

MITSUBISHI

MELSECNET/10

Network Module

User's Manual
(Hardware)

AJ72LP25
AJ72BR15

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

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



MODEL	AJ72LP25/BR15-U-E
MODEL CODE	13JE71
IB(NA)-66505-B(0605)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 PLC in an environment that meets the general specifications contained in CPU module user's manual. Using this PLC 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 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.

[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.

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 (Remote I/O network) Reference Manual	SH-3509 (13JE72)

Before use of this module, be sure to read 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 PLC 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 PLC CPU supplied with the base unit.

The CE logo is printed on the rating plate of the PLC, 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 part names of the AJ72LP25 and AJ72BR15 model MELSECNET/10 network modules (abbreviated as Network Modules) which are used to construct remote I/O systems on MELSEC-A series MELSECNET/10 network systems.

- (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	
AJ72LP25	For remote I/O station of MELSECNET/10	○	-	Main base CPU slot
AJ72BR15		-	○	

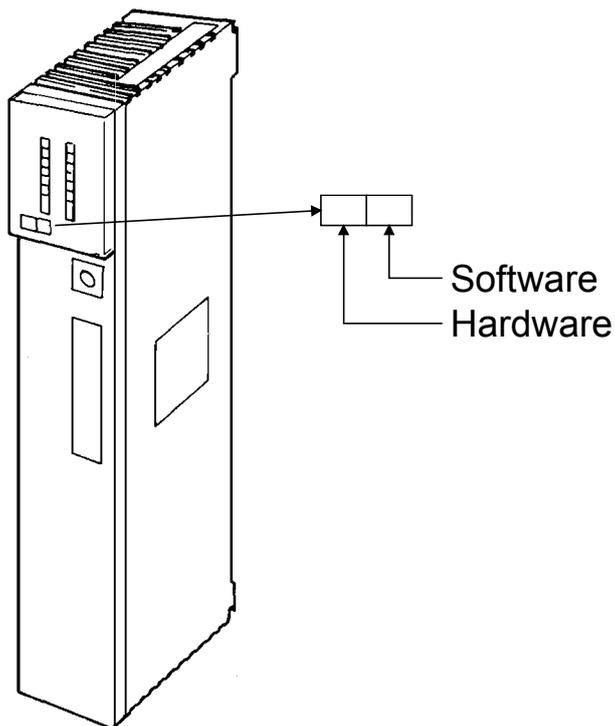
- (2) After unpacking the Network Modules, confirm that any of the following products is enclosed.

Model	Description	Quantity
AJ72LP25	Model AJ72LP25 MELSECNET/10 network module (optical loop type)	1
AJ72BR15	Model AJ72BR15 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 AJ72BR15 does not come with terminal resistors.

(4) When applying the remote I/O network, make sure to use the following software version for the CPU module and the network module.

Master Station Module	Model	Software Version
CPU module	A2UCPU(S1) A3UCPU A4UCPU	"N" or later
	A2USCPU(S1)	"D" or later
	A2USHCPU-S1	"A" or later
Network module	AJ71LP21 AJ71BR11	"J" or later



2. Performance Specifications

The performance specifications for Network Modules are indicated as follows.

Item		Specifications	
		AJ72LP25	AJ72BR15
Maximum link points per network	X/Y	8192 points	
	B	8192 points	
	W	8192 points	
Maximum link points per station		<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 	
Maximum number of I/O points per remote I/O station	X+Y ≤ 2048		
Communication speed	10Mbps (equivalent to 20Mbps for multiple transmission)		10Mbps
Communication method	Token ring		Token bus
Synchronization method	Frame synchronization		
Encoding method	NRZI encoding (Non Return to Zero Inverted)		Manchester encoding
Transmission route format	Duplex optical loop		Single coaxial bus
Transmission format	Conform to HDLC (frame format)		
Maximum number of networks	255		
Number of stations for connection per 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	30km		3C-2V 300m (300m)
	$\left(\begin{array}{l} \text{SI optical cable} \quad : 500\text{m} \\ \text{H-PCF optical cable} : 1\text{km} \\ \text{Broad-band H-PCF optical cable} : 1\text{km} \\ \text{QSI optical cable} \quad : 1\text{km} \end{array} \right)$		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 (AJ72LP25) Diagnostic function for local link circuit check Abnormality detection by link special relay, resistor Network monitor, each type of diagnostic function 		
Transient transmission	Monitoring with peripheral device, program up/download		
Connection cable	Optical fiber cable (Arranged by user *2)		Equivalent to 3C-2V, 5C-2V cables (Arranged by user)

