

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.



● SAFETY PRECAUTIONS ●

(Read these precautions before using.)

When using Mitsubishi equipment, thoroughly read this manual and the associated manuals introduced in this manual. Also pay careful attention to safety and handle the module properly.

These precautions apply only to Mitsubishi equipment. Refer to the CPU module user's manual for a description of the PLC system safety precautions. These ●SAFETY PRECAUTIONS● classify the safety precautions into two categories: "DANGER" and "CAUTION"



Procedures which may lead to a dangerous condition and cause death or serious injury if not carried out properly.



Procedures which may lead to a dangerous condition and cause superficial to medium injury, or physical damage only, if not carried out properly.

Depending on circumstances, procedures indicated by  CAUTION may also be linked to serious results.

In any case, it is important to follow the directions for use.

Store this manual in a safe place so that you can take it out and read it whenever necessary. 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.
- Do not touch the printed circuit board of the module. It may cause damage or erroneous operation.
- Install so that the pegs on the bottom of the module fit securely into the base unit peg holes.
The module fixing screws must be tightened by the specified torque.
Not installing the module correctly or tightening the screws to the terminal base could result in erroneous operation, damage, or pieces of the product falling.

[WIRING PRECAUTIONS]

DANGER

- Completely turn off the external power when installing or placing wiring. Not completely turning off all power could result in electric shock or damage to the product.

CAUTION

- When wiring in the PLC, be sure that it is done correctly by checking the product's rated voltage and the terminal layout. Connecting a power supply that is different from the rating or incorrectly wiring the product could result in fire or damage.
- 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.
- Tighten terminal screws to the specified torque.
If a terminal screw is not tightened to the specified torque, it the module may fall out, short circuit, or malfunction.
If a terminal screw is tightened excessively, exceeding the specified torque, the module may fall out, short circuit, or malfunction due to breakage of the screw or the module.
- Be sure to fix communication cables or power cables leading from the module by placing them in the duct or clamping them.
Cables not placed in the duct or without clamping 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.

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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)

Correspondence to EMC DIRECTIVE

For instructions to make the PLC compatible with EMC standards, refer to "EMC AND LOW-VOLTAGE DIRECTIVE" in PLC CPU User's Manual (Hardware).

- * When the PLC CPU user's manual (Hardware) does not include Chapter 3 "EMC AND LOW-VOLTAGE DIRECTIVE", refer to QnA Series CPU Compatible High-Speed Accessing Basic Base Unit-Additional Explanation for Product Conforming to EMC Standards (IB-66837) (optional).

1. Overview

This manual gives the specifications and nomenclature of the A1SJ72QLP25, A1SJ72QLR25, A1SJ72QBR15 type network module (abbreviated as Network Modules) to be used in a MELSEC-QnA series MELSECNET/10 network system.

- 1) The following table shows the applications, applicable cable and installation position of the Network Modules.

Type	Use	Cable used		Application
		Optical fiber cable	Coaxial cable	
A1SJ72QLP25	For remote I/O station of MELSECNET/10	○	-	Main base CPU slot
A1SJ72QLR25		-	○	
A1SJ72QBR15				

- 2) Please verify the existence of the following parts after opening the package.

a) A1SJ72QLP25

Part name	Quantity
A1SJ72QLP25 Network module	1

b) A1SJ72QLR25

Part name	Quantity
A1SJ72QLR25 Network module	1

c) A1SJ72QBR15

Part name	Quantity
A1SJ72QBR15 Network module	1
F type connector (A6RCON-F)	1

- 3) When configuring a coaxial bus system a terminal resistor (A6RCON-R75) must be installed at both ends. The terminal resistors are not contained in the package and you must be obtained at your own expense.

2. Performance Specifications

The following table shows the performance specifications of the Network Modules.

