

MITSUBISHI

MELSECNET/10

Network Module

User's Manual
(Hardware)

A1SJ72QLP25, A1SJ72QLR25

A1SJ72QBR15

Thank you for buying the Mitsubishi general-purpose programmable 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-C(1112)MEE	

● SAFETY PRECAUTIONS ●

(Read these precautions before using this product.)

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

In this manual, the safety precautions are classified into two levels:
"⚠ WARNING" and "⚠ CAUTION".

WARNING

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 minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠ CAUTION" may lead to serious consequences.

Observe the precautions of both levels because they are important for personal and system safety.

Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Design Precautions]

WARNING

- When there are communication problems with the data link, the communication problem station will enter the following condition. Build an interlock circuit into the sequence program that will make sure the system operates safely by using the communication state information. Not doing so could result in erroneous output or erroneous operation.
 - (1) For the data link data, the data prior to the communication error will be held.
 - (2) The remote I/O station will turn all output off.

However, when the output hold is set for the Q4ARCPU (for the independent system) and A6RAF (for the duplex system), the output state prior to the communication error is held.

When using a module that has an external output function on a remote I/O station, be careful.
- In a mixed system using QnA(R)CPU(S) and AnUCPU(S), never execute the transient transmissions indicated below, which cannot be executed from the QnA(R)CPU to another AnUCPU station.

The AnUCPU receiving the transmission may result in MAIN CPU DOWN or WDT ERROR, and the operation may stop.

 - (1) GPPQ — Remote operation (such as remote RUN, STOP, PAUSE, and RESET)
 - Clock setting
 - Online mode device testing
 - (2) Link dedicated instruction (SEND, READ, SREAD, WRITE, SWRITE, and REQ)

CAUTION

- Do not bundle the control wires and communication cables with the main circuit or power wires, or install them close to each other. They should be installed at least 100 mm (3.94 inches) away from each other. Failure to do so may generate noise that may cause malfunctions.

[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.

[Wiring Precautions]

WARNING

- 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.

[Startup and Maintenance Precautions]

CAUTION

- Please read this manual thoroughly and confirm the safety before starting online operations (especially, program modifications, forced outputs, and operating status modifications), which are performed by connecting the GX Developer via the MELSECNET/10 network system to a running CPU module of other station. Performing incorrect online operations may damage the machinery or result in accidents.
- Never disassemble or modify the module. This may cause breakdowns, malfunctions, injuries or fire.
- When using a wireless communication device such as a mobile phone, keep a distance of 25cm (9.84inches) or more from the programmable controller in all directions.
Failure to do so may cause malfunctions.
- Completely turn off the externally supplied power used in the system before mounting or removing the module. Failure to do so may damage the module or result in malfunctions.
- Do not touch the terminals while the power is on. Doing so may cause malfunctions.
- Be sure to shut off all phases of the external power supply used by the system before cleaning or retightening the terminal screws or module mounting screws. Failure to completely shut off all phases of the external power supply may cause module breakdowns and malfunctions. If the screws are loose, it may cause the module to short-circuit, malfunction or fall off. If the screws are tightened excessively, it may damage the screws and cause the module to short circuit, malfunction or fall off.
- Before handling the module, always touch grounded metal, etc. to discharge static electricity from the human body.
Failure to do so can cause the module to fail or malfunction.

[Disposal Precautions]

CAUTION

- When disposing of this product, treat it as industrial waste.

● CONDITIONS OF USE FOR THE PRODUCT ●

- (1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
 - i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
 - ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

- (2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.

MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.

("Prohibited Application")

Prohibited Applications include, but not limited to, the use of the PRODUCT in;

 - Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
 - Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
 - Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTS are required. For details, please contact the Mitsubishi representative in your region.

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
Dec., 2011	IB(NA)-0800111-C	Correction SAFETY PRECAUTIONS, COMPLIANCE WITH EMC AND LOW VOLTAGE DIRECTIVES, Chapter 3, 5 Addition SAFETY PRECAUTIONS(Chinese), CONDITIONS OF USE FOR THE PRODUCT

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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 EMC AND LOW VOLTAGE DIRECTIVES

(1) Method of ensuring compliance

To ensure that Mitsubishi programmable controllers maintain EMC and Low Voltage Directives when incorporated into other machinery or equipment, certain measures may be necessary. Please refer to one of the following manuals.

- User's manual for the CPU module used
- User's manual (hardware) for the CPU module or base unit used

The CE mark on the side of the programmable controller indicates compliance with EMC and Low Voltage Directives.

(2) Additional measures

To ensure that this product maintains EMC and Low Voltage Directives, please refer to one of the manuals listed under (1).