Item	Specifications	
	AJ72LP25	AJ72BR15
Applicable connector	2-core optical connector plug (Arranged by user *2)	Equivalent to BNC-P-3-NiCAu (For 3C-2V), BNC-P-5-NiCAu (For 5C-2V) (DDK) (Arranged by user)
5VDC current consumption	0.80A	0.90A
Weight	0.53kg	0.60kg

*1 The distance between stations is restricted in accordance with the type of cable and number of stations. Refer to the reference manual of master module in use for details.

*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.

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

3. Handling

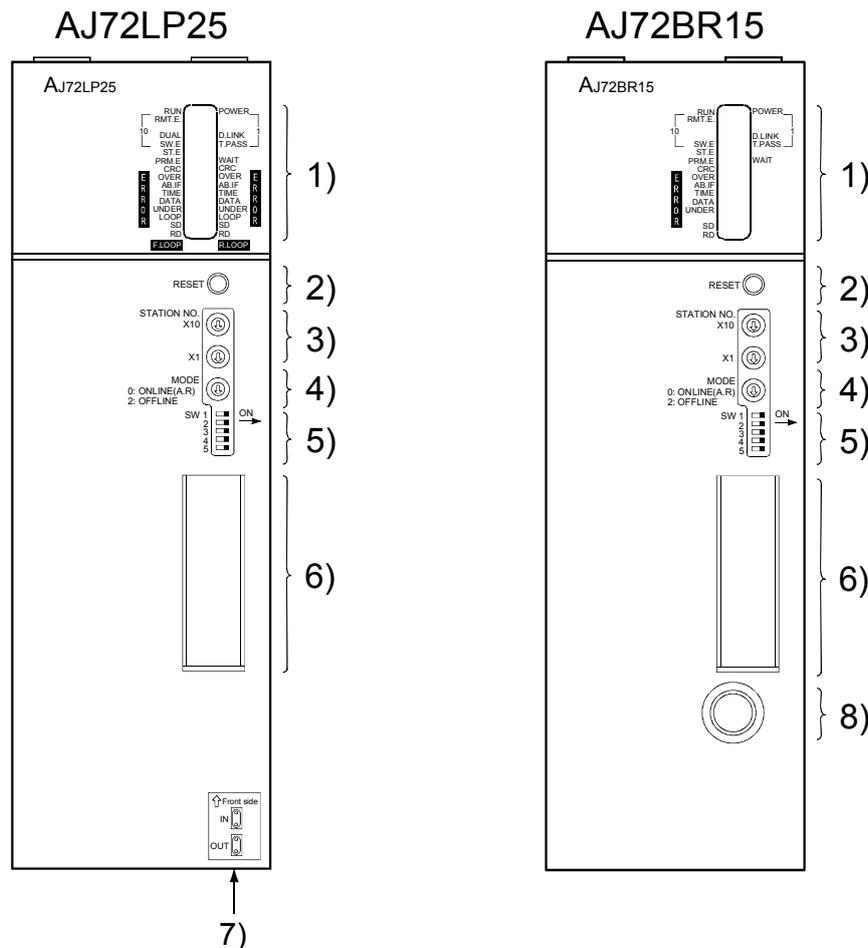
3.1 Cable length restrictions between stations

