

MITSUBISHI

MELSECNET/10

Network Module

User's Manual
(Hardware)

A1SJ72QLP25, A1SJ72QLR25
A1SJ72QBR15

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

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



MODEL	A1SQ-NET10-R-U-JE
MODEL CODE	13JQ94
IB(NA)-0800111-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".




DANGER

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



CAUTION

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, 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.

- 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.

[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.

[WIRING PRECAUTIONS]

DANGER

- Before installation or 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

- Solder the coaxial cable connector properly. Incomplete soldering may cause a malfunction.
- 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.
- 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
Jan.,2000	IB(NA)-0800111-A	First printing
May,2006	IB(NA)-0800111-B	Correction SAFETY PRECAUTIONS, Compliance with the EMC Directive and the Low Voltage Directive, Chapter 1, 2, 3, 4, 5, 6

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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)
For QnA/Q4AR MELSECNET/10 Network System Reference Manual	IB-66690 (13JF78)

Before use of this module, be sure to read the For QnA/Q4AR MELSECNET/10 Network System 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 A1SJ72QLP25, A1SJ72QLR25 and A1SJ72QBR15 model MELSECNET/10 network modules (abbreviated as Network Modules) which are used to construct remote I/O systems on MELSEC-QnA 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	
A1SJ72QLP25	For remote I/O station of MELSECNET/10	○	-	Main base CPU slot
A1SJ72QLR25		-	○	
A1SJ72QBR15				

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

Model	Description	Quantity
A1SJ72QLP25	Model A1SJ72QLP25 MELSECNET/10 network module (optical loop type)	1
A1SJ72QLR25	Model A1SJ72QLR25 MELSECNET/10 network module (coaxial loop type)	1
A1SJ72QBR15	Model A1SJ72QBR15 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 A1SJ72QBR15 does not come with terminal resistors.

2. Performance Specifications

The performance specifications for Network Modules are indicated as follows.

(1) A1SJ72QLP25

Item		Specifications
		A1SJ72QLP25
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 Remote master station → remote sub-master station Remote sub-master station → remote master station $\left\{ \frac{Y+B}{8} + (2 \times W) \right\} \leq 2000$ bytes
Maximum number of I/O points per remote I/O station		X+Y ≤ 1024 (main base unit + 1 extension base units) When X and Y overlap, either of them becomes effective.
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		239
Number of stations for connection per 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 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)
Applicable connector		2-core optical connector plug (Arranged by user *2)
5VDC current consumption		0.52A
Weight		0.41kg

*1: The distance between stations is restricted in accordance with the type of cable and number of stations. Refer to 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.

(2) A1SJ72QLR25, A1SJ72QBR15

Item		Specifications			
		A1SJ72QLR25		A1SJ72QBR15	
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 $\left\{ \frac{Y+B}{8} + (2 \times W) \right\} \leq 1600 \text{ bytes}$ Remote I/O station → remote master station $\left\{ \frac{X+B}{8} + (2 \times W) \right\} \leq 1600 \text{ bytes}$ Remote master station → remote sub-master station Remote sub-master station → remote master station $\left\{ \frac{Y+B}{8} + (2 \times W) \right\} \leq 2000 \text{ bytes}$ 				
Maximum number of I/O points per remote I/O station	X+Y ≤ 1024 (main base unit + 1 extension base units) When X and Y overlap, either of them becomes effective.				
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	239				
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	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 (A1SJ72QLR25) 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	Equivalent to 3C-2V, 5C-2V cables (Arranged by user)				
Applicable connector	Equivalent BNC-P-3-NiCAu (For 3C-2V), BNC-P-5-NiCAu (For 5C-2V) (DDK) (Arranged by user)				
5VDC current consumption	1.24A		0.70A		
Weight	0.42kg		0.43kg		

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

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

3. Handling

[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, 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.
- 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.
- 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.

