MITSUBISHI

Type AJ71UC24
Computer Link Module

MITSUBISHI

General-Purpose PROGRAMMABLE LOGIC CONTROLLER

User's Manual
(Hardware)

Thank you for buying the Mitsubishi general-purpose programmable logic controller MELSEC-A Series.

Prior to use, please read both this manual and detailed manual thoroughly and familiarize yourself with the product.

MODEL	AJ71UC24U-HW-E
MODEL CODE	13JE95

IB(NA)-66559-C (9810) MEE

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●SAFETY PRECAUTIONS●

(Read these precautions before using.)

When using Mitsubishi equipment, thoroughly read this manual and the associated manuals introduced in the manual. Also pay careful attention to safety and handle the module properly.
These precautions apply only to Mitsubishi equipment. Refer to the CPU module user's manual for a description of the PLC system safety precautions.
These ● SAFETY PRECAUTIONS ● classify the safety precautions into two categories: "DANGER" and "CAUTION".

⚠DANGER	**Procedures which may lead to a dangerous condition and cause death or serious injury if not carried out properly.**
⚠CAUTION	**Procedures which may lead to a dangerous condition and cause superficial to medium injury, or physical damage only, if not carried out properly.**

Depending on circumstances, procedures indicated by ⚠**CAUTION** may also be linked to serious results.
In any case, it is important to follow the directions for usage.
Store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.

[DESIGN PRECAUTIONS]

⚠DANGER

- When performing the control of the PLC in operation (especially changing data, program and operation status (status control)) by connecting a personal computer, etc. to the special function module, configure an interlock circuit in a sequence program so the safety of the overall system is always maintained.
  Particularly in the above described control for a remote site PLC from an external device, troubles occurring on the PLC side may not be immediately handled due to a data communication error. Construct an interlock circuit in the sequence program and determine between the external device and PLC the system's error handling procedure and other items regarding data communication errors.

[WIRING PRECAUTIONS]

⚠CAUTION

- Be sure that the communication cable connected to the module is kept in a duct or fixed with cramps.
  Failure to do so may cause a damage to the module or cables due to dangling, shifting or inadvertent handling of cables, or misoperation because of bad cable contacts.
- Before connecting the cables, check the type of interface to be connected.
  Connection, or erroneous wiring to the wrong interface may damage the module and external device.
- When connecting an external device to RS-422 interface of this module, do not connect a device that must receive power from this module.
  The module or external device may be damaged.
- Tighten the terminal screw within the range of specified torque.
  If the screws are loose it may result in short circuit or malfunction.
  Tightening the screws too far may cause damage to the screw and/or the module, resulting in fallout, short circuit or malfunction.
- Do not grab on the cable when removing the communication cable connected to the module.
  When removing the cable with a connector, hold the connector on the side that is connected to the module.
  When removing the cable without a connector, loose the screw on the side that is connected to the module.
  Pulling the cable that is still connected to the module may cause malfunction or damage to the module or cable due to bad cable contacts.
- Be sure there are no foreign substances such as sawdust or wiring debris inside the module.
  Such debris could cause fire, damage or malfunction.

⚠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 (3.9 inch) or more from each other.
  Not doing so could result in noise that would cause malfunction.

[INSTALLATION PRECAUTIONS]

⚠CAUTION

- Use the PLC in an environment that meets the general specifications contained in this manual.
  Using this PLC in an environment outside the range of the general specifications could result in electric shock, fire, malfunction, and damage to or deterioration of the product.
- Be sure to switch all phases of the external power supply off when installing or placing wiring.
  If you do not switch off the external power supply, it will cause electric shock or damage to the product.
- Insert the tabs at the bottom of the module into the mounting holes in the base module.
  If the module is not properly installed it may result in malfunction, failure or fallout.
- Tighten the screw within the range of specified torque.
  If the screw are loose, it may result in fallout, short circuit or malfunction.
  Tightening the screws too far may cause damage to the screw and /or the module, resulting in fallout, short circuit or malfunction.
- Do not directly touch the module's conductive parts or electronic components. Doing so could cause malfunction or failure in the module.
- Perform correct pressure-displacement, crimp-contact or soldering for wire connections using the tools specified by the manufactures.
  Attach connectors to the module securely.

