

MITSUBISHI

MELSECNET/10

Network Module

User's Manual
(Hardware)

A1SJ71LP21, A1SJ71LR21
A1SJ71BR11

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	A1S-NET10-M-U-JE
MODEL CODE	13JQ96
IB(NA)-0800119-E(0706)MEE	

● 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".



Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.



Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage.

Note that the  CAUTION 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]

CAUTION

- 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 projection on the bottom of the module into the hole in the base unit, press the module into position, and tighten the module fixing screws.
Not installing the module correctly or not fixing it with the screws could result in malfunction, damage, or drop of some pieces of the product.
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.

[INSTALLATION PRECAUTIONS]

CAUTION

- 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]

DANGER

- 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.

CAUTION

- 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
Feb., 2000	IB(NA)-0800119-A	First printing
Nov., 2001	IB(NA)-0800119-B	Partial correction Contact address (Back cover)
Oct., 2004	IB(NA)-0800119-C	Partial correction SAFETY PRECAUTIONS, About the Manuals, Chapter 2, 3, 4, Section 5.1, 5.2.1, 5.2.2, 5.2.3, 6.1, 6.2
May, 2006	IB(NA)-0800119-D	Partial correction SAFETY PRECAUTIONS, Compliance with the EMC Directive and the Low Voltage Directive, Chapter 1, 2, 3, 4, 5, 6
Jun., 2007	IB(NA)-0800119-E	Partial correction Section 5.1, 5.2.1, 5.2.2

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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 (PLC to PLC network) Reference Manual	IB-66440 (13JE33)
Type MELSECNET/10 Network System (Remote I/O network) Reference Manual	SH-3509 (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 A1SJ71LP21, A1SJ71LR21 and A1SJ71BR11 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.

	Application	Cable used		Position
		Optical fiber cable	Coaxial cable	
A1SJ71LP21	The control station, normal station and remote master station of MELSECNET/10	○	—	Main base, Extension base I/O slot
A1SJ71LR21		—	○	
A1SJ71BR11				

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

Model	Description	Quantity
A1SJ71LP21	Model A1SJ71LP21 MELSECNET/10 network module (optical loop type)	1
A1SJ71LR21	Model A1SJ71LR21 MELSECNET/10 network module (coaxial loop type)	1
A1SJ71BR11	Model A1SJ71BR11 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: 75Ω) at both terminal stations of the network. The user should arrange for terminal resistors, since the A1SJ71BR11 does not come with terminal resistors.

2. Performance Specifications

The performance specifications for Network Modules are indicated as follows.

(1) A1SJ71LP21

Item		Specifications
		A1SJ71LP21
Maximum link points per network	X/Y	8192 points
	B	8192 points
	W	8192 points
Maximum link points per station	PLC to PLC network	$\left\{ \frac{Y+B}{8} + (2 \times W) \right\} \leq 2000$ bytes
	Remote I/O network	<ul style="list-style-type: none"> Remote master station → remote I/O station $\left\{ \frac{Y+B}{8} + (2 \times W) \right\} \leq 1600$ bytes Remote I/O station → remote master station $\left\{ \frac{X+B}{8} + (2 \times W) \right\} \leq 1600$ bytes
Communication speed		10Mbps (equivalent to 20Mbps for multiple transmission)
Communication method		Token ring
Synchronization method		Frame synchronization
Encoding method		NRZI encoding (Non Return to Zero Inverted)
Transmission route format		Duplex optical loop
Transmission format		Conform to HDLC (frame format)
Maximum number of networks		255 (The sum total of PLC to PLC network and remote I/O network)
Maximum number of groups		9 (Only for PLC to PLC network)
Number of stations for connection per network	PLC to PLC network	64 stations (Control station: 1 Normal stations: 63)
	Remote I/O network	65 stations (Remote master station: 1 Remote I/O stations: 64)
Overall distance		30km
Station-to-station distance *1	SI optical cable	: 500m
	H-PCF optical cable	: 1km
	Broad-band H-PCF optical cable	: 1km
	QSI optical cable	: 1km
Error control method		Retry by CRC ($X^{16}+X^{12}+X^5+1$) and overtime
RAS function		<ul style="list-style-type: none"> 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 Network monitor, each type of diagnostic function
Transient transmission		<ul style="list-style-type: none"> N: N communication (Monitor, program upload/download, etc.) ZNRD/ZNWR instructions (N: N): AnUCPU dedicated instructions

Item	Specifications
	A1SJ71LP21
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	0.18 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 F or earlier is 0.33kg.

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

(2) A1SJ71LR21, A1SJ71BR11

Item		Specifications			
		A1SJ71LR21		A1SJ71BR11	
Maximum link points per network	X/Y	8192 points			
	B	8192 points			
	W	8192 points			
Maximum link points per station	PLC to PLC network	$\left\{ \frac{Y+B}{8} + (2 \times W) \right\} \leq 2000$ bytes			
	Remote I/O network	<ul style="list-style-type: none"> Remote master station → remote I/O station $\left\{ \frac{Y+B}{8} + (2 \times W) \right\} \leq 1600$ bytes Remote I/O station → remote master station $\left\{ \frac{X+B}{8} + (2 \times W) \right\} \leq 1600$ bytes 			
Communication speed		10Mbps (equivalent to 20Mbps for multiple transmission)		10Mbps	
Communication method		Token ring		Token bus	
Synchronization method		Frame synchronization			
Encoding method		Manchester encoding			
Transmission route format		Duplex coaxial loop		Single coaxial bus	
Transmission format		Conform to HDLC (frame format)			
Maximum number of networks		255 (The sum total of PLC to PLC network and remote I/O network)			
Maximum number of groups		9 (Only for PLC to PLC network)			
Number of stations for connection per network	PLC to PLC network	64 stations 〔Control station: 1〕 〔Normal stations: 63〕		32 stations 〔Control station: 1〕 〔Normal stations: 31〕	
	Remote I/O 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 (Station-to-station distance) *1		3C-2V	19.2km (300m)	3C-2V	300m (300m)
		5C-2V	30km (500m)	5C-2V	500m (500m)
		—		Can be extended to 2.5km when used with a repeater module (A6BR10, A6BR10-DC)	
Error control method		Retry by CRC ($X^{16}+X^{12}+X^5+1$) and overtime			
RAS function		<ul style="list-style-type: none"> Loop back function due to abnormality detection and cable disconnection (A1SJ71LR21) 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		<ul style="list-style-type: none"> N: N communication (Monitor, program upload/download, etc.) ZNRD/ZNWR instructions (N: N): AnUCPU dedicated instructions 			