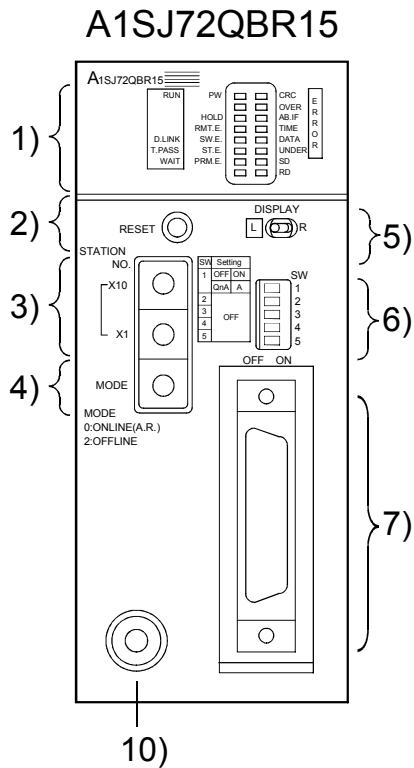
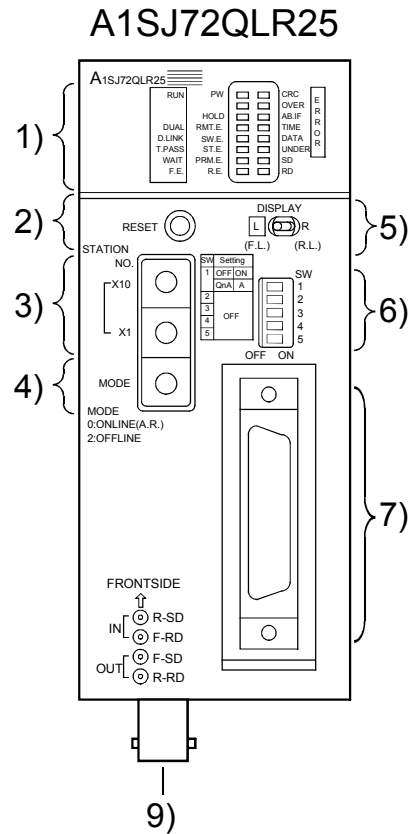
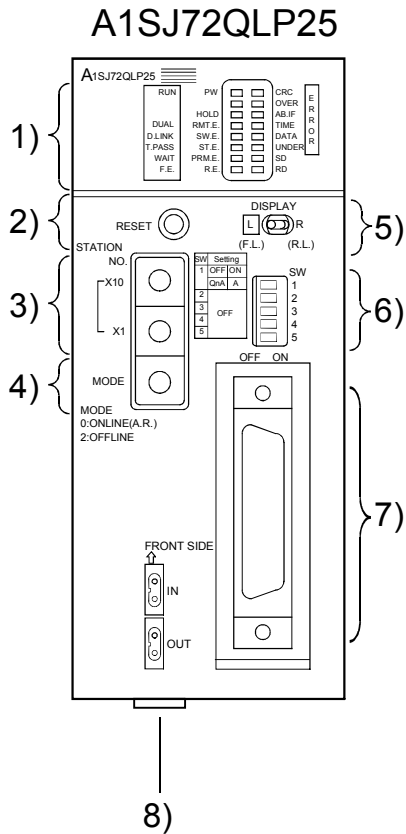
3.1 Cable length restrictions between stations

- (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

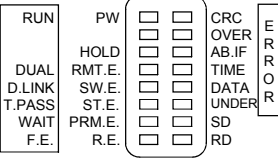
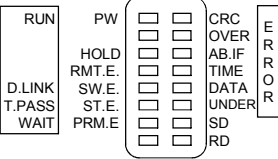
4. The Name and Setting of Each Part


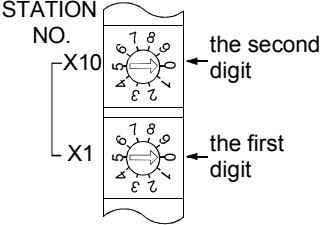
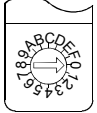
Indicates the name and setting of each part of Network Modules.