[STARTING AND MAINTENANCE PRECAUTION]

⚠DANGER

- Do not touch the terminals while the power is on.
  Doing so may cause malfunction.
- Be sure to switch all phases of the external power supply off before cleaning or re-tightening screws.
  If the screws are loose, it may result in fallout, short circuit or malfunction.
  Tightening the screws too far may cause damage to the screws and/ or the module, resulting in fallout, short circuit or malfunction.

⚠CAUTION

- Do not diassemble or modify the modules.
  Doing so could cause failure, malfunction, injury or fire.
- Be sure to switch all phases of the external power supply off before mounting or removing the module.
  If you do not switch off the external power supply, it will cause failure or malfunction of the module.

[OPERATION PRECAUTIONS]

⚠DANGER

- Do not write data to the "system area" in the buffer memory of the special function module.
  Also, do not output (or turn on) a "use prohibited/cannot be used" signal from the PLC CPU to the special function module. If data is written to the "system area" or if the "use prohibited/cannot be used" signal is output, there is a risk that the PLC system will operate incorrectly.

⚠CAUTION

- Before performing the control of the PLC in operation(especially changing data, program and operation status(status control)) by connecting a personal computer, etc. to the special function module, read user's manual (Com. link func. / Print. func.) carefully and confirm if the overall safety is maintained.
  Failure to perform correct operations to change data, program or the status may result in system malfunction, machine damage or an accident.
- When the EEPROM within the module is used with the contents of the buffer memory registered inside, do not turn off the power to the station to which the module is mounted or reset the PLC CPU during registration.
  If the power to the station to which the module is mounted is turned off or the PLC CPU is reset during registration, the contents of the data inside the EEPROM will need to be registered again since they become inconsistent.
  A module failure or malfunction may also be caused by the above operations.

[DISPOSAL PRECAUTIONS]

⚠CAUTION

- When disposing the product, treat it as industrial waste.

About This Manual

The following product manuals are available. Please use this table as a reference to request the appropriate manual as necessary.

Related Manual

Manual Names	Manual No. (Model Code)
Computer Link Module Guide Book	SH-3510 (13JE76)
Computer Link Module (Com. link func. / Print. func.) User's Manual	SH-3511 (13JE77)

When using the computer link function of this module, be sure to read Computer Link Module User's Manual (Com. link func. / Print. func.) as well as this manual.

Correspondence to EMC DIRECTIVE

To make the PLCs compliant with the EMC directive, refer to Chapter 2 "EMC AND LOW-VOLTAGE DIRECTIVE" in the PLC user's manual (Hardware).

* When the PLC CPU user's manual (Hardware) does not include Chapter 2 "EMC AND LOW-VOLTAGE DIRECTIVE", refer to QnA Series CPU Compatible High-Speed Access Basic Base Unit Corresponding CPU EMC Conforming Product Additional Explanation (IB-68837) (optional).

1. Overview

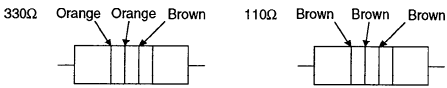
This manual is intended for installing the computer link module and performing wiring for external devices.

After unpacking the module, check that the following products are included:

Item name	Quantity
AJ71UC24 computer link module	1
Terminal resistor for RS-422 communication 330 Ω 1/4 W (orange-orange-brown [ ])	2
Terminal resistor for RS-485 communication 110 Ω 1/2 W (brown-brown-brown [ ])	2

* In the explanation hereafter, the computer link module is abbreviated as the "UC24."

* Differentiate the terminal resistors as follows:



2. Transmission Specifications

The following table indicates the transmission specifications when using the UC24 computer link function.

For general specifications of the UC24, see the user's manual for the CPU module used.

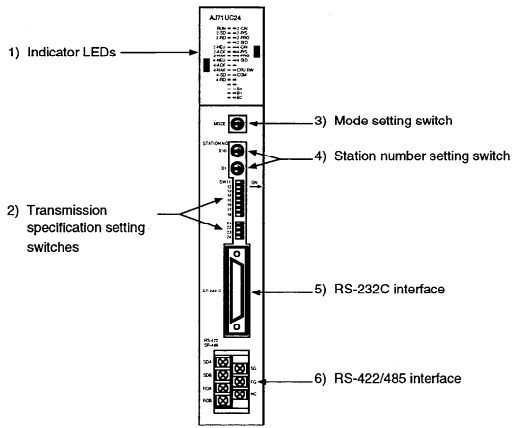
Item	Specification		
Interface	Conform to RS-232C		
	Conform to RS-422/485		
Transmission method	RS-232C	Dedicated protocol	Half duplex communication method *1
		No protocol/ Bidirectional	Full duplex or half duplex communication method (depends on the setting in the buffer memory)

