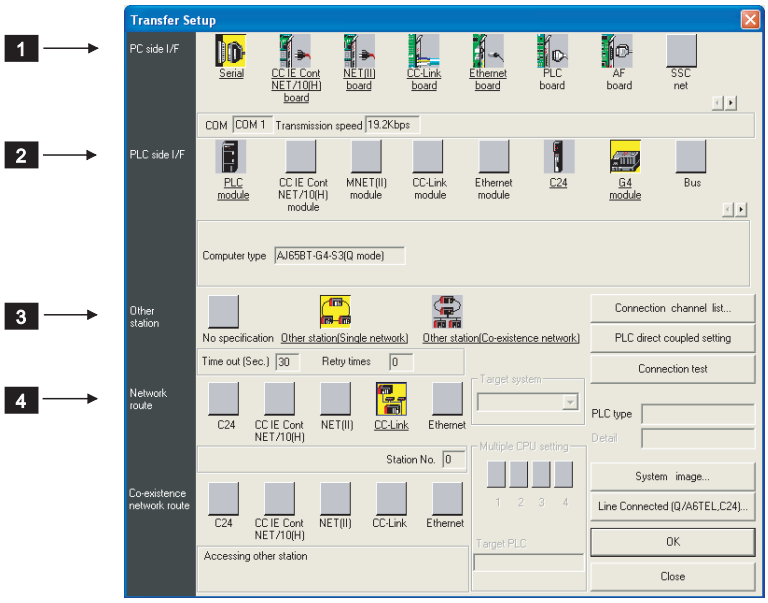


Figure 6.18 [Transfer Setup] dialog box

Table 6.19 Connection target setting

No.	Setting item	Setting	Detailed setting
1	PC side I/F	Serial	PC-side IF Serial setting •COM port: COM1 •Transmission speed: 19.2kbps
2	PLC side I/F	G4 module	PLC side I/F detailed setting of G4 module •Model (mode): AJ65BT-G4-S3 (Q mode)
3	Other station specification	Other station (Single network)	Other station Detailed setting •Check at communication time: 30 seconds •Retry times: 0 time
4	Network route	CC-Link	Network communication route Detailed setting of CC-Link •Station No.: 0

Point

Be sure to select AJ65BT-G4-S3 (Q mode) for the model of [PLC side I/F detailed setting of G4 module].

CHAPTER 7 TROUBLESHOOTING

This chapter describes the troubleshooting procedures and error codes of the AJ65BT-R2N.
For troubleshooting and error codes, check the modules in the following order.

(1) Programmable controller CPU used
For troubleshooting and error codes, refer to the following.
☞User's manual for the programmable controller CPU used

(2) Master module used
For troubleshooting and error codes, refer to the following.
☞User's manual for the master module used

(3) AJ65BT-R2N
For troubleshooting and error codes, refer to the following.
☞Section 7.1 Troubleshooting When Using the MELSOFT Connection Function
Section 7.2 Error Code List

7.1 Troubleshooting When Using the MELSOFT Connection Function

(1) Troubleshooting list

The following is a troubleshooting list of the AJ65BT-R2N.

Table 7.1 Troubleshooting list

Symptom	Cause	Action
RUN LED turned OFF.	Incorrect switch setting	•Correct the switch setting. ☞Section 5.4 Part Names and Settings •Check if all of the RS-232 transmission setting switches are set to OFF.
	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.
Unable to operate programmable controller CPU from the engineering tool.	A CC-Link communication error has occurred.	•Check the indicator LEDs and take corrective actions.
	The RS-232 cable is not properly connected between the AJ65BT-R2N and engineering tool.	•Correct the RS-232 cable connection.
	Incorrect switch setting	•Correct the switch setting. ☞Section 5.4 Part Names and Settings •Check if the Mode setting switch is set to 5, and the RS-232 transmission setting switches are set to all OFF.

