

MITSUBISHI Ethernet Interface Module

User's Manual
(Hardware)

A1SJ71QE71-B2
A1SJ71QE71-B5

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

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



MODEL	A1SQE71-U-H/W-E
MODEL CODE	13J866
IB (NA)-66705-C (0006) MEE	

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● SAFETY PRECAUTIONS ●

(Always read before starting use)

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

These precautions apply only to the installation of Mitsubishi equipment and the wiring with the external device. Refer to the user's manual of the CPU module to be used 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 usage. 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.

[DESIGN PRECAUTIONS]

CAUTION

- When laying the control wire or communication cable, do not bundle with or place near main circuit or power line. Keep them at least 100 mm (3.94 in.) away from such cables. Noise may cause erroneous operation.

[INSTALLATION PRECAUTIONS]

CAUTION

- Use the PLC in the environment given in the general specifications section of the user's manual to be used. Using the PLC outside the range of the general specifications may result in electric shock, fire, or erroneous operation or may damage or degrade the product.

[INSTALLATION PRECAUTIONS]

CAUTION

- Install so that the pegs on the bottom of the module fit securely into the base unit peg holes and then tighten the module fixing screw by the specified torque. Not installing the module or tightening the screws correctly to the terminal base could result in erroneous operation, damage, or pieces of the product falling.
- Tighten the screw within the range of specified torque. If the screws are loose, it may result in fallout, short circuits or malfunction. Tightening the screws to far may cause damage to the screw and/or the module, resulting in fallout, short circuits or malfunction.
- Make sure to switch all phases of the external power supply off before mounting or removing the module. If you do not switch off the external power supply, it will cause electric shock or damage to the product.
- Do not touch the electronic parts or the module conducting area directly. It may cause erroneous operation or failure.

[WIRING PRECAUTIONS]

CAUTION

- Perform correct pressure-displacement, crimp-contact or soldering for external wire connections using the tools specified by the manufactures. Incorrect connection may cause short circuits, fire or malfunction.
- Attach connector to the module securely.
- Be sure to fix communication cables or power supply 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.
- Tighten the screw within the range of specified torque. If the screws are loose, it may result in short circuits or malfunction. Tightening the screws to far may cause damage to the screw and/or the module, resulting in fallout, short circuits or malfunction.
- Do not grab on the cable when removing the communication cable connected to the module. 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 part that is connected to the terminal block. Pulling the cable that is still connected to the module may cause a malfunction or damage to the module or cable.
- Solder coaxial cable connectors properly. Insufficient soldering may cause malfunction.
- Be sure that cuttings, wire chips, or other foreign matter do not enter the module. Foreign matter may start a fire or cause an accident or erroneous operation.

About the Manuals

The following product are available for this equipment. Refer to the table given below to choose suitable manuals.

Detailed Manual

Manual name	Manual No (Model code)
Ethernet Interface Module User's Manual (For QnA Series)	IB-66661 (13J844)

Related Manual

Manual name	Manual No (Model code)
Ethernet Interface Module User's Manual type AJ71E71	IB-66310 (13J661)
Ethernet Interface Module User's Manual type A1SJ71E71-B2/B5	IB-66547 (13JE87)
Ethernet Interface Module User's Manual	SH-3598 (13J856)

* For the E71 commands, either the communication time, IB-66310, IB-66547, or SH-3598 manual is required.

Correspondence to EMC DIRECTIVE

To make the PLCs compliant with the EMC directive, refer to Chapter 3 "EMC AND LOW-VOLTAGE DIRECTIVE" in the user's manual (Hardware) of the CPU module to be used.

* When the CPU module 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-68837) (optional).

1 Overview

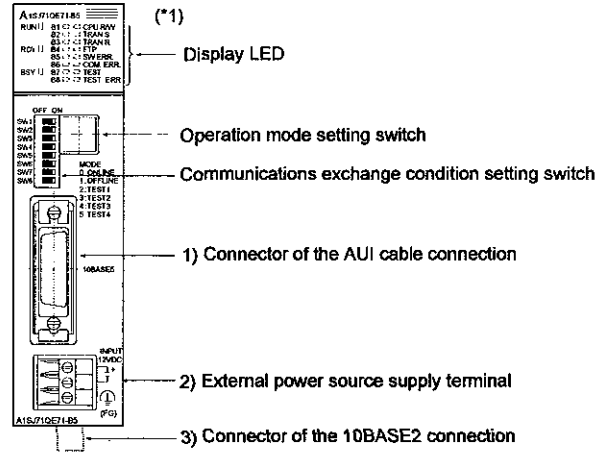
This manual explains how to install A1SJ71QE71-B2 and A1SJ71QE71-B5 Ethernet interface module (abbreviated as QE71 hereafter) and how to wire them external devices

After unpacking QE71, verify that the following parts are contained.