<table>
<tr><th colspan="2">Item</th><th colspan="5">Specification</th></tr>
<tr><td colspan="2" rowspan="3">Transmission method</td><td rowspan="3">RS-422/485</td><td>Dedicated protocol</td><td colspan="3">Half duplex communication method *1</td></tr>
<tr><td rowspan="2">No protocol/ Bidirectional</td><td>1 : 1 connection</td><td colspan="2">Full duplex communication method</td></tr>
<tr><td>1 : n, m : n connection</td><td colspan="2">Half duplex communication method</td></tr>
<tr><td colspan="2">Synchronization system</td><td colspan="5">Start-stop synchronization</td></tr>
<tr><td colspan="2">Transmission speed</td><td colspan="5">300, 600, 1200, 2400, 4800, 9600, 19200 bps (Selected via the switch)</td></tr>
<tr><td rowspan="4">Data format</td><td>Start bit</td><td colspan="5">1</td></tr>
<tr><td>Data bit</td><td colspan="2">7 or 8</td><td colspan="3" rowspan="3">Selected via the switch</td></tr>
<tr><td>Parity bit</td><td colspan="2">1 or none</td></tr>
<tr><td>Stop bit</td><td colspan="2">1 or 2</td></tr>
<tr><td colspan="2">Access cycle</td><td colspan="5">Processing for one request is performed during the END processing of the sequence program. Therefore, the access cycle is one scan time.</td></tr>
<tr><td colspan="2" rowspan="2">Error detection</td><td colspan="5">Parity check yes (odd/even) or no</td></tr>
<tr><td colspan="5">Sum check yes or no</td></tr>
<tr><td colspan="2">DTR/DSR control (ER/DR)</td><td colspan="5" rowspan="2">Yes/No (select one or the other depending on the setting in the buffer memory). For RS-422/485, X ON/OFF (DC1/DC3) control only</td></tr>
<tr><td colspan="2">X ON/OFF control (DC1/DC3)</td></tr>
<tr><td colspan="2" rowspan="3">Line configuration (external device: PLC CPU)</td><td colspan="3">Dedicated protocol</td><td colspan="2">1 : 1, 1 : n, m : n</td></tr>
<tr><td colspan="3">No protocol</td><td colspan="2">1 : 1, 1 : n</td></tr>
<tr><td colspan="3">Bidirectional</td><td colspan="2">1 : 1</td></tr>
<tr><td colspan="2" rowspan="2">Transmission distance</td><td colspan="5">RS-232C 15m (49.2 ft.) or less</td></tr>
<tr><td colspan="5">RS-422/485 Overall distance 500m (1640.5 ft.) or less</td></tr>
<tr><td colspan="2">Current consumption</td><td colspan="5">5VDC 0.3A</td></tr>
<tr><td colspan="2">Occupied I/O points</td><td colspan="5">32 points *2</td></tr>
<tr><td colspan="2">Weight</td><td colspan="5">0.63 kg</td></tr>
</table>

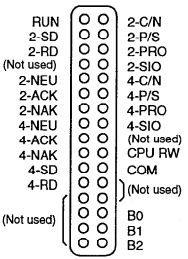
*1 When data communication can be performed using the full duplex transmission method, this transmission method is used whenever the on-demand function is used.

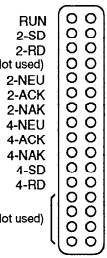
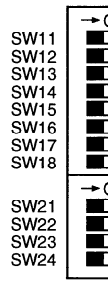
*2 When performing I/O assignment using the GPP function, set as special 32 points.
When using dedicated commands, register the model name as "AJ71UC24" if the PLC CPU to which the UC24 is mounted is AnUCPU and "AJ71C24S3" if it is AnACPU.