Item	Specifications	
	A1SJ71LR21	A1SJ71BR11
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	1.14 A	0.80 A
Weight	0.30 kg	0.33 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.

3. Handling

[INSTALLATION PRECAUTIONS]

CAUTION

- 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 projection on the bottom of the module into the hole in the base unit, press the module into position, and tighten the module fixing screws.
Not installing the module correctly or not fixing it with the screws could result in malfunction, damage, or drop of some pieces of the product.
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.

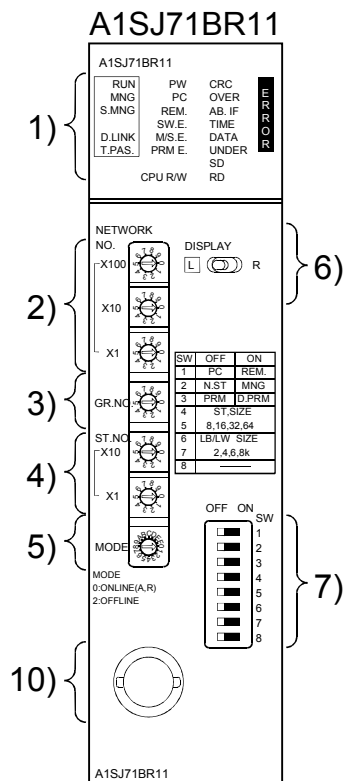
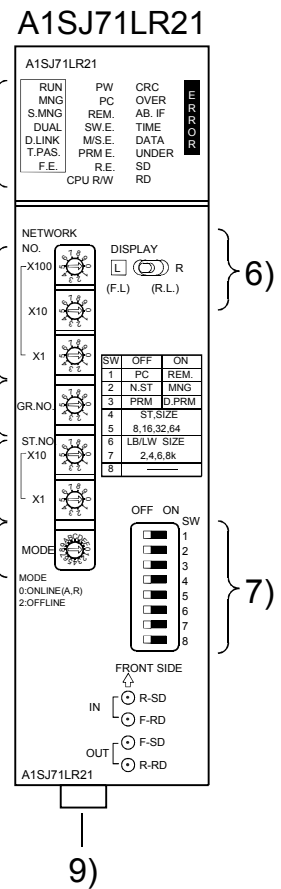
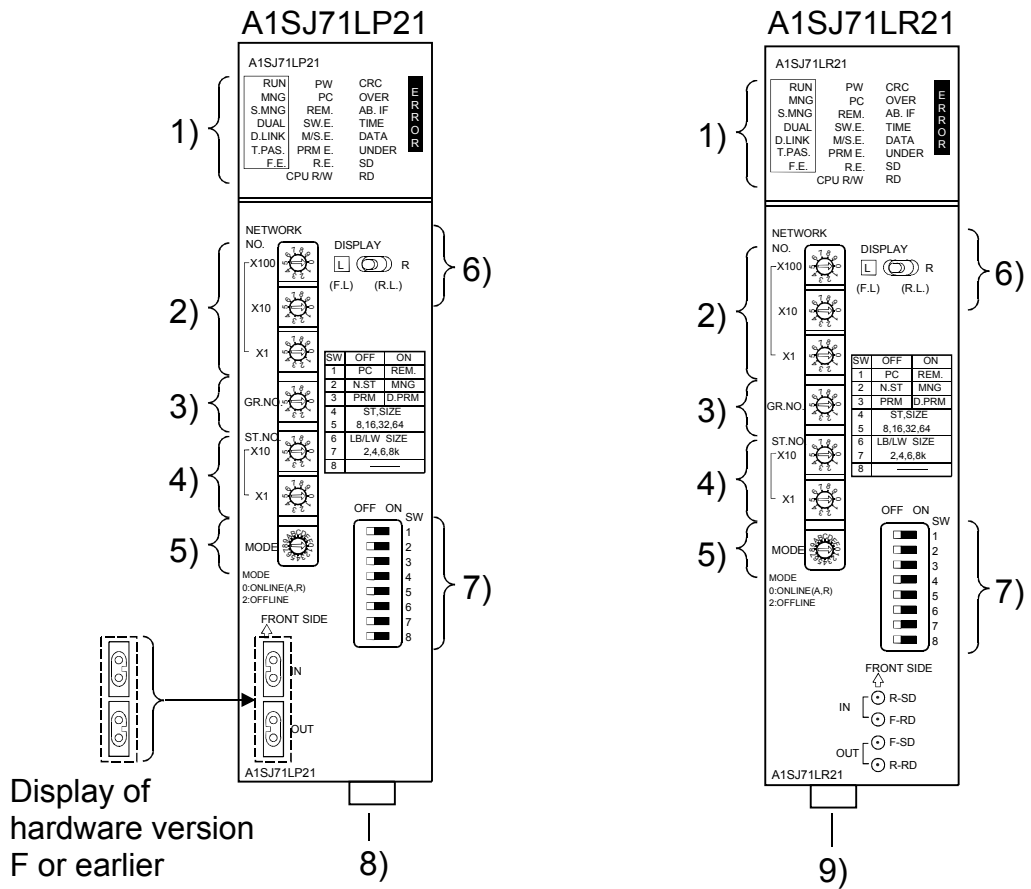
3.1 Cable length restrictions between stations

- (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.