Item	A1SJ72QLP25	A1SJ72QLR25	A1SJ72QBR15
	Optical loop system	Coaxial loop system	Coaxial bus system
Maximum number of link points per network	X/Y	8192 points	
	B	8192 points	
	W	8192 points	
Maximum number of link points per station	<ul style="list-style-type: none"> Remote master station → Remote I/O station $\left[\frac{Y+B}{8} + (2 \times W) \right] + (2 \times W) \leq 1600 \text{ bytes}$		
	<ul style="list-style-type: none"> Remote I/O station → Remote master station $\left[\frac{X+B}{8} + (2 \times W) \right] + (2 \times W) \leq 1600 \text{ bytes}$		
	<ul style="list-style-type: none"> Remote master station → Remote sub-master station Remote sub-master station → Remote master station $\left[\frac{Y+B}{8} + (2 \times W) \right] + (2 \times W) \leq 2000 \text{ bytes}$		
Max. number of I/O points per station	X+Y ≤ 2048 (main base plus 7 extension bases)		
Communication speed	10Mbps (20Mbps: multiple transmission)		10Mbps
Communication method	Token-ring method		Token bus method
Synchronization system	Frame synchronization		
Coding system	NRZI coding (Non Return to Zero Inverted)		Manchester coding
Transmission channel type	Duplex loop		Single bus
Transmission format	Conforms to HDLC (frame format)		
Maximum number of networks	239		
Number of stations connectable per network	65 stations (Master station: 1; remote I/O stations: 64)		33 stations (Master station:1; remote I/O stations:32)
Overall extension distance	30km SI cable H type: station-to-station distance 300m SI cable L type: station-to-station distance 500m QSI cable: station to station distance 1km	3C-2V	3C-2V
		19.2km (inter station 300m)	300m (station-to-station distance 300m)
		5C-2V	5C-2V
		30km (inter station 500m)	500m (station-to-station distance 500m)
			Repeater unit Extension up to 2.5km possible by using A6BR10 or A6BR10DC
Error control system	Retry by CRC (X ¹⁶ +X ¹² +X ⁴ +1) and overtime		
RAS function	<ul style="list-style-type: none"> Loopback function in response to error detection and cable disconnection (A1SJ72QLP25, A1SJ72QLR25) Diagnosis function for self-station link line check Error detection using special relays and registers Network monitor and other diagnosis functions 		
Transient transmission	Monitoring with peripheral device, program up/download		

Item	A1SJ72QLP25	A1SJ72QLR25	A1SJ72QBR15
Connection cable	Optical fiber cable SI-200/220, SI-200/250 QSI-185/230 (Arranged by user *1)	3C-2V, 5C-2V or equivalent	
Applicable connector	2-core optical connector plug DL-72ME (For SI-200/250) CA7003, CA7005 (For SI-200/220 and QSI- 185/230)	BNC connector compatible with 3C-2VC, 5C-2V cable	
5VDC current consumption (A)	0.52	1.24	0.7
Weight (kg)	0.41	0.42	0.43

*1: 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 CPU module that is to be used.

3. Handling

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.*
- Do not touch the printed circuit board of the module.
It may cause damage or erroneous operation.
- Install so that the pegs on the bottom of the module fit securely into the base unit peg holes.
The module fixing screws must be tightened by the specified torque.
Not installing the module correctly or tightening the screws to the terminal base could result in erroneous operation, damage, or pieces of the product falling.

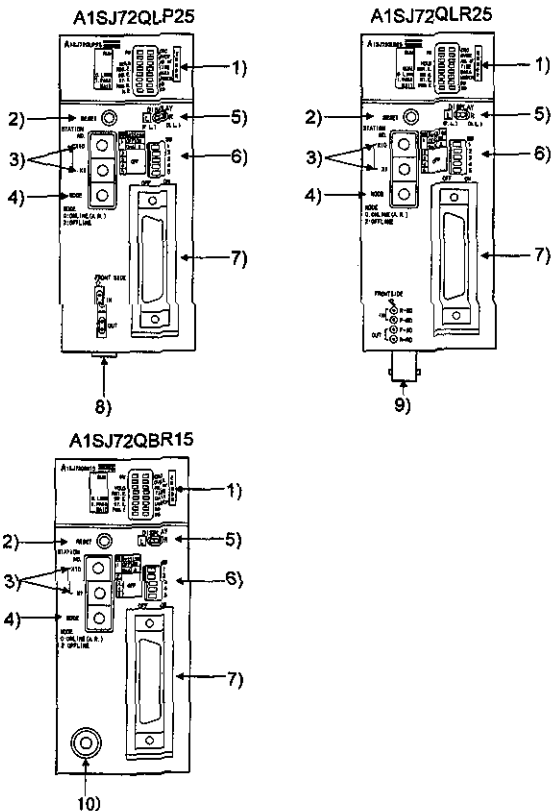
3.1 Cable length restrictions between stations.