(Continued to next page)

(From previous page)

Table 7.1Troubleshooting list (Continued)

Symptom	Cause	Action
Unable to operate programmable controller CPU from the engineering tool.	Unable to access from the engineering tool to the programmable controller CPU.	•When an error message, "Cannot communicate with the PLC." is displayed in the engineering tool, check the following. •Check if the specified target station No. is correct. •Check the RS-232 cable connected between the AJ65BT-R2N and GX Developer for any fault. •When the AJ61BT11 or A1SJ61BT11 is used, confirm the restrictions on the use of the MELSOFT connection mode. ☞Section 4.2 (3) Precautions for use of the MELSOFT connection function •When the access target is AJ61BT11 or A1SJ61BT11, check if the condition setting switch, SW8 is set to OFF (Intelli. mode).
	Some settings in the engineering tool are not correct.	•If an error message meaning the following is displayed in the engineering tool, check the station No. setting for the access target. •Password has not been changed. •Unable to receive data from the programmable controller. (Timeout) •The programmable controller type is different. •When an online operation is not possible in the correct setting, or when an error message other than the above is displayed, refer to the following manual and take corrective actions. ☞Operating manual for the engineering tool used
When using AJ61BT11 or A1SJ61BT11, access to programmable controller from GX Developer connected to AJ65BT-R2N generates communication error.	The programmable controller CPU has frequently executed FROM/TO instructions to the buffer memory of the AJ61BT11 or A1SJ61BT11.	•In the case of access to the buffer memory of the AJ61BT11 or A1SJ61BT11, add a contact to the FROM/TO instruction so that the input signal (XnC) to the module is OFF.
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 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

