MITSUBISHI

A1SJ71UC24-R2/A1SJ71C24-R2
Computer Link Module
A1SJ71UC24-PRF/A1SJ71C24-PRF
Computer Link Module

MITSUBISHI

General-Purpose PROGRAMMABLE CONTROLLER

User's Manual
(Hardware)

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

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

MODEL	A1SJ71C24-R2/PRF (H/W)-U-E
MODEL CODE	13JE51
IB(NA)-66490-D (0902) MEE	

● 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 used for a description of the programmable controller 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 programmable controller in operation (especially changing data, program and operation status (Remote RUN/STOP)) 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 programmable controller from an external device, troubles occurring on the programmable controller 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 programmable controller CPU the system's error handling procedure and other items regarding data communication errors.

⚠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 programmable controller in the environment given in the general specifications section of the applicable User's Manual for the CPU module used.
  Using this programmable controller 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.
- Shut off the external power supply for the system in all phases before 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, and tighten the module installation screws with the specified torque.
  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.

[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.
- When connecting a wire to a connector, use the specified tool to connect it by crimping, pressure welding, or soldering correctly. Plug the connector into the module securely.
- 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.
- 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.
  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 unit.
  Such debris could cause fire, damage or malfunction.

[STARTING AND MAINTENANCE PRECAUTION]

⚠DANGER

- Do not touch the terminals while the power is on.
  Doing so may cause malfunction.
- Always switch OFF the external supply power used by the system in all phases before cleaning or retightening screws.
  If you do not switch off the external power supply, it will cause failure or malfunction of the module.
  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.
- Shut off the external power supply for the system in all phases 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.
- Before handling the module, touch a grounded metal object to discharge the static electricity from the human body.
  Not doing so may cause a 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" signal from the programmable controller CPU to the special function module. If data is written to the "system area" or if the "use prohibited" signal is output, there is a risk that the programmable controller system will operate incorrectly.

⚠CAUTION

- Before performing the control of the programmable controller in operation(especially changing data, program and operation status(Remote RUN/STOP)) 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 programmable controller CPU during registration.
  If the power to the station to which the module is mounted is turned off or the programmable controller 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 Manuals

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

Related Manuals

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

A1SJ71UC24-R2/PRF computer link function is the same as AJ71UC24.
And A1SJ71UC24-R2/PRF printer function is the same as A1SJ71C24-PRF.
When you refer to the following manual to use A1SJ71UC24-R2/PRF, replace the module model name to refer.

- Computer Link Module User's Manual (Com. link func. /Print. func.)
  Version C or before

Computer link function

AJ71UC24 → A1SJ71UC24-R2/PRF

Printer function

A1SJ71C24-PRF → A1SJ71UC24-PRF

Conformation to the EMC Directive and Low Voltage Instruction

For details on making Mitsubishi programmable controller conform to the EMC directive and low voltage instruction when installing it in your product, please see Chapter 3, "EMC Directive and Low Voltage Instruction" of the User's Manual (Hardware) of the programmable controller CPU to use.

The CE logo is printed on the rating plate on the main body of the programmable controller that conforms to the EMC directive and low voltage instruction.

By making this product conform to the EMC directive and low voltage instruction, it is not necessary to make those steps individually. (A1SCPUC24-R2, A2CCPUC24(PRF) removes.)

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:

Model name	Item name	Quantity
A1SJ71UC24-R2	A1SJ71UC24-R2 computer link module	1
	D-sub 9 pin (male), screw type 17JE-23090-02 (-D8A) manufactured by Daiichi Denshi Kogyo (DDK)	1
A1SJ71C24-R2	A1SJ71C24-R2 computer link module	1
	D-sub 9 pin (male), screw type 17JE-23090-02 (-D8A) manufactured by Daiichi Denshi Kogyo (DDK)	1
A1SJ71UC24-PRF	A1SJ71UC24-PRF computer link module	1
	D-sub 9 pin (male), screw type 17JE-23090-02 (-D8A) manufactured by Daiichi Denshi Kogyo (DDK)	1
A1SJ71C24-PRF	A1SJ71C24-PRF computer link module	1
	D-sub 9 pin (male), screw type 17JE-23090-02 (-D8A) manufactured by Daiichi Denshi Kogyo (DDK)	1

