

MITSUBISHI

PROGRAMMABLE CONTROLLER

MELSEC-A

Mitsubishi General Use PC User's Manual

AJ71E71-S3 Ethernet Interface Module (Hardware)

Thank you for buying the Mitsubishi General Use PC MELSEC-A Series.
Before use, please read this manual carefully and correctly operate the
module with a sufficient understanding of the A series PC functions and
performance.

Please place this manual in a location where it is available to end users.

MODEL	AE71S3-U-H/W-E
MODEL CODE	13J854



IB (NA) 66687-B (9809) MEE

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● SAFETY PRECAUTIONS ●

(Read these precautions before using.)

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 Mitsubishi equipment. Refer to the CPU module user's manual for a description of the PC 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]

DANGER

- When controlling (changing data, program or operation status (status control) in particular) a PC while it is running via a device such as a personal computer connected to the special function module, configure an interlock circuit in the sequence program so that the safety of the overall system is always maintained.

Especially, when performing the above control for a remote PC from an external device, troubles occurring on the PC side due to data communication error may not be handled immediately. Determine error handling methods between the external device and the PC CPU for when data communication errors occur, in addition to configuring an interlock circuit in the sequence program.

[DESIGN PRECAUTIONS]

CAUTION

- When laying AUI cable (transceiver cable)/coaxial 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 PC in the environment given in the general specifications section of this manual. Using the PC outside the range of the general specifications may result in electric shock, fire, or erroneous operation or may damage or degrade the product.
- Make sure to switch all phases of the external power supply off when installing or placing wiring.
If you do not switch off the external power supply, it will cause electric shock or damage to the product.
- Make sure to switch all phases of the external power supply off before mounting the module.
If you do not switch off the external power supply, it will cause electric shock or damage to the product.
- Insert the tabs at the bottom of the module into the holes in the base unit before installing the module. (The Q2AS series module shall be fastened by screws in the base unit at the specified torque.) Improper installation may cause erroneous operation, accidents, or the module to fall out.
- 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.
- Do not touch the electronic parts or the unit conducting area.
It may cause erroneous operation or failure.
- Perform correct pressure-displacement, crimp-contact or soldering for wire connections using the tools specified by the manufactures. Attach connectors to the module securely.

[WIRING PRECAUTIONS]

CAUTION

- Do not connect the AUI cable when the module installation station's power is turned on.
- Make sure to secure communication cable and power supply cable connected to the module is stored in the conduct or fixed with cramps. Failure to do so may cause a malfunction or damage to the module or cables due to dangling or inadvertent handling of cables.
- 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.
Pulling the cable that is still connected to the module may cause a malfunction or damage to the module or cable.
- 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.

[STARTING AND MAINTENANCE PRECAUTIONS]

DANGER

- Do not touch live terminals.
It may cause erroneous operation.
- Make sure to switch all phases of the external power supply off before cleaning or retightening terminal screw.
If you do not switch off the external power supply, it will cause a damage to a module or malfunction.
If the screws are loose, it may result in fallout, short circuits or malfunction.
Tightening screws too far may cause damages to the screws and/or the module, resulting in fallout, short circuits or malfunction.

[STARTING AND MAINTENANCE PRECAUTIONS]

CAUTION

- Do not disassemble or rebuild the module.
It may cause accidents, erroneous operation, injury, or fire.
- Turn off the power before mounting and dismounting the module.
Mounting or dismounting the module while the power is on may damage the module or cause erroneous operation.

[PRECAUTIONS WHILE OPERATING]

DANGER

- Do not write data in the "system area" in the buffer memory of the special function module.
Also, of the output signals directed to the special function module from the PC CPU, do not output (switch on) the signals that are "use-prohibited."
If data is written to the "system area" or output is performed with respect to a "use-prohibited" signal, it may result in the malfunctioning of the PC system.

CAUTION

- When controlling (changing data, program or operation status (status control) in particular) a PC while it is running via a device such as a personal computer connected to the special function module, read the manual carefully and conform if the overall safety is maintained.
Failure to perform correct operations to change data, program, or the status may result in system malfunction, machine damage or an accident.
- When performing remote RUN/STOP for the PC CPU on the station loading this module (or the present station), it is recommended to read the manual thoroughly and use the function stated as "data communication when PC CPU is stopped."
If remote RUN/STOP is performed without using the "data communication when PC CPU is stopped" function, the communication line will be disconnected (by the close processing), since the output signal to this module from the PC CPU turns off. Therefore, all data communication will be disabled thereafter, including the remote RUN/STOP control of the PC CPU from other nodes.

