MITSUBISHI

CC-Link System RS-232 Interface Module

User's Manual
(Hardware)

AJ65BT-R2N

Thank you for purchasing the Mitsubishi programmable controller MELSEC-A series.

Prior to use, please read this and relevant manuals thorougly to fully understand the product.

MODEL	AJ65BT-R2N-U-HW
MODEL CODE	13JY30
IB(NA)-0800381-D(1112)MEE	

● 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. 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 instructions are ranked as " ⚠ WARNING" and " ⚠ CAUTION".

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

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

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

[Design Precautions]

⚠WARNING

- When controlling a running programmable controller (data modification) by connecting a peripheral to a CPU module or connecting a personal computer to an intelligent/special function module, create an interlock circuit on the sequence program so that the whole system will operate safely all the time. Also, before performing other controls (e.g. program modification, operating status change (status control)), read this manual carefully and ensure the safety.
  Especially, in the control from an external device to a programmable controller in a remote location, some programmable-controller-side problems cannot be resolved immediately due to a data communication failure.
  To prevent this, establish corrective procedures for communication failure between the external device and the programmable controller CPU, as well as creating an interlock circuit on the sequence program.
- In the case of a data link error, the operation status of a faulty station is as shown below. Using the communication status information, create an interlock circuit on the sequence program for the system to operate safely. Incorrect output or malfunction can lead to an accident.
  (1) All of general-purpose inputs from this module turn OFF.
  (2) All of general-purpose outputs from this module turn OFF.
- Depending on the module failure, inputs and outputs may turn ON or OFF incorrectly.
  For I/O signals that may cause a serious accident, provide an external monitoring circuit.

⚠CAUTION

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other.
  They should be installed 100 mm (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.
- 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.

[Wiring Precautions]

⚠CAUTION

- 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 cause a malfunction or failure of the module.

[Startup and 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.

[Startup and Maintenance Precautions]

⚠CAUTION
● 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 right of the cover.

Print Date	*Manual Number	Revision
May, 2007	IB(NA)-0800381-A	First edition
Oct., 2007	IB(NA)-0800381-B	Partially revised Section 2.2, Section 2.4.1, Section 2.4.2, Section 3.1
Sep., 2008	IB(NA)-0800381-C	Partially revised SAFETY PRECAUTIONS, Compliance with the EMC and Low Voltage Directives, Section 2.4.1, Section 2.5, Section 3.1
Dec., 2011	IB(NA)-0800381-D	Added SAFETY PRECAUTIONS (Chinese), CONDITIONS OF USE FOR THE PRODUCT Partially revised COMPLIANCE WITH EMC AND LOW VOLTAGE DIRECTIVES, Section 2.1

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)	SH-080685ENG (13JY00)
CC-Link System RS-232 Interface Module User's Manual (MELSOFT Connection Mode)	SH-080687ENG (13JZ01)

COMPLIANCE WITH EMC AND LOW VOLTAGE DIRECTIVES

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

1. OVERVIEW

This manual describes how to install and connect the AJ65BT-R2N CC-Link system RS-232 interface module (hereinafter referred to as AJ65BT-R2N).

(Packing list)

Table 1.1 Packing list

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

2. SPECIFICATIONS

2.1 General Specifications

Table 2.1 General specifications

<table>
<tr><th>Item</th><th colspan="5">Specification</th></tr>
<tr><td>Operating ambient temperature</td><td colspan="5">0 to 55℃</td></tr>
<tr><td>Storage ambient temperature</td><td colspan="5">-20 to 75℃</td></tr>
<tr><td>Operating ambient humidity</td><td colspan="5" rowspan="2">10 to 90%RH, non-condensing</td></tr>
<tr><td>Storage ambient humidity</td></tr>
<tr><td rowspan="8">Vibration resistance</td><td rowspan="8">Compliant with JIS B 3502 and IEC 61131-2</td><td colspan="3">Under intermittent vibration</td><td rowspan="2">Sweep count</td></tr>
<tr><td>Frequency</td><td>Constant acceleration</td><td>Half amplitude</td></tr>
<tr><td>5 to 8.4Hz</td><td>-</td><td>3.5mm</td><td rowspan="2">10 times each in X, Y, Z directions</td></tr>
<tr><td>8.4 to 150Hz</td><td>9.8m/s^2</td><td>-</td></tr>
<tr><td colspan="3">Under continuous vibration</td><td rowspan="2">Sweep count</td></tr>
<tr><td>Frequency</td><td>Constant acceleration</td><td>Half amplitude</td></tr>
<tr><td>5 to 8.4Hz</td><td>-</td><td>1.75mm</td><td rowspan="2">-</td></tr>
<tr><td>8.4 to 150Hz</td><td>4.9m/s^2</td><td>-</td></tr>
<tr><td>Shock resistance</td><td colspan="5">Compliant with JIS B 3502 and IEC 61131-2
(147 m/s^2, 3 times each in 3 directions X, Y, Z)</td></tr>
<tr><td>Operating atmosphere</td><td colspan="5">No corrosive gases</td></tr>
<tr><td>Operating altitude *1</td><td colspan="5">0 to 2000m</td></tr>
<tr><td>Installation location</td><td colspan="5">Inside a control panel</td></tr>
<tr><td>Overvoltage category *2</td><td colspan="5">II or less</td></tr>
<tr><td>Pollution degree *3</td><td colspan="5">2 or less</td></tr>
</table>

