MITSUBISHI MELSECNET/10 Network Module

User's Manual

(Hardware)

AJ71LP21, AJ71LR21 AJ71BR11

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

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



MODEL	AJ71LP21/BR11-U-E
MODEL	
CODE	13JE32

IB(NA)-66444-D(0706)MEE

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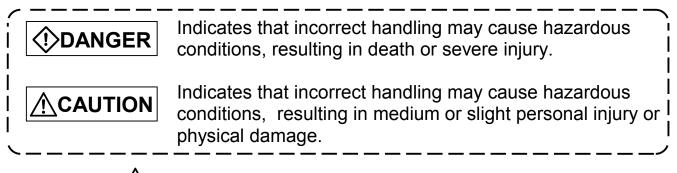
SAFETY PRECAUTIONS •

(Always read before starting use.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly.

The instructions given in this manual are concerned with this product. For the safety instructions of the programmable controller system, please read the CPU module user's manual.

In this manual, the safety instructions are ranked as "DANGER" and "CAUTION".



Note that the ACAUTION level may lead to a serious consequence according to the circumstances.

Always follow the instructions of both levels because they are important to personal safety.

Please store this manual in a safe place and make it accessible when required. Always forward it to the end user.

[INSTALLATION PRECAUTIONS]

 Use the programmable controller in an environment that meets the general specifications contained in CPU module user's manual. Using this programmable controller in an environment outside the range of the general
specifications could result in electric shock, fire, erroneous operation, and damage to or deterioration of the product.
 Fully insert the protection on the bottom of the module into the hole in the base unit and press the module into position.
Not installing the module correctly could result in malfunction, damage, or drop of some pieces of the product.
If using the product in a vibratory environment, tighten the module with the screws.
Always tighten the module fixing screws within the specified torque range. Loose tightening could result in drop of some pieces of the product, short- circuit, and malfunction.
Tightening the screws too much could result in drop of some pieces of the product, short- circuit, or malfunction due to the breakage of a screw or the module.
 Do not directly touch the printed circuit board, the conducting parts and electronic parts of the module.
It may cause damage or erroneous operation.

- Before handling the module, touch a grounded metal object to discharge the static electricity from the human body. Failure to do so may cause malfunction or failure of the module.
- Completely turn off the externally supplied power used in the system before mounting or removing the module.

Not doing so could result in damage to the product.

[WIRING PRECAUTIONS]

 Before wiring, be sure to shut off all phases of the external power supply used by the system.

Failure to do so may cause electric shocks or damage the product.

- Be sure there are no foreign substances such as sawdust or wiring debris inside the module. Such debris could cause fires, damage, or erroneous operation.
- Solder the coaxial cable connector properly. Incomplete soldering may cause a malfunction.
- Make sure to place the communication and power cables into a duct or fasten them using a clamp.

Cables not placed in the duct or not clamped may hang or shift, allowing them to be accidentally pulled, which may cause a module malfunction and cable damage.

• When removing the communication cable or power cables from the module, do not pull the cable. When removing the cable with a connector, hold the connector on the side that is connected to the module.

When removing the cable connected to the terminal block, first loosen the screws on the terminal block.

Pulling the cable that is still connected to the module may cause malfunction or damage to the module or cable. Revisions

* The manual number is noted at the lower right of the top cover.

Print Date	*Manual Number	Revision
Oct., 1993	IB(NA)-66444-A	First printing
Oct., 2004	IB(NA)-66444-B	
000, 2001		Manual size change
		$A4 \rightarrow A6$
		Correction
		Overall reexamination
May, 2006	IB(NA)-66444-C	Correction
		SAFETY PRECAUTIONS, Compliance with
		the EMC Directive and the Low Voltage
		Directive, Chapter 1, 2, 3, 4, 5, 6
Jun., 2007	IB(NA)-66444-D	Correction
		Section 5.1, 5.2.1, 5.2.2
	1	

Japanese Manual Version IB-68388-J

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About the Manuals

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

Detailed Manual

Manual name	Manual No. (Model code)
Type MELSECNET/10 Network System	(Model code) IB-66440
Type MELSECNET/10 Network System	
(PLC to PLC network) Reference Manual	(13JE33)
Type MELSECNET/10 Network System	SH-3509
(Remote I/O network) Reference Manual	(13JE72)

Before use of this module, be sure to read the Type MELSECNET/10 Network System (PLC to PLC network) Reference Manual or the Type MELSECNET/10 Network System (Remote I/O network) Reference Manual.

Compliance with the EMC Directive and the Low Voltage Directive

When incorporating the Mitsubishi programmable controller into other industrial machinery or equipment and keeping compliance with the EMC and low voltage directives, refer to Chapter 3 "EMC Directive and Low Voltage Instruction" of the User's Manual (Hardware) for the CPU module used or the programmable controller CPU supplied with the base unit.

The CE logo is printed on the rating plate of the programmable controller, indicating compliance with the EMC and low voltage directives. For making this product compliant with the EMC and low voltage directives, please refer to Section 3.1.3 "Cable" in Chapter 3 of the above-mentioned

user's manual.

1. Overview

This manual explains the specifications and names of each part, etc., of the AJ71LP21, AJ71LR21 and AJ71BR11 model MELSECNET/10 network module (abbreviated as Network Modules) which are used with MELSECNET/10 network system of the MELSEC-A series.