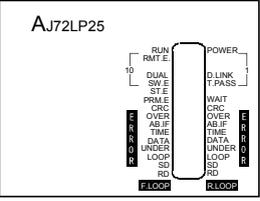
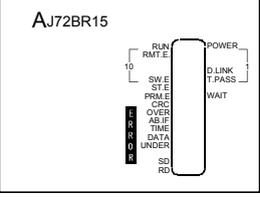
- (1) The main modules case is made of plastic, so do not drop it or subject it to strong impacts.
- (2) Do not dismount the printed wiring board from the case. It may damage the module.
- (3) When wiring, be careful never to let foreign matter from the above module such as wiring scraps get inside the 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

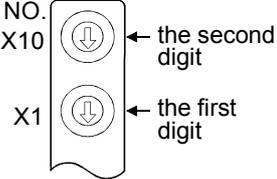
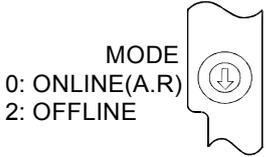
Indicates the name and setting of each part of Network Modules.



No.	Name	Contents			
		Name	Status	Contents	
1)	LED AJ72LP25  AJ72BR15 	RUN	ON	Normal state	
		RMT.E.	OFF	WDT error, SP. UNIT ERROR	
		DUAL	ON	When a blown fuse or I/O check error occurs. (Host station)	
		SW.E.		Multiplex transfer in execution (OFF: Multiplex transfer not executed)	
		ST.E.		Incorrect setting of switches 3) to 4)	
		PRM.E.		Station number status is duplicated on the same network.	
		POWER		<ul style="list-style-type: none"> When I/O allocation is abnormal. When the number of LB/LW points is insufficient. (special-function module) When the parameters received from the remote master station are abnormal. 	
		D.LINK		Power being supplied (OFF: No power being supplied)	
		T.PASS		Data link being performed (OFF: Data link stopped)	
		WAIT		Participating in token passing (Transient transmission is available.)	
		CRC		When waiting for communication with special-function module.	
		OVER		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.	
		AB.IF		Error occurred when receive data processing is delayed <Cause> Hardware failure, cable fault, noise, etc.	
		TIME		<ul style="list-style-type: none"> Consecutive 1s exceeding the specified number were received. Length of received data is too short. 	
		DATA		<Cause> Timing at which station sending data to target station is disconnected from network, too short monitoring time, cable fault, noise, etc.	
		UNDER		Data link WDT times out. <Cause> Monitoring time too short, cable fault, noise, etc.	
		LOOP		Abnormal data larger than 2 kbytes are received. <Cause> Cable fault, noise, etc.	
		SD		Internal send data processing is not done at fixed intervals. <Cause> Hardware failure	
		RD		Forward/reverse loop (F.LOOP/R.LOOP) is faulty. <Cause> Power-off of adjacent station, cable disconnection, no connection, etc.	
				Dimly	Data being sent
				ON	Data being received

Caution

Do not change the setting of the DIP switch on the printed circuit board at the side face of the module.

No.	Name	Contents																																						
2)	Reset switch 	Resets the host station hardware.																																						
3) *1	Station number setting switch 	Station number setting (factory setting at time of shipping: 1) *2 <Setting range> 1 to 64 : Station number Other than 1 to 64 : Setting error (The SW.E. LED turns ON)																																						
4) *1	Mode setting switch 	Mode setting (factory setting at time of shipping: 0)																																						
		<table border="1"> <thead> <tr> <th>Mode</th> <th>Name</th> <th>Contents</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Online (automatic online return effective)</td> <td>Data link with automatic online return effective</td> </tr> <tr> <td>1</td> <td colspan="2">Not used (Setting to this turns on the SW.E. LED.)</td> </tr> <tr> <td>2</td> <td>Offline</td> <td>Disconnects the host station.</td> </tr> <tr> <td>3</td> <td>Forward loop test</td> <td>Checks the forward loop of the whole network system.</td> </tr> <tr> <td>4</td> <td>Reverse loop test</td> <td>Checks the reverse loop of the whole network system.</td> </tr> <tr> <td>5</td> <td>Station-to-station test (master station)</td> <td rowspan="2">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.</td> </tr> <tr> <td>6</td> <td>Station-to-station test (slave station)</td> </tr> <tr> <td>7</td> <td>Self-loopback test</td> <td>Check the hardware of a module in isolation, including the communication circuit and cables of the transmission system.</td> </tr> <tr> <td>8</td> <td>Internal self-loopback test</td> <td>Check the hardware of a module in isolation, including the communication circuit of the transmission system.</td> </tr> <tr> <td>9</td> <td>Hardware test</td> <td>Check the hardware inside the network module.</td> </tr> <tr> <td>A to E</td> <td>Not used</td> <td>(Do not set the mode.)</td> </tr> <tr> <td>F</td> <td>Station number check</td> <td>Checks the number using LEDs</td> </tr> </tbody> </table>	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 E	Not used	(Do not set the mode.)	F	Station number check	Checks the number using LEDs
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5)	DIP switches	Always off.																																						
6)	RS-422 interface	Connects the peripheral device																																						