*1 Do not use or store the AJ65BT-R2N under pressure higher than the atmospheric pressure of altitude 0m. Doing so may cause malfunction. When using the AJ65BT-R2N under pressure, please consult your local Mitsubishi Electric representative.

*2 This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises.
Category II applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300V is 2500V.

*3 This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used.
Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

2.2 Performance Specifications

Table 2.2 Performance specifications

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

2.3 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 (http://www.cc-link.org/)

Remarks

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

2.4 RS-232 Interface Specifications

2.4.1 RS-232 connector specifications

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

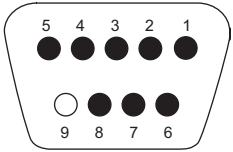


Figure 2.1 RS-232 connector(Seen from the front of the module)

Table 2.3 RS-232 connector specifications

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

Use the following model as a connector shell of the AJ65BT-R2N side connection cable.

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

2.4.2 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.)

2.5 General-purpose I/O Specifications

A terminal name of the general-purpose I/O terminal block and general-purpose output specifications have been changed from hardware version B.
For products of hardware version A, refer to the following manual.
☞CC-Link System RS-232 Interface Module User's Manual (Nonprocedural Protocol Mode)

(1) General-purpose I/O terminal block
The following explains the general-purpose I/O terminal block.

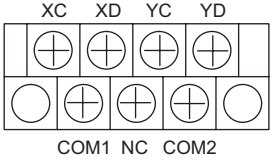
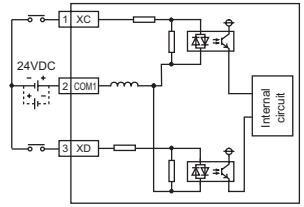


Figure 2.2 General-purpose I/O terminal block

(2) General-purpose input specifications

Table 2.4 General-purpose input specifications

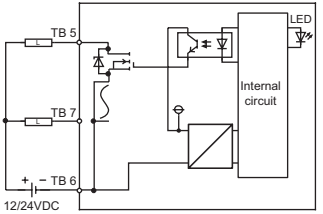
Item		DC input (Positive common/negative common shared type)				
		AJ65BT-R2N	External connection view			
No. of input points		2 points				
Insulation method		Photocoupler				
Rated input voltage		24V DC				
Rated input current		Approx. 7mA				
Operating voltage range		19.2 to 28.8V DC (Ripple ratio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

(3) General-purpose output specifications

Table 2.5 General-purpose output specifications

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

External connection view



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

3. IMPLEMENTATION AND INSTALLATION

3.1 Handling Precautions

POINT

For handling precautions on installation or removal of the module, read ●SAFETY PRECAUTIONS● provided at the beginning of this manual.

(1) Tighten the module installation screws within the following ranges.

Table 3.1 Screw tightening torque

Screw	Tightening toque range	Remarks
Module installation screw (M4)	0.78 to 1.18N•m	-
Terminal block terminal screw (M3.5)	0.59 to 0.88N•m	-
Terminal block installation 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 installation screw pitch
When installing a DIN rail, tighten the screws at a pitch of 200mm or less.

