MITSUBISHI

PROGRAMMABLE CONTROLLER

MELSEC-A

User's Manual

MELSECNET/10 network module type A1SJ71LP21/A1SJ71BR11 (Hardware)

Art.No.: 70158

990713

Version A

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) 66572-A

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IB (NA) 66572-A (9506) MEE Printed in Japan

Specifications subject to change without notice.

1. GENERAL DESCRIPTION

This manual gives the specifications and nomenclature of the A1SJ71LP21/A1SJ71BR11 type network modules to be used in a MELSEC-A series MELSECNET/10 network system.

(1) The following table shows the applications, applicable cable and installation position of the A1SJ71LP21 and A1SJ71BR11.

	Application	Applicable Cable		Module Installation Position
		Optical fiber cable	Coaxial cable	
A1SJ71LP21	For control, normal and master stations of MELSECNET/10	O	—	I/O slot of main or extension base unit
A1SJ71BR11		—	O	

(2) Please confirm that the following parts have been supplied on unpacking the package:

(a) A1SJ71LP21

Part Name	Quantity
A1SJ71LP21 network module	1

(b) A1SJ71BR11

Part Name	Quantity
A1SJ71BR11 network module	1
F type connector (A6RCON-F)	1

(3) When configuring a coaxial bus system a terminal resistor (A6RCON-R75) must be installed at both ends. The terminal resistors are not contained in the package and you must be obtained at your own expense.

(4) The following table shows the possible combinations of station types and PC CPUs:

	Station Type	PC CPU
PC-to-PC network	Control station	A2ASCPU(S1)
	Normal station	A1SCPU(S1) A1SJCPU A2SCPU(S1) A52GCPU(T21B) A2ASCPU(S1)
Remote I/O network	Master station	A2ASCPU(S1) (software version "D" or later)

(5) Refer to the following manual for details of the MELSECNET/10 network system:

MELSECNET/10 Network System (PC-to-PC Network) Reference Manual (IB-66440)

2. PERFORMANCE SPECIFICATIONS

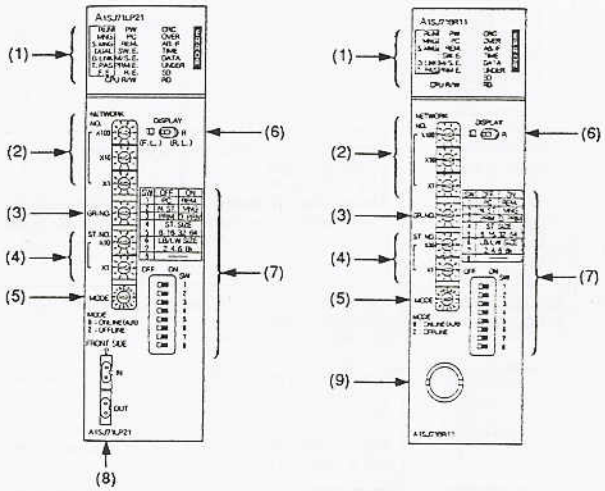
The following table shows the performance specifications of the A1SJ71LP21 and of the A1SJ71BR11.