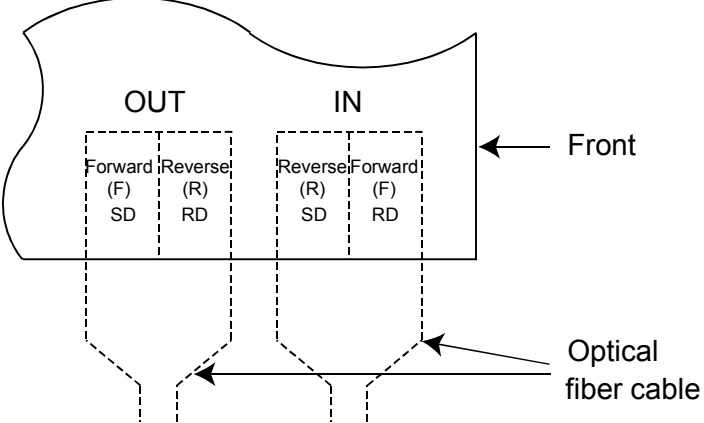
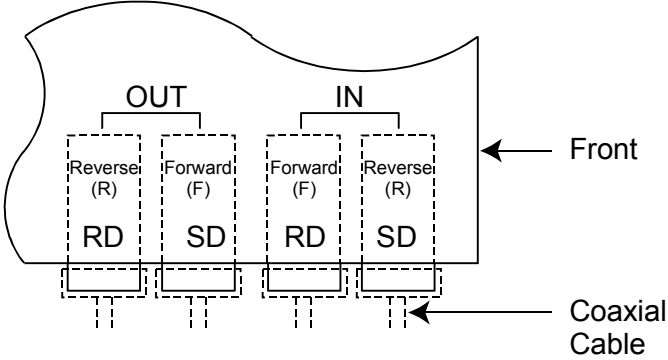
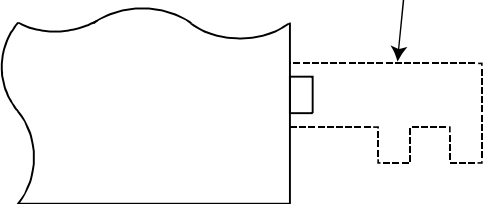


CAUTION

Do not switch the dip switch on the printed-circuit board inside the module on base mounting side. (fixed in OFF)

No.	Name	Contents			
1)	<p>LED</p> <p>A1SJ72QLP25 A1SJ72QLR25</p>  <p>A1SJ72QBR15</p> 	Name	Status	Contents	
		RUN	ON	Normally operating.	<p>The position of switch for the display switch over of 5) is valid when it is on the left side.</p> <p>The position of switch for the display switch over of 5) is valid when it is on the right side.</p>
			OFF	WDT error occurred (hardware failure)	
		DUAL	ON	Multiplex transfer in execution (OFF: Multiplex transfer not executed)	
		D.LINK		Data link being performed (OFF: Data link stopped)	
		T.PASS		Participating in token passing (Transient transmission is available.)	
		WAIT		When waiting for communication with special-function module.	
		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)	
		HOLD		Output status is held when communication is abnormal. Standard network ...Q4ARCPU output hold/reset setting switch is set to "Hold". Duplex network ...A6RAF is set to "Hold" at "HOLD/RESET MODE" section.	
		RMT.E.		When a blown fuse or I/O check error occurs. (Host station)	
		SW.E.		Incorrect setting of switches 3) and 4)	
		ST.E.		Station number or remote master station status is duplicated on the same network.	
		PRM.E.		<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. 	
R.E.	Reverse loop (R.LOOP) is faulty. <Cause> Power-off of adjacent station, cable disconnection, no connection, etc.				
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.				

No.	Name	Contents		
1)	LED	Name	Status	Contents
		AB.IF	ON	<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		Token has not reached host within monitoring time. <Cause> Monitoring time too short, cable fault, noise, etc.
		DATA		Data with erroneous code was received. <Cause> Cable fault, noise, etc.
		UNDER		Internal send data processing is not done at fixed intervals. <Cause> Hardware failure
		SD	Dimly	Data being sent
		RD	ON	Data being received
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 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.)	