- 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) 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

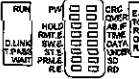

4. The Name and Setting of Each Part


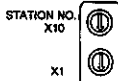

This section gives the names of each part of the Network Modules and explains their settings.



CAUTION

Please do not touch dip switch on the base board of module side. (fixes to turning OFF)

No.	Name	Contents									
1)	LED	RUN	Module at the normal time: lamp is lit When a WDT error is generated: lamp is not lit	The position of the switch for the display switch over of 5 is valid when it is on the left side.							
	A1SJ72QLP25 A1SJ72QLR25	DUAL	During execution of multiplex transmission: lamp is lit								
		D.LINK	During data link: lamp is lit								
		T.PASS	At the time of baton pass (transmission): lamp is lit								
		WAIT	At the communication waiting state with the special function module: lamp is lit								
		F.E.	If there is an error when the Plus (F.Loop) loop is abnormal: lamp is lit <Primary cause> The power supply of the adjacent station is off, the cable is cut or not connected, etc.								
		PW	When the power supply is supplied: lamp is lit								
	A1SJ72QBR15	HOLD	Q4AR output in hold mode: lamp is lit Q4AR output in reset mode: lamp is not lit		The position of the switch for the display switch over of 5 is valid when it is on the right side.						
		RMT.E	When setting a remote I/O: lamp is lit (turns on the SW1)								
		SW.E	When there is an abnormality with a switch between 3 and 4: lamp is lit								
		ST.E	Station number setting is overlapping: lamp is lit								
		PRM.E	When there is a conformity error with a common parameter and station existent parameter and when the parameter received from a sub-management station and the local station parameter received from the management station are different: lamp is lit								
		R.E.	If there is an error when the Sub (R.Loop) loop is abnormal: lamp is lit <Primary cause> The power supply of the adjacent station is off, the cable is cut or not connected, etc.								
		CRC	When there is a code check error of receiving data: lamp is lit <Primary cause> The timing of a station in parallel condition sending data to corresponding station, H/W abnormality, cable abnormality, noise, etc.								
		OVER	When there is an error due to delayed processing of receiving data: the lamp is lit <Primary cause> H/W abnormality, cable abnormality, noise, etc.								
		AB.IF	Errors when successively receiving communication which is "1" above the regulations and or when the length of the receiving data is short: lamp is lit <Primary causes> The timing of a station in parallel condition sending data to the corresponding station, monitoring time is short, cable is abnormal, noise, etc.								

No.	Name	Contents		
1)	LED	TIME	An error at the time that the data link timer is working; lamp is lit <Primary causes> Monitoring time is short, cable abnormality, noise, etc.	
		DATA	Error when receiving abnormal data which is 2K bytes or over; lamp is lit. <Primary causes> Cable abnormality, noise, etc.	
		UNDER	An error when the internal processing of the sending transmission data is not in constant intervals; lamp is lit <Primary causes> H/W abnormality	
		SD	During data sending; lamp is lit	
		RD	During data receiving; lamp is lit	
2)	Reset switch 	Resets the host station hardware.		
3) *1	Station number setting switch 	Station number setting (setting on delivery: 1) <Setting range> 1 to 64 Any number outside the range will result in an error (the SW.E LED will come on).		
4)	Mode setting switch  MODE 0:FOML TIME(A,R) 2:OFFLINE	Mode setting (factory setting at time of shipping: 0)		
		Mode	Name	Contents
		0	On-line (automatic double line existent)	Data link (automatic double line existent)
		1	Use not possible	-
		2	Off-line	Placing local station in parallel condition
		3	Forward loop	Data link system Check of all forward loop side circuits is executed.
		4	Reverse loop	Data link system Check of all reverse loop side circuits is executed.
		5	Test between stations (master stations)	By the mode which checks circuits between 2 stations, execute the check of the one which has a smaller number as the master station and the other as the sub master station.
		6	Test between stations (sub master stations)	By the mode which checks circuits between 2 stations, execute the check of the one which has a smaller number as the master station and the other as the sub master station.
		7	Self back to back test	By the module simplex, check the hardware including the sending and receiving communication circuit of the transmission system and the cable.
		8	Internal self back to back test	By the unit simplex, check the hardware including the sending and receiving communication circuit of the transmission system.
		9	Hardware test	Check the internal hardware of the network module.
		A to E	Use prohibited	(Do not set the mode.)
		F	Station number check	Checks the number using LEDs

