

# MITSUBISHI

PROGRAMMABLE CONTROLLER

# MELSEC-A

User's Manual

## Ethernet Interface Module type A1SJ71E71-B2/A1SJ71E71-B5 (Hardware)

### SAFETY CAUTION

To ensure correct use of this equipment, you must read the safety precautions in the CPU module user's manual before using it

### INTRODUCTION

Thank you for choosing the Mitsubishi MELSEC-A 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.



IB (NA) 66546-A

## 1. GENERAL DESCRIPTION

### 1 GENERAL DESCRIPTION

This manual gives the specifications and names of parts of the A1SJ71E71-B2/B5 Ethernet Interface Module (hereafter called the A1SJ71E71-B2/B5) which is used to connect a MELSEC-A series programmable controller to a computer using the Ethernet TCP/IP method

(1) Applicable CPUs and Maximum Number of A1SJ71E71-B2/B5s

CPU Module	Maximum Number of Modules	Note
A1SCPU C24	1	When the following modules are used with the AJ71E71 B2/B5, they must be included in the total number of modules
A1SCPU (S1) A1SJCPU A2SCPU (S1)	2	<ul style="list-style-type: none"> <li>A1SJ71C24-R2/R4/PRF A1SD51S</li> <li>AD51(S3), AD51H(S3), AJ71C21(S1) (in the BASIC program mode), AJ71C22(S1)/C23/C24(S3/S6/S8), AJ71UC24 AJ71P41 AJ71E71</li> </ul>
A2ASCPU (S1)	6	

(2) Applicable Base Units

The A1SJ71E71-B2/B5 can be loaded in any slot of a main base unit or extension base unit

(3) On unpacking the A1SJ71E71-B2/B5, make sure that the following items have been supplied.

Model	Name of Item	Quantity
A1SJ71E71-B2	A1SJ71E71 B2 Cheapernet Interface Module	1
	T-shaped BNC connector UG-274/U	1
A1SJ71E71-B5	A1SJ71E71-B5 Ethernet Interface Module	1

(4) Related Manuals

For the pre-operation settings and procedure, detailed explanations of each function, and troubleshooting, refer to the following manuals

A1SJ71E71-B2/A1SJ71E71-B5 Ethernet Interface Module User's Manual (IB-66547)

## 2. PERFORMANCE SPECIFICATIONS

### 2 Performance Specifications

Item	Specifications	
	A1SJ71E71-B2 10BASE2 (Cheapernet)	A1SJ71E71 B5 10BASE5 (Ethernet)
Transmission specifications	Data transmission speed	10 Mbps
	Transmission method	Base band
	Max network distance	925 m
	Max segment length	185 m
	Max number of nodes	30/segment
Communication data storage memory	Fixed buffer	2 kbytes x 8
	Random access buffer	12 kbytes x 1
Number of I/O points	32 points	
5 VDC internal current consumption [A]	0.52	0.35
12 VDC external power supply capacity	Must satisfy the transceiver and transceiver cable specifications, taking the voltage drop in the module (max 0.8 V) into account	
Outside dimensions mm (inch)	130(5.07)[H] x 34.5(1.36)[W] x 93.6(3.69)[D]	
Weight kg (lb)	0.30(0.66) *1	0.27(0.6)

\*1 This includes the weight of the T-adaptor (20g) and the terminal resistor (10g)

For the general specifications, refer to the User's Manual for the PC CPU you are using

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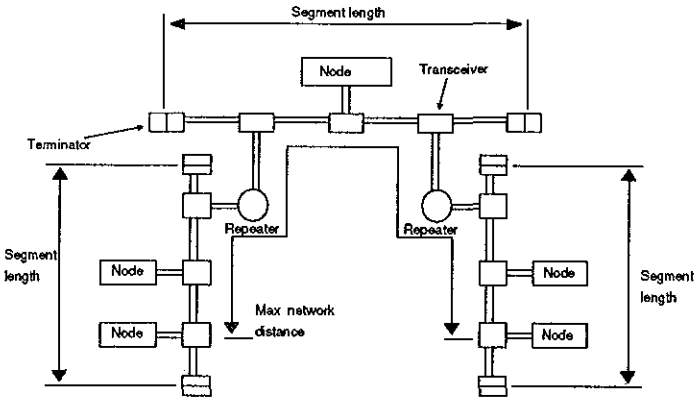
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Specifications subject to change without notice