No.	Name	Contents																		
5)	Switch for mode switch over	<p>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)</p> <table border="1" data-bbox="464 219 1399 461"> <thead> <tr> <th data-bbox="464 219 695 255">Switch position</th> <th data-bbox="695 219 1399 255">Contents</th> </tr> </thead> <tbody> <tr> <td data-bbox="464 255 695 353">L(F.L.)</td> <td data-bbox="695 255 1399 353">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)</td> </tr> <tr> <td data-bbox="464 353 695 461">R(R.L.)</td> <td data-bbox="695 353 1399 461">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)</td> </tr> </tbody> </table>	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)												
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6) *1	Conditions setting switch	<p>Operation condition setting (factory setting at the time of shipping: all off)</p> <table border="1" data-bbox="464 528 1399 779"> <thead> <tr> <th data-bbox="464 528 584 564">SW</th> <th data-bbox="584 528 1023 564">OFF</th> <th data-bbox="1023 528 1399 564">ON</th> </tr> </thead> <tbody> <tr> <td data-bbox="464 564 584 636">1</td> <td data-bbox="584 564 1023 636">Peripheral device for QnA series connected</td> <td data-bbox="1023 564 1399 636">Peripheral device for A series connected</td> </tr> <tr> <td data-bbox="464 636 584 672">2</td> <td colspan="2" data-bbox="584 636 1399 672">Not used (always off)</td> </tr> <tr> <td data-bbox="464 672 584 707">3</td> <td colspan="2" data-bbox="584 672 1399 707"></td> </tr> <tr> <td data-bbox="464 707 584 743">4</td> <td colspan="2" data-bbox="584 707 1399 743"></td> </tr> <tr> <td data-bbox="464 743 584 779">5</td> <td colspan="2" data-bbox="584 743 1399 779"></td> </tr> </tbody> </table>	SW	OFF	ON	1	Peripheral device for QnA series connected	Peripheral device for A series connected	2	Not used (always off)		3			4			5		
SW	OFF	ON																		
1	Peripheral device for QnA series connected	Peripheral device for A series connected																		
2	Not used (always off)																			
3																				
4																				
5																				
7)	RS-422 interface	Connects the peripheral device																		
8)	Connector (A1SJ72QLP25)	<p>Connect the optical fiber cable.</p>  <p>The diagram shows a rectangular connector with two main sections: 'OUT' on the left and 'IN' on the right. Each section has two ports. The 'OUT' section has 'Forward (F) SD' and 'Reverse (R) RD'. The 'IN' section has 'Reverse (R) SD' and 'Forward (F) RD'. An arrow labeled 'Front' points to the right side of the connector. Below the ports, dashed lines represent 'Optical fiber cable' connections.</p>																		
9)	Connector (A1SJ72QLR25)	<p>Connect the coaxial type cable.</p>  <p>The diagram shows a rectangular connector with two main sections: 'OUT' on the left and 'IN' on the right. Each section has two ports. The 'OUT' section has 'Reverse (R) RD' and 'Forward (F) SD'. The 'IN' section has 'Forward (F) RD' and 'Reverse (R) SD'. An arrow labeled 'Front' points to the right side of the connector. Below the ports, dashed lines represent 'Coaxial Cable' connections.</p>																		
10)	Connector (A1SJ72QBR15)	<p>Connect the F-type connector.</p>  <p>The diagram shows a rectangular connector with a small protrusion on the right side. A dashed line represents an 'F-type connector' being attached to this protrusion. An arrow labeled 'F-type connector' points to the dashed line.</p>																		

*1: When the setting is changed while the power supply is ON, reset using the reset switch in 2).

*2: The setting range for the A1SJ72QBR15 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.)

5. Wiring

DANGER

- Before installation or 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

- Solder the coaxial cable connector properly. Incomplete soldering may cause a malfunction.
- 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.
- 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.