(1) The use, cable used and installation position of the Network Modules are indicated on the following chart.

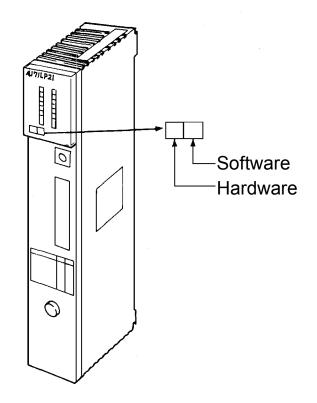
		Cable ι		
	Application	Optical	Coaxial	Position
		fiber cable	cable	
AJ71LP21	The control station, normal	\bigcirc		Main base,
AJ71LR21	station and remote master		\bigcirc	Extension
AJ71BR11	station of MELSECNET/10		Û	base I/O slot

(2) After unpacking the Network Modules, confirm that any of the following products is enclosed.

Model	Description	Quantity
AJ71LP21	Model AJ71LP21 MELSECNET/10 network module (optical loop type)	1
AJ71LR21	Model AJ71LR21 MELSECNET/10 network module (coaxial loop type)	1
AJ71BR11	Model AJ71BR11 MELSECNET/10 network module (coaxial bus type)	1
	F-type connector (A6RCON-F)	1

(3) The coaxial bus-type network system requires terminal resistors (A6RCON -R75: 75 Ω) at both terminal stations of the network. The user should arrange for terminal resistors, since the AJ71BR11 does not come with terminal resistors.

(4) The remote I/O network is supported from the software version J or later. (For the AJ71LR21, the software version must be "A" or later.)



In addition, make sure to use the following software version for the CPU module applicable to the remote I/O network.

Model	Software version
A2UCPU(S1)	
A3UCPU	N or later
A4UCPU	
A2ASHCPU(S1)	D or later
A2USHCPU-S1	A or later

2. Performance Specifications

The performance specifications for Network Modules are indicated as follows.

(1) A1SJ71LP21

Item		Specifications AJ71LP21		
Maximum	X/Y			
Maximum		8192 points		
link points	B	8192 points		
per network	W	8192 points		
Maximum link points	PLC to PLC network	$\left\{\frac{Y+B}{8} + (2\timesW)\right\} \leq 2000 \text{ bytes}$		
per station	Remote I/O	• Remote master station \rightarrow remote I/O station		
	network	$\left\{\frac{Y+B}{8} + (2 \times W)\right\} \leq 1600 \text{ bytes}$		
		• Remote I/O station \rightarrow remote master station		
		$\left\{\frac{X+B}{8} + (2\times W)\right\} \le 1600 \text{ bytes}$		
Communicatio	on speed	10Mbps (equivalent to 20Mbps for multiple transmission)		
Communicatio	on method	Token ring		
Synchronizati	on method	Frame synchronization		
Encoding met		NRZI encoding (Non Return to Zero Inverted)		
Transmission		Duplex optical loop		
Transmission		Conform to HDLC (frame format)		
Maximum nur		255		
networks		(The sum total of PLC to PLC network and remote I/O network)		
Maximum nur	nber of	9 (Only for PLC to PLC network)		
groups				
Number of stations for	PLC to PLC network	64 stations (Control station: 1 Normal stations: 63)		
connection per network	Remote I/O network	65 stations (Remote master station: 1 Remote I/O stations: 64)		
Overall distan		30km		
Station-to-stat		SI optical cable : 500m		
*1		H-PCF optical cable : 1km		
		Broad-band H-PCF optical cable : 1km		
		QSI optical cable : 1km		
Error control r	nethod	Retry by CRC ($X^{16}+X^{12}+X^5+1$) and overtime		
RAS function		• Loop back function due to abnormality detection and cable		
		disconnection		
		Diagnostic function for local link circuit check		
		 Prevention of system down due to shifting to control station 		
		(Only for PLC to PLC networks)		
		Abnormality detection by link special relay, resistor		
		 Abnormality detection by link special relay, resistor Network monitor, each type of diagnostic function 		
Transient tran	smission	 N: N communication (Monitor, program upload/download, etc.) 		
Transient transmission		 N. N communication (Monitor, program upload/download, etc.) ZNRD/ZNWR instructions (N: N): AnUCPU dedicated instructions 		
		Instructions		

Item	Specifications	
ltem	AJ71LP21	
Connection cable	Optical fiber cable (Arranged by user *2)	
Applicable connector	2-core optical connector plug (Arranged by user *2)	
5VDC current consumption	0.65 A	
Weight	0.31 kg *3	
No. of occupied I/O points	32 points (I/O assignment: 32 points as special)	

*1: There are restrictions to the distance between stations, being determined according to the type of cable and number of stations. See sections 5.1.

*2: Specialised training and specific tools are required to connect the connector to the optical-fiber cable; the connector itself is a custom product. Please contact your nearest Mitsubishi Electric System Service Corporation when purchasing these items.

*3: The weight for the hardware version P or earlier is 0.45kg.

For general specifications of the network module, refer to the user's manual for the programmable controller CPU that is to be used.