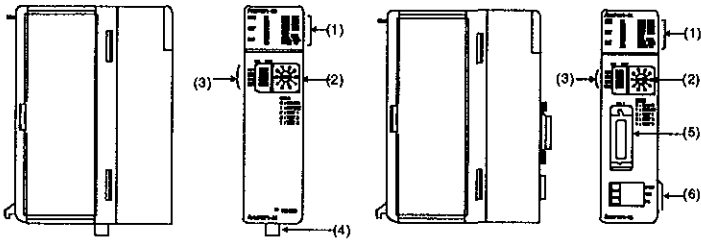
**REMARK**

The maximum node interval and segment length are illustrated below



**3. NOMENCLATURE**

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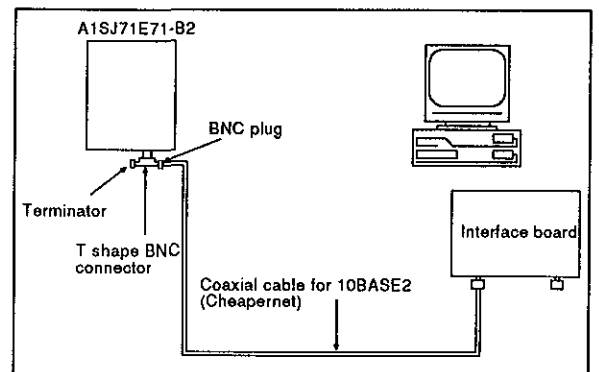
No	Name	Description																					
(1)	LED	RUN Normal run indication																					
		RDY "Ready for communication" indication																					
		BSY "Communication processing in progress" indication																					
		B1 Connection No 1 connection status																					
		B2 Connection No 2 connection status																					
		B3 Connection No 3 connection status																					
		B4 Connection No 4 connection status																					
		B5 Connection No 5 connection status																					
		B6 Connection No 6 connection status																					
		B7 Connection No 7 connection status																					
		B8 Connection No 8 connection status																					
		RAM CHK "RAM test in progress" indication																					
		RAM ERR "RAM error detected" indication																					
		ROM CHK "ROM test in progress" indication																					
		ROM ERR "ROM error detected" indication																					
		S C "Self loopback test in progress" indication																					
		S C ERR "Self loopback error detected" indication																					
		COM ERR "Communication error detected" indication																					
FROM/TO "Data being read/written" indication																							
(2)	Mode Setting Switch	Used to select the operating mode from among "online", "offline" or "self diagnostic test" Normally, leave the setting at "online" The factory setting is "0" (online)																					
		<table border="1"> <thead> <tr> <th>Setting number</th> <th>Setting name</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Online</td> <td>Communication with other nodes is executed in the RUN mode</td> </tr> <tr> <td>1</td> <td>Offline</td> <td>The module is disconnected from the network</td> </tr> <tr> <td>2</td> <td>Test 1</td> <td>Self diagnostic test executed by using the self loopback test</td> </tr> <tr> <td>3</td> <td>Test 2</td> <td>RAM test executed</td> </tr> <tr> <td>4</td> <td>Test 3</td> <td>ROM test executed</td> </tr> <tr> <td>5 to 9</td> <td>Unusable</td> <td></td> </tr> </tbody> </table>	Setting number	Setting name	Meaning	0	Online	Communication with other nodes is executed in the RUN mode	1	Offline	The module is disconnected from the network	2	Test 1	Self diagnostic test executed by using the self loopback test	3	Test 2	RAM test executed	4	Test 3	ROM test executed	5 to 9	Unusable	
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(3)	Communication condition setting switches	Used to select the start condition, communication processing condition, code type during communication, and presence/absence of TCP time out error processing The factory setting is SW1 to SW4 all "OFF"																			
		<table border="1"> <thead> <tr> <th>Switch</th> <th>Set Item</th> <th>Meaning of Settings</th> </tr> </thead> <tbody> <tr> <td rowspan="2">SW1</td> <td rowspan="2">Selection of line processing when TCP time out error occurs</td> <td>OFF The line is closed on occurrence of a TCP time out error</td> </tr> <tr> <td>ON The line does not close on occurrence of a time out error</td> </tr> <tr> <td rowspan="2">SW2</td> <td rowspan="2">Data code selection</td> <td>OFF Communication executed in binary code</td> </tr> <tr> <td>ON Communication executed in ASCII code</td> </tr> <tr> <td rowspan="2">SW3</td> <td rowspan="2">CPU communication timing setting</td> <td>OFF Writing from other nodes is disabled while the PC CPU is in the RUN mode</td> </tr> <tr> <td>ON Writing from other nodes is possible even while the PC CPU is in the RUN mode</td> </tr> <tr> <td rowspan="2">SW4</td> <td rowspan="2">Initial timing setting</td> <td>OFF Quick start (start with no delay time) Make this setting when the system comprises a single network</td> </tr> <tr> <td>ON Normal start (start after 20 seconds delay time) Make this setting when the system comprises multiple networks</td> </tr> </tbody> </table>	Switch	Set Item	Meaning of Settings	SW1	Selection of line processing when TCP time out error occurs	OFF The line is closed on occurrence of a TCP time out error	ON The line does not close on occurrence of a time out error	SW2	Data code selection	OFF Communication executed in binary code	ON Communication executed in ASCII code	SW3	CPU communication timing setting	OFF Writing from other nodes is disabled while the PC CPU is in the RUN mode	ON Writing from other nodes is possible even while the PC CPU is in the RUN mode	SW4	Initial timing setting	OFF Quick start (start with no delay time) Make this setting when the system comprises a single network	ON Normal start (start after 20 seconds delay time) Make this setting when the system comprises multiple networks
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(4)	10BASE2 (Cheapernet) connector	Connector for connecting an A1SJ71E71 B2 to a 10BASE2 (Cheapernet)																			
(5)	AUI (transceiver cable) connector	Connector for connecting an A1SJ71 B5 to an AUI (transceiver cable)																			
(6)	External power supply terminal	Power supply terminal used to supply power to a transceiver with the A1SJ71E71-B5 Length of bared wire: 13 mm Applicable wire size: 0.5 to 2 mm <sup>2</sup>																			