Model name	Product name	No. of items
A1SJ71QE71-B2	A1SJ71QE71-B2 type Ethernet Interface Module BNC T-adapters (UG-274/U)	1
A1SJ71QE71-B5	A1SJ71QE71-B5 type Ethernet Interface Module	1

Ethernet is the registered trademark of XEROX CO LTD
10BASE2 is the formal way to say Cheapernet.
There is no registered trademark for Cheapernet.

3 Settings and Names of Each Part



*1 The module diagram is shown with A1SJ71QE71-B5
A1SJ71QE71-B2 does not have the external supply power terminal and AUI cable connector, but have 10BASE2 connector instead under the module

No	Designation	Contents
1)	Connector of the AUI cable connection	Connector for the connection of 10BASE5-use AUI cable (transceiver cable) to QE71 * Only for A1SJ71QE71-B5
2)	External power source supply terminal	Power source terminals for power source supply to the transceiver in the connection of 10BASE5 (14.08 V to 15.75 V) * Only for A1SJ71QE71-B5
3)	Connector of the 10BASE2 connection	Connector for the connection of 10BASE2-use coaxial cable to QE71 * Only for A1SJ71QE71-B2

2. Performance Specifications

The performance specifications of QE71 is shown below See CPU module user's manual for QE71 general specifications.

Topic	Specifications	
	A1SJ71QE71 B2 10BASE2 (Cheapernet)	A1SJ71QE71 B5 10BASE5 (Ethernet)
Data transmission speed	10 Mbps	
Transmission method	Base band	
Maximum distance between nodes	925 m (3034.77 ft)	2500 m (8202.10 ft)
Maximum segment length	185 m (606.96 ft)	500 m (1640.42 ft)
Maximum number of nodes	30 nodes per segment	100 nodes per segment
Minimum distance between nodes	0.5 m (1.64 ft)	2.5 m (8.20 ft)
Sending/receiving communication data memory for storage	Fixed buffer . 1 k word x 8 Random access buffer . 6 k word x 1	
Number of external nodes that can be communicated with a single initial processing	Max 256 stations (*1)	
EEPROM write frequency	Maximum of 10,000 times in the same area	
Number of input output power points	32 points (*2)	
5 V DC internal consumption current [A]	0.8	0.6
12 V DC external power supply capacity	-	(*3)
External dimensions [mm (inch)]	130 (5.12) x 34.5 (1.36) x 93.6 (3.69)	
Mass [kg]	0.28	0.27

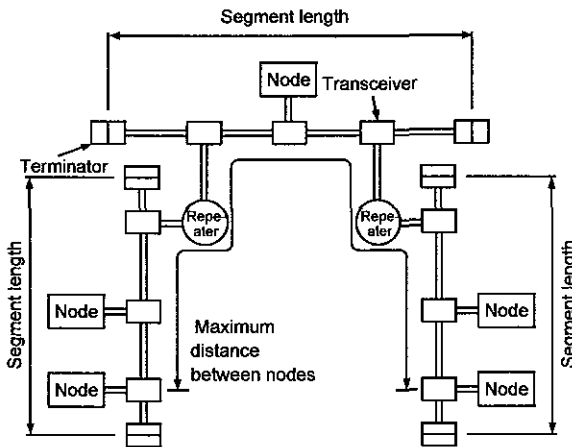
*1 Maximum number of external nodes that can be communicated with a single initial processing of QE71 is 256 stations
(The original station is included when a message is sent to several stations at once by UDP/IP)

More external nodes can be communicated by repeating the initial processing

*2 I/O assignment should be set by special 32 points when performed with GPP function

*3 It is required to use that which satisfies the specifications of the transceiver and the AUI cable, considering the voltage drop in QE71 (Maximum 0.8 V)

Notes The following diagram indicates the longest between the modes, and the segment length



(1) Display LED display contents

Display LED	Display contents	When lamp is lit	Lamp is not lit
RUN	Normal operation display	Normal	Abnormal
RDY	Standard display of communication exchange completion	Light flashing during on-line operation (initial processing complete)	
BSY	Display during execution of communication exchange processing	Executing	Not executing
B1 to B8	Display of telecommunication line connection status of connection No. n corresponding to Bn.	Open completed	Close state
CPU R/W	Communication processing with PLC CPU executing display	Communicating	Not communicating
TRAN S	Data link instruction request executing display	Executing	Not executing
TRAN R	Data link instruction RECV instruction request wait display	Request waiting	Request not waiting
FTP	FTP sever function operating display	Operating	Stopped
SW ERR	CPU error, CPU type error or rotary switch error display	Abnormal	Normal
COM ERR	Display of communication exchange abnormality detection	Error detecting	Normal (no error)
TEST	Display during execution of self-diagnosis	Self-diagnosis executing	Self-diagnosis complete
TEST.EER	Self-diagnosis results display	Abnormal	Normal