(2) AJ71LR21, AJ71BR11

Item		Specifications				
			AJ71LR21		AJ71BR11	
Maximum link	X/Y	8192 point	S			
points per	В	8192 point	S			
network	W	8192 point	S			
Maximum link points per	PLC to PLC network	$\left\{\frac{Y+B}{8}\right\} + (2)$	$(\times W) $ \leq 2000 bytes			
station	Remote I/O network	$\left\{\frac{Y+B}{8}\right\} + (2)$ • Remote I	master station \rightarrow rem (2×W) ≤ 1600 bytes /O station \rightarrow remote (2×W) ≤ 1600 bytes			
Communicatio	n speed	10Mbps (e	quivalent to 20Mbps transmission)	10Mbps		
Communicatio	n method	Token ring		Token bus		
Synchronizatio		· · · · · · · · · · · · · · · · · · ·	chronization			
Encoding meth		Mancheste				
Transmission r		Duplex coa	V	Single coa	ixial bus	
Transmission f			HDLC (frame forma			
Maximum num		255		-/		
networks		(The sum total of PLC to PLC network and remote I/O network)				
Maximum num groups	iber of		PLC to PLC network			
Number of	PLC to PLC	64 stations		32 stations	6	
stations for connection	network	Control s	station: 1 stations: 63	Control station: 1 Normal stations: 31		
per network	network		65 stations [Remote master station: 1] Remote I/O stations: 64		33 stations [Remote master station: 1] Remote I/O stations: 32	
Overall distance	e	3C-2V	19.2km (300m)	3C-2V	300m (300m)	
(Station-to-stat	tion	5C-2V	30km (500m)	5C-2V	500m (500m)	
distance) *1				used with a	tended to 2.5km when a repeater module A6BR10-DC)	
Error control m	nethod	Retry by CRC ($X^{16}+X^{12}+X^5+1$) and overtime				
RAS function		 Loop back function due to abnormality detection and cable disconnection (AJ71LR21) Diagnostic function for local link circuit check Prevention of system down due to shifting to control station (Only for PLC to PLC networks) Abnormality detection by link special relay, resistor Network monitor, each type of diagnostic function 				
Transient transmission		• N: N com	munication (Monitor, JWR instructions (N:	program u	pload/download, etc.)	

Item	Specifications		
lteni	AJ71LR21	AJ71BR11	
Connection cable	Equivalent to 3C-2V, 5C-2V cables (Arranged by user)		
Applicable connector	Equivalent to BNC-P-3-NiCAu (For 3C-2V), BNC-P-5-NiCAu (For		
	5C-2V) (DDK) (Arranged by user)		
5VDC current consumption	1.20 A	0.80 A	
Weight	0.45 kg	0.45 kg	
No. of occupied I/O points	32 points (I/O assignment: 32 points as special)		

*1: There are restrictions to the distance between stations, being determined according to the type of cable and number of stations. See sections 5.2.1 and 5.2.2.
For general specifications of the network module, refer to the user's manual for the programmable controller CPU that is to be used.

[INSTALLATION PRECAUTIONS]

	Use the programmable controller in an environment that meets the general specifications contained in CPU module user's manual. Using this
	programmable controller in an environment outside the range of the general specifications could result in electric shock, fire, erroneous operation, and
	damage to or deterioration of the product.
•	Fully insert the protection on the bottom of the module into the hole in the
	base unit and press the module into position.
	Not installing the module correctly could result in malfunction, damage, or drop of some pieces of the product.
	If using the product in a vibratory environment, tighten the module with the screws.
	Always tighten the module fixing screws within the specified torque range.
	Loose tightening could result in drop of some pieces of the product, short- circuit, and malfunction.
	Tightening the screws too much could result in drop of some pieces of the
	product, short- circuit, or malfunction due to the breakage of a screw or the module.
	Do not directly touch the printed circuit board, the conducting parts and
	electronic parts of the module.
	It may cause damage or erroneous operation.
	Before handling the module, touch a grounded metal object to discharge the
	static electricity from the human body. Failure to do so may cause
	malfunction or failure of the module.

• Completely turn off the externally supplied power used in the system before mounting or removing the module.

Not doing so could result in damage to the product.

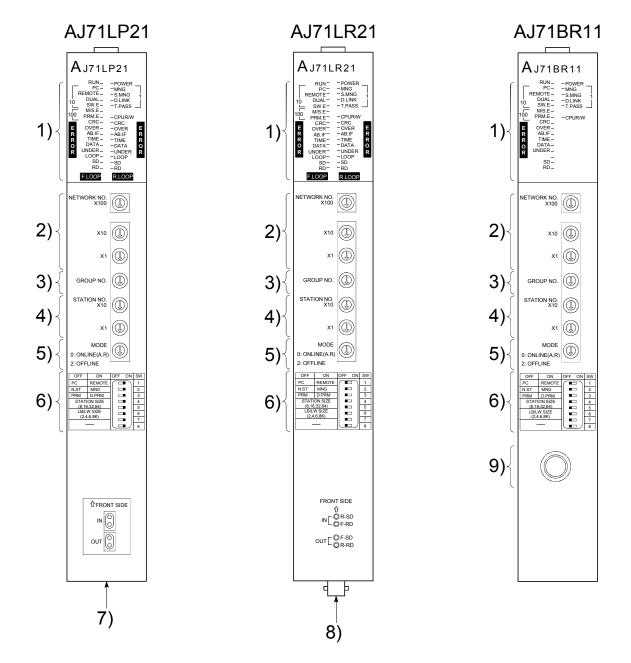
3.1 Cable length restrictions between stations

- (1) The main modules case is made of plastic, so do not drop it or subject it to strong impacts.
- (2) Do not dismount the printed wiring board from the case. It may damage the module.
- (3) When wiring, be careful never to let foreign matter from the above module such as wiring scraps get inside the module. If something goes in, get rid of it.
- (4) The module installation screw should be kept within the following range.