Item		A1SJ71LP21	A1SJ71BR11
Maximum number of link points per network		LX/LY: 8192 points	
		LB: 8192 points	
		LW: 8192 points	
Maximum number of link points per station	In PC-to-PC network	$\left(\frac{LB+LY}{8}+(2\times LW)\right) \leq 2000$ bytes	
	In remote I/O network	• Master station → Remote I/O station $\left(\frac{LB+LY}{8}+(2\times LW)\right) \leq 1600$ bytes • Remote I/O station → Master station $\left(\frac{LB+LY}{8}+(2\times LW)\right) \leq 1600$ bytes	
Communication speed		10 MBPS (20 MBPS: multiple transmission)	10 MBPS
Communication method		Token-ring method	Token bus method
Synchronization system		Frame synchronization	
Transmission channel type		Duplex loop	Single bus
Overall extension distance		30 km [SI cable H type: station-to-station distance 300 m SI cable L type: station-to-station distance 500 m QSI cable: station-to-station distance 1 km]	3C-2V: 300 m (station-to-station distance 300 m) 5C-2V: 500 m (station-to-station distance 500 m) Repeater unit Extension up to 2.5 km possible by using A6BR10 or A6BR10DC
Maximum number of networks		255 (total number of PC-to-PC and remote I/O networks)	
Maximum number of groups		9 (PC-to-PC networks only)	
Number of stations connectable per network	In PC-to-PC network	64 stations (control station: 1; normal station: 63)	32 stations (control station: 1; normal station: 31)
	In remote I/O network	65 stations (master station: 1; remote I/O station: 64)	33 stations (master station: 1; remote I/O station: 32)
Maximum number of modules installed per CPU		A2ASCPU(S1): 4 Other than A2ASCPU(S1): 1	
Coding system		NRZI coding (Non Return to Zero Inverted)	Manchester coding
Transmission format		Conforms to HDLC (frame format)	
Error control system		Retry by CRC ($X^{16}+X^{12}+X^{5}+1$) and overtime	
RAS function		• Loopback function in response to error detection and cable disconnection (A1SJ71LP21 only) • Diagnosis function for self-station link line check • System down prevention by control station shift (PC-to-PC network only) • Error detection using special relays and registers • Network monitor and other diagnosis functions	
Transient transmission		• N: N communication (monitor, program upload/download, etc.) • ZNRD/ZNWR instructions (N:N): AnUCPU dedicated instructions	
Connection cable		SI-200/250 ; QSI-185/230	3C-2V, 5C-2V or equivalent
Applicable connector		2-core optical fiber cable connector plug CA7003	BNC connector compatible with 3C-2V, 5C-2V cable
Cable transmission loss		12 dB/km or less ; 5.5 dB/km or less	Conforms to JIS C 3501
Current consumption (5 VDC)		0.65 A	0.8 A
Weight kg (lb)		0.33 (0.73)	
Number of occupied I/O points		32 points	

For general specifications, refer to the user's manual for the PC CPU used for the network system.

3. NOMENCLATURE AND SETTINGS

This section gives the names of each part of the A1SJ71LP21 and A1SJ71BR11 and explains their settings.



No.	Name	Description	
(1)	LED	RUN	When the module is normal: On When a WDT error occurs: Off
		MNG	When a control or master station is set: On When normal stations are set: Off
		S.MNG	After shift to a sub-control station: On
		DUAL	During duplex transmission: On
		D.LINK	During data link: On
		T.PAS.	When taking part in baton passing (during transient transmission): On
		F.E	When an error occurs while forward (F.E.)/reverse (R.E.) loop is faulty: On <Cause> Power off of adjacent station, disconnected or unconnected cable, etc.
		R.E.	
		PW	When power is supplied: On
		PC	When PC-to-PC network is set: On (SW1 off)
		REM.	When remote I/O network is set: On (SW1 on)
		SW.E.	When settings of switches (2) to (5) are incorrect: On
		M/S.E.	When two or more stations have the same number or two or more control stations exist in the same network: On
		PRM.E.	On occurrence of a common parameter/station specific parameter matching error, and when parameters received from a sub-control station do not match self-station parameters: On
		CPU R/W	During CPU communication: On
		CRC	When there is a code check error in the received data: On <Cause> Timing when the station that is sending data to a specific station is set off-line, hardware fault, cable fault, noise, etc.
		OVER	When an error occurs due to delay in processing of received data: On <Cause> Hardware fault, cable fault, noise, etc.
		AB.IF	When the number of "1"s received in succession exceeds the specified number, or when an error occurs due to short data length of received data: On <Cause> Timing when the station that is sending data to a specific station is set off-line, WDT setting too short, cable fault, noise, etc.
		TIME	When an error occurs when the data link monitoring timer operates: On <Cause> Short WDT time, cable fault, noise, etc.
		DATA	When an error occurs due to receipt of more than 2 Kbytes of data: On <Cause> Cable fault, noise, etc.
		UNDER	When an error occurs due to internal processing of sent data at irregular intervals: On <Cause> Hardware fault
		SD	During data transmission: On
		RD	During data reception: On

4. CAUTIONS ON COAXIAL BUS SYSTEM CONFIGURATION

(1) Restrictions on the station-to-station cable length

Use a station-to-station coaxial cable of an appropriate length for the total number of stations according to the table to the right.

Using a cable of a length other than that specified in this table may cause communication errors.

The overall extension length is 500 m, irrespective of the total number of stations.

