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MITSUBISHI

Ethernet Interface Module

User's Manual
(Hardware)

AJ71E71-S3

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

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

MODEL	AE71S3-U-H/W-E
MODEL CODE	13J854
IB (NA)-66687-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"

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

- Insert the tabs at the bottom of the module into the mounting holes in the base unit If the module is not properly installed, it may result in malfunctions, breakdowns, or the module may fall off
- 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, alllowing 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	Products of SH-3598-C or later (13J856)

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)

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1 Overview

This manual describes how to install AJ71E71-S3 Ethernet Interface Module (hereafter abbreviated as E71) and how to wire them with external devices
After unpacking E71, please confirm that the following products are contained.

Model name	Product name	No. of items
AJ71E71-S3	AJ71E71-S3 Ethernet Interface Module	1
(*1)	BNC T-type adapter (UG-274/U)	1

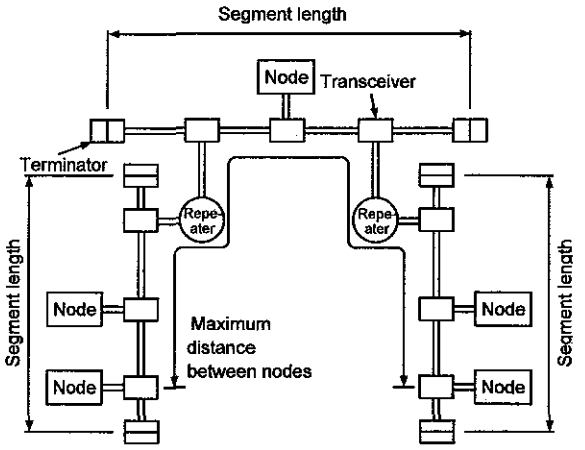
*1 Products of hardware version C or later

Point

Even though hardware specifications for the switches, 10BASE2 connector and other areas of AJ71E71-S3 have been changed in hardware version C or later, the functional and performance specifications in those areas are the same as the conventional products The user can use the product just in the same manner as the conventional one.

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

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



2. Performance Specifications

Performance Specifications of E71 are described below
For general specification, refer to User's Manual of CPU module to be used.

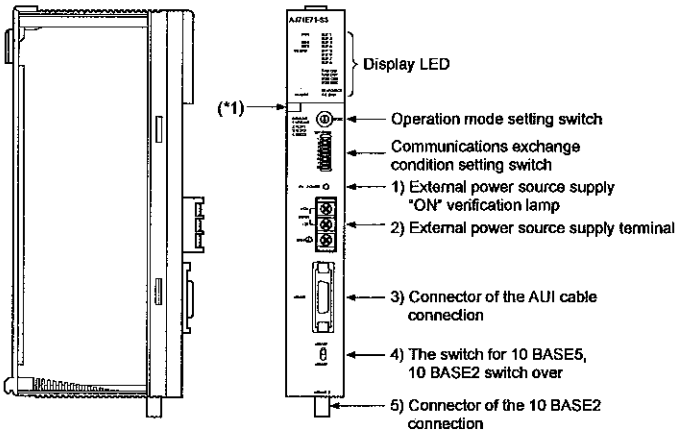
Topic		Specifications	
		10BASE2 (Cheapernet)	10BASE5 (Ethernet)
Transmission specifications	Data transmission speed	10 Mbps	
	Transmission method	Base band	
	Maximum distance between nodes	925 m (3034 77 ft)	2500 m (8202 10 ft)
	Maximum segment length	185 m (606 96 ft)	500 m (1640 42 ft)
	Maximum number 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 × 8	
		Random access buffer . 3 k word × 2	
Number of external nodes that can be communicated with a single initial processing		Max 20 stations (*1)	
Number of input output power points		32 points (*2)	
5 V DC internal consumption current [A]		0 48 (When using 10BASE2) 0.26 (When using 10BASE5)	
12 V DC external power supply capacity		-	(*3)
External dimensions [mm (inch)]		250(9.84) × 37.5(1.48) × 119(4.69)	
Mass [kg]		0.52	

*1 Number of nodes that can be communicated
- When using E71 of which software version is "K" or before
  Maximum number of external nodes that can be communicated with a single initial processing of E71 is 20 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
- When using E71 of which software version is "L" or later
  There are no special restrictions

*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 E71 (Maximum 0 8 V)