Screw Locations	Tightening Torque Range
Module installation screws (M4 screws)	78 to 118N•cm

4. The Name and Setting of Each Part

Indicates the name and setting of each part of Network Modules.



No.	Name			Contents
1)	LED	Name	Status	Contents
		RUN	ON	Normal state
	AJ71LP21		OFF	WDT error, SP.UNIT ERROR
	AJ71LR21	PC		Set as PLC to PLC network (SW1 turned OFF)
	AJ71LP21	REMOTE		Set as remote I/O network (SW1 turned ON)
		DUAL		Multiplex transfer in execution
	RUNPOWER PCMNG			(OFF: Multiplex transfer not executed)
	DUAL D.LINK	SW.E.		Incorrect setting of switches 2) to 6)
	10SW.ET.PASS M/S.E 100PRM.ECPUR/W	M/S.E.		Station number or control/remote master station status
	CRC - CRC			is duplicated on the same network.
	R AB.IF – AB.IF R R TIME – TIME R	PRM.E.		 Duplication of network refreshes parameters when
				multiple modules are mounted.
	LOOPLOOP SDSD RDRD			Inconsistency between the common and station
	F.LOOP R.LOOP			specific parameters
				 Difference between parameter received from sub-control station and the one of the host (received
				from control station).
	AJ71BR11	POWER		Power being supplied (OFF: No power being supplied)
	Δ	MNG		Operating as control station or remote master station
	A J71BR11			(OFF: Normal station)
	RUNPOWER PCMNG	S.MNG		Operating as sub-control station
	REMOTE S.MNG DUAL D.LINK	D.LINK		Data link being performed (OFF: Data link stopped)
	10SW.ET.PASS M/S.E 100PRM.ECPUBAW	T.PASS.		Participating in token passing
	CRC-			(Transient transmission is available.)
	R AB.IF – R TIME –	CPU R/W		Communicating with CPU
	O DATA_ R UNDER_	CRC	ON	Error detected in code check of receive data
	SD_ RD_		UN	<cause> Timing at which station sending data to target</cause>
				station is disconnected from network, hardware failure,
				cable fault, noise, etc.
		OVER		Error occurred when receive data processing is
				delayed
				<cause> Hardware failure, cable fault, noise, etc.</cause>
		AB.IF		Consecutive 1s exceeding the specified number were
				received.
				 Length of received data is too short. <cause> Timing at which station sending data to target</cause>
				station is disconnected from network, too short
				monitoring time, cable fault, noise, etc.
		TIME		Data link WDT times out.
				<cause> Monitoring time too short, cable fault, noise,</cause>
				etc.
		DATA		Abnormal data larger than 2 kbytes are received.
				<cause> Cable fault, noise, etc.</cause>
		UNDER		Internal send data processing is not done at fixed
				intervals.
				<cause> Hardware failure</cause>
		LOOP		Forward/reverse loop (F.LOOP/R.LOOP) is faulty.
				<cause> Power-off of adjacent station, cable</cause>
		00	Direct	disconnection, no connection, etc.
		SD	Dimly	Data being sent
		RD	ON	Data being received

No.	Name		Contents		
2) *1	Network number setting switch NETWORK NO. X100 $+$ the third X10 $+$ the second X10 $+$ the first X1 $+$ the first X1 $+$ the first X1	<setting rang<br="">1 to 255</setting>	ber setting (factory setting at time of shipping: 1) e> : Network number to 255 : Setting error (The SW.E. LED turns ON) Becomes off-line condition		
3) *1	Group number setting Switch	Group number setting (factory setting at time of shipping: 0) <setting range=""> 0 : No specified group 1 to 9 : Group number Group number</setting>			
4)	Station number setting switch	Station numb	er setting (factory setting at time of shipping: 1)		
*1	\frown	Туре	Setting		
	STATION NO.	PLC to PLC	1 to 64 : Station number		
	X10 (⊖) ← the second dight	network *2	Other than 1 to 64 :Setting error		
			(The SW.E. LED turns ON)		
	L X1 ((≦)) ← the first dight	Remote I/O	0 : Remote master station		
		network	Other than 0 to 64 :Setting error		
+4 1			(The SW.E. LED turns ON)		

*1: When the setting has been changed with the CPU module powered ON, reset the CPU module (Shift the RUN/STOP key switch from RESET to any other than RESET.) *2: The setting range for the AJ71BR11 is shown below.

