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

The United States	Mitsubishi Electronics America Inc , (Industrial Automation Division) 800 Biermann Court, Mt Prospect, IL 60056 Phone: (708)298 9223
Canada	Mitsubishi Electric Sales Canada, Inc (Industrial Automation Division) 4299 14th Avenue, Markham Ontario L3R OJ2 Phone: (416)475 7728
United Kingdom	Mitsubishi Electric UK Ltd. (Industrial Sales Division) Travellers Lane, Hatfield, Herts AL10 8XB Phone: (0707)276100
Germany	Mitsubishi Electric Europe GmbH, (Industrial Automation Division) Gothaer Strasse 8, Postfach 1548 D 4030 Ratingen 1 Phone (02102)4860
Taiwan	Setsuyo Enterprise Co , Ltd., (106) 11th Fl., Chung Ling Bldg 363 Sec 2 Fu Hsing S Rd , Taipei Taiwan R.O.C. Phone: (02)732-0161
Hongkong (& China)	Ryoden International Ltd., (Industrial & Electrical Controls Division) 10/F Manulife Tower, 169 Electric Rd North Point Hong Kong Phone: 8878870
Singapore (& Malaysia)	MELCO Sales Shingapore Pte. Ltd , (Industrial Division) 307 Alexandra Rd #05 01/02, Mitsubishi Electric Bldg Singapore 0315 Phone: 4732308
Thailand	F.A Tech Co Ltd., 1138/33-34 Rama 3 Rd , Yannawa Bangkok 10120 Phone: (02)295-2861-4
Australia	Mitsubishi Electric Australia Pty. Ltd (Industrial Controls Division) 348 Victoria Rd , Rydalmere N S W 2116 Phone: (02)684 7200
Republic of South Africa	M S A. Manufacturing (Pty) Ltd , (Factory Automation Division) P.O Box 39733, Bramley Johannesburg 2018 Phone: (011)444 8080

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE:MITSUBISHI DENKI BLDG MARUNOUCHI TOKYO I-CO TELEX: J24532 CABLE MELCO TOKYO
NAGOYA WORKS:1-14 YADA-MINAMI 5, HIGASHI-KU NAGOYA, JAPAN

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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	O	—	CPU slot of main base unit
AJ72BR15		—	O	

(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

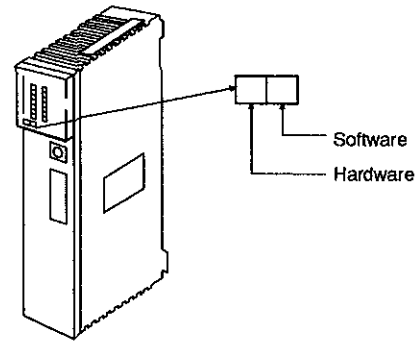
Item Name	Quantity
AJ72BR15 network unit	1
Type F connector (A6RCON-F)	1

(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) A3UCPU A4UCPU	"N" or later
	A2USCPU (S1)	"D" or later
Network module	AJ71LP21 AJ71BR11	"J" or later



2. PERFORMANCE SPECIFICATIONS

2 PERFORMANCE SPECIFICATIONS

The performance specifications of the AJ72LP25 and AJ72BR15 are given below

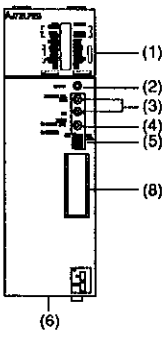
Item		AJ72LP25		AJ72BR25
		Fiber-Optic Loop System		Coaxial Bus System
Max. number of link points per network	LX/LY	8192 points		
	LB	8192 points		
	LW	8192 points		
Max number of link point per station		$M \leftarrow R\left\{\frac{LX+LB}{8}+(2\times LW)\right\} \leq 1600$ bytes		$M \leftarrow R\left\{\frac{LY+LB}{8}+(2\times LW)\right\} \leq 1600$ bytes
Max number of I/O points per station		$X+Y \leq 2048$		
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		• Loopback in case of error detection or cable disconnection (available with optical loop system only) • Link channel check for the host station • Error detection by using special relays and registers • Network monitor and diagnostic functions.		
Transient transmission		• Monitoring, program up/downloading using peripheral devices		
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

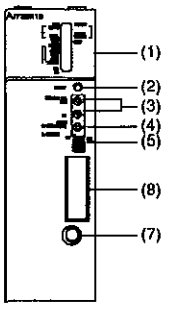
3. PART IDENTIFICATION AND SETTINGS

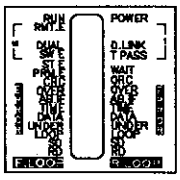
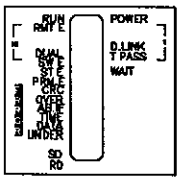
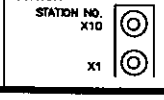
- This chapter gives the names of the various parts of the AJ72LP25 and AJ72BR15 and describes their settings