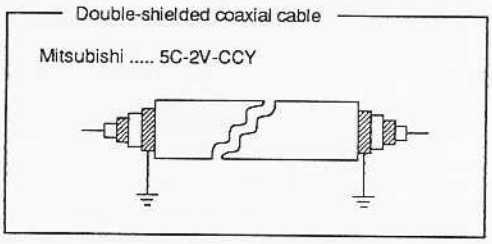
Total Number of Stations	Station-to-Station Cable Length
9 or fewer stations	1 to 500 m
10 or more stations	1 to 5 m 13 to 17 m 25 to 500 m

(2) For an A6BR10 or A6BR10-DC type repeater unit, use a station-to-station cable whose length corresponds to one of the lengths specified for "10 or more stations".

(3) Cautions on wiring

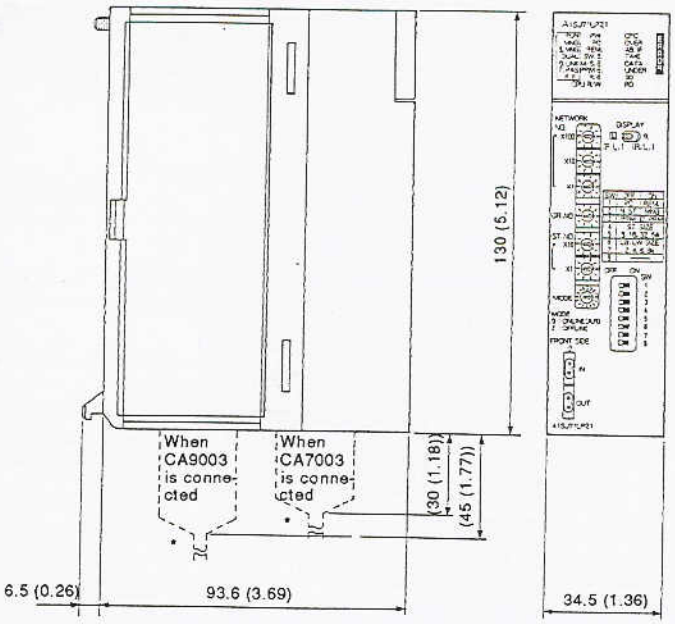
(a) Keep coaxial cables more than 100 mm away from other power cables and control cables.

(b) It is advisable to connect double-shielded coaxial cable in locations susceptible to noise.



5. OUTSIDE DIMENSIONS

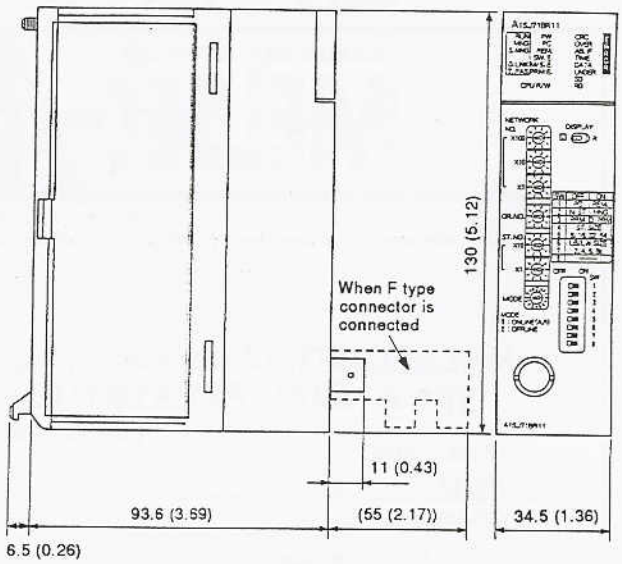
5.1 A1SJ71LP21



Unit: mm (inch)

* Take account of the bending radius of the cable. (Refer to the Reference Manual.)

5.2 A1SJ71BR11



Unit: mm (inch)

REVISIONS

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Jun., 1995	

IMPORTANT

(1) Design the configuration of a system to provide an external protective or safety interlocking circuit for the PCs.

(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.

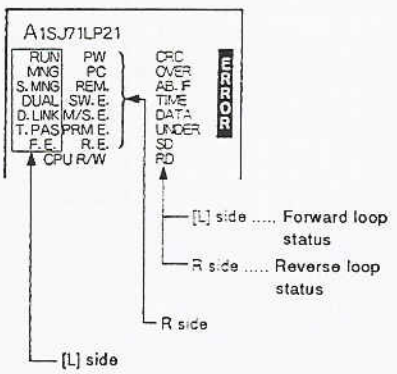
All examples and diagrams shown in this manual are intended only as an aid to understanding the text, not to guarantee operation.
Mitsubishi Electric will accept no responsibility for actual use of the product based on these illustrative examples.