3.2 Installation Environment

(1) AJ65BT-R2N
For the AJ65BT-R2N installation environment, refer to the following.
☞Section 2.1 General Specifications

(2) CC-Link
For the installation environment for the CC-Link system, refer to the following.
☞User's Manual for the master module to be used

4. PART NAMES AND SETTINGS

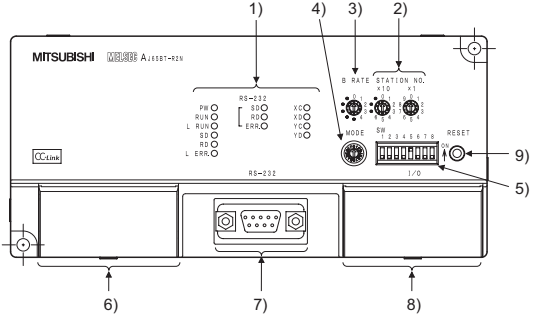
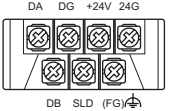


Figure 4.1 AJ65BT-R2N outline view

Table 4.1 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 switches	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

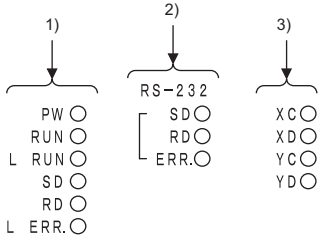


Figure 4.2 Indicator LEDs

Table 4.2 Indicator LEDs

LED		State	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

Table 4.2 Indicator LEDs (Continued)

	LED	State	Description
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

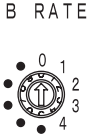


Figure 4.3 Data link transmission speed setting switch

Table 4.3 Data link transmission speed setting switch

Setting	Transmission speed
0*1	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps
•	Use prohibited

*1 Data link transmission speed setting switch at factory default setting is 0 (156kbps).

(3) Mode setting switch

Figure 4.4 Mode setting switch

Table 4.4 Mode setting switch

Setting	Name			Description
0*1	Nonprocedural protocol mode	For send/ receive buffer communication function	Mode 0	Communications are performed in Nonprocedural protocol mode. Set this when using the send/receive buffer communication function.
1		For buffer memory auto-refresh function	Mode 1	Communications are performed in Nonprocedural protocol mode. Set this when using the buffer memory auto-refresh function.
2			Mode 2	
3			Mode 3	
4			Mode 4	
5	MELSOFT connection mode			Used for communications with GX Developer.
6	Use prohibited			Setting error (RUN LED OFF)
7				
8				
9				
A				
B				Use prohibited
C				
D	Hardware test mode			Set this when conducting a hardware test.
E	Use prohibited			Setting error (RUN LED OFF)
F				

*1 Mode setting switch at factory default setting is 0 (Nonprocedural protocol mode).

(4) RS-232 transmission setting switches

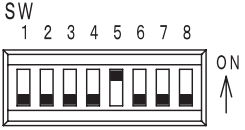


Figure 4.5 RS-232 transmission setting switches

Table 4.5 RS-232 transmission setting switches

Switch No.	Setting item	Switch status		Factory default setting
		ON	OFF	
SW1	Transmission speed	For details, refer to Table 4.6.		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 4.6 RS-232 transmission setting switches (SW1 to SW4)

Setting item		Switch No.			
		SW1	SW2	SW3	SW4
Transmission speed	300bps	OFF	OFF	OFF	OFF
	600bps	ON	OFF	OFF	OFF
	1200bps	OFF	ON	OFF	OFF
	2400bps	ON	ON	OFF	OFF
	4800bps	OFF	OFF	ON	OFF
	9600bps	ON	OFF	ON	OFF
	19200bps	OFF	ON	ON	OFF
	38400bps	ON	ON	ON	OFF
	57600bps	OFF	OFF	OFF	ON
	115200bps	ON	OFF	OFF	ON

POINT

(1) When MELSOFT connection mode is used, turn OFF SW1 to SW8.
If any of SW1 to SW8 is ON, the setting error (RUN LED is OFF) may occur.

(2) Unless data are sent concurrently from the AJ65BT-R2N and external-device sides in Nonprocedural protocol mode, communication at 57600bps or 115200bps is available.
If data is communicated simultaneously, the RS-232 receive overrun error ($BB23_H$) may occur.

POINT

For wiring of the module, refer to ●SAFETY PRECAUTIONS● provided at the beginning of this manual.

5.1 CC-Link Dedicated Cable Connection Method

The following shows how to connect the AJ65BT-R2N to a master module and a remote module with CC-Link dedicated cables.