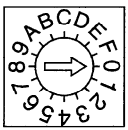
3. Name of Each Part and Setting

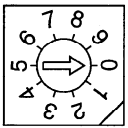


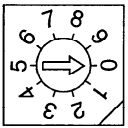
Number	Name	Contents	
1)	Indicator LEDs	RUN	Normal operation indicator Normal : lit Error : unlit
		2-SD	Transmission status on the RS-232C side Data being transmitted : flashing
		2-RD	Reception status on the RS-232C side Data being received : flashing
		2-NEU	Neutral status on the RS-232C side Transmission sequence initial status (waiting for ENQ) : lit ENQ reception complete : unlit
		2-ACK	ACK transmission status on the RS-232C side ACK transmitted : lit NAK transmitted : unlit
		2-NAK	NAK transmission status on the RS-232C side NAK transmitted : lit ACK transmitted : unlit

Number	Name	Contents	
1)	Indicator LEDs (continued)  	4-NEU	Neutral status on the RS-422/485 side Transmission sequence initial status (waiting for ENQ) : lit ENQ reception complete : unlit
		4-ACK	ACK transmission status on the RS-422/485 side ACK transmitted : lit NAK transmitted : unlit
		4-NAK	NAK transmission status on the RS-422/485 side NAK transmitted : lit ACK transmitted : unlit
		4-SD	Transmission status on the RS-422/485 side Data being transmitted : flashing
		4-RD	Reception status on the RS-422/485 side Data being received : flashing
		2-C/N	Result of communication between RS-232C side and PLC CPU Error in communication with the PLC CPU : lit Normal communication : unlit
		2-P/S	Parity/sum check error status on the RS-232C side Parity/sum check error : lit Normal : unlit
		2-PRO	Protocol error status on the RS-232C side Communication protocol error : lit Normal : unlit
		2-SIO	SIO error status on the RS-232C side Overrun, framing error : lit When received data has been discarded due to OS receive area full : lit Normal : unlit
		4-C/N	Result of communication between RS-422/485 side and PLC CPU Error in communication with the PLC CPU : lit Normal communication : unlit
		4-P/S	Parity/sum check error status on the RS-422/485 side Parity/sum check error : lit Normal : unlit

<table>
<tr><th>Number</th><th>Name</th><th colspan="3">Contents</th></tr>
<tr><td>1)</td><td>Indicator LEDs (continued)
 
</td><td>4-PRO</td><td colspan="2">Protocol error status on the RS-422/485 side
Communication protocol error : lit
Normal : unlit</td></tr>
<tr><td></td><td></td><td>4-SIO</td><td colspan="2">SIO error status on the RS-422/485 side
Overrun, framing error : lit
When received data has been discarded due to OS receive area full : lit
Normal : unlit</td></tr>
<tr><td></td><td></td><td>CPUR/W</td><td colspan="2">Status of communication with PLC CPU</td></tr>
<tr><td></td><td></td><td>COM</td><td colspan="2">Function selection
Computer link : lit
Multi-drop link : unlit</td></tr>
<tr><td></td><td></td><td>B0
B1
B2</td><td colspan="2">Transmission speed setting status See *1</td></tr>
<tr><td>2)</td><td>Transmission specification setting switches
 
</td><td colspan="3">Transmission specification settings (all are OFF at the time of shipment)
<table><tr><th>SW</th><th>Setting item</th><th colspan="2">Status</th></tr><tr><th></th><th></th><th>OFF</th><th>ON</th></tr><tr><td>11</td><td>Main channel setting</td><td>RS-232C</td><td>RS-422/485</td></tr><tr><td>12</td><td>Data bit setting</td><td>7 bits</td><td>8 bits</td></tr><tr><td>13
14
15</td><td>Transmission speed setting</td><td colspan="2">See *1</td></tr><tr><td>16</td><td>Setting for the use of parity bit</td><td>No</td><td>Yes</td></tr><tr><td>17</td><td>Even/odd parity setting</td><td>Odd</td><td>Even</td></tr><tr><td>18</td><td>Stop bit setting</td><td>1 bit</td><td>2 bits</td></tr><tr><td>21</td><td>Setting for the use of sum check</td><td>No</td><td>Yes</td></tr><tr><td>22</td><td>Setting for write during RUN</td><td>Disabled</td><td>Enabled</td></tr><tr><td>23</td><td>Computer link/multi-drop link selection</td><td>Setting prohibited</td><td>Computer link</td></tr><tr><td>24</td><td>Not used</td><td>——</td><td>——</td></tr></table></td></tr>
</table>

<table>
<tr><th>Number</th><th>Name</th><th>Contents</th></tr>
<tr><td>3)</td><td>Mode setting switch
 