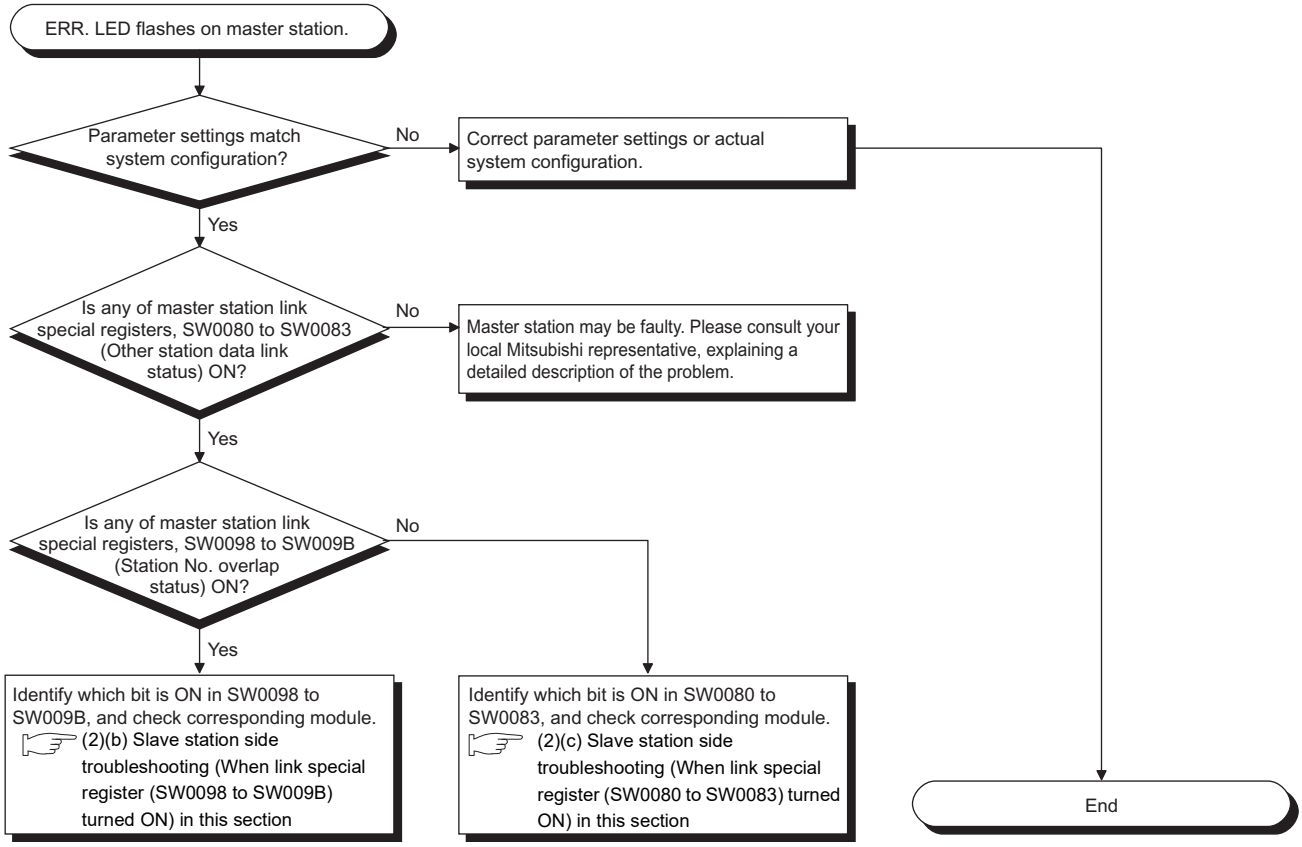


Figure 7.1 Troubleshooting when the master station's ERR. LED flashes

(b) Slave station side troubleshooting (When link special register (SW0098 to SW009B) turned ON)

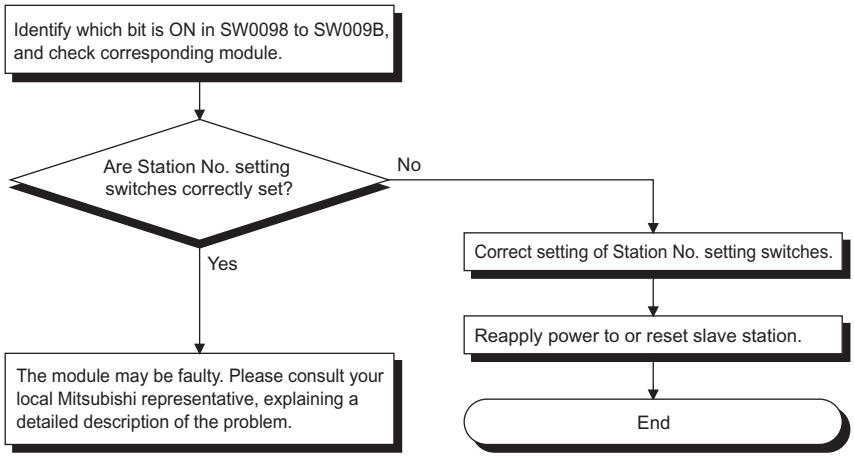


Figure 7.2 When link special register (SW0098 to SW009B) turned ON

(c) Slave station side troubleshooting (When link special register (SW0080 to SW0083) turned ON)

