

# MITSUBISHI

PROGRAMMABLE CONTROLLER

# MELSEC-A

User's Manual

## MELSECNET/10 Remote I/O Module type AJ72LP25/AJ72BR15 (Hardware)

### INTRODUCTION

Thank you for choosing the Mitsubishi MELSEC-A Series of General Purpose Programmable Controllers. Please read this manual carefully so that the equipment is used to its optimum. A copy of this manual should be forwarded to the end User.

 **MITSUBISHI  
ELECTRIC**  
IB (NA) 66505-A

## 1. GENERAL DESCRIPTION

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This manual gives the specifications and part names of the AJ72LP25 MELSECNET/10 remote I/O module and AJ72BR15 MELSECNET/10 remote I/O module, which are used to configure remote I/O systems associated with MELSECNET/10 network systems.

- (1) The applications of the AJ72LP25 and AJ72BR15 modules, the cables used with them, and their installation locations, are indicated in the table below.

	Application	Cables used		Module Installation Location
		Fiber-Optic Cable	Coaxial Cable	
AJ72LP25	Used as MELSECNET/10 remote I/O stations	○	—	CPU slot of main base unit
AJ72BR15		—	○	

- (2) On unpacking the module, check that the following items have been supplied.

(a) In the case of the AJ72LP25 module

Item Name	Quantity
AJ72LP25 network module	1

(b) In the case of the AJ72BR15 module

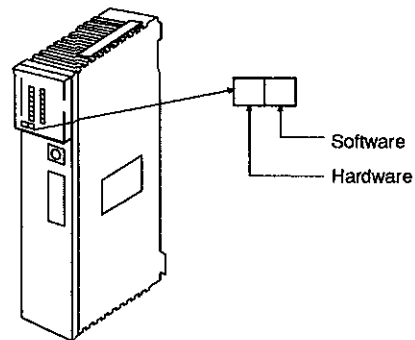
Item Name	Quantity
AJ72BR15 network unit	1
Type F connector (A6RCON-F)	1

- (3) If configuring a coaxial bus system, terminal resistors (A6RCON-R75, or BNC-TMP-05(75) made by Hirose Denki) must be connected at both ends of the system. These items are not supplied with the module and must be purchased separately.

- (4) For detailed information on MELSECNET/10 network systems, refer to the MELSECNET/10 Network System Reference Manual (Remote I/O Networks) (SH-3509-A).

- (5) If configuring a remote I/O network, use CPU modules and network modules with the software versions indicated below.

Master Station Module	Model	Software Version
CPU module	A2UCPU(S1)	"N" or later
	A3UCPU	
	A4UCPU	
Network module	A2USCPU (S1)	"D" or later
	AJ71LP21 AJ71BR11	"J" or later



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Specifications subject to change without notice.

## 2. PERFORMANCE SPECIFICATIONS

### 2 PERFORMANCE SPECIFICATIONS

The performance specifications of the AJ72LP25 and AJ72BR15 are given below

Item	AJ72LP25		AJ72BR25	
	Fiber-Optic Loop System		Coaxial Bus System	
Max. number of link points per network	LX/LY	8192 point#		
	LB	8192 point#		
	LW	8192 point#		
Max number of link point per station	$M \leftarrow R \left\{ \frac{LX+LY}{8} + (2 \times LW) \right\} \leq 1600$ bytes		$M \leftarrow R \left\{ \frac{LY+LB}{8} + (2 \times LW) \right\} \leq 1600$ bytes	
Max number of I/O points per station	X + Y ≤ 2048			
Communication speed	10 MBPS (multiplex transmission)/20 MBPS		10 MBPS	
Communication method	Token ring method		Token bus method	
Synchronizing method	Frame synchronous			
Coding method	NRZI coding (Non Return to Zero Inverted)		Manchester coding	
Type of transmission channel	Duplex loop		Single bus	
Transmission format	Confirms to HDLC (frame type)			
Max number of networks	255			
Number of stations connected to a network	65 stations (1 master station, 64 remote I/O stations)		33 stations (1 master station, 32 remote I/O stations)	
Overall distance of a network	30 km (500 m station intervals if S1 cable used 1 km station intervals if QS1 cable used)		3C-2V	300 m (300 m station interval)
			5C-2V	500 m (500 m station interval)
Error control method	Retry due to CRC (generating polynomial $X^{16} + X^{12} + X^5 + 1$ ) and time over			
RAS functions	<ul style="list-style-type: none"> <li>• Loopback in case of error detection or cable disconnection (available with optical loop system only)</li> <li>• Link channel check for the host station</li> <li>• Error detection by using special relays and registers</li> <li>• Network monitor and diagnostic functions.</li> </ul>			
Transient transmission	<ul style="list-style-type: none"> <li>• Monitoring, program up/downloading using peripheral devices</li> </ul>			
Connection cable	SI-200/250	QSI-185/230	3C-2V, 5C 2V or equivalent	
Applicable connectors	2 core fiber-optic cable connector plug CA9003	2 core fiber-optic cable connector plug CA7003	BNC-P 3-Ni CAU	BNC-P 5-Ni-CAU(DDK) or equivalent
Cable transmission loss	12 dB/km or less	5.5 dB/km or less	Conforms to JIS C 3501	
Current consumption (5 VDC)	0.8 A		0.9 A	
Weight	0.53 kg		0.6 kg	