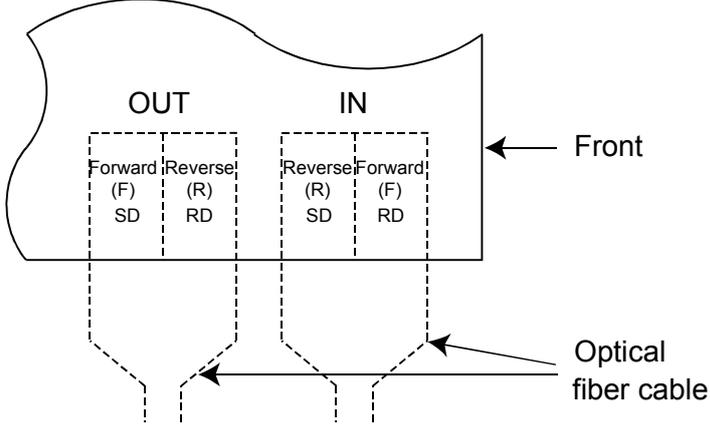
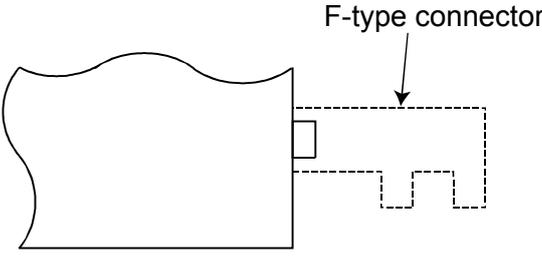
*1: When the setting is changed while the power supply is ON, reset using the reset switch in 2).
When the mode setting switch in 4) is set "F", reset is unnecessary.

*2: The setting range for the AJ72BR15 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
7)	Connector (AJ72LP25)	<p>Connect the optical fiber cable.</p>  <p>The diagram shows a rectangular connector with a wavy top edge. It is divided into two main sections: 'OUT' on the left and 'IN' on the right. Each section contains two vertical columns of labels. Under 'OUT', the left column is labeled 'Forward (F) SD' and the right column is labeled 'Reverse (R) RD'. Under 'IN', the left column is labeled 'Reverse (R) SD' and the right column is labeled 'Forward (F) RD'. A horizontal arrow labeled 'Front' points to the right side of the connector. Below the connector, four dashed lines represent the connection points for optical fiber cables, with an arrow labeled 'Optical fiber cable' pointing to these connections.</p>
8)	Connector (AJ72BR15)	<p>Connect the F-type connector.</p>  <p>The diagram shows a rectangular connector with a wavy top edge. On the right side, there is a small rectangular protrusion. An arrow labeled 'F-type connector' points to a dashed-line representation of an F-type connector being attached to this protrusion.</p>