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 $\left\{ \frac{Y+B}{8} + (2 \times W) \right\} \leq 1600 \text{ bytes}$ 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	$X+Y \leq 1024$ (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)	

Item	Specifications
	A1SJ72QLP25
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			

Item	Specifications	
	A1SJ72QLR25	A1SJ72QBR15
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

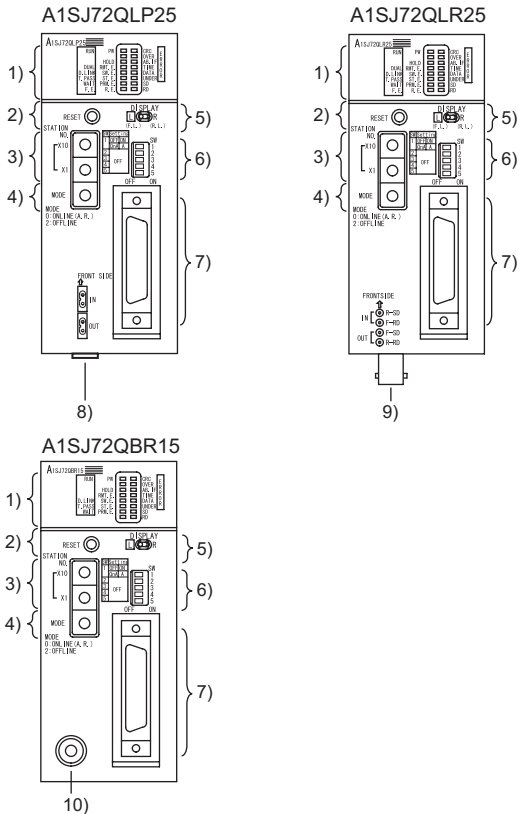
3.1 Cable length restrictions between stations

- (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

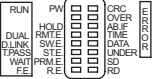
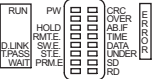
4. THE NAME AND SETTING OF EACH PART


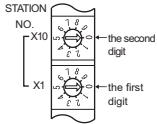
Indicates the name and setting of each part of Network Modules.

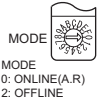


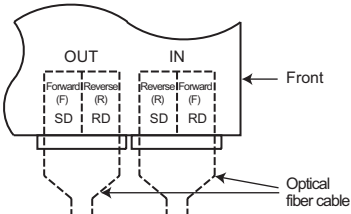
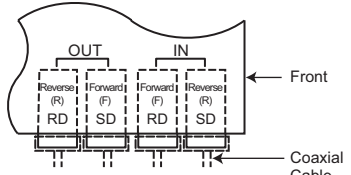
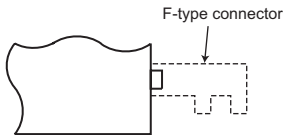
CAUTION

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)	LED A1SJ72QLP25 A1SJ72QLR25  A1SJ72QBR15 	Name	status	Contents		
		RUN	ON	Normally operating.	The position of switch for the display switch over of 5) is valid when it is on the left side.	
			OFF	WDT error occurred (hardware failure)		
		DUAL		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)		The position of switch for the display switch over of 5) is valid when it is on the right side.
		HOLD	ON	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.				

No.	Name	Contents		
1)	LED	Name	status	Contents
		CRC	ON	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		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	
	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)		

No.	Name	Contents		
4) *1		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.)
5)	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)			
6) *1	Conditions setting switch	Operation condition setting (factory setting at the time of shipping: all off)		
		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		

No.	Name	Contents
8)	Connector (A1SJ72QLP25)	Connect the optical fiber cable. 
9)	Connector (A1SJ72QLR25)	Connect the coaxial type cable. 
10)	Connector (A1SJ72QBR15)	Connect the F-type connector. 

*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

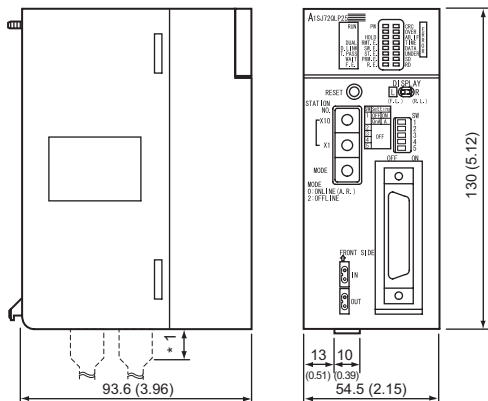
Please refer to the reference manual of used master module for the wiring for network system.

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

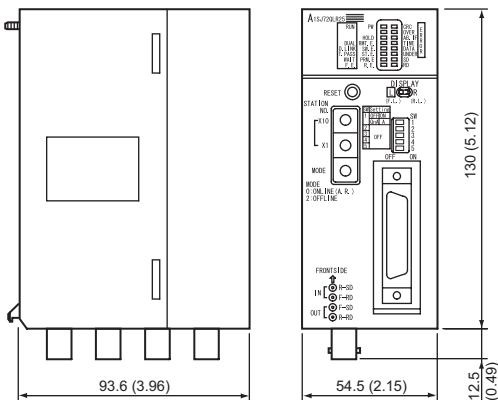
6.1 A1SJ72QLP25



Unit: mm (in.)

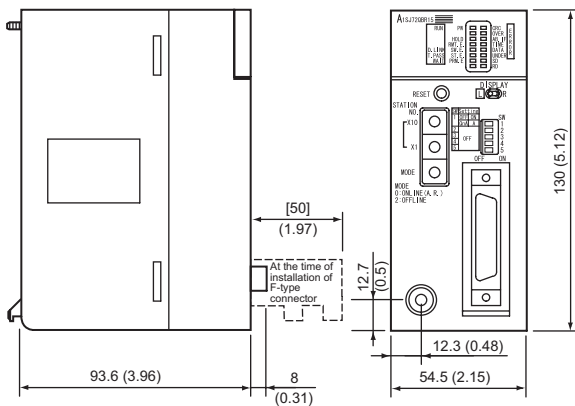
*1 Please confirm details to Mitsubishi Electric System Service Corporation.

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.

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