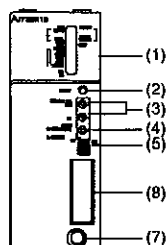
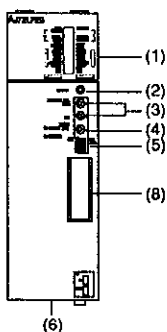
For the general specifications, refer to the User's Manual for the programmable controller CPU used in the network system

## 3. PART IDENTIFICATION AND SETTINGS

• This chapter gives the names of the various parts of the AJ72LP25 and AJ72BR15 and describes their settings

• AJ72LP25


• AJ72BR15



No	Names	Descriptions		
		Name	Status	Meaning
(1)	<p>LED</p> <p>AJ72LP25</p> <p>AJ72BR15</p>	RUN	ON	Normal state
		RUN	OFF	WDT error, SP UNIT ERROR
		RMT E		Blown fuse or I/O verification error (self station)
		DUAL		Executing multiplex transmission (Unlit: Multiplex transmission not executed)
		SW E		Switch settings with (3) and (4) have abnormality
		ST E		Station No duplicated in same network
		PRM E		<ul style="list-style-type: none"> <li>• I/O allocation fault</li> <li>• Number of LB/LW points insufficient</li> <li>• Parameters received from master station abnormal</li> </ul>
		POWER		Power is supplied (Unlit: Power is not supplied)
		D LINK		Data link is operative (Unlit: Data link is inoperative)
		T PASS		Participating in baton passing (transient transmission possible)
		WAIT		On standby for communication with special function module
		CRC	ON	Code check error in received data <Causes> Timing when the station which is sending data to a specific station is set off-line, hardware fault, cable fault, noise, etc
		OVER		Processing of received data delayed <Causes> Hardware fault, cable fault, noise, etc
		AB IF		<ul style="list-style-type: none"> <li>• "1"s in the number larger than specified are received consecutively</li> <li>• Received data length is shorter than specified &lt;Causes&gt; Timing when the station which is sending data to a specific station is set off-line, WDT setting is too short, cable fault, noise, etc.</li> </ul>
		TIME		Data link WDT times out <Causes> WDT setting is too short, cable fault, noise etc
		DATA		Abnormal data larger than 2 kbytes are received <Causes> Cable fault, noise, etc
		UNDER		Internal processing of send data is not at constant intervals <Causes> Hardware fault
		LOOP		The forward or reverse loop is faulty <Causes> Power to the adjacent station is OFF Cable breakage or not connected, etc
		SD	Dimly lit	Sending data
		RD		Receiving data
(2)	Reset switch 	• Resets the hardware of the self station		
(3)	Station number setting switch 	Setting of station number (Factory setting: 1) <Setting range> 1 to 64 Other than 1 to 64 Setting error (SW E LED is lit)		

### Note

Do not alter the settings of the DIP switches on the printed circuit board at the side face of the module

No	Name	Description		
(4)	Mode select switch	Used to set the mode Factory setting: 0		
		No	Mode	
		0	ONLINE (A/R)	Establishes a data link with the automatic online return function
		1	Cannot be used (if set, an SW E error occurs)	
		2	OFFLINE	Disconnects the self station
		3	Forward loop test	Checks the entire forward loop circuit of the data link system
		4	Reverse loop test	Checks the entire reverse loop circuit of the data link system
		5	Station to-station test (master station)	Mode in which the line between two stations is checked Set the station with the lower station number as the master station and the one with the higher station number as the slave station
		6	Station-to-station test (slave station)	Mode in which the line between two stations is checked Set the station with the lower station number as the master station and the one with the higher station number as the slave station
		7	Self loopback test	Checks the hardware of individual modules in isolation, including the communication circuits of the transmission system, and the cables
		8	Internal self-loopback test	Checks the hardware of individual modules in isolation, including the communication circuits of the transmission system
		9	Hardware test	Checks the hardware inside the network module
(5)	DIP switches	Set always OFF		
(6)	Connectors	Connect the fiber-optic cables here The connector nearer the front face of the module is "IN" the other is "OUT"		
(7)		Connect and F type cable here		
(8)	RS-422 interface	Used to connect peripheral devices		

#### POINTS

- Press the reset switch (2) to reset the module after changing the settings of (3), (4), and (5) (This is not necessary if the mode select switch is set to "F")
- For details on settings, and on the operations used for the various test modes, refer to the MELSECNET/10 Network System Reference Manual (Remote I/O Networks)

#### 4. PRECAUTIONS WHEN BUILDING A COAXIAL BUS SYSTEM

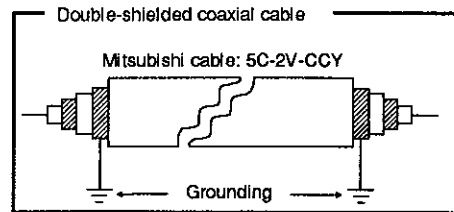
- Restrictions on cables between stations  
The length of coaxial cable that can be used to connect network modules depends on the total number of stations in the network, as shown in the table to the right. If a cable length outside the applicable range in this table is used, a communication error may occur. Note that the restriction on total cable length is not affected by the number of modules in the network; it is always 500 m.