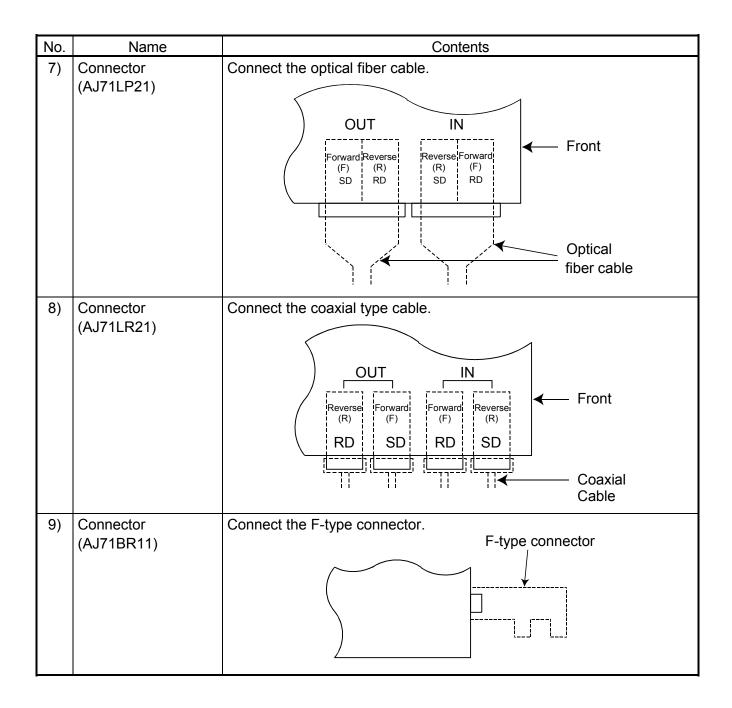
<Setting range> 1 to 32

: Station number

Other than 1 to 32 : Setting error (The SW.E. LED turns ON. Note that it does not turn ON when set to any of 33 to 64.)

No.	Name	Contents										
5)	Mode setting switch	Мос	Mode setting (factory setting at ti				time of shipping: 0)					
*3		Mo	ode	Na	ame				Cor	ntents		
	MODE		0	Online (autonomic online retu			Data effec		th aut	omatic	online	e return
	0: ONLINE(A.R)		1	Not used (Settin	g to thi	s turn	s on the	e SW.	.E. LEC).)	
	2: OFFLINE		2	Offline			Disc	onnects	s the I	host sta	ation.	
			3	Forward lo	op tes	st		cks the /ork sys		ird loop	of the	e whole
			4	Reverse lo	op tes	st		cks the /ork sys		se loop	of the	e whole
		;	5	Station-to- (master sta		n test		mode f stations				tween ion with
			6	Station-to- (slave stati		n test	the r	smaller naster :	statio	n and tl	he oth	
			-	`		. 1		sidered				
			7	Self-loopba	аск те	st	isola com	ck the h ition, ind munica	cludin tion c	g the ircuit ar	nd ca	
			_	1.1		11		ransmi				
			8	Internal se	it-loop	рраск		ck the h			a moc	iule in
				test		isolation, including the communication circuit of the						
						transmission system.						
			9	Hardware	test						ide th	e
						Check the hardware inside the network module.						
			o C	Not used			(Do not set the mode.)					
			D	Test mode	8		Netv	vork No	. che	ck (LÉC) disp	olay)
			E	Test mode	9		Grou	up No. d	check	(LED o	displa	y)
			F	Test mode			Station No. check (LED display)				ay)	
6)	Conditions setting switch			n condition s								
*3	OFF ON OFF ON SW PC REMOTE 1	(fac	tory s	etting at the	time	of ship	pping: all off)					
	N.ST MNG 2	SW	С	ontents		0	FF			C	N	
	PRM D.PRM 3 STATION SIZE 4 4 (8.16.32.64) 5 5 I.B/I.W.SIZE 6 6	1		ork type		to PLC		vork		ote I/O		ork
	(2.4.6.8K)			on type	Normal statio							
		3 Use para		meters	Para	meters	in co	mmon	Defa	ult Para		ers
	4		statio		OFF	8 stati-	ON	16 stati-	OFF	32 stati-	ON	64 stati-
	*4 <	5	lsv	llid when V3 is ON	OFF		OFF		ON	ons	ON	ons
		6	gene	number of eral point	OFF	ZK	ON	4k	OFF	ок	ON	8k
		7	lsv	llid when V3 is ON	OFF	points	OFF	points	ON	points	ON	points
	-	8	Not	used (alwa	ys off)					(1 4	

*3: When the setting has been changed with the CPU module powered ON, reset the CPU module (Shift the RUN/STOP key switch from RESET to any other than RESET.) Note that resetting the CPU module is not needed for mode "D" to "F".
 *4: The settings are enabled when the module is a control station in the PLC to PLC network.



5. Wiring

 Before wiring, be sure to shut off all phases of the external power supply used by the system.

Failure to do so may cause electric shocks or damage the product.

- Be sure there are no foreign substances such as sawdust or wiring debris inside the module. Such debris could cause fires, damage, or erroneous operation.
- Solder the coaxial cable connector properly. Incomplete soldering may cause a malfunction.
- Make sure to place the communication and power cables into a duct or fasten them using a clamp.

Cables not placed in the duct or not clamped may hang or shift, allowing them to be accidentally pulled, which may cause a module malfunction and cable damage.

• When removing the communication cable or power cables from the module, do not pull the cable. When removing the cable with a connector, hold the connector on the side that is connected to the module.

When removing the cable connected to the terminal block, first loosen the screws on the terminal block.