* In the explanation hereafter, the computer link modules are abbreviated as follows except when differentiate specially.
  - The general term of above 4 type is abbreviated as "C24."
  - The general term of A1SJ71UC24-R2 and A1SJ71C24-R2 is abbreviated as "C24-R2."
  - The general term of A1SJ71UC24-PRF and A1SJ71C24-PRF is abbreviated as "C24-PRF."
* The following accesses to the programmable controller CPU with a dedicated protocol of the computer link function are possible by using A1SJ71UC24-R2 and A1SJ71UC24-PRF.
  - Access to the device extended by AnACPU, AnUCPU and A2US(H)CPU.
  - Access to the other stations via MELSECNET/10.

  Other specifications are the same as A1SJ71C24-R2 and A1SJ71C24-PRF.

2. Transmission Specifications

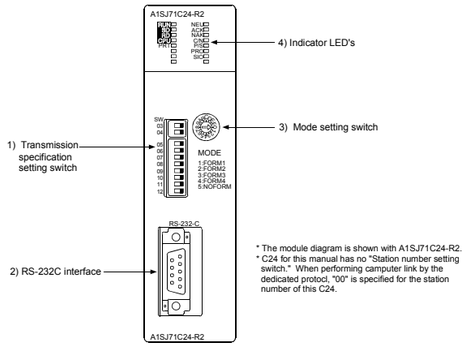
The following table indicates the transmission specifications for the C24.
For general specifications of the C24, see the user's manual for the CPU module used.

Item		Specification		
Interface		Conform to RS-232C		
Transmission method		Dedicated protocol	Half duplex communication method *1	
		No protocol/ Bidirectional/ Printer function	Full duplex or half duplex (depend on setting to the buffer memory)	
Synchronization system		Start-stop synchronization method		
Transmission speed		300, 600, 1200, 2400, 4800, 9600, 19200 bps (Selected via the switch)		
Data format	Start bit	1		
	Data bit	7 or 8		Selected via the switch
	Parity bit	1 or none		
	Stop bit	1 or 2		
Access cycle		Processing for one request is performed during the END processing of the sequence program. Therefore, the access cycle is one scan time.		
Error detection		Parity check yes (odd/even) or no		
		Sum check yes or no		
DTR/DSR control (ER/DR)		Yes/No (selected by setting to the buffer memory)		
X ON/OFF control (DC1/DC3)				
Line configuration (external device: programmable controller CPU)		Dedicated protocol	1 : 1	
		No protocol/Printer function	1 : 1	
		Bidirectional	1 : 1	
Transmission distance		RS-232C 15 m (49.2 ft.) or less		
Current consumption		5VDC 0.1A		
Occupied I/O points		32 points *2		
Weight		0.22 kg(0.49 lb.)		

*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 GX Developer, set as special 32 points.
The model name to register when using the dedicated commands, the following model name should be set depending on C24 and programmable controller CPU mounted to C24.

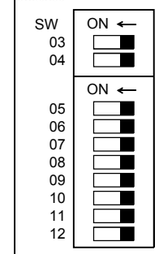
Programmable controller CPU mounted to C24	Types of C24 to mount			
	A1SJ71UC24-R2	A1SJ71UC24-PRF	A1SJ71C24-R2	A1SJ71C24-PRF
AnUCPU	AJ71UC24		AJ71C24S3	
AnACPU	AJ71C24S3			
Other than AnU/AnACPU	(Model name setting is not necessary as the dedicated command cannot be used.)			