No.	Name	Contents		
5)	Switch for mode switch over	Switch over of forward/reverse loop of the error display of CRC-Under and the display switch over of Run-F.E./PW-R.E. (factory setting at the time of shipping: left side)		
		Switch position	Contents	
		L(F.L.)	The CRC-Under error display is set to the forward loop side and the RUN to R.E. display is set to valid.	
	R(R.L.)	(PW to R.E. display is invalid) The CRC-Under error display is set to the reverse loop side and the PW to R.E. display is set to valid. (RUN to R.E. display is invalid)		
6)	Conditions setting switch	Operation condition setting (setting at delivery: all OFF)		
		SW	OFF	ON
		1	Peripheral device for QnA series connected	Peripheral device for A series connected
		2	Unusable (leave OFF at all times)	
		3		
		4		
5				
7)	RS-422 interface	Connects the peripheral device		
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: After changing a setting while the power supply is ON, reset using the reset switch (2). However, when the mode setting switch (4) is set to "F", resetting is not necessary.

5. Wired

DANGER

- Completely turn off the external power when installing or placing wiring. Not completely turning off all power could result in electric shock or damage to the product.

CAUTION

- When wiring in the PLC, be sure that it is done correctly by checking the product's rated voltage and the terminal layout. Connecting a power supply that is different from the rating or incorrectly wiring the product could result in fire or damage.
- 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.
- Tighten terminal screws to the specified torque.
If a terminal screw is not tightened to the specified torque, the module may fall out, short circuit, or malfunction.
If a terminal screw is tightened excessively, exceeding the specified torque, the module may fall out, short circuit, or malfunction due to breakage of the screw or the module.
- Be sure to fix communication cables or power cables leading from the module by placing them in the duct or clamping them.
Cables not placed in the duct or without clamping 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.

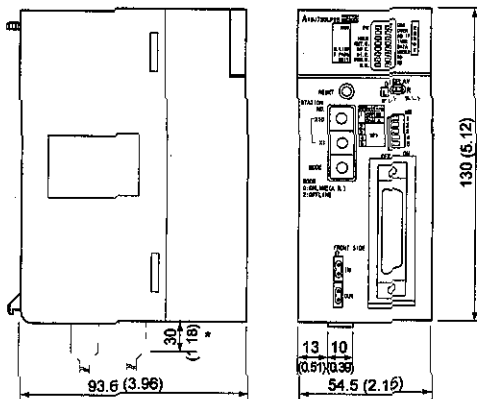
Please refer to the user's manual of connected master module for the wiring for network system.

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 Diagram

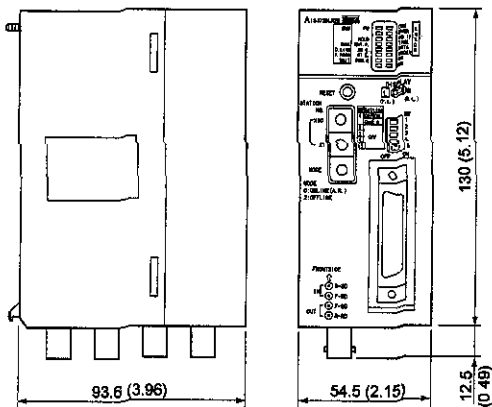
6.1 A1SJ72QLP25



Unit: mm (in.)

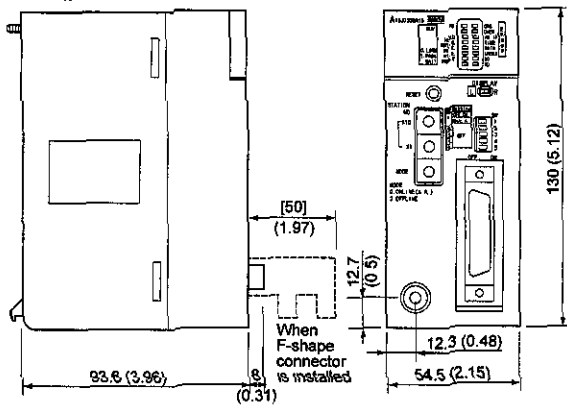
* When CA7003 is installed. Please confirm details to Mitsubishi Electric System Service Corporation.

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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