MODE</td><td>Mode setting (set to 0 at the time of shipment)
<table>
<tr><th>Mode</th><th colspan="2">Setting contents</th></tr>
<tr><th></th><th>RS-232C side</th><th>RS-422/485 side</th></tr>
<tr><td>0</td><td colspan="2">Use prohibited</td></tr>
<tr><td>1</td><td>Type 1 dedicated protocol mode</td><td rowspan="4">NO protocol mode
* Bidirectional mode
communication is possible by
setting to the buffer memory</td></tr>
<tr><td>2</td><td>Type 2 dedicated protocol mode</td></tr>
<tr><td>3</td><td>Type 3 dedicated protocol mode</td></tr>
<tr><td>4</td><td>Type 4 dedicated protocol mode</td></tr>
<tr><td>5</td><td rowspan="4">NO protocol mode
* Bidirectional mode
communication is possible by
setting to the buffer memory</td><td>Type 1 dedicated protocol mode</td></tr>
<tr><td>6</td><td>Type 2 dedicated protocol mode</td></tr>
<tr><td>7</td><td>Type 3 dedicated protocol mode</td></tr>
<tr><td>8</td><td>Type 4 dedicated protocol mode</td></tr>
<tr><td>9</td><td colspan="2">No protocol ⟷ No protocol</td></tr>
<tr><td>A</td><td>Type 1 dedicated protocol mode</td><td>⟷ Type 1 dedicated protocol mode</td></tr>
<tr><td>B</td><td>Type 2 dedicated protocol mode</td><td>⟷ Type 2 dedicated protocol mode</td></tr>
<tr><td>C</td><td>Type 3 dedicated protocol mode</td><td>⟷ Type 3 dedicated protocol mode</td></tr>
<tr><td>D</td><td>Type 4 dedicated protocol mode</td><td>⟷ Type 4 dedicated protocol mode</td></tr>
<tr><td>E</td><td colspan="2">Use prohibited</td></tr>
<tr><td>F</td><td colspan="2">For module test</td></tr>
</table></td></tr>
<tr><td>4)</td><td>Station number setting switch
 

×10
 

×1</td><td>Module station number setting (set to 00 at time of shipment)
<Setting range>
00 to 31
X10 set the station number ten's place
X1 set the station number unit's place</td></tr>
<tr><td>5)</td><td>RS-232C interface</td><td>RS-232C interface for external device connection</td></tr>
<tr><td>6)</td><td>RS-422/485 interface</td><td>RS-422/485 interface for external device connection</td></tr>
</table>

*1 Transmission speed settings and indication of setting status

Indicator LED's	Setting switch	Transmission speed (unit: bps)						
		300	600	1200	2400	4800	9600	19200
B0	SW13	OFF	ON	OFF	ON	OFF	ON	OFF
B1	SW14	OFF	OFF	ON	ON	OFF	OFF	ON
B2	SW15	OFF	OFF	OFF	OFF	ON	ON	ON

LED: OFF = unlit, ON = lit

Point

(1) When using the computer link function, always set the SW23 of the transmission mode setting switch (2), to ON.
The SW23 and SW24 functions are different between the AJ71UC24 and AJ71C24-S8.

Switch number	AJ71UC24	AJ71C24-S8
SW23	Computer link/multi-drop link selection	Setting for the availability of a terminal resistor on the transmission side
SW24	Not used	Setting for the availability of a terminal resistor on the reception side

(2) When an external device is connected to only one or the other of the UC24 interfaces, always set the mode setting switch at between "1" and "8" in accordance with the mode used and the target interface.

4. Loading and Installation

This section explains precautionary items regarding handling of the UC24 from unpacking up to installation, and the installation environment that are common to all modules.

See the user's manual for the PLC CPU module used for further details regarding module loading and installation.

4.1 Precautionary Items when Handling

The following explains precautionary items when handling the module:

(1) Do not drop or apply severe shock to the module case since it is made of resin.

(2) Tighten the module installation screws within the specified torque range as follows:

Screw Area	Tightening Torque Range
RS-422 / 485 terminal block terminal screws (M3.5 screw)	59 to 88N • cm {6 to 9kgf • cm} (5.2 to 7.8lb • inch)
Module installation screws (M4 screw)	78 to 118N • cm {8 to 12kgf • cm} (6.9 to 10.4lb • inch)
RS-422 / 485 terminal block installation screws (M3.5 screw)	49 to 78N • cm {5 to 8kgf • cm} (4.3 to 6.9lb • inch)
RS-232C connector installation screws (M2.6 screw)	19 to 24N • cm {1.9 to 2.4kgf • cm} (1.7 to 2.0lb • inch)

4.2 Installation Environment

Avoid the following conditions for the installing location of the A Series PLC:

(1) Location where the ambient temperature exceeds the range of 0 to 55 °C.