3. Name of Each Part and Setting



* The module diagram is shown with A1SJ71C24-R2.
* C24 for this manual has no "Station number setting switch." When performing camputer link by the dedicated protocl, "00" is specified for the station number of this C24.

Number	Name	Description
1)	Transmission setting switches	Transmission settings (all are set to OFF at the time of shipment)



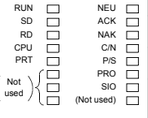
SW	Setting item	Status ON	Status OFF
03	A1ADP-SP setting *1	A1ADP-SP used	A1ADP-SP not used
04	Write during RUN setting	Enabled	Disabled
05	Transmission speed setting	See *2	
06			
07			
08	Data bit setting	8 bits	7 bits
09	Parity bit setting	YES	NO
10	Even/odd parity setting	Even	Odd
11	Stop bit setting	2 bits	1 bit
12	Sum check setting	YES	NO

2)	RS-232C interface	RS-232C interface for external device connection
3)	Mode setting switch	Mode setting (set to 0 at the time of shipment)

MODE

Mode	Setting contents
0	Use prohibited
1	Type 1 dedicated protocol mode
2	Type 2 dedicated protocol mode
3	Type 3 dedicated protocol mode
4	Type 4 dedicated protocol mode
5	Non procedure mode or printer function
6 to E	Use prohibited
F	For module test

4)	Indicator LED's	RUN	Normal operation indicator Normal : lit Error : unlit
		SD	Transmission status Data being transmitted : flashing
		RD	Reception status Data being received : flashing
		CPU	Communication Status with CPU main module. Communicating with programmable controller CPU : flashing
		PRT	Printer message printout Printer message being Printed out : lit (displayed only on C24-PRF)
		NEU	Neutral status Transmission sequence initial status (waiting for ENQ) : lit ENQ reception complete : unlit
		ACK	ACK transmission status ACK transmitted : lit NAK transmitted : unlit
		NAK	NAK transmission status NAK transmitted : lit ACK transmitted : unlit
		C/N	Result of communication with programmable controller CPU Error in communication with the programmable controller CPU : lit Normal communication : unlit
		P/S	Parity/sum check error Parity/sum check error : lit Normal : unlit
		PRO	Protocol error Normal protocol error : lit Normal : unlit
		SIO	SIO error When overrun or framing error : lit When received data has been discarded due to OS receive area full : lit Normal : unlit



*1 This setting is available when software version of the A1SJ71UC24-R2/A1SJ71UC24-PRF is X or later, and not available for the A1SJ71C24-R2/A1SJ71C24-PRF.

*2 Transmission speed settings

Setting switch	Transmission speed (unit: bps) 300	600	1200	2400	4800	9600	19200
SW05	OFF	ON	OFF	ON	OFF	ON	OFF
SW06	OFF	OFF	ON	ON	OFF	OFF	ON
SW07	OFF	OFF	OFF	OFF	ON	ON	ON

4. Loading and Installation

This section explains precautionary items regarding handling of the C24 from unpacking up to installation, and the installation environment that are common to all modules.

See the user's manual for the programmable controller 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
Module installation screws (M4 screw)	78 to 118N • cm (6.9 to 10.4 lb • inch)
RS-232C connector installation screws (M2.6 screw)	19 to 24N • cm (1.7 to 2.0 lb • inch)

4.2 Installation Environment

Avoid the following conditions for the installing location of the AnS Series programmable controller:

(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.

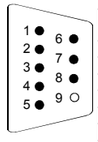
(7) Location where strong electric fields or magnetic fields form.