[DISPOSAL PRECAUTIONS]

 CAUTION
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- | |
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| <ul style="list-style-type: none">• When disposing of this product, handle it as industrial waste. |
|--|

Related Manuals

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

Related Manual

Manual Name	Manual No. (Model code)
Ethernet Interface Module User's Manual	Products of SH-3598-C or later (13J856)

Please read Ethernet Interface Module User's Manual (Details) before using this module.

Correspondence to EMC DIRECTIVE

To make the PCs compliant with the EMC directive, refer to Chapter 2 "EMC AND LOW-VOLTAGE DIRECTIVE" in the PC user's manual (Hardware).

- * When the PC CPU user's manual (Hardware) does not include Chapter 2 "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 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 Module	1
(*1)	BCN T-type adapter (UG-274/u)	1

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.

2. Performance Specifications

Performance Specifications of E71 are described below.

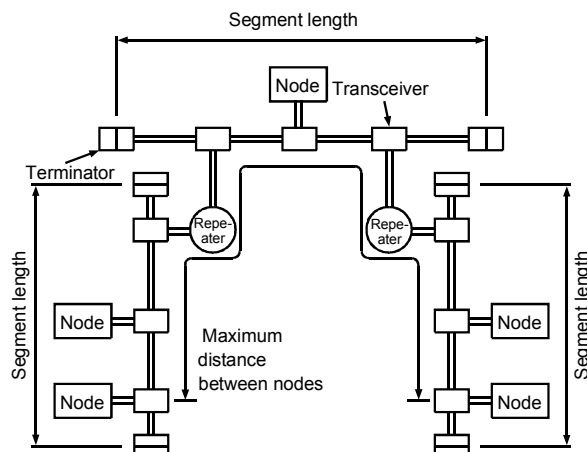
For general specification, refer to User's Manual of CPU module to be used.

Topic		Specifications	
		10BASE2 (Cheaper-net)	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 * More external nodes can be connected by repeating the initial processing.	
Number of input output power points		32 points	
5 V DC internal consumption current [A]		0.48 (When using 10BASE2) 0.26 (When using 10BASE5)	
12 V DC external power supply capacity		That which satisfies the specifications of the transceiver and the AUI cable, considering the voltage drop of the module (Maximum 0.8 V)	
External dimensions [mm (inch)]		250 (9.84) × 37.5 (1.48) × 119 (4.69)	
Mass [kg (lb)]		0.52 (1.144)	

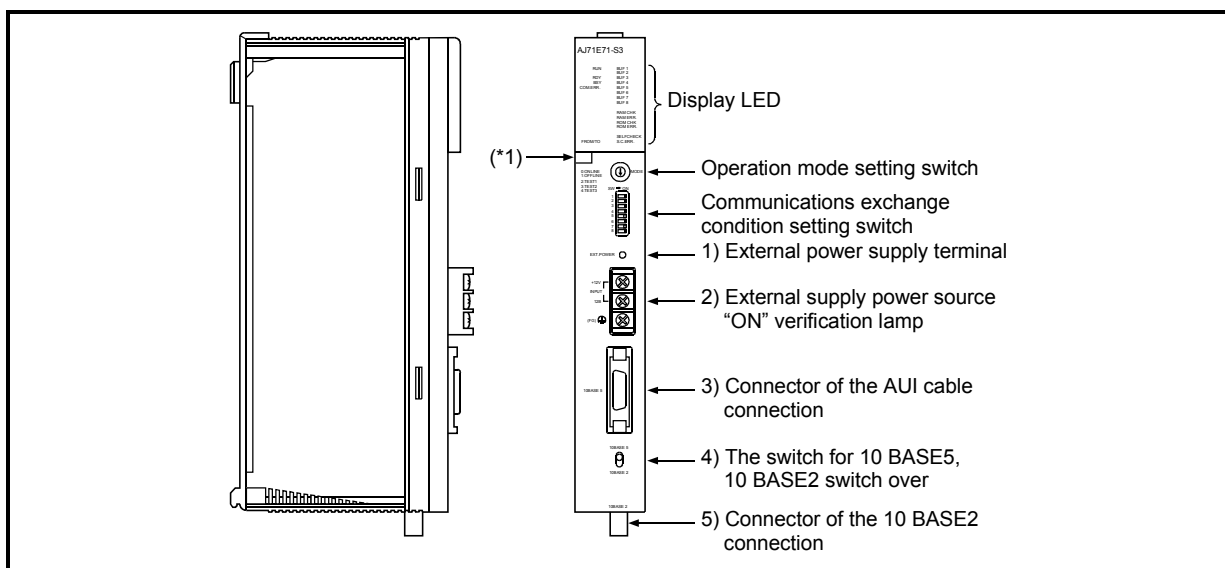
For general specification, refer to User's Manual of PC CPU to be used.