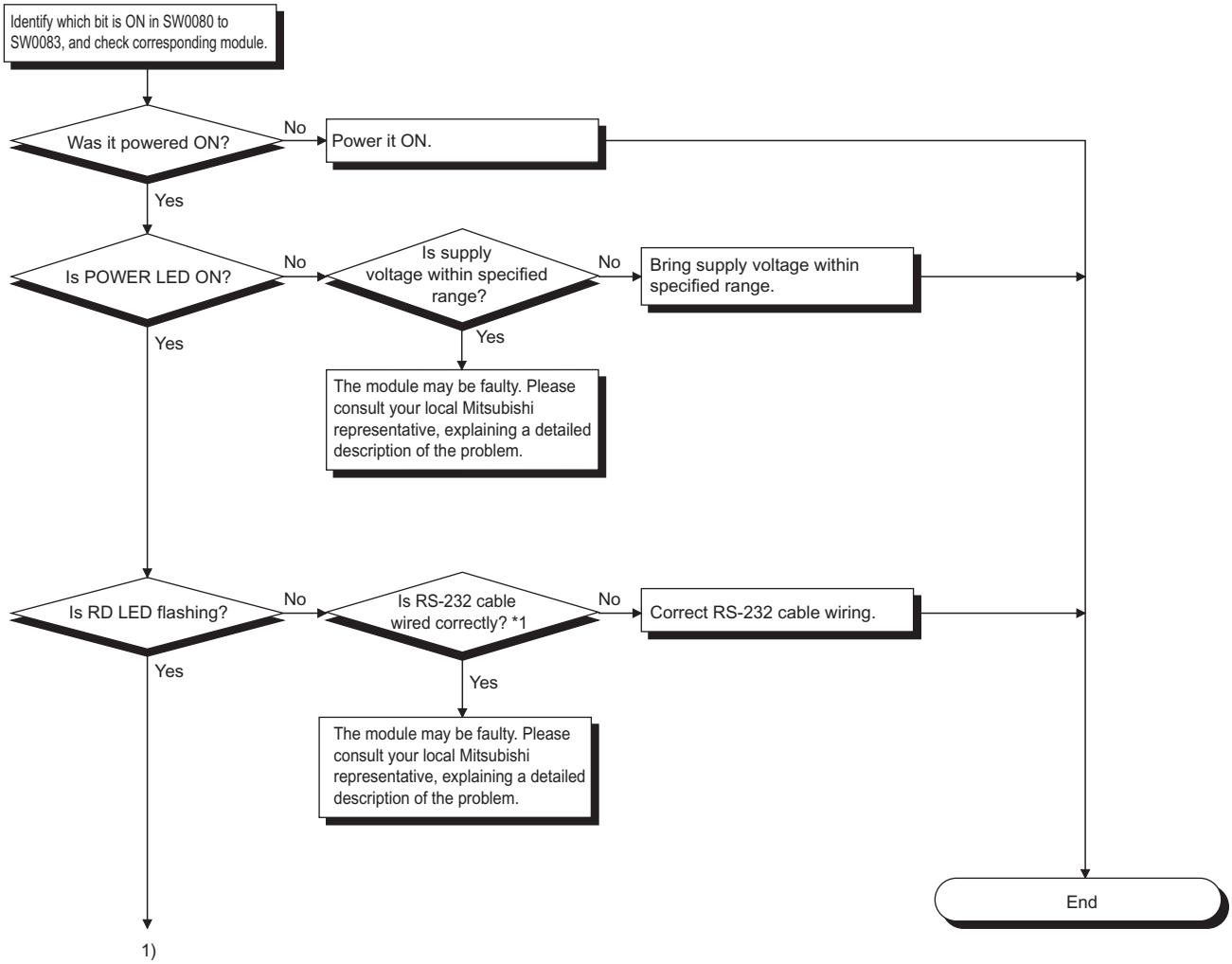


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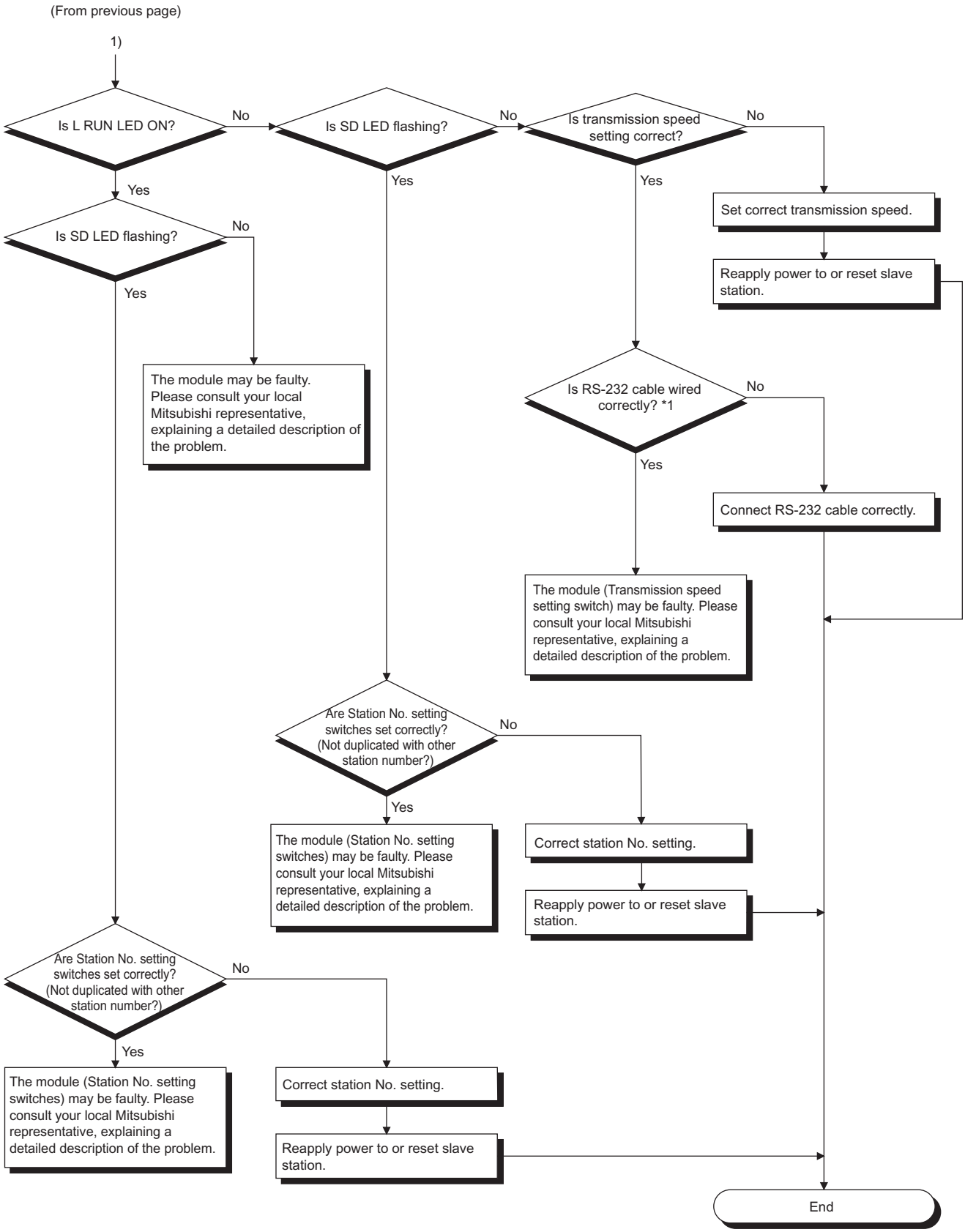
Figure 7.3 When link special register (SW0080 to SW0083) turned ON



*1 Check for short circuit, reverse connection, disconnection, terminating resistor, FG connection, overall cable distance, and block distance.

Figure 7.3 When link special register (SW0080 to SW0083) turned ON (Continued)

7.2 Error Code List

This section explains the error codes of the AJ65BT-R2N.

(1) How to check an error code
Check an error code in the completion status of a dedicated instruction.

(2) Error code list
The following list shows only the error code that may occur in MELSOFT connection mode.

Table 7.2 Error code list

Error code	Error name	Cause	Action
$BB43_H$	MELSOFT connection mode command error	In MELSOFT connection mode, a write command to the buffer memory was received.	•Do not write data to the buffer memory in MELSOFT connection mode. •Change the mode of the AJ65BT-R2N to Nonprocedural protocol mode.

APPENDICES

Appendix 1 Differences between AJ65BT-R2N and AJ65BT-G4-S3

Appendix 1.1 Specifications comparisons

In this section, the performance specifications, applicable software packages and functions are compared between the AJ65BT-R2N and AJ65BT-G4-S3.

(1) Performance specifications comparisons

The table below shows performance specifications comparisons between the AJ65BT-R2N and AJ65BT-G4-S3.