**4. EQUIPMENT REQUIRED TO CONFIGURE A NETWORK**

**4 EQUIPMENT REQUIRED TO CONFIGURE A NETWORK**

- (1) When using an A1SJ71E71-B2 (Cheapernet) the equipment required is that shown in the figure below This equipment must be procured by the user
  - (a) 10BASE2 (Cheapernet) coaxial cable RG-58/U
  - (b) BNC plug (for connection to a T-shape BNC connector) UG-88/U or equivalent
  - (c) Terminator Plug type terminator BNC type or equivalent



Example Network System Configuration

- (2) When using an A1SJ71E71-B5 (Ethernet), the equipment required is that shown in the figure below. This equipment must be procured by the user.

- (a) Use a coaxial cable for 10BASE5 (Ethernet), and N-connectors, N-terminators, transceivers, and transceiver cables, that satisfy IEEE802.3 10BASE5 standards. Generally, use a transceiver that has a signal designated "SQTEST" or the "heart beat signal" (this signal executes a transceiver function which checks whether the transceiver operates normally after data is sent).

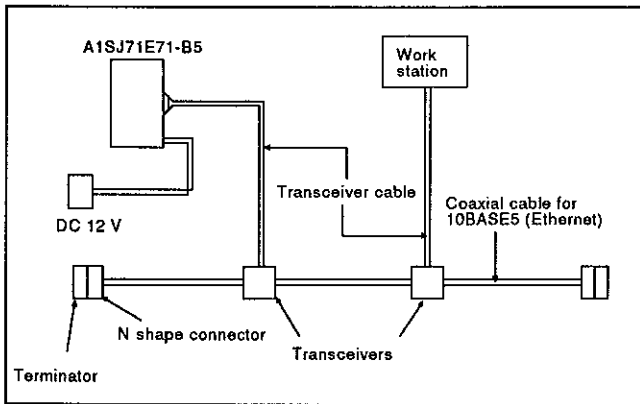
- (b) Use a 12 VDC power supply to the transceiver that satisfies the specifications of the transceiver and transceiver cable, taking into account the voltage drop (max. 0.8 V) in the A1SJ71E71-B5.

**REMARK**

The IEEE802.3 standard includes the following stipulations:

- Transceiver input terminal voltage: 12V <sup>-6%</sup> to 15V <sup>+15%</sup>
- Transceiver cable DC resistance: 40 Ω/km max., length: 50 m
- Transceiver max. current consumption: 500 mA or less

Accordingly, when the voltage drop of 0.8 V in the A1SJ71E71-B5 is taken into account, the guide range for the transceiver power supply is 13.08 V to 15.75 V.



Example Network System Configuration

**POINTS**

- (1) Entrust 10BASE2 (Cheapernet) and 10BASE5 (Ethernet) installation work to a specialist contractor since adequate safety measures must be implemented. For the installation environment, refer to JISX5252.
- (2) When laying the transceiver cable, maintain a distance of at least 50 mm between it and power lines or circuits carrying large currents.