(2) Operation mode setting switch setting Set the QE71 operation mode. (Usually set to on-line)

Operation mode setting switch	Setting number	Setting designation	Setting contents
	0	On-line	Execute communication exchange with another node by regular operation mode.
	1	Off-line	Parallel off this module from network.
	2	Test 1	Execute self diagnosis from self back to back test.
	3	Test 2	Execute RAM test.
	4	Test 3	Execute ROM test.
	5	Test 4	Conduct an EEPROM test.
	6 to F	Use is impossible	

(This is set at "0 (on-line)" at the time of shipping from factory)

(3) Communications exchange condition setting switch setting
Set the conditions for data communication with other nodes.

Communications exchange condition setting switch	Switch	Setting designation	Setting contents		
<p>OFF ON</p> <p>SW1 <input type="checkbox"/></p> <p>SW2 <input type="checkbox"/></p> <p>SW3 <input type="checkbox"/></p> <p>SW4 <input type="checkbox"/></p> <p>SW5 <input type="checkbox"/></p> <p>SW6 <input type="checkbox"/></p> <p>SW7 <input type="checkbox"/></p> <p>SW8 <input type="checkbox"/></p>	SW1	TCP time out error temporary circuit process selection	Selection of circuit processing when a TCP time out error occurrence (Usually set to OFF.)		
			OFF	Close the circuit.	
	SW2	Data code selection	Select a classification of data codes of communication exchange data of another node.		
			OFF	Communication exchange by binary code.	
	SW3	Automatic startup mode selection	Select the QE71 startup method		
			OFF	Operated in accordance with Y19 (initial processing request signal).	
	SW4 to SW6	-	-	ON	Reads the parameters in the EEPROM to the buffer memory regardless of the Y19 after the power is turned on or reset. These contents are used to conduct initial processing.
				Use is impossible	
	SW7	CPU communications exchange timing setting	During the RUN of PLC CPU, select approval/prohibition of the data reading from another node.		
			OFF	Writing prohibited.	
	SW8	Initial timing setting	Select the timing which starts initial processing. (Usually set to OFF.)		
			OFF	Quick start (start without delay)---Set when entirely constructed in a single network.	
ON			Normal start (start after a 20 second delay)---Set when entirely constructed in multiple networks.		

(This is set at "OFF" at the time of shipping from factory)

5 Connection to a Network

The following is an explanation of the connection method of the QE71 to the 10BASE5 or the 10BASE2.

Point
Installation procedures of the 10BASE5 and 10BASE2 require sufficient safety measures. For the execution of such operations as terminal processing of connection cable, trunk line cable etc., please consult with a trained professional.

5.1 Connection to 10BASE2

The following is an explanation of the method of connecting the QE71 to the 10BASE2 network.

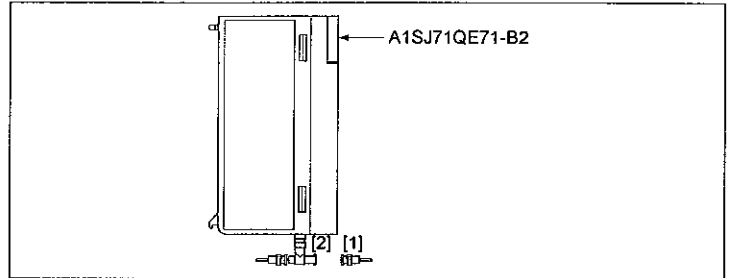


Diagram 5.1 Connection diagram of the coaxial cable for 10BASE2

Method of connecting the coaxial cable for 10BASE2

- 1) Line up the ratchet [2] with the groove [1] in diagram 5.1 while pushing it in
- 2) While pushing in the connector, turn it 1/4 turn to the right
- 3) Turn the connector until it locks
- 4) Verify that the connector has locked

4 Loading and Installation

The following is explanations of the handling precautions and installation environment which is common to modules when handling QE71 from unpacking to installation. For the details of loading and installation of the module, refer to User's Manual of CPU module to be used.

4.1 Handling precautions

The following is an explanation of handling precautions of the module

- (1) Because the case of the module is made of resin, be careful not to drop it or expose it to strong impact
- (2) Execute tightening of the module's installation screws within the range indicated below

Screw position	Tightening torque range
Electrical supply cord connection terminal screw (M4 screw)	40 N cm
Module fixing screw (M4 screw)	78 to 118 N cm

4.2 Installation environment

Do not install the QnAS series PLC in the following environments

- (1) Where the ambient temperature exceeds the 0 to 55°C range
- (2) Where the ambient humidity exceeds the 10 to 90% RH range
- (3) Where condensation is produced by sudden temperature changes
- (4) Where corrosive or combustible gas is present
- (5) Where dust, iron powder and other conductive powder, oil mist, salt, or organic solvents are prevalent
- (6) In direct sunlight
- (7) Where a strong electric or magnetic field is generated
- (8) Where vibration and shock may be transmitted directly to the module

5.2 Connection to 10BASE5

The following is an explanation of the method of connecting QE71 to the 10BASE5 network.