Total Number of Stations	Station-to-Station Cable Length
2 to 9 stations	1 to 500 m
10 to 33 stations	1 to 5 m 13 to 17 m 25 to 500 m

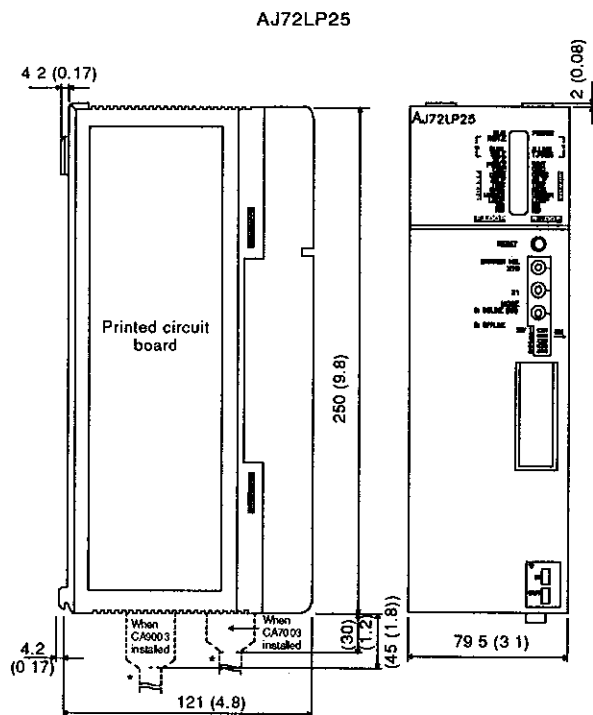
- If an A6BR10/A6BR10-DC repeater unit is used, use the station-to-station cable length indicated for "10 to 33 stations", regardless of the number of connected stations.

#### (3) Cautions on cabling

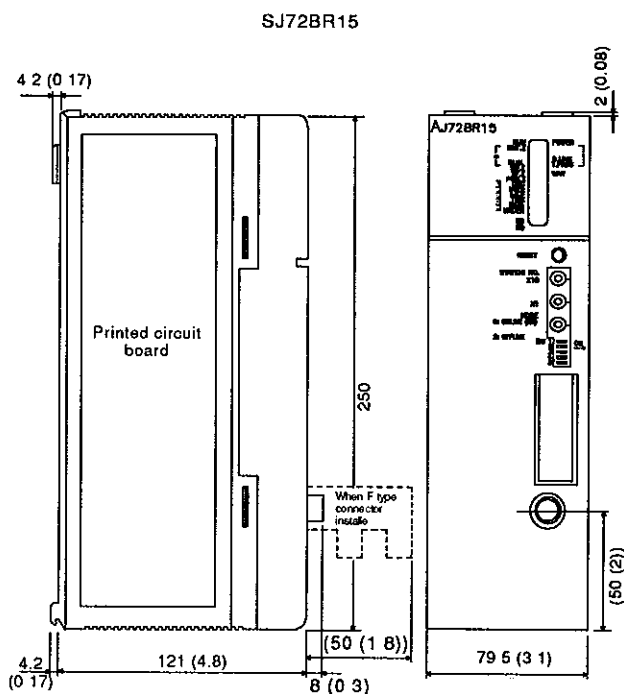
- Coaxial cable must be laid providing a 100 mm (3.94 inch) or more clearance to power cables or control cables.
- Where intensive influence by noise is expected, use of double-shielded coaxial cables is recommended.



#### 5. DIMENSIONS



\* Take the bend radius of the cable into account



Unit: mm(inch)

REVISIONS

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**IMPORTANT**

- (1) Design the configuration of a system to provide an external protective or safety interlocking circuit for the CPs
- (2) The components on the printed circuit boards will be damaged by static electricity, so avoid handling them directly. If it is necessary to handle them take the following precautions
  - (a) Ground human body and work bench
  - (b) Do not touch the conductive areas of the printed circuit board and its electrical parts with and non-grounded tools etc

Under no circumstances will Mitsubishi Electric be liable or responsible for any consequential damage that may arise as a result of the installation or use of this equipment

All examples and diagrams shown in this manual are intended only as an aid to understanding the text, not to guarantee operation. Mitsubishi Electric will accept no responsibility for actual use of the product based on these illustrative examples

Owing to the very great variety in possible applications of this equipment, you must satisfy yourself as to its suitability for your specific application