5. Wiring

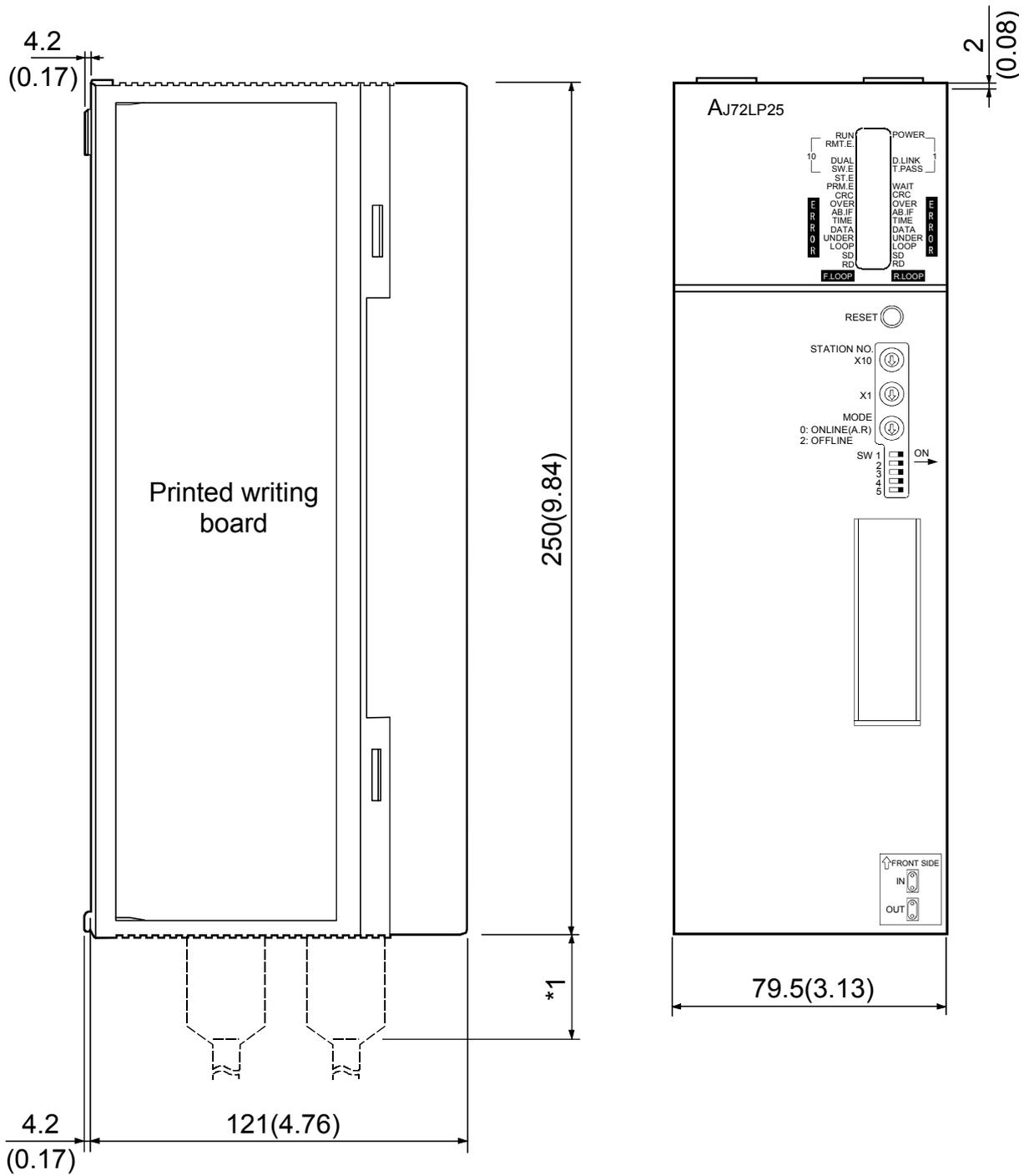
Please refer to the reference manual of used master module for the wiring for network system.

Please wire IN/OUT or 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.