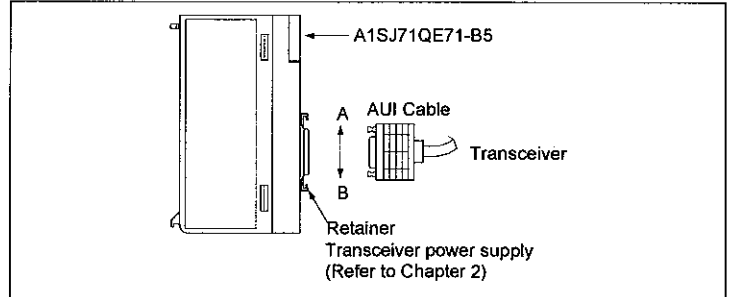


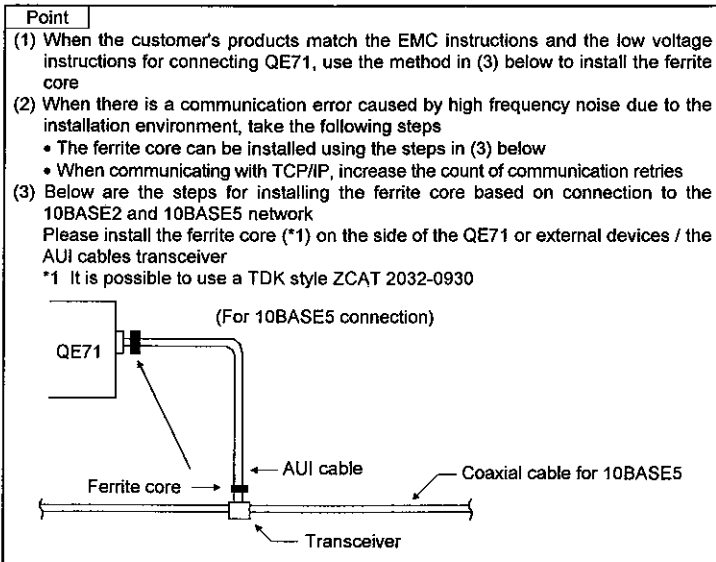
Diagram 5.2 AUI Cable connection diagram

Method of connecting the AUI cable (transceiver cable)*1

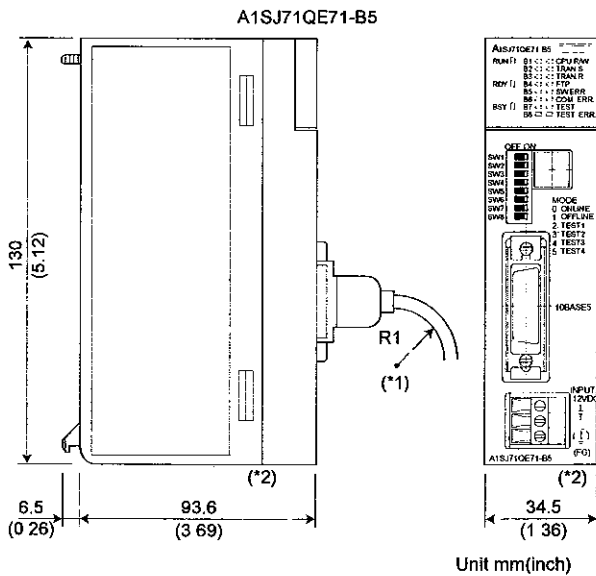
- 1) Slide the retainer in the B direction of diagram 5.2
- 2) Plug in the AUI cable side connector as far as it will go
- 3) Slide the retainer in the A direction of diagram 5.2
- 4) Verify that the AUI cable is locked
- 5) Input the power supply to the transceiver *2

*1 Execute AUI cable connection when the power supply of the module installation station is turned off

*2 For the transceiver, generally use that which has the function called SQETEST or heartbeat (as a function of the transceiver a signal for confirming that the transceiver is functioning normally after sending a communication)

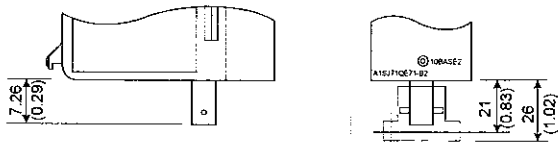


6 External Dimensions



*1 When connecting the AUI cable, make the bend radius (R1 Scale value) in the vicinity of the connector to (cable outside diameter × 4)

*2 The external dimension diagram of the A1S/J71QE71-B2 to interface unit



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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