(2) Location where the ambient humidity exceeds the range of 10 to 90% RH.

(3) Location where condensation occurs due to a sudden temperature change.

(4) Location where corrosive or inflammable gas exists.

(5) Location where a lot of conductive powdery substance such as dust and iron filing, oil mist, salt, or organic solvent exists.

(6) Location exposed to direct sunlight.

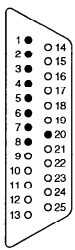
(7) Location where strong electric fields or magnetic fields form.

(8) Location where vibration or impact is directly applied to the main unit.

5. External Wiring

5.1 Connecting to the RS-232C

The standard method for connecting the RS-232C line is shown below:



Pin No.	Name	Signal abbreviation	Signal direction UC24 ↔ Computer
1	Frame ground	FG	← →
2	Transmission data	SD (TXD)	→
3	Reception data	RD (RXD)	←
4	Transmission request	RS (RTS)	→
5	Transmission possible	CS (CTS)	←
6	Data set ready	DSR (DR)	←
7	Signal ground	SG	← →
8	Receive carrier detected	CD	←
20	Data terminal ready	DTR (ER)	→

The following model of RS-232C connectors are used. Use connectors which are compatible with these on the opposite side.

D-sub 25 pin (female), screw type

17L-10250-27-D9AC manufactured by Daiichi Denshi Kogyo (DDK)

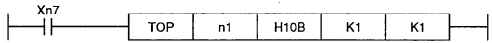
(1) Example of a connection to an external device capable of turning on/off the CD signal (pin No. 8)

UC24		Cable connection and signal direction (example)	External device
Signal name	Pin No.		Signal Name
FG	1		FG
SD (TXD)	2		SD (TXD)
RD (RXD)	3		RD (RXD)
RS (RTS)	4		RS (RTS)
CS (CTS)	5		CS (CTS)
DSR (DR)	6		DSR (DR)
SG	7		SG
CD	8		CD
DTR (ER)	20		DTR (ER)

(2) Example of a connection to an external device which cannot turn on/off the CD signal (pin No. 8 pin)

When connecting to a device which cannot turn on/off the CD signal, use the "not performed" setting at the buffer memory address 10BH (setting for whether or not to perform CD terminal check for the RS-232C).

(Setting example)



(a) Example of external wiring under DC code control or DTR/DSR control

UC24		Cable connection and signal direction (example)	External device
Signal name	Pin No.		Signal name
FG	1		FG
SD (TXD)	2		SD (TXD)
RD (RXD)	3		RD (RXD)
RS (RTS)	4		RS (RTS)
CS (CTS)	5		CS (CTS)
DSR (DR)	6		DSR (DR)
SG	7		SG
CD	8		CD
DTR (ER)	20		DTR (ER)

(b) Example of external wiring under DC code control

UC24		Cable connection and signal direction (example)	External Device
Signal name	Pin No.		Signal name
FG	1		FG
SD (TXD)	2		SD (TXD)
RD (RXD)	3		RD (RXD)
RS (RTS)	4		RS (RTS)
CS (CTS)	5		CS (CTS)
DSR (DR)	6		DSR (DR)
SG	7		SG
CD	8		CD
DTR (ER)	20		DTR (ER)

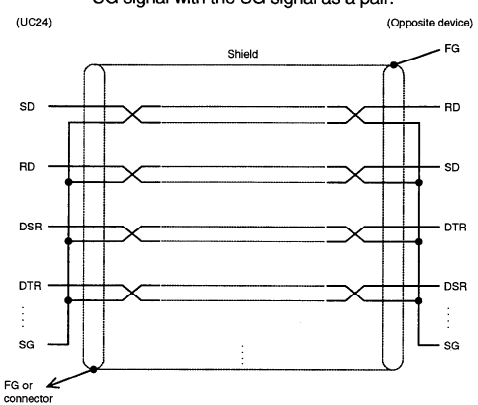
(3) Precautionary items when wiring

1) Treat the FG signal and shield of the connection cable as indicated below:

	Connection method	Remarks
FG signal	Connect to the FG signal on the UC24 side.	• Do not short the FG signal and SG signal of the connector cable. • When the FG signal and SG signal are internally connected in the external device, do not connect the UC24's FG signal to the external device.
Shield	Connect to the FG signal on the UC24 side. (Do not connect to the external device.)	