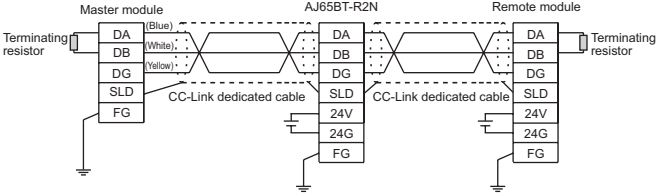


Figure 5.1 Connection between AJ65BT-R2N and master module

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.)

5.2 External Device Connection Method

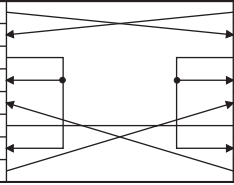
(1) Connection examples

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

Wire the CD signal line of the AJ65BT-R2N and external device as shown in Table 5.1.

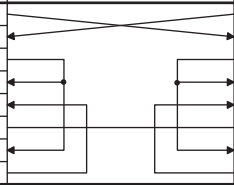
(a) Connection example where DC code control and DTR/DSR (ER/DR) control are executable

Table 5.1 DC code control and DTR/DSR (ER/DR) control

AJ65BT-R2N side (DTE)		Cable connection and signaling	External device (DTE)
Signal name	Pin No.		Signal name
SD	3		SD
RD	2		RD
RS	7		RS
CS	8		CS
DR	6		DR
SG	5		SG
CD	1		CD
ER	4		ER

(b) Connection example only DC code control is executable

Table 5.2 Connection example only DC code control is executable

AJ65BT-R2N side (DTE)		Cable connection and signaling	External device (DTE)
Signal name	Pin No.		Signal name
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 5.3 Precautions for connection

RS-232 cable	Connection method	Remarks
FG signal	Connected to the screw clamp of the AJ65BT-R2N side connector.	• Do not short-circuit the FG and SG signal lines of the RS-232 cable. • If the FG and SG signal lines are connected inside the external-device side, do not connect the FG signal line on the AJ65BT-R2N side to the external device.
Shield	Connected to the screw clamp of the AJ65BT-R2N side connector. (Not connected to external device)	

(b) When data communication cannot be performed normally due to external noise, connect the wires as follows:

1) Connect the FG terminals of both stations with the shield of the RS-232 cable.
For the external device side, refer to the handling instructions for the external device.
2) Each signal line (except for SG) must be twisted with the SG signal line.
3) FG of the AJ65BT-R2N is connected to the screw clamp of the connector, acting as FG of the module.

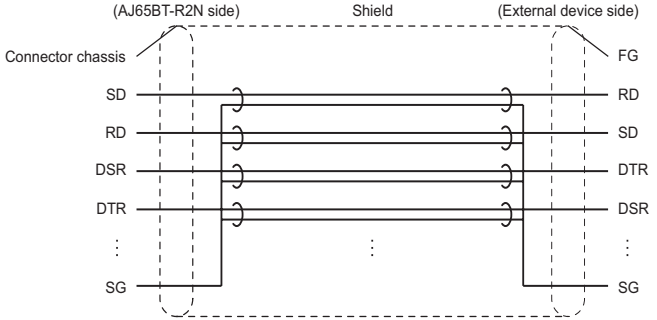
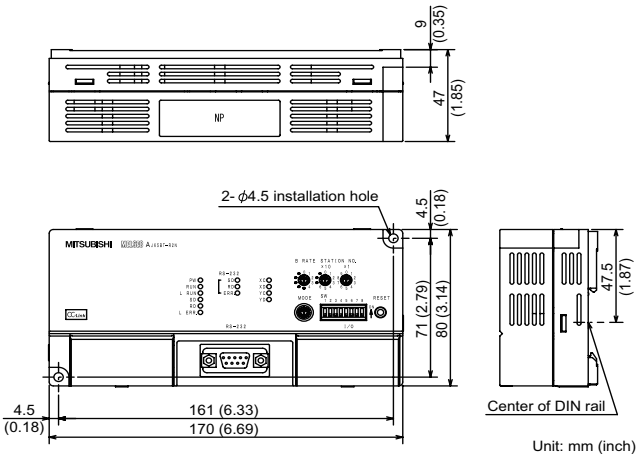


Figure 5.2 Precautions for connection

(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.

6. EXTERNAL DIMENSIONS



Unit: mm (inch)

Figure 6.1 External dimensions

MEMO

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