MITSUBISHI

MELSEC QnA Series

User's Manual

MELSECNET/10 remote I/O module type AJ72QLP25/AJ72QBR15 (Hardware)

INTRODUCTION

Thank you for choosing the Mitsubishi MELSEC QnA Series of General Purpose Programmable Controllers. Please read this manual carefully so that the equipment is used to its optimum A copy of this manual should be forwarded to the end User

PROGRAMMABLE CONTROLLER

IB (NA) 66621-A

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Cautions on Safety

(Please read before using the module)

Please carefully read this manual and related ones mentioned herein to ensure safety and operate this module properly
The following cautions are applicable only to the module For the cautions on safety relating to the PC CPU system, see the PC CPU User's Manual
The cautions in this cautions on safety are classified into two ranks, "DANGER" and "CAUTION", according to their importance

⚠ DANGER	A warnig given when improper operation could result in a dangerous situation causing death or serious injuries
⚠ CAUTION	A caution given when improper operation could result in a dangerous situation causing moderate or injuries, and physical damage to the module, etc

Even failure to observe a caution marked ! CAUTION may bring about a serious accident depending on the situation Do not fail to follow the cautions
Retain this manual for consultation whenever necessary, and provide a copy to the end user

[Cautions on Design]

⚠ DANGER

- When there is a communication fault in the data link system, the following happens at the faulty station Using the communications status information, create an interlock circuit in the sequence program to ensure that the system will operate safely despite such faults

  (1)The data link data that existed before the fault is retained

  (2)All outputs of remote I/O stations go OFF

  For details on the method for confirming the faulty station and the operating status when a communication fault occurs, see the manual for the relevant data link

⚠ CAUTION

- Do not bundle the control wire and the communication cable with the main circuit or power line or keep them close to one another
  Keep the control wire and the communication cable at least 100 mm away from the main circuit or power line: otherwise, noise or malfunctions will occur

[Cautions on Installation]

⚠ CAUTION

- Use the PC in the environment specified in the General Specifications section in this manual
  Using it in an environment which does not meet the general specifications could cause electric shock, fire or malfunctions, and damage or deterioration of the module
- Install the module by engaging the module mounting projections on the lower part of the module in the mounting holes of the base unit Incorrect installation could result in malfunctions, failure of detachment

[Cautions on Wiring]

⚠ DANGER

- Always switch off all power supply phases externally before attempting installation or wiring work
  If all power supply phases are not switched off, there will be a danger of electric shock or damage to the product

⚠ CAUTION

- Take all possible measures to prevent chips or wire scraps from entering the module
  Entry of foreign material will cause fire, failure of malfunctions
- Crimp, pressure weld, or correctly solder connectors for external connections, using the correct tools
  An imperfect connecrion could cause short circuiting, fire, or malfunction

[Cautions on Start-Up and Maintenance]

⚠ DANGER

- Do not touch the terminals while they are live This will cause malfunctions
- Switch the power off before cleaning the module or retightening the terminal screws
  If the power is left on, the module will break down or malfunction

⚠ CAUTION
• Read the manual carefully and confirm safety before attempting operations such as program changes, forced output, RUN, STOP, PAUSE, etc , during operation Incorrect procedure could damage the machine or cause accidents • Do not disassemble or tamper with the module This will cause failure, malfunctions, injuries or fire • Switch the power off before installing or removing the module If the power is left on, the module will break down or malfunction

[Cautions on Disposal]

⚠ CAUTION
• Dispose of the module as industrial waste

1. GENERAL DESCRIPTION

This manual gives the specifications and nomenclature of the AJ72QLP25/AJ72QBR15 type 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 AJ72QLP25 and AJ72QBR15

	Application	Applicable Cable		Module Installation Position
		Optical Fiber Cable	Coaxial Cable	
AJ72QLP25	For remote I/O stations of MELSECNET/10	O	—	CPU slot of main base unit
AJ72QBR15		—	O	

(2) Please confirm that the following parts have been supplied on unpacking the package:

(a) AJ72QLP25

Part Name	Quantity
AJ72QLP25 network module	1

(b) AJ72QBR15

Part Name	Quantity
AJ72QBR15 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

1 1 Rated Manual

QnA MELSECNET/10 Reference Manual (IB-66620)