3 Settings and Names of Each Part



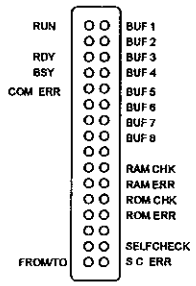
No	Designation	Contents
1)	External power source supply "ON" verification lamp	Lamp for verifying if power is being supplied to the transceiver when used as 10BASE5 * When connecting with 10BASE2, verification is unnecessary.
2)	External power source supply terminal	Power source terminals for power source supply to the transceiver in the connection of 10BASE5 (14 08V to 15 75V) * When connecting with 10BASE2, this connection is unnecessary.
3)	Connector of the AUI cable connection	Connector for the connection of AUI cable (transceiver cable) for 10BASE5 to E71.
4)	The switch for 10BASE5 10BASE2 switch over	Switch for interface switch over of 10BASE5 and 10BASE2 At the time of shipping from the factory it is set to the 10BASE5 side.
5)	Connector of the 10BASE2 connection	Connector for the connection of coaxial cable for 10BASE2 to E71

*1 The seal shows the hardware version and software version of a module

(Example) A B
- B: It shows that the software version is B
- A: It shows that the hardware version is A

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(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	
BSY	Display during execution of communication exchange processing	Executing	Not executing
COM ERR	Display of communication exchange abnormality detection	During detection of abnormality	Normal (no abnormalities)
FROM/TO	Display during data reading (FROM)/display during data writing (TO)	During the execution of reading/writing	Not reading/ writing
BUF1 to BUF8	Display of telecommunication line connection status of connection No n corresponding to BUFn.	Open completed	Closed status
RAM CHK	Display during execution of RAM test	During execution of test	Not testing
RAM ERR.	Display of RAM abnormality detection	RAM abnormality	Normal
ROM CHK	Display during execution of ROM test	During execution of test	Not testing
ROM ERR.	Display of ROM abnormality detection	ROM abnormality	Normal
SELFCHECK	Display during self back to back test	During execution of test	Not testing
S C ERR	Display of self back to back abnormality detection	Back to back abnormality	Normal

(2) Operation mode setting switch setting
Set the E71 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 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	
	1	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
			ON	Do not close the circuit.
	2	Data code selection	Select a classification of data codes of communication exchange data of another node.	
			OFF	Communication exchange by binary code.
			ON	Communication exchange by ASCII code.
	3 to 6	-	Use is impossible	
	7	CPU communications exchange timing setting	During the RUN of PLC CPU, select approval/ prohibition of the data reading from another node.	
			OFF	Writing prohibited
			ON	Writing approved.
	8	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)

4. Loading and Installation

The following is explanations of the handling precautions and installation environment which is common to modules when handling E71 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)	98 to 137 N cm
Module fixing screw (Normally unnecessary) (M4 screw)	78 to 118 N cm

4 2 Installation environment
Do not install the A 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 Connection to a Network

The following is an explanation of the connection method of the E71 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 E71 to the 10BASE2 network.

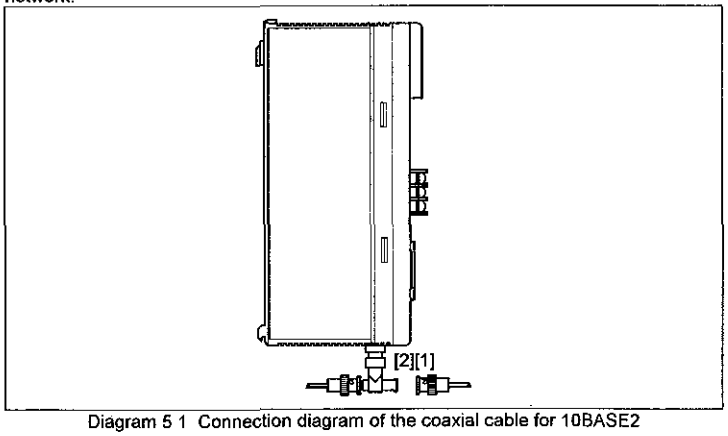


Diagram 5 1 Connection diagram of the coaxial cable for 10BASE2

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

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5 2 Connection to 10BASE5

The following is an explanation of the method of connecting E71 to the 10BASE5 network.