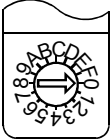
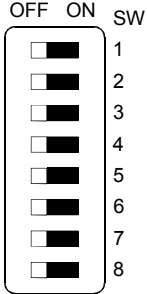
Screw Locations	Tightening Torque Range
Module installation screws (M4 screws)	78 to 118N•cm

4. The Name and Setting of Each Part

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

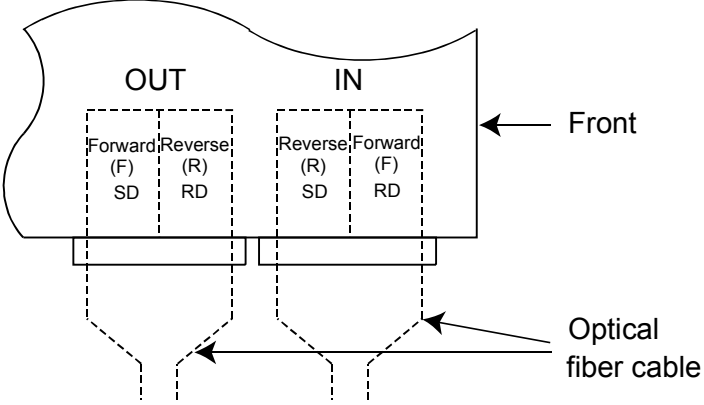
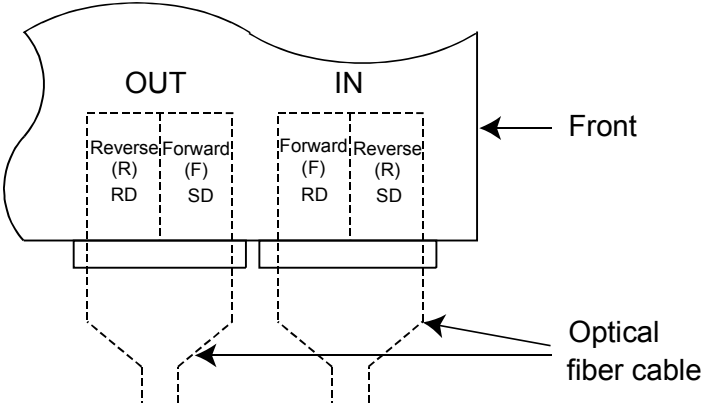
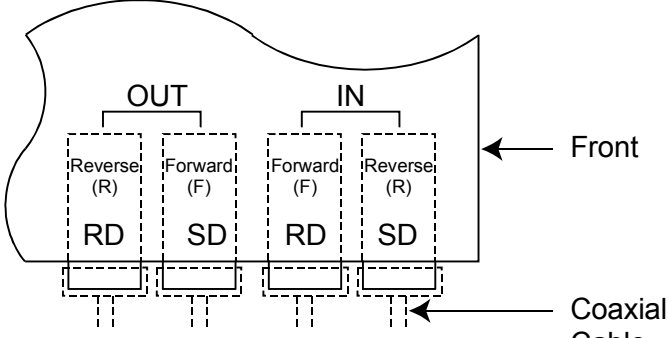
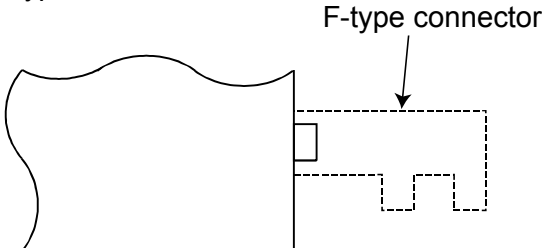