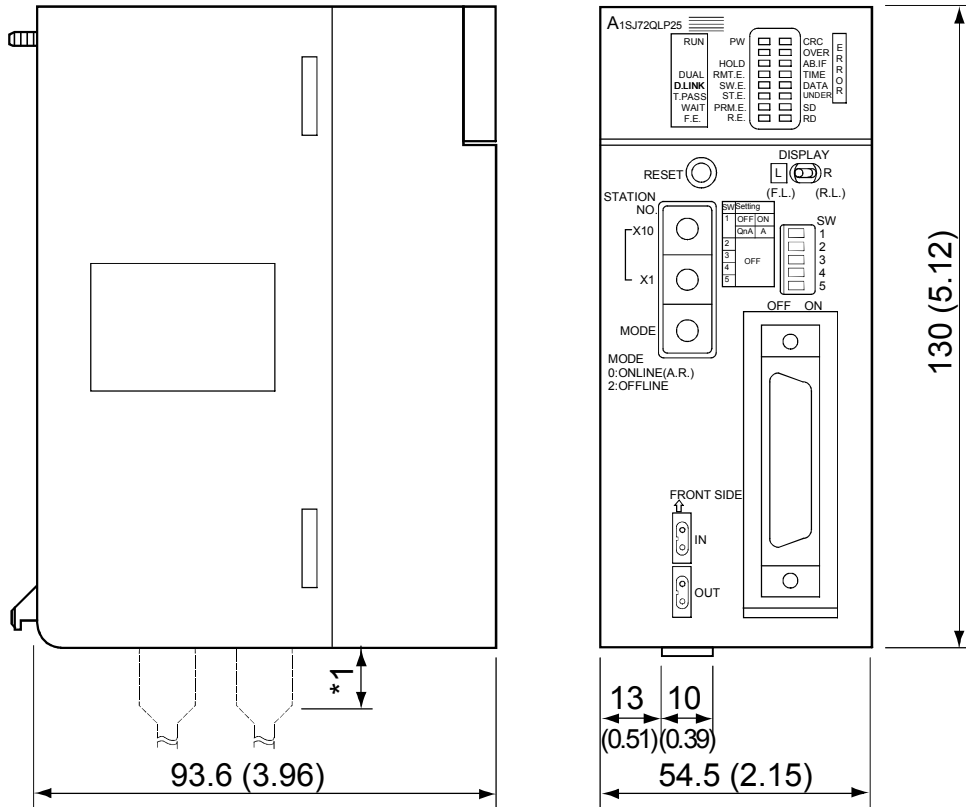
Please refer to the reference manual of used master module for the wiring for network system.