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

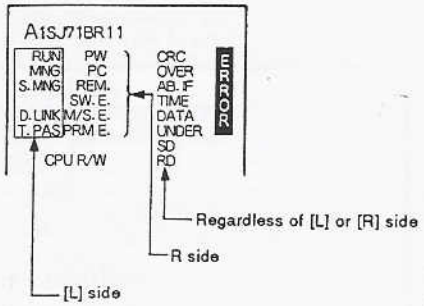
No.	Name	Description
(2) *1	Network number setting switch NETWORK NO. X100 X10 X1	Network number setting (setting on delivery: 1) <Setting range> 1 to 255 Any number out of the range will result in an error (the SW.E LED comes on).
(3) *1	Group number setting switch GR.NO.	Group number setting (setting on delivery: 0) <Setting range> 1 to 9: Group No. The number "0" means that no group is specified. (This setting is not required for a remote I/O network.)
(4) *1	Station number setting switch ST.NO. X10 X1	Station number setting (setting on delivery: 1) <Setting range> For PC-to-PC network 1 to 64 Any number outside the range will result in an error (the SW.E LED will come on). For remote I/O network 0 (master station) Any number other than 0 will result in an error (the SW.E LED will come on).
(5) *1	Mode setting switch MODE MODE 0 : ONLINE (A,R) 2 : OFFLINE	Mode setting (setting on delivery: 0)

Mode	Name	Description
0	Online (automatic online return effective)	Data link with automatic online return effective
1	Unusable	———
2	Offline	Disconnects the host station.
3	Forward loop test	Checks the forward loop line of the entire data link system.
4	Reverse loop test	Checks the reverse loop line of the entire data link system.
5	Station-to-station test (master station)	The mode for a line check between two stations, in which the station with the smaller number is regarded as the master station and the other is considered the slave station.
6	Station-to-station test (slave station)	
7	Self-loopback test	Checks the hardware of a module in isolation, including the communication circuit and cables of the transmission system.
8	Internal self-loopback test	Checks the hardware of a module in isolation, including the communication circuit of the transmission system.
9	Hardware test	Checks the hardware inside the network module.
A to F	Unusable	———

No.	Name	Description
(6)	LED display selector switch A1SJ71LP21 DISPLAY (F.L.) (R.L.)	Switches the LED display.



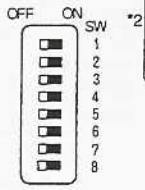
No.	Name	Description
(6)	A1SJ71BR11 DISPLAY R	



* The CPU R/W is displayed regardless of the switch position.

(7) *1 Condition setting switch

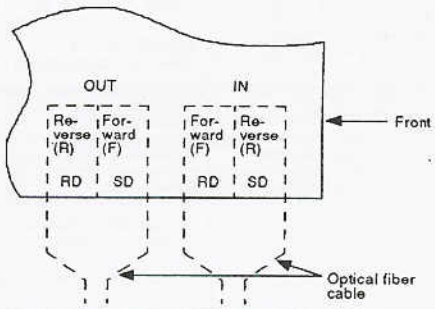
SW	OFF	ON
1	PC	REM
2	N.ST	MNG
3	PRM	O.PRM
4 5	ST.SIZE 8, 16, 32, 64	
6 7	LBA.W SIZE 2, 4, 6, 8 K	
8	———	



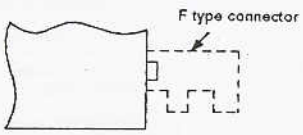
Operation condition setting (setting at delivery: all OFF)

SW	Description	OFF				ON			
1	Network type	PC-to-PC network				Remote I/O network			
2	Station type	Normal station				Control station			
3	Used parameter	Common parameters				Default parameters			
4	Number of stations (valid with SW3 on)	OFF	8 stations	ON	16 stations	OFF	32 stations	ON	64 stations
5		OFF		OFF		ON		ON	
6	Total number of B/W points (valid with SW3 on)	OFF	2 K points	ON	4 K points	OFF	6 K points	ON	[illegible] points
7		OFF		OFF		ON		ON	
8	Not used (always OFF)								

No.	Name	Description
(8)	Connector	An optical fiber cable is connected.



No.	Name	Description
(9)	Connector	An F type connector is connected.



*1: Reset the ACPU after changing the settings of (2), (3), (4), (5) and (7) with the ACPU power on.

*2: The switches need not be set when a remote I/O network is configured (SW1 on).