No.	Name	Contents																																															
1)	LED A1SJ71LP21 A1SJ71LR21 <div style="border: 1px solid black; padding: 5px; width: fit-content;"> A1SJ71LP21 <table style="font-size: small; border-collapse: collapse;"> <tr><td>RUN</td><td>PW</td><td>CRC</td></tr> <tr><td>MNG</td><td>PC</td><td>OVER</td></tr> <tr><td>S.MNG</td><td>REM.</td><td>AB. IF</td></tr> <tr><td>DUAL</td><td>SW.E.</td><td>TIME</td></tr> <tr><td>D.LINK</td><td>M/S.E.</td><td>DATA</td></tr> <tr><td>T.PAS.</td><td>PRM.E.</td><td>UNDER</td></tr> <tr><td>F.E.</td><td>R.E.</td><td>SD</td></tr> <tr><td>CPU R/W</td><td>RD</td><td></td></tr> </table> </div> A1SJ71BR11 <div style="border: 1px solid black; padding: 5px; width: fit-content;"> A1SJ71BR11 <table style="font-size: small; border-collapse: collapse;"> <tr><td>RUN</td><td>PW</td><td>CRC</td></tr> <tr><td>MNG</td><td>PC</td><td>OVER</td></tr> <tr><td>S.MNG</td><td>REM.</td><td>AB. IF</td></tr> <tr><td>DUAL</td><td>SW.E.</td><td>TIME</td></tr> <tr><td>D.LINK</td><td>M/S.E.</td><td>DATA</td></tr> <tr><td>T.PAS.</td><td>PRM.E.</td><td>UNDER</td></tr> <tr><td>CPU R/W</td><td>RD</td><td></td></tr> </table> </div>	RUN	PW	CRC	MNG	PC	OVER	S.MNG	REM.	AB. IF	DUAL	SW.E.	TIME	D.LINK	M/S.E.	DATA	T.PAS.	PRM.E.	UNDER	F.E.	R.E.	SD	CPU R/W	RD		RUN	PW	CRC	MNG	PC	OVER	S.MNG	REM.	AB. IF	DUAL	SW.E.	TIME	D.LINK	M/S.E.	DATA	T.PAS.	PRM.E.	UNDER	CPU R/W	RD		Name	Status	Contents
		RUN	PW	CRC																																													
		MNG	PC	OVER																																													
		S.MNG	REM.	AB. IF																																													
		DUAL	SW.E.	TIME																																													
		D.LINK	M/S.E.	DATA																																													
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		S.MNG	REM.	AB. IF																																													
		DUAL	SW.E.	TIME																																													
		D.LINK	M/S.E.	DATA																																													
		T.PAS.	PRM.E.	UNDER																																													
		CPU R/W	RD																																														
			RUN	ON	Normal state	The position of switch for the display switch over of 6) is valid when it is on the left side.																																											
				OFF	WDT error, SP.UNIT ERROR																																												
			MNG		Operating as control station or remote master station (OFF: Normal station)																																												
			S.MNG		Operating as sub-control station																																												
	DUAL		Multiplex transfer in execution (OFF: Multiplex transfer not executed)																																														
	D.LINK		Data link being performed (OFF: Data link stopped)																																														
	T.PAS.		Participating in token passing (Transient transmission is available.)																																														
	F.E.		Forward loop (F.LOOP) is faulty. <Cause> Power-off of adjacent station, cable disconnection, no connection, etc.																																														
	PW		Power being supplied (OFF: No power being supplied)	The position of switch for the display switch over of 6) is valid when it is on the right side.																																													
	PC		Set as PLC to PLC network (SW1 turned OFF)																																														
	REM.		Set as remote I/O network (SW1 turned ON)																																														
	SW.E.		Incorrect setting of switches 2) to 5) and 7)																																														
	M/S.E.		Station number or control/remote master station status is duplicated on the same network.																																														
	PRM.E.		<ul style="list-style-type: none"> Duplication of network refreshes parameters when multiple modules are mounted. Inconsistency between the common and station specific parameters Difference between parameter received from sub-control station and the one of the host (received from control station). 																																														
	R.E.		Reverse loop (R.LOOP) is faulty. <Cause> Power-off of adjacent station, cable disconnection, no connection, etc.																																														
	CPU R/W		Communicating with CPU																																														
	CRC		Error detected in code check of receive data <Cause> Timing at which station sending data to target 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.																																														
	AB.IF		<ul style="list-style-type: none"> Consecutive 1s exceeding the specified number were received. Length of received data is too short. <Cause> Timing at which station sending data to target 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, etc.																																														

No.	Name	Contents																											
5) *3	Mode setting switch  MODE 0:ONLINE(A,R) 2:OFFLINE	Mode setting (factory setting at time of shipping: 0)																											
		Mode	Name	Contents																									
		0	Online (automatic online return effective)	Data link with automatic online return effective																									
		1	Not used (Setting to this turns on the SW.E. LED.)																										
		2	Offline	Disconnects the host station.																									
		3	Forward loop test	Checks the forward loop of the whole network system.																									
		4	Reverse loop test	Checks the reverse loop of the whole network 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	Check the hardware of a module in isolation, including the communication circuit and cables of the transmission system.																									
		8	Internal self-loopback test	Check the hardware of a module in isolation, including the communication circuit of the transmission system.																									
		9	Hardware test	Check the hardware inside the network module.																									
A to F	Not used	(Do not set the mode.)																											
6)	Switch for mode switch over	Switch over of forward/reverse loop of the error display of CRC to UNDER and the display switch over of RUN to F.E./PW to R.E. (factory setting at the time of shipping: left side)																											
		Switch position	Contents																										
		L(F.L.)	The CRC to UNDER error display is set to the forward loop side and the RUN to F.E. display is set to valid. (PW to R.E. display is invalid)																										
R(R.L.)	The CRC to UNDER error display is set to the reverse loop side and the PW to R.E. display is set to valid. (RUN to F.E. display is invalid)																												
7) *3	Conditions setting switch <table border="1" data-bbox="150 1344 363 1585"> <thead> <tr> <th>SW</th> <th>OFF</th> <th>ON</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>PC</td> <td>REM.</td> </tr> <tr> <td>2</td> <td>N.ST</td> <td>MNG</td> </tr> <tr> <td>3</td> <td>PRM</td> <td>D.PRM</td> </tr> <tr> <td>4</td> <td colspan="2">ST. SIZE</td> </tr> <tr> <td>5</td> <td colspan="2">8,16,32,64</td> </tr> <tr> <td>6</td> <td colspan="2">LB/LW SIZE</td> </tr> <tr> <td>7</td> <td colspan="2">2,4,6,8k</td> </tr> <tr> <td>8</td> <td colspan="2"></td> </tr> </tbody> </table> 	SW	OFF	ON	1	PC	REM.	2	N.ST	MNG	3	PRM	D.PRM	4	ST. SIZE		5	8,16,32,64		6	LB/LW SIZE		7	2,4,6,8k		8			Operation condition setting (factory setting at the time of shipping: all off)
		SW	OFF	ON																									
		1	PC	REM.																									
		2	N.ST	MNG																									
		3	PRM	D.PRM																									
		4	ST. SIZE																										
		5	8,16,32,64																										
		6	LB/LW SIZE																										
		7	2,4,6,8k																										
		8																											
		SW	Contents	OFF	ON																								
		1	Network type	PLC to PLC network	Remote I/O network																								
2	Station type	Normal station	Control station																										
3	Use parameters	Parameters in common	Default Parameters																										
4	Number of stations (Valid when SW3 is ON)	OFF 8 stations	ON 16 stations	OFF 32 stations	ON 64 stations																								
5		OFF 2k points	ON 4k points	OFF 6k points	ON 8k points																								
6	B/W number of general point (Valid when SW3 is ON)	OFF 2k points	ON 4k points	OFF 6k points	ON 8k points																								
7		OFF 2k points	ON 4k points	OFF 6k points	ON 8k points																								
8	Not used (always off)																												

*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.)