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

5. External Wiring

5.1 Connecting to the RS-232C

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



Pin No.	Signal abbreviation	Name	Signal direction C24 ↔ External device
1	CD	Receive carrier detected	←
2	RD (RXD)	Reception data	←
3	SD (TXD)	Transmission data	→
4	DTR (ER)	Data terminal ready	→
5	SG	Signal ground	↔
6	DSR (DR)	Data set ready	←
7	RS (RTS)	Transmission request	→
8	CS (CTS)	Transmission possible	←

The following model of RS-232C connectors are used. Use connectors which are compatible with these on the opposite side.
D-sub 9 pin (female), screw type

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

C24 Signal name	C24 Pin No.	Cable connection and signal direction (example)	External device Signal Name
CD	1		CD
RD (RXD)	2		RD (RXD)
SD (TXD)	3		SD (TXD)
DTR(ER)	4		DTR(ER)
SG	5		SG
DSR (DR)	6		DSR (DR)
RS(RTS)	7		RS(RTS)
CS(CTS)	8		CS(CTS)

(2) Example of a connection to an external device which cannot turn on/off the CD signal (pin No. 1 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)

Xn7	TOP	n1	H10B	K1	K1

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

C24 Signal name	C24 Pin No.	Cable connection and signal direction (example)	External device Signal name
CD	1		CD
RD (RXD)	2		RD (RXD)
SD (TXD)	3		SD (TXD)
DTR(ER)	4		DTR(ER)
SG	5		SG
DSR (DR)	6		DSR (DR)
RS(RTS)	7		RS(RTS)
CS(CTS)	8		CS(CTS)

(b) Example of external wiring under DC code control

C24 Signal name	C24 Pin No.	Cable connection and signal direction (example)	External Device Signal name
CD	1		CD
RD (RXD)	2		RD (RXD)
SD (TXD)	3		SD (TXD)
DTR(ER)	4		DTR(ER)
SG	5		SG
DSR (DR)	6		DSR (DR)
RS(RTS)	7		RS(RTS)
CS(CTS)	8		CS(CTS)

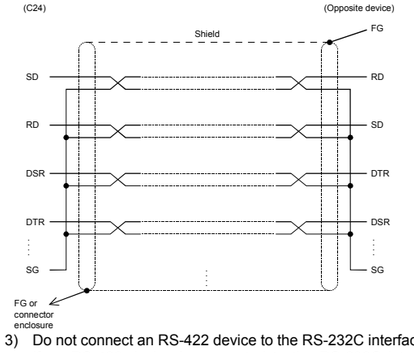
(3) Precautionary items when wiring

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

	Connection method	Remarks
FG signal	Connect to the connector enclosure on the C24 side.	● Do not short the FG signal and SG signal of the connector cable.
Shield	Connect to the FG terminal on the external device side or connector enclosure on the UC24 side.	

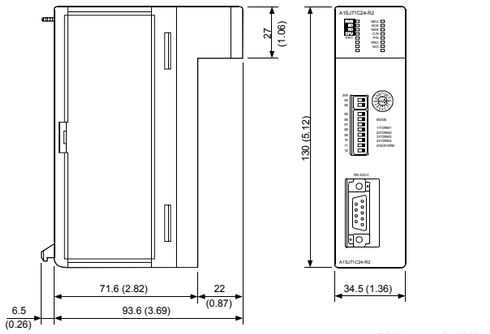
2) If data communication cannot be performed normally due to external noise even if the wiring is done as described above, perform wiring as follows:

● Connect all signals of the connection cable except for the SG signal with the SG signal as a pair.



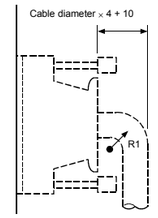
3) Do not connect an RS-422 device to the RS-232C interface.
If an RS-422 device is connected to the RS-232C interface, the RS-422 interface hardware for the connected device will be damaged and communications cannot be performed.

6. External Dimensions



(Unit: mm (inch))

*Bending radius of the cable when wiring to the external device.



R1 (Bending radius near connector) : Cable diameter × 4

External dimensions of C24 corresponding to this manual are the same for all 4 types. The diagram above is A1SJ71UC24-R2 external dimensions.

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U.S.A	Mitsubishi Electric Automation Inc. 500 Corporate Woods Parkway Vernon Hills, IL 60061, U.S.A. Tel : +1-847-478-2100
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