2. PERFORMANCE SPECIFICATIONS

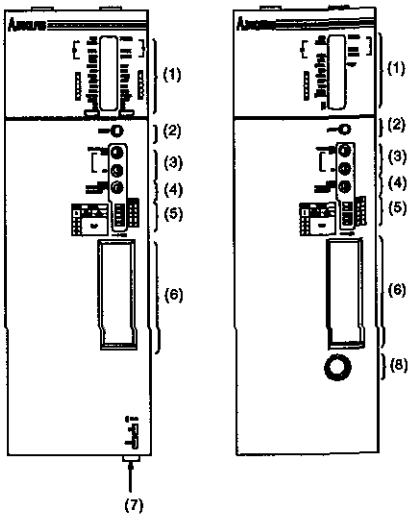
The following table shows the performance specifications of the AJ72QLP25 and AJ72QBR15

Item	AJ72QLP25	AJ72QBR15
	Optical 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	• Remote master station → Remote I/O station $\left(\frac{Y+B}{8}+(2\times W)\right) \le 1600$ bytes • Remote I/O station → Remote master station $\left(\frac{X+B}{8}+(2\times W)\right) \le 1600$ bytes • Remote master station → Remote sub-master station Remote sub-master station → Remote master station $\left(\frac{Y+B}{8}+(2\times W)\right) \le 2000$ bytes	
Max number of I/O points per station	X+Y ≤ 2048 (main base plus 7 extension bases)	
Communication speed	10 MBPS (20 MBPS: multiple transmission)	10 MBPS
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 station: 64)	33 stations (master station: 1; remote I/O station: 32)
Overall extension distance	30 km (SI cable H type: station-to-station distance 300 m; SI cable L type: station-to station distance 500 m; QSI cable: station to-station distance 1 km)	3C-2V: 300 m (station-to-station distance 300 m); 5C 2V: 500 m (station-to-station distance 500 m) Repeater unit Extension up to 2 5 km possible by using A6BR10 or A6BR10DC
Error control system	Retry by CRC ($X^{16}+X^{12}+X^5+1$) and overtime	
RAS function	• Loopback function in response to error detection and cable disconnection (Optical loop system only) • 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	
Connection cable	SI 200/250 ; QSI-185/230	3C 2V, 5C-2V or equivalent
Applicable connector	2-core optical fiber cable connector plug CA7003	BNC connector compatible with 3C-2V, 5C-2V cable
Cable transmission loss	12 dB/km or less ; 5 5 dB/km or less	Conforms to JIS C 3501
Current consumption (5 VDC)	0 8 A	0 9 A
Weight kg (lb)	0 53 (1 17)	0 6 (1 32)

For general specifications, refer to the user's manual for the PC CPU used for the network system

3. NOMENCLATURE AND SETTINGS

This section gives the names of each part of the AJ72QLP25 and AJ72QBR15 and explains their settings



No	Name	Description		
		Name	State	Description
(1)	LED AJ72QLP25 AJ72QBR15	RUN	ON	When the module is normal
			OFF	When a WDT error occurs
		RMT E	ON	When a blown fuse or I/O check error occurs (Host station)
		DUAL		During duplex transmission (Off: when duplex transmission not executed)
		SW E		When settings of switches (3) to (4) are incorrect
		ST E		When two or more stations have the same number exist in the same network
		PRM E		• When I/O allocations are abnormal. • When the number of LB/LW points is insufficient • When the parameters received from the remote master station are abnormal
		POWER		When power is supplied (Off: when power is not being supplied)
		D LINK		During data link (Off: when data link stopped)
		T PASS		When taking part in baton passing (during transient transmission)
		WAIT		When waiting for communication with special-function module
		CRC		When there is a code check error in the received data <Cause> Timing when the station that is sending data to a specific station is set off-line, hardware fault, cable fault, noise, etc
		OVER		When an error occurs due to delay in processing of received data <Cause> Hardware fault, cable fault, noise, etc
		AB IF		• When the number of "1"s received in succession exceeds the specified number • When an error occurs due to short data length of received data <Cause> Timing when the station that is sending data to a specific station is set off line, WDT setting too short, cable fault, noise, etc
		TIME		When an error occurs when the data link monitoring timer operates <Cause> Short WDT time, cable fault, noise, etc
		DATA		When an error occurs due to receipt of more than 2 Kbytes of data <Cause> Cable fault, noise, etc