*4: The settings are enabled when the module is a control station in the PLC to PLC network.

No.	Name	Contents
8)	Connector (A1SJ71LP21)	<p>Connect the optical fiber cable. Hardware version G or later</p>  <p>Hardware version F or earlier</p> 
9)	Connector (A1SJ71LR21)	<p>Connect the coaxial type cable.</p> 
10)	Connector (A1SJ71BR11)	<p>Connect the F-type connector.</p> 

5. Wiring

DANGER

- 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.

CAUTION

- 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.

Type	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.)

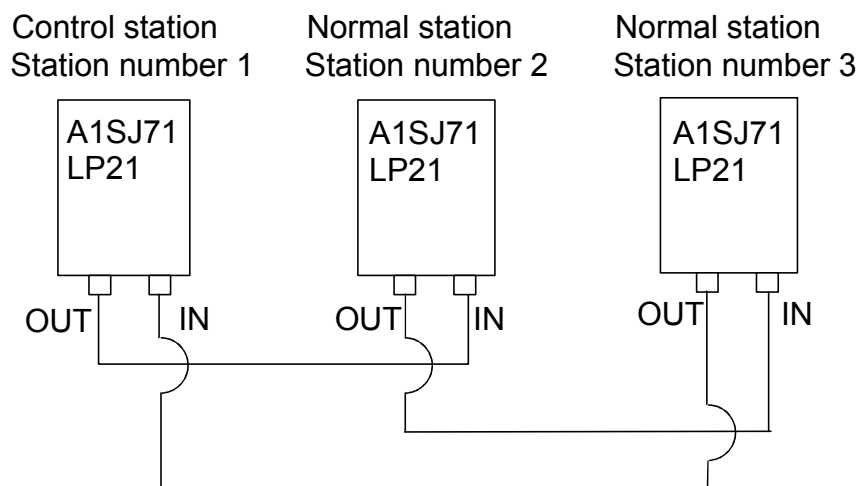
- (2) When connecting an optical fiber cable, the following restrictions on the bending radius must be observed.

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

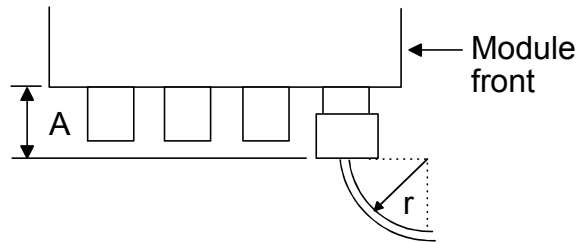
5.2.1 For the Coaxial Loop Type

- (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 (62995.2 ft.)
5C-2V	500 m (1640.5 ft.)	30 km (98430 ft.)

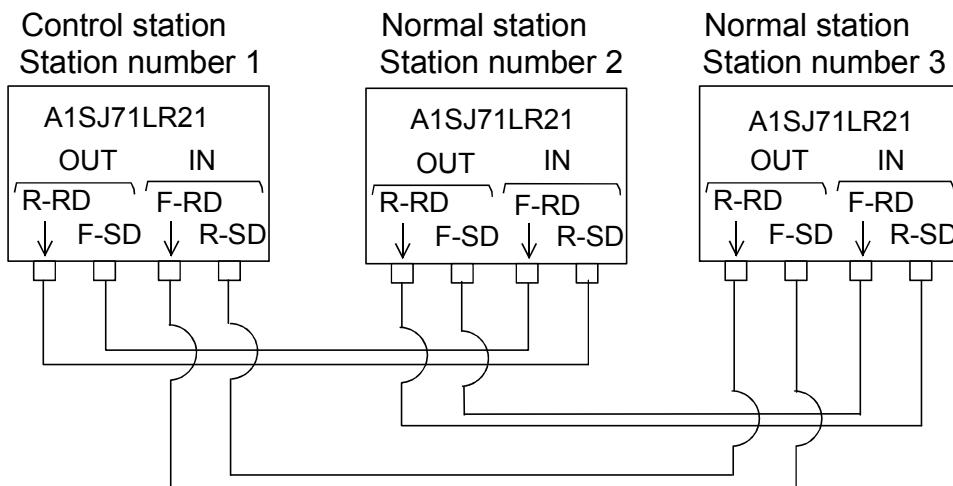
- (2) When connecting a coaxial cable, the following restrictions on the bending radius must be observed.

Cable type	Allowable bending radius r [mm (in.)]	Connector A [mm (in.)]
3C-2V	23 (0.91)	35 (1.38)
5C-2V	30 (1.18)	

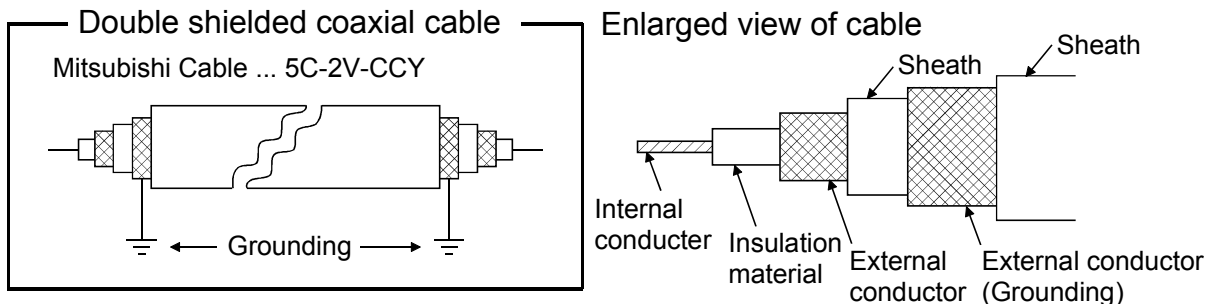


- (3) The Coaxial cable is wired in the following manner.