Table App.1 Performance specifications comparisons

Item		AJ65BT-R2N	AJ65BT-G4-S3
Interface		RS-232 compliant (D-Sub 9P)	RS-422 compliant
Communication method		Full-duplex communication method	
Synchronization method		Asynchronous method	
Transmission speed		9600, 19200, 38400, 57600, 115200 (bps)	9600, 19200, 38400 (bps) (Selected by operation setting DIP switch)
Transmission distance		Up to 15m	Up to 30m (When using AC300R4)
Data format	Start bit	1	
	Data bit	8	
	Parity bit	1 (Vertical parity)	
	Stop bit	1	
Error detection	Parity check	Checked (Odd)	
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)	
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 1 μs, 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)	24VDC (15.6V to 28.8V)
		Current consumption: 0.11A	Current consumption: 0.19A
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	0.36kg

(2) Applicable software packages

The applicable software packages are compared between the AJ65BT-R2N and AJ65BT-G4-S3 as shown below.

Table App.2 Applicable software packages

External device		Applicable software packages	AJ65BT-R2N	AJ65BT-G4-S3
Personal computer	Windows®-based	GX Works2	○	○
		GX Developer (Version 6 or later)	○	○
		GX Developer (Version 5 or earlier)	×	
	IBM PC/AT	SWnIVD-GPPA (n = 2 to 4)	×	○
		SWnIVD-GPPQ (n = 0 to 2)		

○ : Applicable, × : N/A

(3) Function comparisons

The table below shows function comparisons between the AJ65BT-R2N and AJ65BT-G4-S3.

Table App.3 Function comparisons

Function	AJ65BT-R2N	AJ65BT-G4-S3	Changes from AJ65BT-G4-S3
Nonprocedural protocol mode	○	×	*1
MELSOFT connection mode	△	○	Changes in applicable software packages ☞Appendix 1.1 (2) Applicable software packages

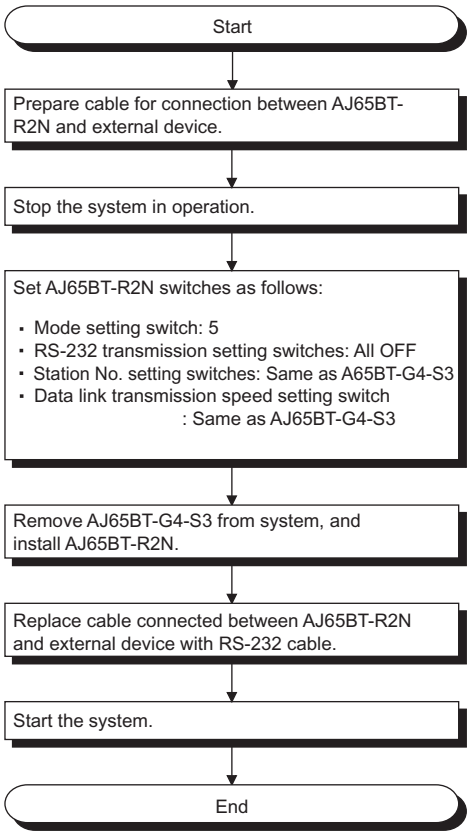
○ : Available, △ : Partially restricted, × : N/A

* 1 For details, refer to the following manual.

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

Appendix 1.2 Procedures and precautions for replacing AJ65BT-G4-S3 with AJ65BT-R2N

(1) Procedures for replacing AJ65BT-G4-S3 with AJ65BT-R2N



· · · Section 5.4 Part Names and Settings

Figure App.1 Procedures for replacing AJ65BT-G4-S3 with AJ65BT-R2N

Point

There is no need to change the parameter settings of the master station.

(2) Precautions for replacing AJ65BT-G4-S3 with AJ65BT-R2N

(a) Use the engineering tool for the external device.

(b) The AJ65BT-G4-S3 can be replaced with the AJ65BT-R2N only when it can be used in Q mode.
If QnA or A mode has been used in the AJ65BT-G4-S3, set the AJ65BT-R2N into Q mode.

(c) Use an RS-232 cable for connection between the AJ65BT-R2N and external device.