Notes

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

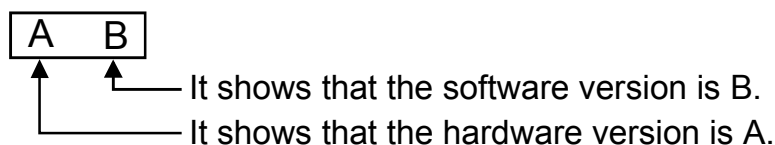


3. Settings and Names of Each Part



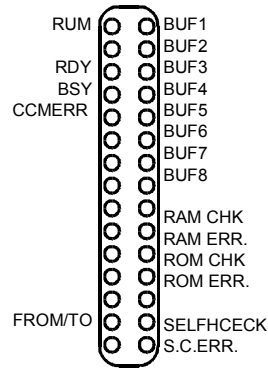
*1 The seal shows the hardware version and software version of a module.

(Example)



No.	Designation	Contents
1)	External power source supply terminal	Power source terminals for power source supply to the transceiver in the connection of 10BASE5. * When connecting with 10BASE2, this connection is unnecessary.
2)	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.
3)	Connector of the AUI cable connection	Connector for the connection of AUI cable (transceiver cable) for 10BASE2 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.

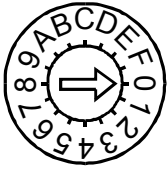
(1) Display LED display contents



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
SELF CHECK	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.	
			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. (Set to off)	
	7	CPU communications exchange timing setting	During the RUN of PC 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.	
			OFF	Quick start (start without delay)--when entirely constructed in a single network.
ON			Normal start (start after a 20 second delay)--when entirely constructed in multiple networks.	

This is set at "0 (on-line)" 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 PC 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 E71 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 (10 to 14 kg · cm) (8.7 to 12.1 lb. · inch)
Module fixing screw (Normally unnecessary) (M4 screw)	78 to 118 N·cm {8 to 12 kg · cm} (6.9 to 10.4 lb. · inch)

4.2 Installation environment

Do not install the Q2AS series PC 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 99% 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.