Pulling the cable that is still connected to the module may cause malfunction or damage to the module or cable.

5.1 Precautions for Laying Optical Fiber Cables

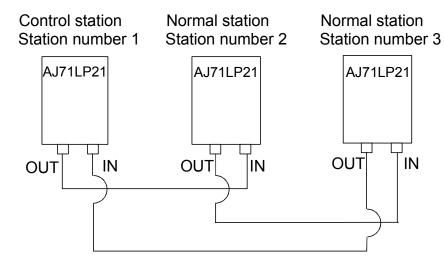
(1) The optical fiber cable type that can be used differs depending on the station to station distance.

Туре	Distance between stations
SI optical fiber cable	500 m (1640.5 ft.)
H-PCF optical fiber cable	1000 m (3281 ft.)
Broad-band H-PCF optical fiber cable	1000 m (3281 ft.)
QSI optical fiber cable	1000 m (3281 ft.)

(2) When connecting an optical fiber cable, the following restrictions on the bending radius must be observed.

Make sure of the specifications of the cable to be used.

(3) The optical fiber cable is wired in the following manner. There is no problem even if not wiring in order of the station number. There is no problem even if station how many become control station.



- (4) When laying the optical fiber cable, do not touch the fiber core of the cable connector or module connector, or let dirt or dust collect on it. If oil from the hands, dirt or dust should adhere to the core, the transmission loss will increase, causing a malfunction in the data link. Also, do not remove the cover from the module connector until an optical fiber cable is connected.
- (5) When attaching or detaching the optical fiber cable to/from the module, hold the cable connector securely with the hands.
- (6) Connect the cable connector and module connector securely until you hear a "click" sound.
- (7) Please wire IN/OUT of the connector for the cable correctly. Please do loopback test, the set confirmation test, and the bureau order confirmation test after wiring. It might be generated that a baton abnormal passing cannot be generated when miswiring and the downed bureau which cannot do the loopback of an arbitrary bureau do the row again even by the reclosing of the power supply.
- (8) Completely turn off the externally supplied power used in the system when connecting or disconnecting the cable.

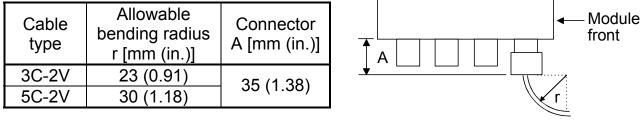
5.2 Precautions when Installing the Coaxial Cables

5.2.1 For the Coaxial Loop Type

(1) For connection between network modules, use the cable length given in the following table depending on the cable type.

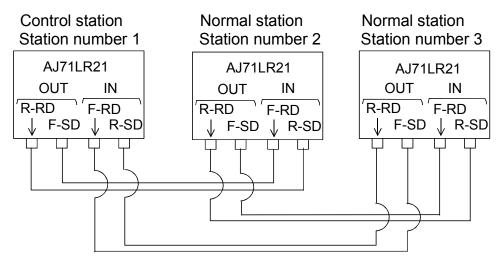
Cable type	Interstation cable length	Overall distance
3C-2V	300 m (984.3 ft.)	19.2 km (62995.2ft.)
5C-2V	500 m (1640.5 ft.)	30 km (98430 ft.)

(2) When connecting a coaxial cable, the following restrictions on the bending radius must be observed.

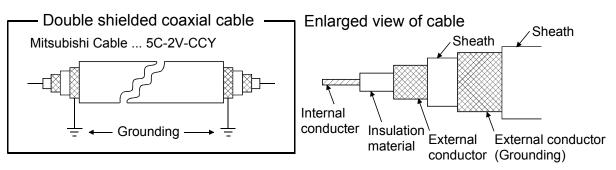


(3) The Coaxial cable is wired in the following manner.

There is no problem even if not wiring in order of the station number. There is no problem even if station how many become control station.



- (4) Install the coaxial cables at least 100 mm (3.94 in.) away from other power cables and control cables.
- (5) Consider wiring using double-shielded coaxial cable in places that are subject to large amounts of noise.



The 5C-2V connector plug is applicable to double-shielded coaxial cable. Connect the 5C-2V connector plug to the coaxial cable inside a doubleshielded coaxial cable. Ground the shielded part outside a double-shielded coaxial cable as shown in the above figure. (6) Do not pull any of the connected cables.

This will cause a faulty contact, cable disconnection, or damage to the module.

(7) Please wire SD/RD of the connector for the cable correctly.

Please do loopback test, the set confirmation test, and the bureau order confirmation test after wiring. It might be generated that a baton abnormal passing cannot be generated when miswiring and the downed bureau which cannot do the loopback of an arbitrary bureau do the row again even by the reclosing of the power supply.

(8) Completely turn off the externally supplied power used in the system when connecting or disconnecting the cable.

5.2.2 For the Coaxial Bus Type

(1) The cable to connect between network modules must be the following according to the number of stations connected.

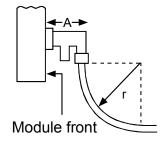
When a cable length other than those specified in the table below is used, a communication error may result.