- AJ72LP25



- AJ72BR15



No	Names	Descriptions		
		Name	Status	Meaning
(1)	LED AJ72LP25  AJ72BR15 	RUN	ON	Normal state
			OFF	WDT error, SP UNIT ERROR
		RMT E	ON	Blown fuse or I/O verification error (self station)
		DUAL	ON	Executing multiplex transmission (Unlit: Multiplex transmission not executed)
		SW E	ON	Switch settings with (3) and (4) have abnormality
		ST E	ON	Station No duplicated in same network
		PRM E	ON	• I/O allocation fault • Number of LB/LW points insufficient • Parameters received from master station abnormal
		POWER	ON	Power is supplied (Unlit: Power is not supplied)
		D LINK	ON	Data link is operative (Unlit: Data link is inoperative)
		T PASS	ON	Participating in baton passing (transient transmission possible)
		WAIT	ON	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	ON	Processing of received data delayed <Causes> Hardware fault, cable fault, noise, etc
		AB IF	ON	• "1"s in the number larger than specified are received consecutively • Received data length is shorter than specified <Causes> 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.
		TIME	ON	Data link WDT times out <Causes> WDT setting is too short, cable fault, noise etc
		DATA	ON	Abnormal data larger than 2 kbytes are received <Causes> Cable fault, noise, etc
		UNDER	ON	Internal processing of send data is not at constant intervals <Causes> Hardware fault
		LOOP	ON	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	Dimly lit	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 MODE 0: ONLINE (AR) 2: OFFLINE	Used to set the mode Factory setting: 0		
		No	Mode	Description
		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)	
		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
		A to E	——	Cannot be used
		F	Station number check	Numbers checked with the LEDs
(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

(1) 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")

(2) 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

(1) 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

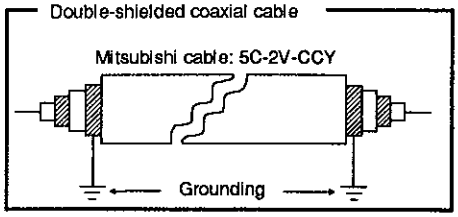
Total Number of Stations	Station-to Station Cable Length
2 to 9 stations	1 to 500 m
10 to 33 stations	1 to 5 m 13 to 17 m 25 to 500 m

(2) 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

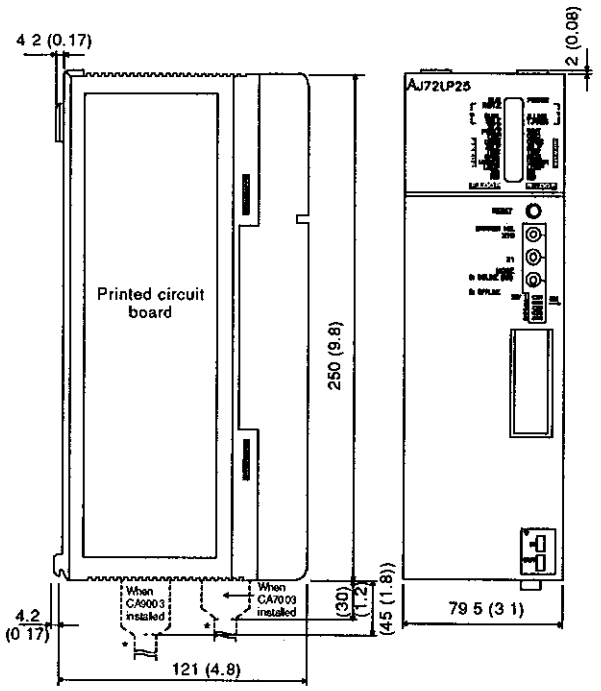
(a) Coaxial cable must be laid providing a 100 mm (3 94 Inch) or more clearance to power cables or control cables

(b) Where intensive influence by noise is expected, use of doubleshielded coaxial cables is recommended



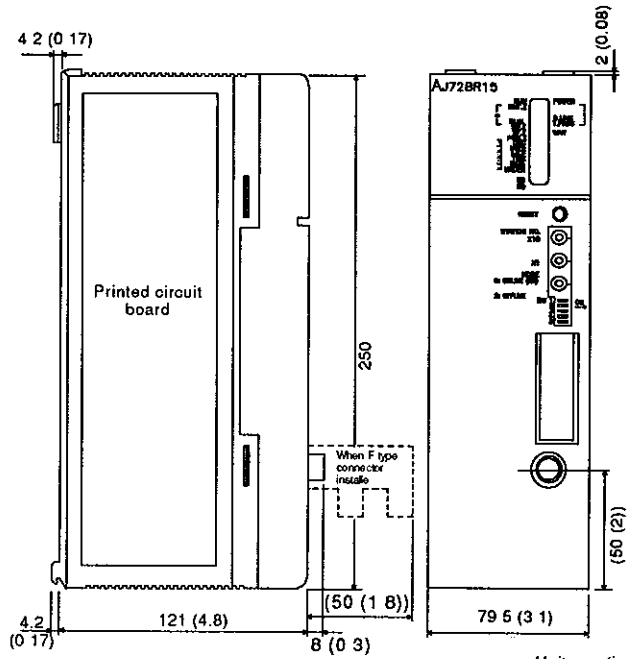
5. DIMENSIONS

AJ72LP25



* Take the bend radius of the cable into account

SJ72BR15



Unit: mm(inch)

REVISIONS

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Jun, 1994	

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 circumstaces 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