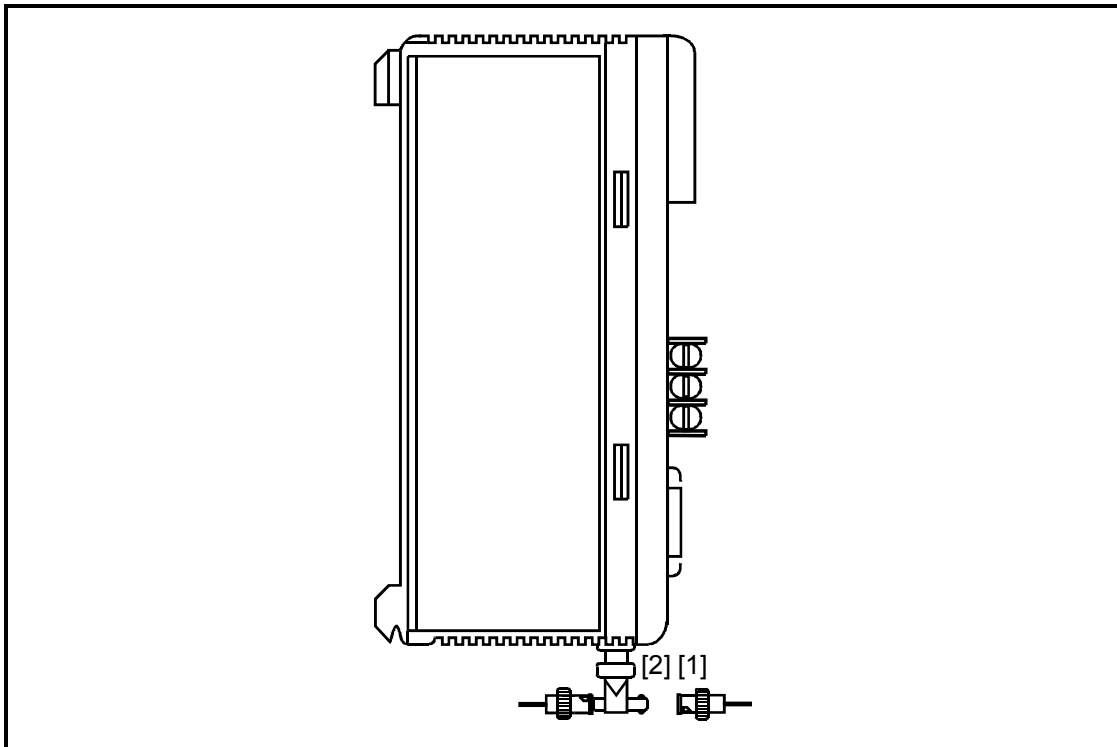


Diagram 5.1 Connection diagram of the coaxial cable for 10BASE2

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.

5.2 Connection to 10BASE5

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

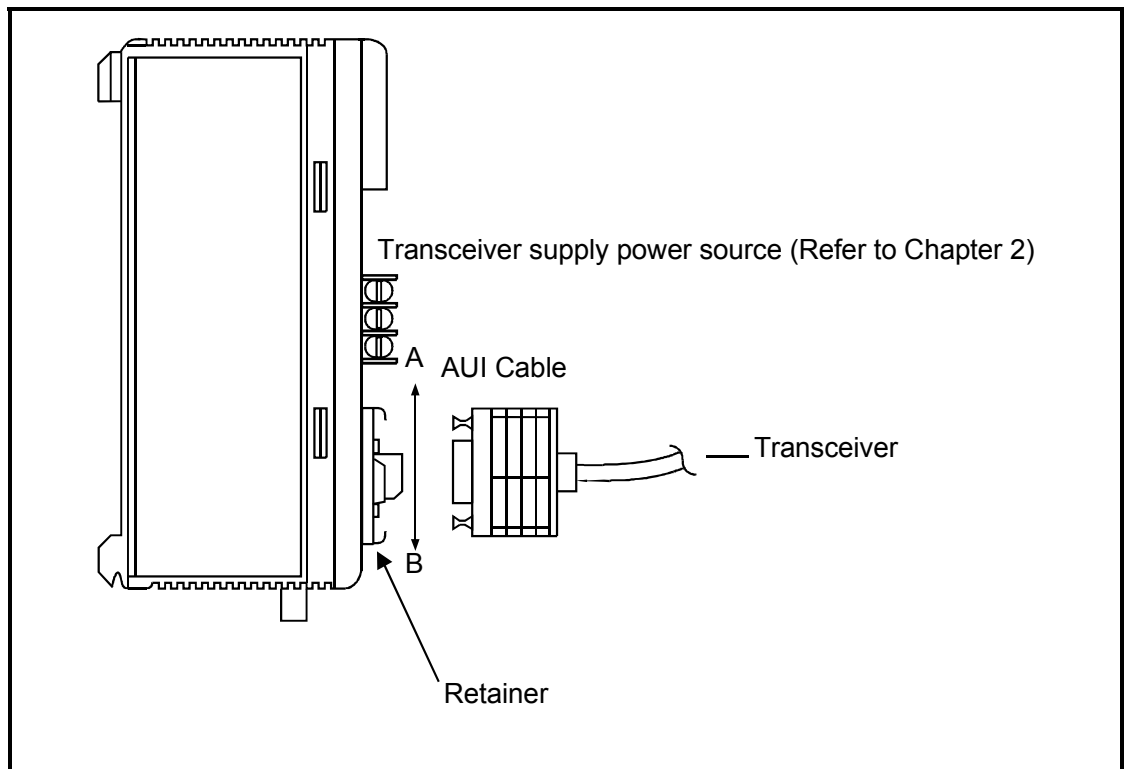


Diagram 5.2 AUI Cable connection diagram

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

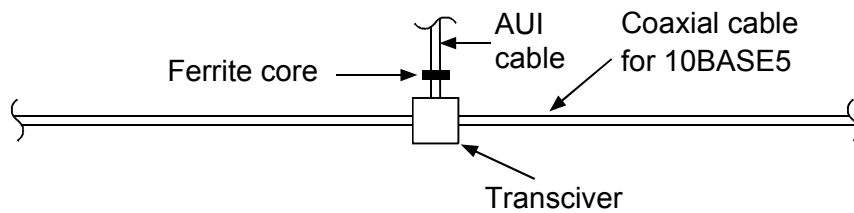
*1 Execute AUI cable connection when the power supply of the module installation station is turned off.