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

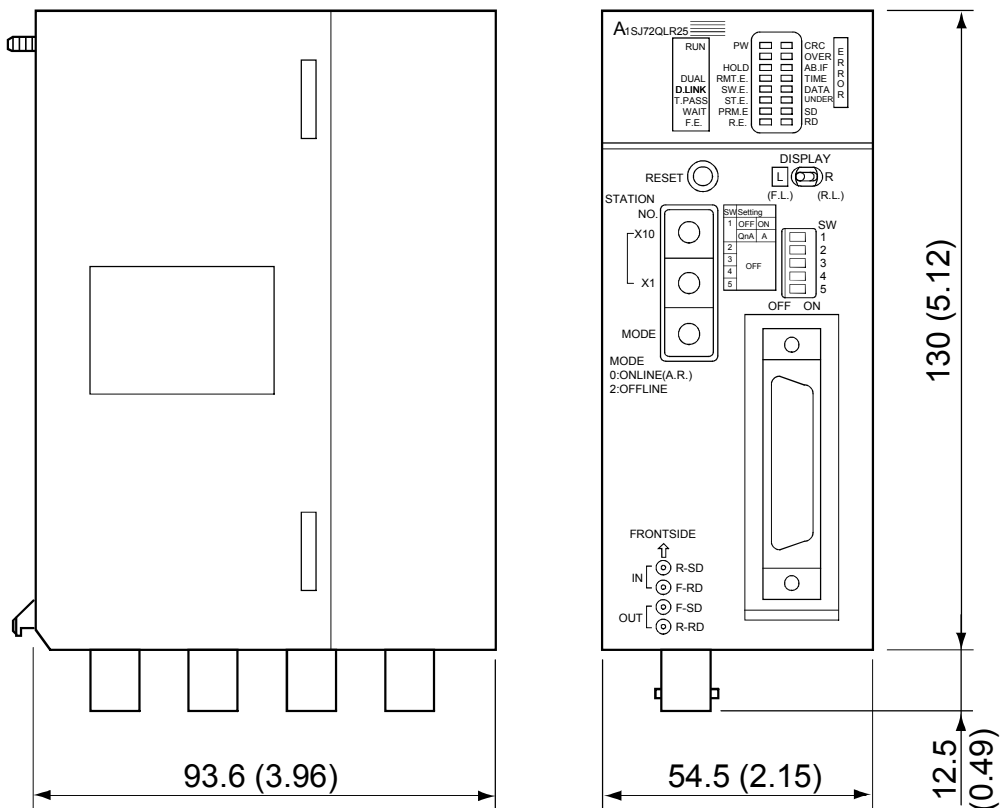
6.1 A1SJ72QLP25



Unit: mm (in.)

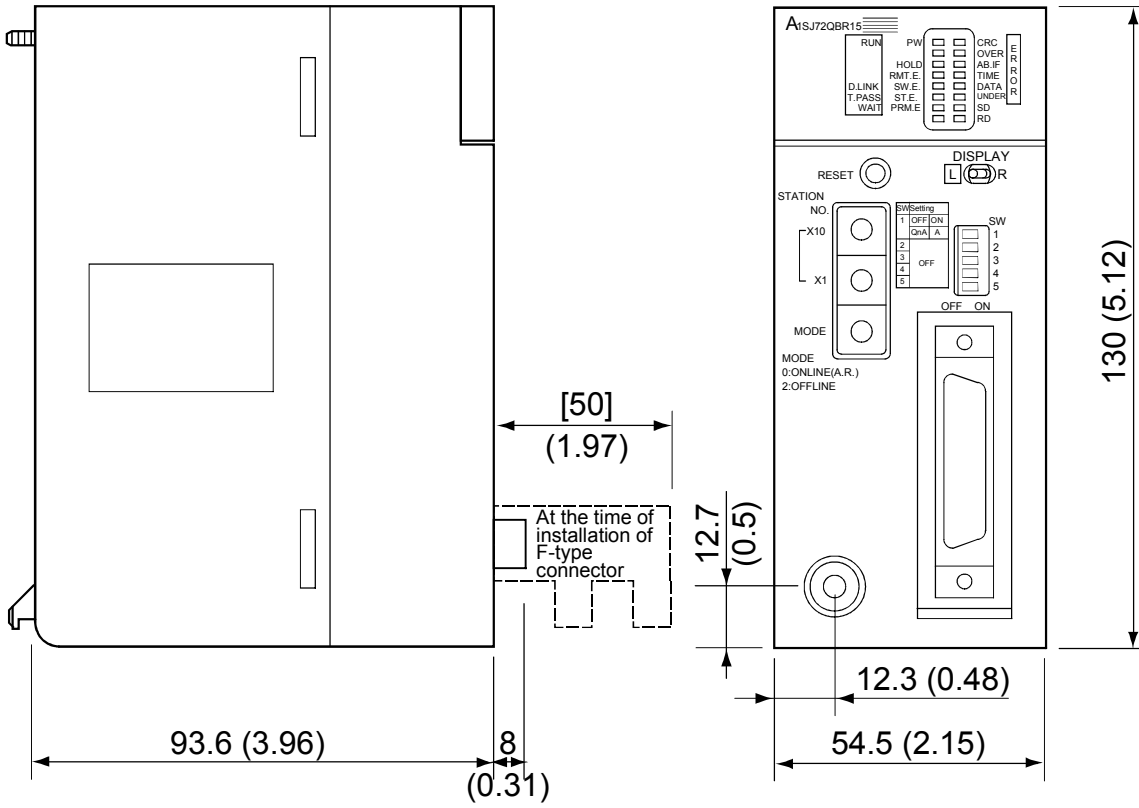
*1: Please confirm details to Mitsubishi Electric System Service Corporation.

6.2 A1SJ72QLR25



Unit: mm (in.)

6.3 A1SJ72QBR15



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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