6. External Dimensions

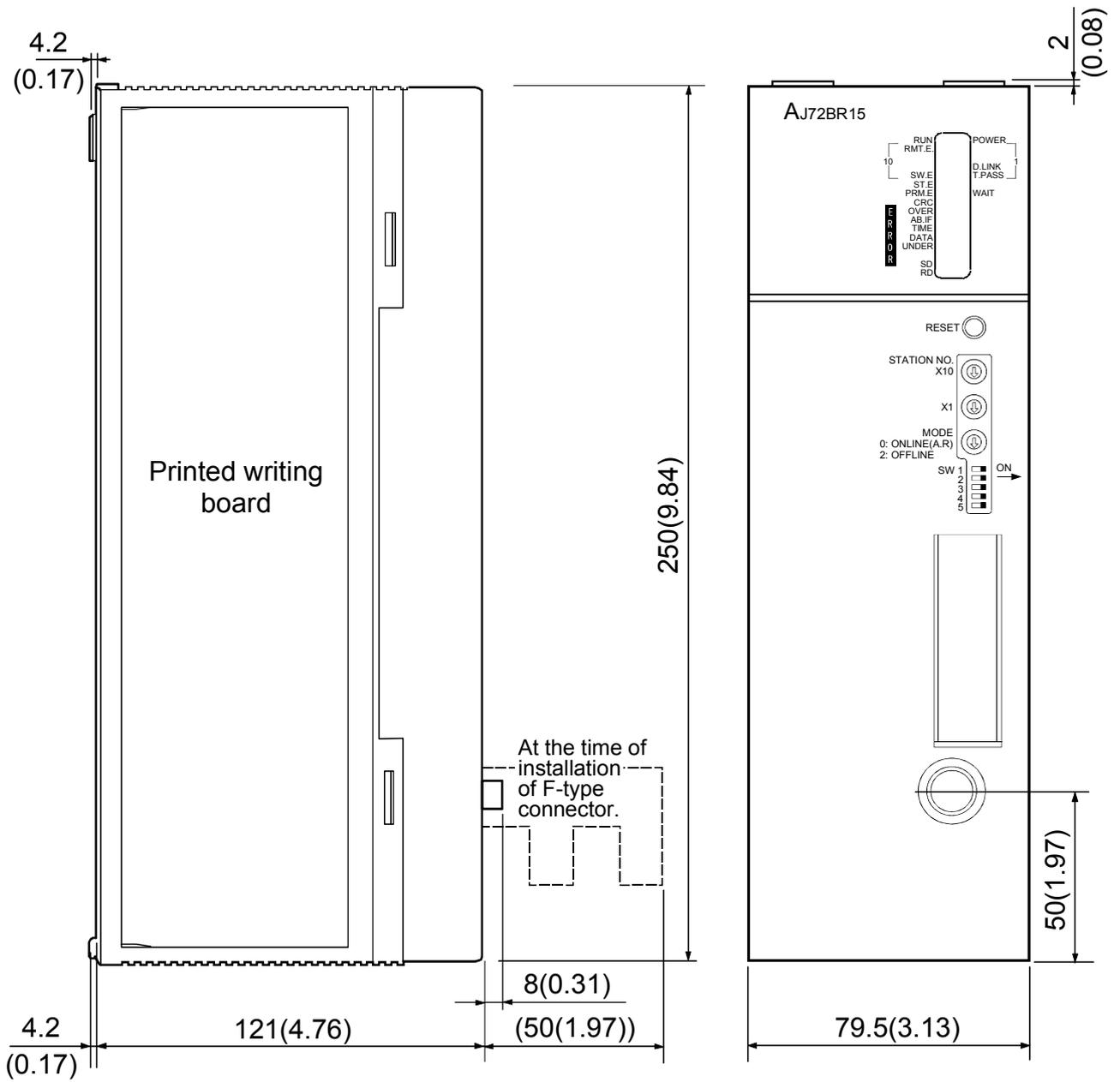
6.1 AJ72LP25



Unit: mm (in.)

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

6.2 AJ72BR15



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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