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 double-shielded 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

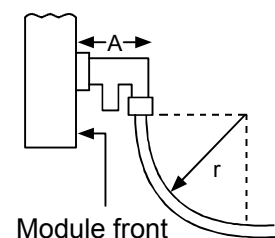
- (1) The cable to connect between network modules must be the following according to the number of stations connected.
When a cable length other than those specified in the table below is used, a communication error may result.

Number of stations connected Station-to-station cable length	2 to 9 stations		10 to 33 stations	
	Cable type			
	3C - 2V	5C - 2V	3C - 2V	5C - 2V
0 to 1 m (3.28 ft.)	× (cable less than 1m (3.28 ft.) in length cannot be used.)			
1 (3.28 ft.) to 5 m (16.41 ft.)	○	○	○	○
5 (16.41 ft.) to 13 m (42.65 ft.)	○	○	×	×
13 (42.65 ft.) to 17 m (55.78 ft.)	○	○	○	○
17 (55.78 ft.) to 25 m (82.03 ft.)	○	○	×	×
25 (82.03 ft.) to 300 m (984.3 ft.)	○	○	○	○
300 (984.3 ft.) to 500 m (1640.5 ft.)	×	○	×	○

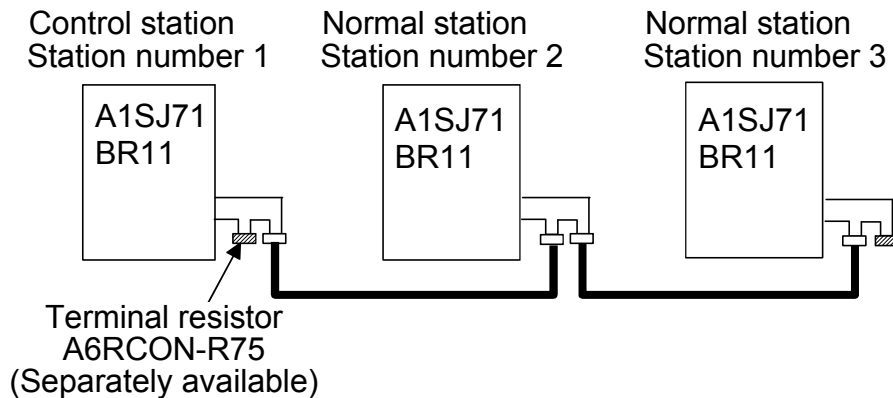
○: Allowed ×: Not allowed

- (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.

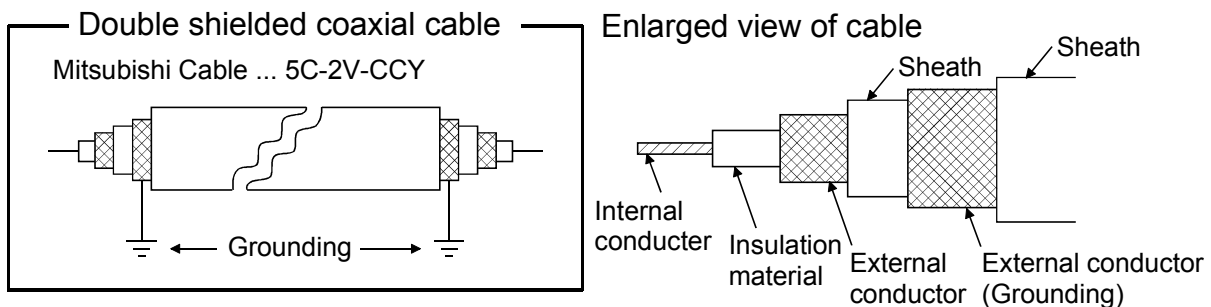
Cable type	Allowable bending radius r [mm (in.)]	Connector A [mm (in.)]
3C-2V	23 (0.91)	50 (1.97)
5C-2V	30 (1.18)	



- (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.



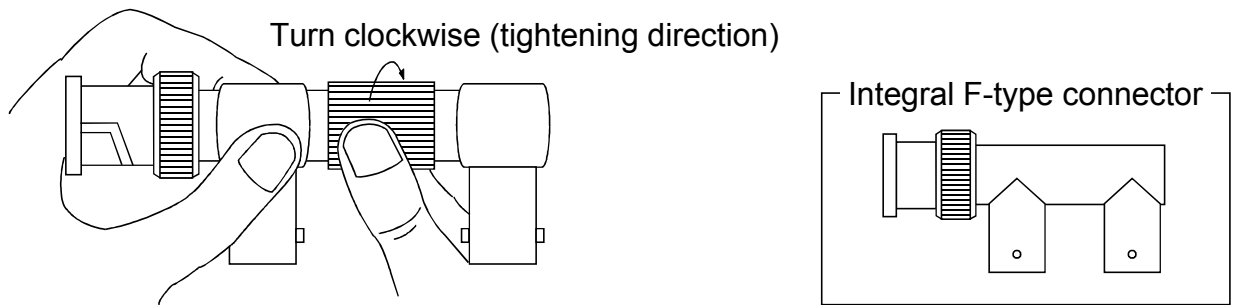
- (6) Install the coaxial cables at least 100 mm (3.94 in.) away from other power cables and control cables.
- (7) Consider wiring using double-shielded coaxial cable in places that are subject to large amounts of noise.