Number of stations connected Station-to-station cable length	2 to 9 s	stations	10 to 33 stations		
Cable type	3C - 2V	5C - 2V	3C - 2V	5C - 2V	
0 to 1 m (3.28 ft.)	•	le less tha ngth cann	•	,	
1 (3.28 ft.) to 5 m (16.41 ft.)	\bigcirc	\bigcirc	\bigcirc	\bigcirc	
5 (16.41 ft.) to 13 m (42.65 ft.)	\bigcirc	\bigcirc	×	×	
13 (42.65 ft.) to 17 m (55.78 ft.)	\bigcirc	\bigcirc	\bigcirc	\bigcirc	
17 (55.78 ft.) to 25 m (82.03 ft.)	\bigcirc	\bigcirc	×	×	
25 (82.03 ft.) to 300 m (984.3 ft.)	0	0	0	Ó	
300 (984.3 ft.) to 500 m (1640.5 ft.)	×	\bigcirc	×	\bigcirc	

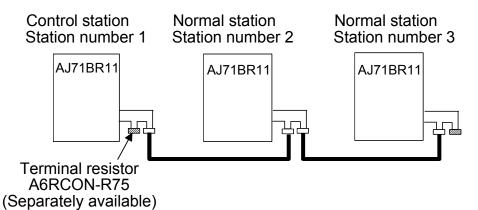
 \bigcirc : Allowed \times : Not allowed

- (2) If there is the possibility of an increase in the number of stations due to system expansion, install the cables with advance consideration of the restrictions.
- (3) When using a repeater module (models A6BR10 or A6BR10-DC), use the station-to-station cable length indicated by "10 to 33" stations, regardless of the number of stations connected or the number of repeater modules.
- (4) When connecting a coaxial cable, the following restrictions on the bending radius must be observed.

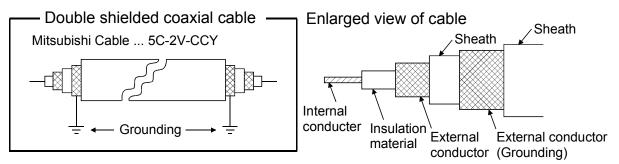
Cable	Allowable bending radius	Connector
type	r [mm (in.)]	A [mm (in.)]
3C-2V	23 (0.91)	50 (1.97)
5C-2V	30 (1.18)	50 (1.97)



 (5) The coaxial cable is wired in the following manner. There is no program even if not wiring in order of the station number. There is no program even if station how many become control station.



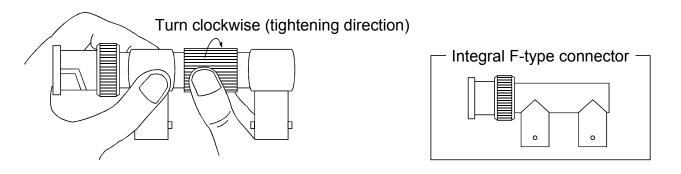
- (6) Install the coaxial cables at least 100 mm (3.94 in.) away from other power cables and control cables.
- (7) Consider wiring using double-shielded coaxial cable in places that are subject to large amounts of noise.



The 5C-2V connector plug is applicable to double-shielded coaxial cable. Connect the 5C-2V connector plug to the coaxial cable inside a double-shielded coaxial cable. Ground the shielded part outside a double-shielded coaxial cable as shown in the above figure.

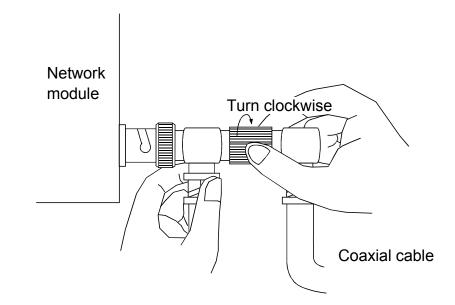
- (8) Do not pull any of the connected coaxial cables. This will cause a faulty contact, cable disconnection, or damage to the module.
- (9) Make sure to connect a terminal resistor to both terminal stations of the coaxial bus type network system.
- (10) A white oxide, which may be deposited on the F-type connector depending on the operating environment, is not producted in the fitting portion, posing no functional problems.
- (11) Completely turn off the externally supplied power used in the system when connecting or disconnecting the cable.

(12)There are integral type and separate F-type connectors. In the case of the separate F-type connector, tighten the ring of the connector until the ring is tight before connecting the connector to the network module. If the ring is loose, a communication error may occur.



After connecting the F-type connector to the network module, retighten its ring periodically.

Retighten it with both hands as shown below.

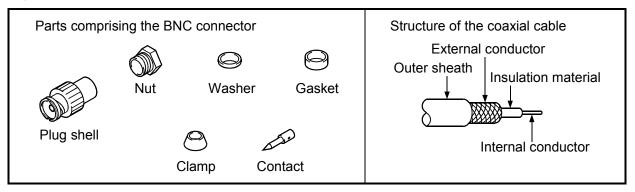


5.2.3 Connecting the Connector for the Coaxial Cables

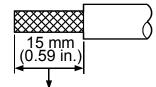
The following section explains how to connect the BNC connector (connector plug for the coaxial cable) to the cable.

(1) Structure of the BNC connector and coaxial cable

The structure of the BNC connector and coaxial cable are shown in the figure below.

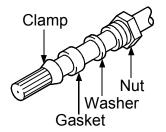


- (2) How to connect the BNC connector and the coaxial cable
 - (a) Cut off the outer sheath of the coaxial cable to the length shown in the diagram below.