*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)

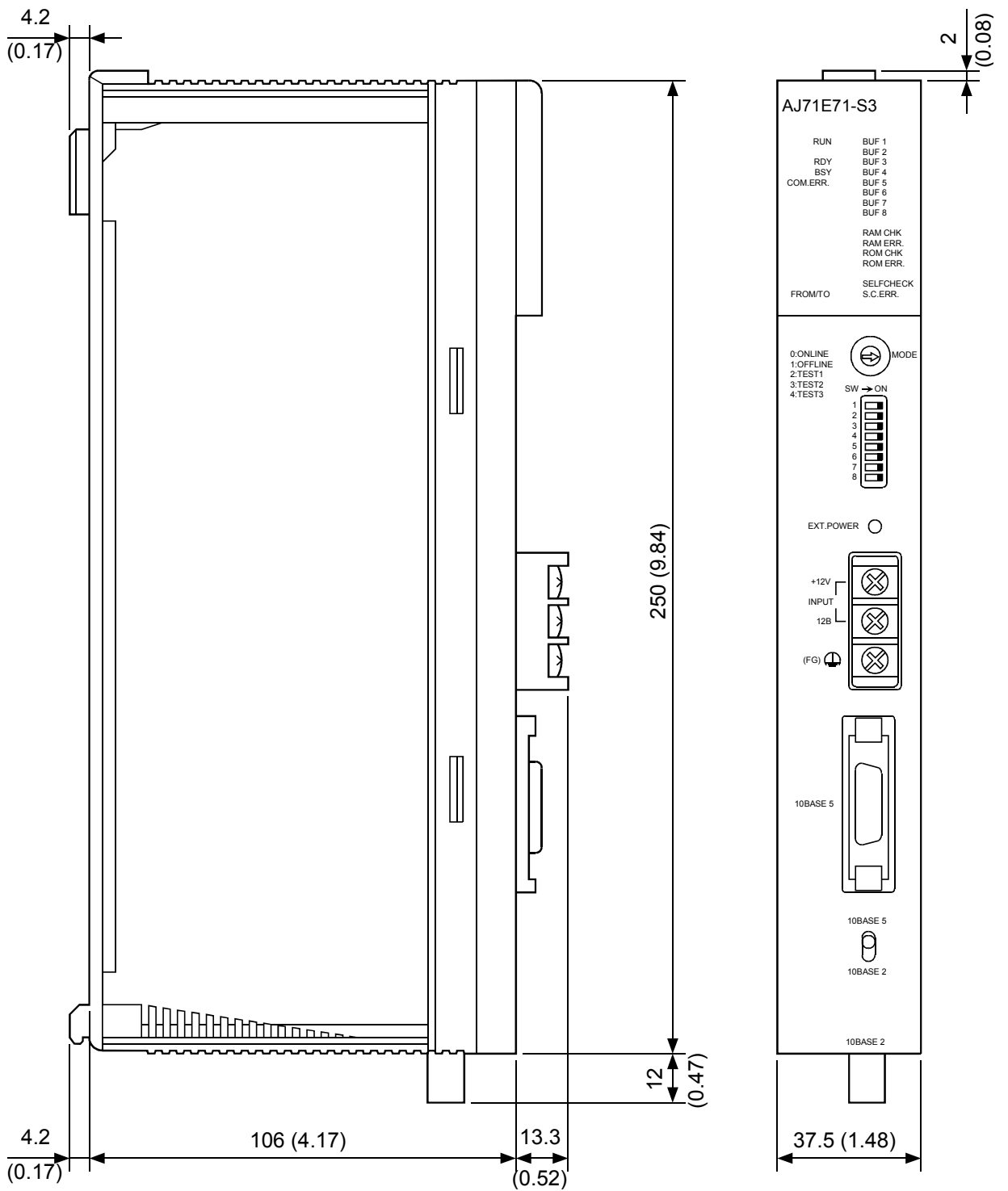
Point

When connection to the network is made using the 10BASE5, if countermeasures against high-frequency and noise generated in the installation environment of E71 is necessary, attach a ferrite core *3 to the transceiver side of the AUI cable to eliminate these effects.

*3 ZCAT 2032-0930 manufactured by TDK can be used.



6. External Dimensions



mm (inch)