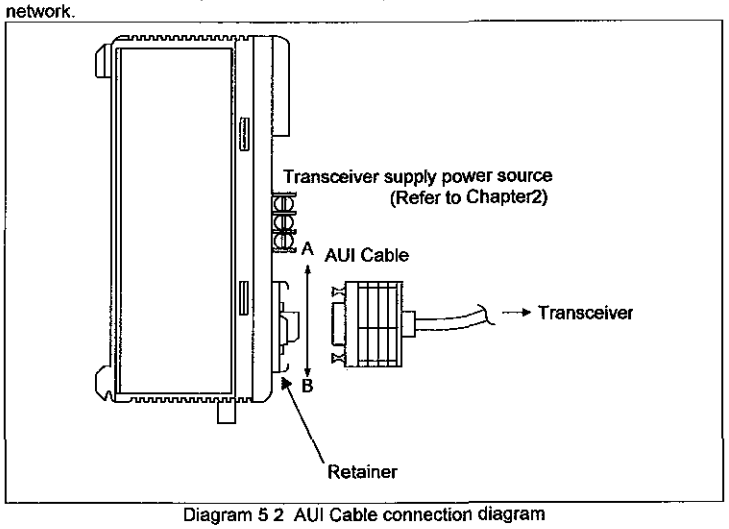


Diagram 5 2 AUI Cable connection diagram

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

(1) Slide the retainer in the A 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 B 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

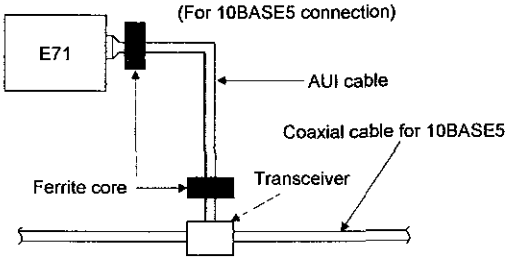
*2 For the transceiver, generally use that which has the function called SQETEST or heartbeat (as a function of the transceiver, a signal for confirming that the transceiver is functioning normally after sending a communication)

Point

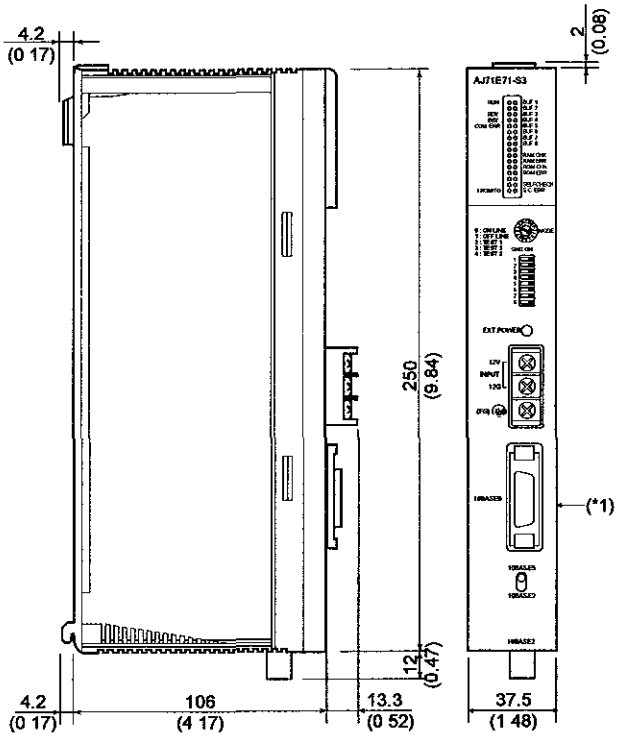
(1) When the customer's products match the EMC instructions and the low voltage instructions for connecting E71, use the method in (3) below to install the ferrite core

(2) When there is a communication error caused by high frequency noise due to the installation environment, take the following steps
- The ferrite core can be installed using the steps in (3) below
- When communicating with TCP/IP, increase the count of communication retries

(3) Below are the steps for installing the ferrite core based on connection to the 10BASE2 and 10BASE5 network
Please install the ferrite core (*1) on the side of the E71 or external devices / the AUI cables transceiver
*1 It is possible to use a TDK style ZCAT 2032-0930



6 External Dimensions



Unit mm(inch)

*1 Bending radius (a guide) around the connector should be more than (cable's external dimension × 4), when connecting cables

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⚠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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