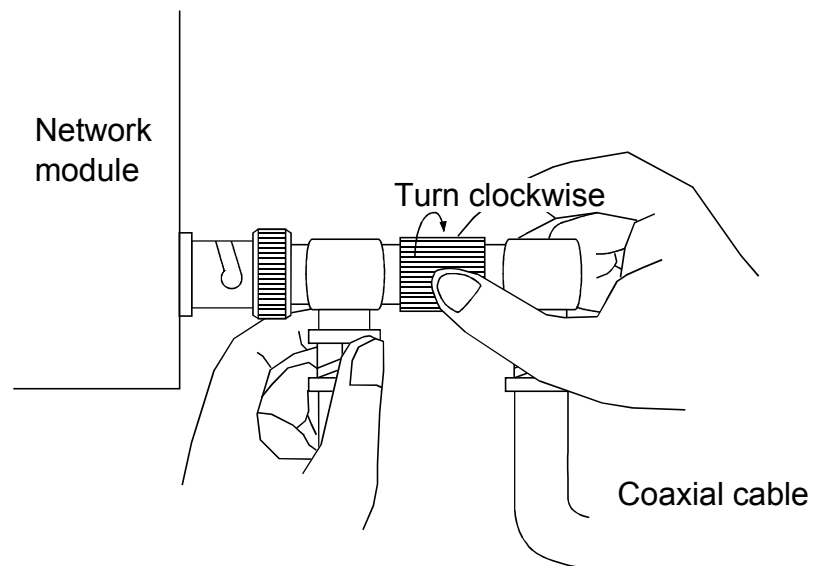
The 5C-2V connector plug is applicable to double-shielded coaxial cable. Connect the 5C-2V connector plug to the coaxial cable inside a double-shielded coaxial cable. Ground the shielded part outside a double-shielded coaxial cable as shown in the above figure.

- (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 produced 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.

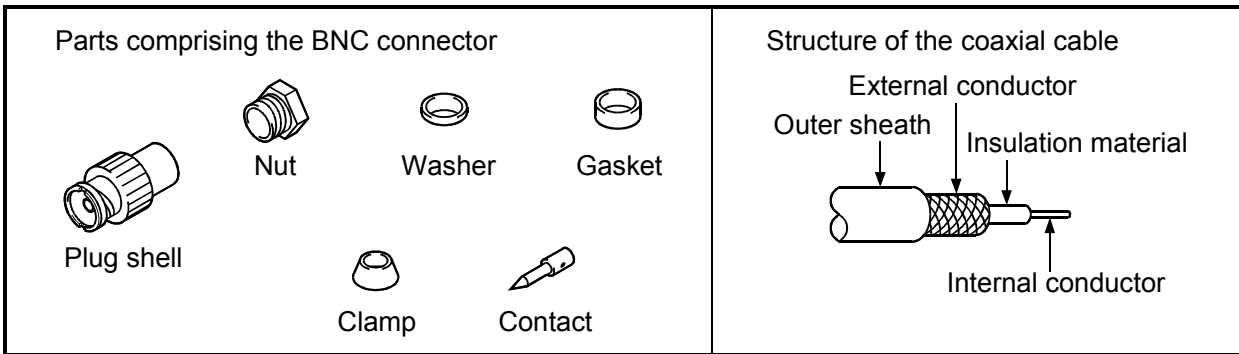


5.2.3 Connecting the Connector for the Coaxial Cables

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

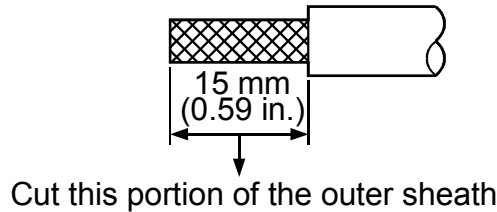
(1) Structure of the BNC connector and coaxial cable

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

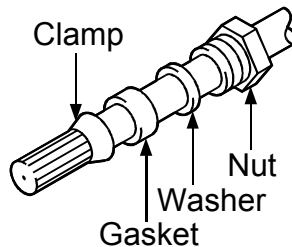


(2) How to connect the BNC connector and the coaxial cable

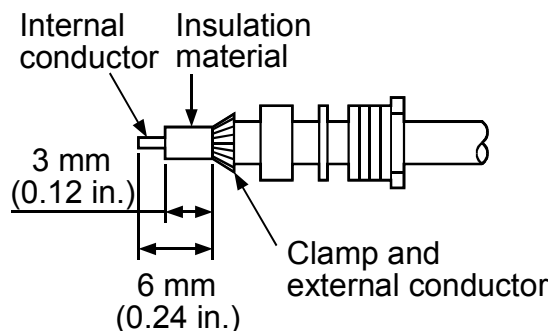
(a) Cut off the outer sheath of the coaxial cable to the length shown in the diagram below.



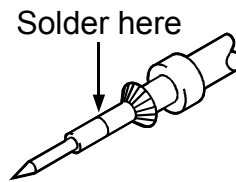
(b) Feed the nut, washer, gasket and clamp on the coaxial cable through, as shown below, then unfasten the external conductor.



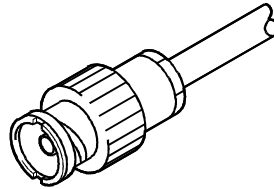
(c) Cut the external conductor, insulation material and internal conductor to the dimensions shown below. However, cut the external conductor to the same dimension as the tapered section of the clamp and smooth it down to the clamp.



(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.