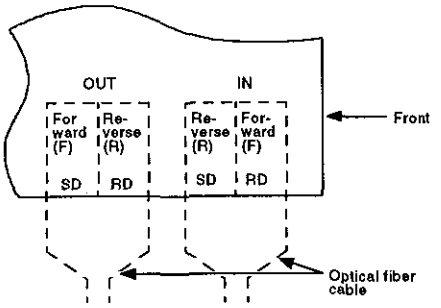
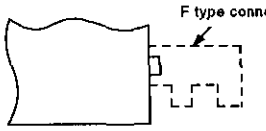
Caution

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

No	Name	Description		
(1)	LED	NDER	ON	When an error occurs due to internal processing of sent data at irregular intervals <Cause> Hardware fault
		LOOP		When error occurs due to abnormal forward or reverse loop (F LOOP/R LOOP) <Cause>Power OFF at adjacent station, cable disconnection, connection not made, etc
		SD	Dimly lit	uring data transmission
		RD		During data reception
(2)	Reset switch RESET	• Resets the host station hardware		
(3) *1	Station number setting switch STATION NO. X10 X1	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) *1	Mode setting switch MODE 0:ONLINE(A.R) 2:OFFLINE	Mode setting (setting on delivery: 0)		

Mode	Name	Description
0	Online (automatic online return effective)	Data link with automatic online return effective
1	Unusable	
2	Offline	Disconnects the host station
3	Forward loop test	Checks the forward loop line of the entire data link system
4	Reverse loop test	Checks the reverse loop line of the entire data link 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	Checks the hardware of a module in isolation, including the communication circuit and cables of the transmission system
8	Internal self-loopback test	Checks the hardware of a module in isolation, including the communication circuit of the transmission system
9	Hardware test	Checks the hardware inside the network module
A to E	————	Unusable
F	Station number check	Checks the number using LEDs

(5) *1	Condition 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		
(6)	RS-422 interface	Connects the peripheral device		

No	Name	Description
(7)	Connector	An optical fiber cable is connected 
(8)	Connector	An F type connector is connected 

*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

4. CAUTIONS ON COAXIAL BUS SYSTEM CONFIGURATION

(1) Restrictions on the station-to-station cable length

Use a station-to-station coaxial cable of an appropriate length for the total number of stations according to the table to the right

Using a cable of a length other than that specified in this table may cause communication errors

The overall extension length is 500 m (1640 ft), irrespective of the total number of stations

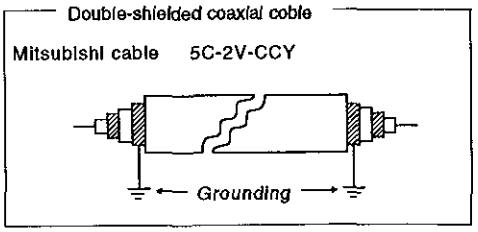
Total Number of Stations	Station-to-Station Cable Length
2 to 9 stations	1 to 500 m (3 28 to 1640 ft)
10 to 33 stations	1 to 5 m (3 28 to 16 4 ft) 13 to 17 m (42 65 to 55 77 ft) 25 to 500 m (82 02 to 1640 ft)

(2) For an A6BR10 or A6BR10-DC type repeater unit, use a station-to-station cable whose length corresponds to one of the lengths specified for "10 to 33 stations"