Appendix 2 External Dimensions

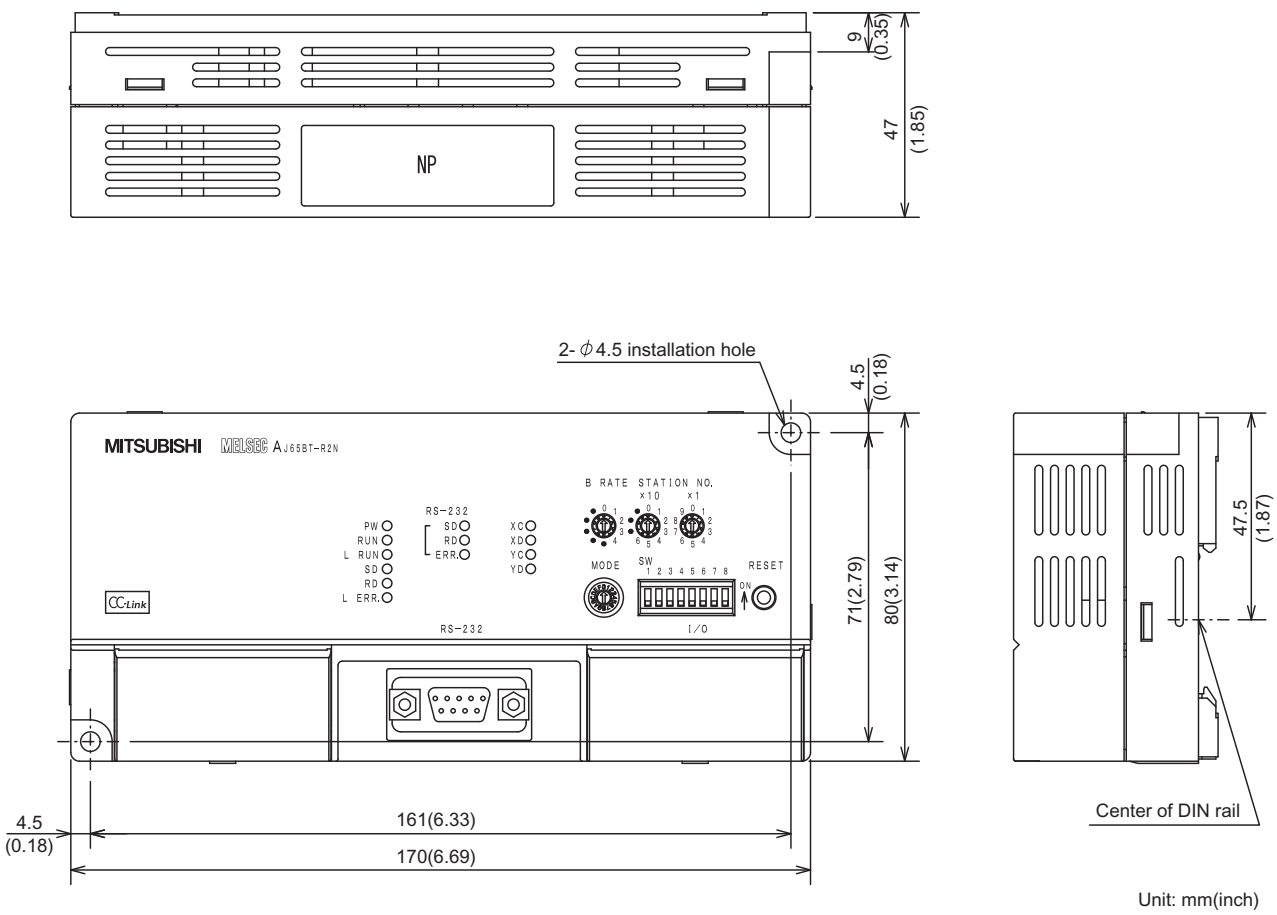


Figure App.2 External dimensions

Appendix 3 RS-232 Interfaces Used for the AJ65BT-R2N

The connectors listed below are used as RS-232 interface connectors.

Table App.4 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

Memo

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)-080687ENG-D

SH(NA)-080687ENG-D(2001)MEE
MODEL: AJ65BT-R2N-U-MEL-E
MODEL CODE: 13JZ01

MITSUBISHI ELECTRIC CORPORATION

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NAGOYA WORKS : 1-14 , YADA-MINAMI 5-CHOME , HIGASHI-KU, NAGOYA , JAPAN

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Specifications subject to change without notice.