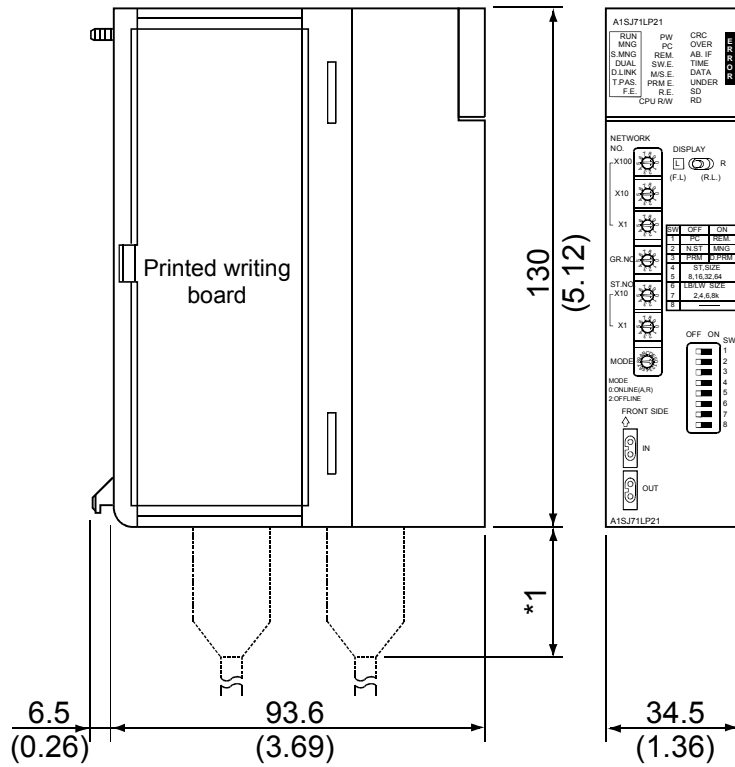


Important

- (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

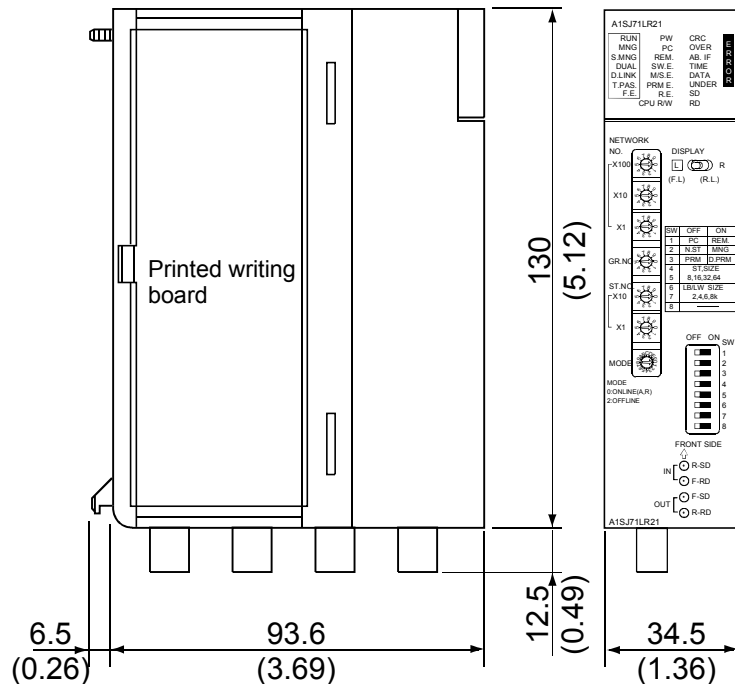
6.1 A1SJ71LP21



Unit: mm (in.)

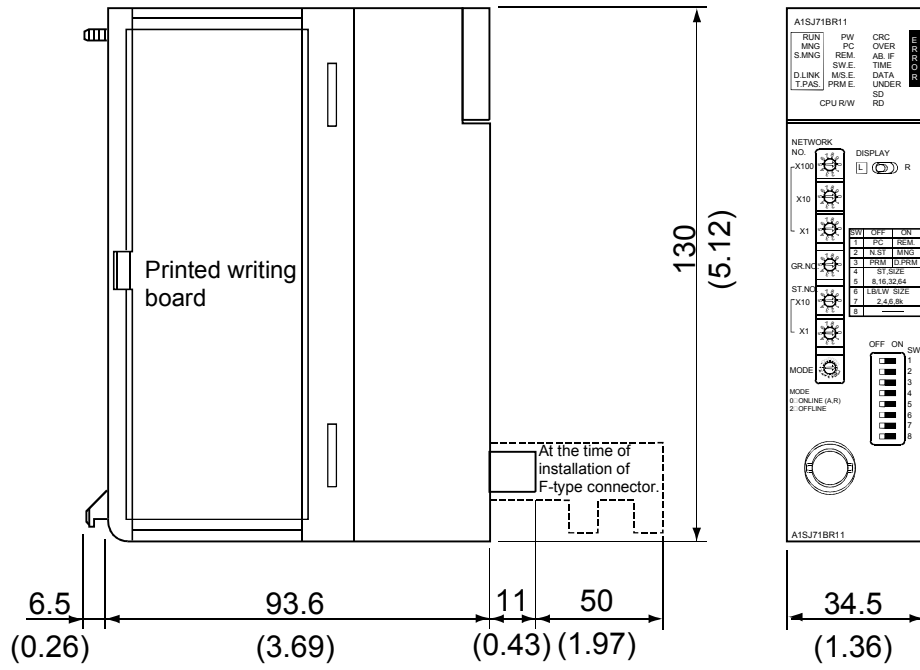
*1: Please confirm details to Mitsubishi Electric System Service Corporation.

6.2 A1SJ71LR21



Unit: mm (in.)

6.3 A1SJ71BR11



Unit: mm (in.)

Warranty

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

⚠ For safe use

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- 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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