(3) Cautions on wiring

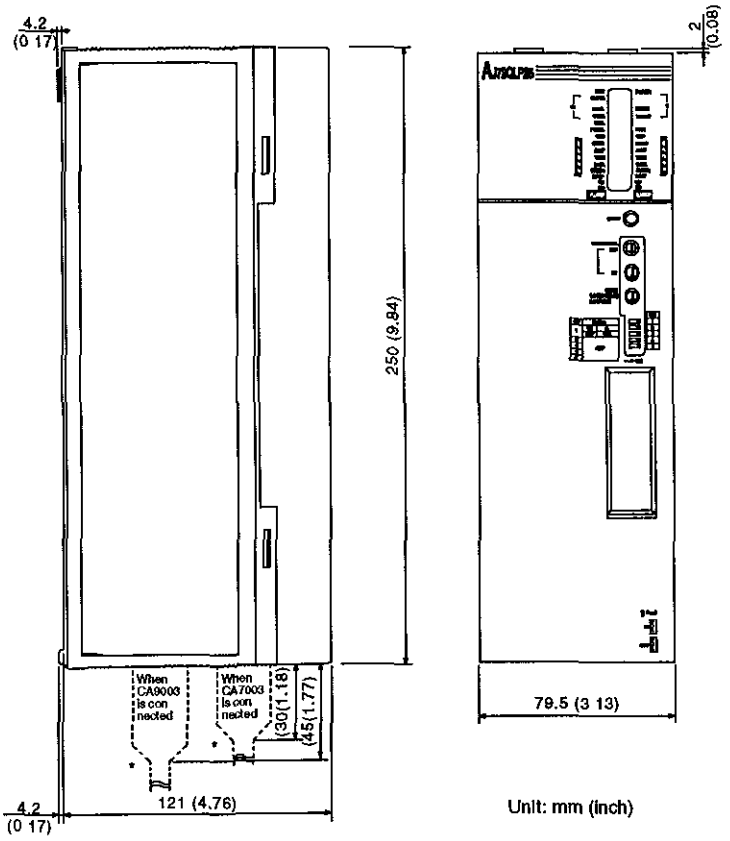
(a) Keep coaxial cables more than 100 mm (3 94 in) away from other power cables and control cables

(b) It is advisable to connect double-shielded coaxial cable in locations susceptible to noise



5. OUTSIDE DIMENSIONS

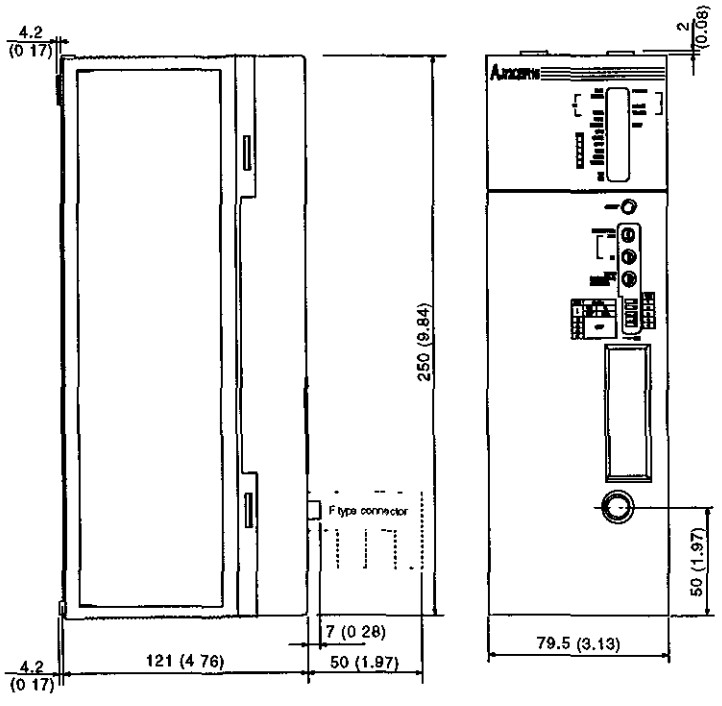
5.1 AJ72QLP25



Unit: mm (inch)

* Take account of the bending radius of the cable (Refer to the Reference Manual)

5 2 A1SJ71BR11



Unit: mm (inch)

REVISIONS

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IMPORTANT

(1) *Design the configuration of a system to provide an external protective* or safety interlocking circuit for the PCs

(2) The components on the printed circuit boards will be damaged by static electricity, so avoid handling them directly If it is necessary to handle them take the following precautions

(a) Ground human body and work bench

(b) *Do not touch the conductive areas of the printed circuit board and* its electrical parts with and non-grounded tools etc

Under no circumstances will Mitsubishi Electric be liable or responsible for any consequential damage that may arise as a result of the installation or use of this equipment

All examples and diagrams shown in this manual are intended only as an aid to understanding the text, not to guarantee operation Mitsubishi Electric will accept no responsibility for actual use of the product based on these illustrative examples

Owing to the very great variety in possible applications of this equipment you must satisfy yourself as to its suitability for your specific application