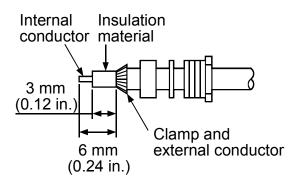


Cut this portion of the outer sheath

(b) Feed the nut, washer, gasket and clamp on the coaxial cable through, as shown below, then unfasten the external conductor.



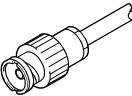
(c) Cut the external conductor, insulation material and internal conductor to the dimensions shown below. However, cut the external conductor to the same dimension as the tapered section of the clamp and smooth it down to the clamp.



(d) Solder the contact to the internal conductor.



(e) Insert the connector assembly in (d) into the plug shell and screw the nut into the plug shell.

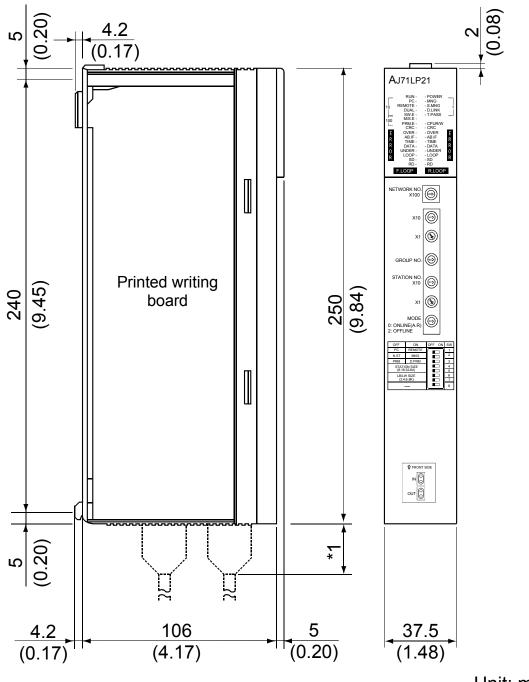


Important

- (1) Note the following precautions when soldering the internal conductor and contact.
 - Make sure that the solder does not bead up at the soldered section.
 - Make sure there are no gaps between the connector and cable insulator or they do not cut into each other.
 - Perform soldering quickly so the insulation material does not become deformed.
- (2) Before connecting or disconnecting the coaxial connector, touch a grounded metal object to discharge the static electricity from the human body. Failure to do so may result in a module malfunction.

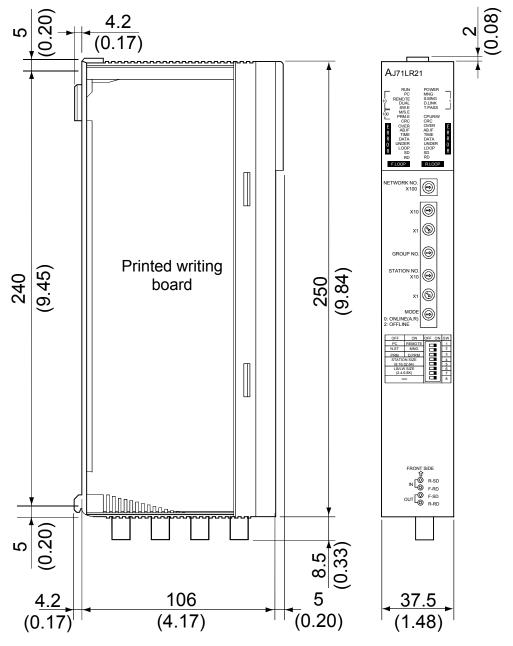
6. External Dimensions

6.1 AJ71LP21

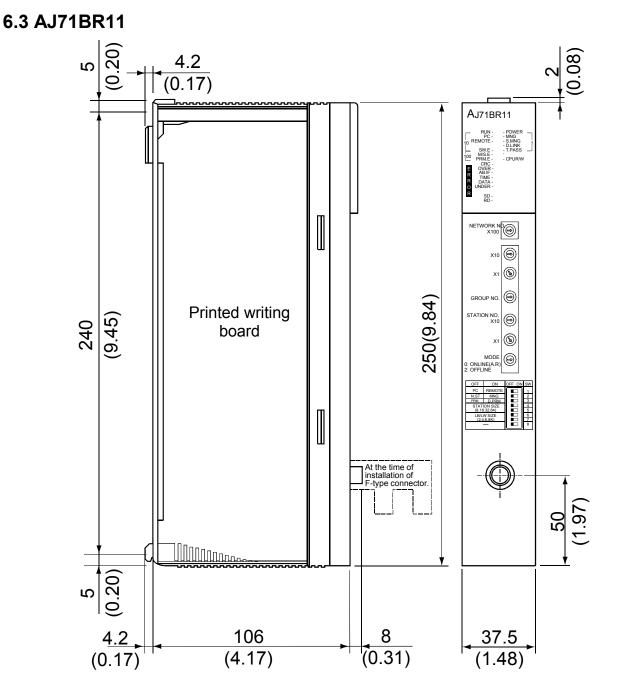


Unit: mm (in.)

*1: Please confirm details to Mitsubishi Electric System Service Corporation.



Unit: mm (in.)



Unit: mm (in.)

MEMO

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- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
- This product has been manufactured under strict quality control. However, when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

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