2) If data communication cannot be performed normally due to external noise even if the wiring is done as described above, perform wiring as follows:

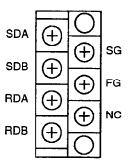
- Connect the FG terminal of the external device and the FG signal of the UC24 using the connector cable shield. As for the connection on the external device, follow the instruction manual for the external device.
- Connect all signals of the connection cable except for the SG signal with the SG signal as a pair.



3) Do not connect an RS-422 device to the RS-232C interface. If an RS-422 device is connected to the RS-232C interface, the RS-422 interface hardware for the connected device will be damaged and communications cannot be performed.

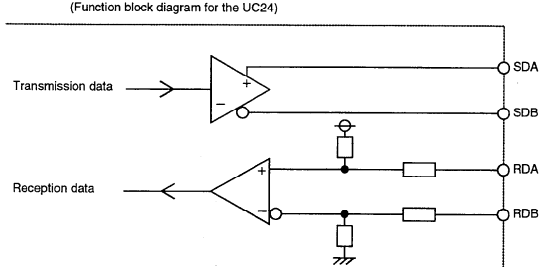
5.2 Connecting to the RS-422/485

The standard method for connecting the RS-422/485 line is shown below:



Signal abbreviation	Signal direction UC24 ⟷ Computer	Description
SDA	→	Transmission data
SDB	→	Transmission data
RDA	←	Reception data
RDB	←	Reception data
SG	⟷	Signal ground
FG	⟷	Frame ground
NC	—	Vacancy

(Function block diagram for the UC24)



Point

If the UC24 serves as the first or the last station on the RS-422/485 line, connect a terminal resistor as shown below to the RS-422/485 interface according to the communication specification.

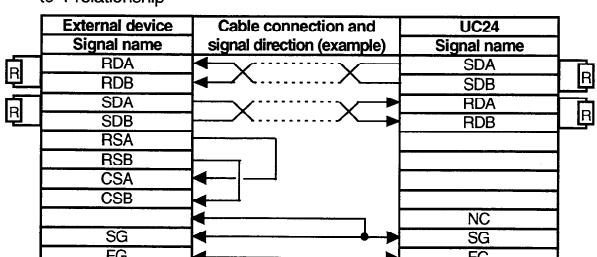
When a terminal resistor is not connected, an error may result during data communication.

- For RS-422 communication ····· 330 Ω, 1/4W
- For RS-485 communication ····· 110 Ω, 1/2W

(1) When an external device and the UC24 are connected in 1-to-1 or 1-to-n relationship, connect a terminal resistor between SDA and SDB as well as between RDA and RDB.

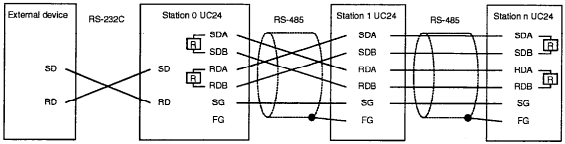
(2) When an external device and UC24 are connected in m-to-n relationship, connect a terminal resistor between RDA and RDB. The R in the following wiring diagram represents a terminal resistor.

(1) Example when an external device and UC24 are connected in 1-to-1 relationship

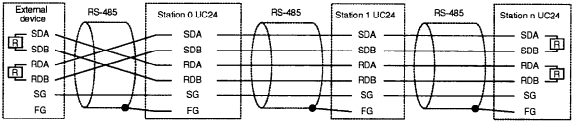


(2) Example when an external device and UC24 are connected in 1 : n relationship

1) Connecting the external device and UC24 modules via RS-232C

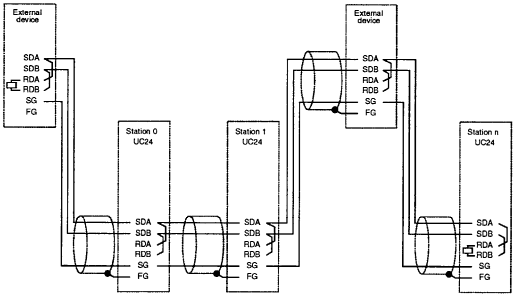


2) Connecting the external device and UC24 modules via RS-485



(3) Example of connecting external devices and UC24 by m : n

* Connecting external devices and UC24 modules via RS-485



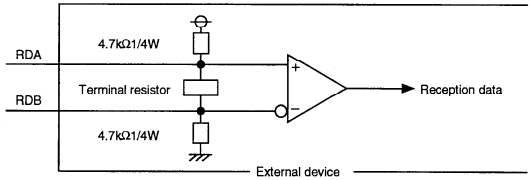
Point

See Section 5.1 for a connection example between external devices and UC24 modules in m-to-n relationship via RS-232C.

(4) Countermeasure for data reception errors in the external device with the RS-422 or RS-422/485 connection

During data communication with external devices via UC24 RS-422/485 interface , if there is a possibility that the external device receives an error data, install pull-up and pull-down resistors to the external device side (about 4.7kΩ, 1/4 W as a reference of resistor value).

Installation of pull-up and pull-down resistors will prevent data reception errors.



Point

Installation of pull-up and pull-down resistors will prevent data reception errors.

Remarks

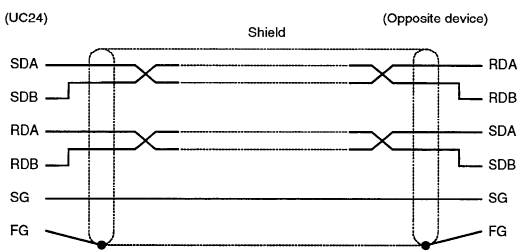
The following explains the case in which pull-up and pull-down resistors are not installed to the external device:

1) When none of the stations are receiving, the transmission line is in a state of high impedance, causing the transmission line to become unstable due to noise and a possibility that the data will be received incorrectly at the external device.
   When this happens, a parity error or framing error is likely to occur. Therefore, skip the data when the error has occurred.

2) For data communication using the dedicated protocol, the first data will be determined based on the format used by the user. Skip the data received prior to the first data as determined.

(5) Precautionary items when wiring

1) When connecting the SG and FG signals of the UC24 to an external device, follow the specification of the external device.
2) Connect the connector cable shield to either one of the FG terminals on the connected device.
3) If data communication cannot be performed normally due to external noise even if the wiring is done as described above, perform wiring as follows:
   - Connect the FGs of both stations using the connector cable shield. As for the connection on the external device, follow the instruction manual for the external device.
   - Connect nnA and nnB in each signal of the connector cable as a pair.

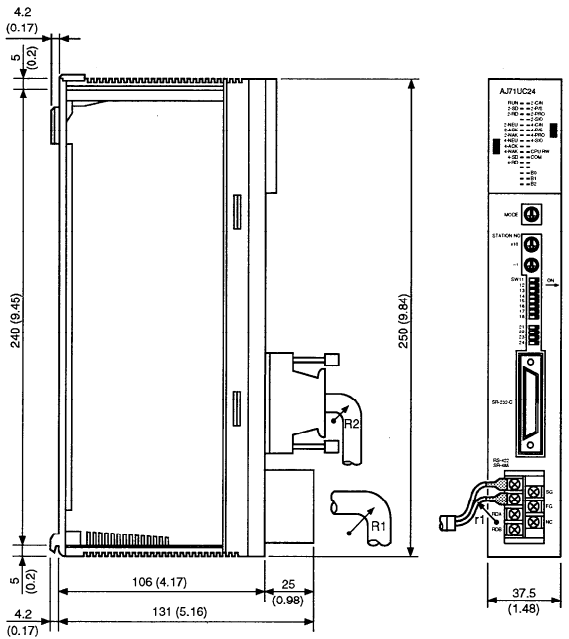


Point

(1) In the explanation of the terminal resistor setting/connection in this section, when an RS-232C - RS-422 converter or other equipment is used for the device which serves as either of the line terminating stations, setting and wiring for a terminal resistor is required on the converter (or the equipment).
(2) The devices connected to the UC24's RS-422/RS485 interface must use all RS-422 or all RS-485, including 1-to-n and m-to-n connections.

6. External Dimensions

(AJ71UC24)



(Unit : mm (inch))

R1 (Bending radius near terminal block) : Cable diameter × 4
R2 (Bending radius near connector) : Cable diameter × 4
r1 (Bending radius near crimp contact) : Can be connected in a range without extreme bend

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