**5. HANDLING**

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**5.1 Cautions on Handling**

The following cautions must be observed when handling the A1SJ71E71-B2/B5:

- (1) The case of the A1SJ71E71-B2/B5 is made of resin; do not drop it or subject it to strong impact.
- (2) Do not remove the printed circuit board from the case. This could cause failure.
- (3) Make sure that no wire offcuts or other debris enters the top of the module during wiring. If anything does enter the module, remove it.
- (4) Tighten the module mounting and terminal screws as specified below.

Screw	Tightening Torque Range
Terminal screw for power supply connection (M4 screw)	40 N cm (4 kg cm) {3.5 lb inches}
Module mounting screw (normally not necessary) (M4 screw)	78.5 to 117.6 N cm (8 to 12 kg cm) {6.9 to 10.3 lb inches}

**6. SELF-DIAGNOSTIC TESTS**

**6 Self-DIAGNOSTIC TESTS**

**6.1 Self-Loopback Test**

The self-loopback test is a check whereby the node sends a test message to itself through the network line and determines if the sent message is received unchanged. The purpose is to check the hardware, including the communication circuit of the A1SJ71E71. This test takes about 5 seconds.

- (1) How to do a self-loopback test
  - (a) Connect the A1SJ71-B2/B5 to a 10BASE2 or 10BASE5 line.
  - (b) Set the mode setting rotary switch on the front of the A1SJ71E71-B2/B5 to "2".
  - (c) Reset the PC CPU, then start the self-loopback test. Make sure the S.C. LED comes ON.
- (2) Test results
  - (a) When the S.C. LED goes OFF, the self-loopback test is completed.
  - (b) Confirm the test result with the S.C. ERR LED.
 

Normal	The S.C. ERR LED is OFF
Faulty	The S.C. ERR LED is ON
  - (c) The following are the probable causes of faults:
    - A1SJ71E71-B2/B5 hardware fault
    - 10BASE2/10BASE5 line fault
    - Faulty 12 VDC external power supply (when testing 10BASE5)
- (3) Post-test operation

Set the operating mode setting rotary switch on the front of the AJ71E71 to the online mode or another test mode, then reset the PC CPU.

**POINT**

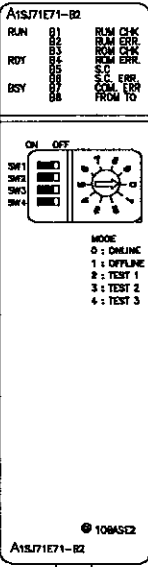
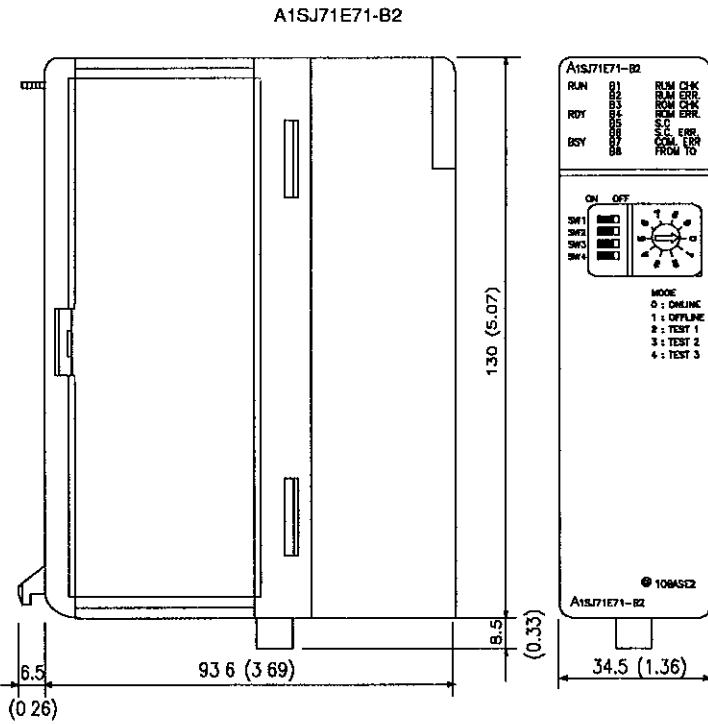
The hardware permits a self-loopback test to be executed while other nodes are online. However, if packets interfere with each other in the line, the test will take longer than 5 seconds due to collisions between packets. If this happens, stop data communication with the other nodes before executing the self-loopback test.

# 7. OUTSIDE DIMENSIONS

## REVISION

### 7. OUTSIDE DIMENSIONS

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Feb., 1995	



Unit mm(inch)

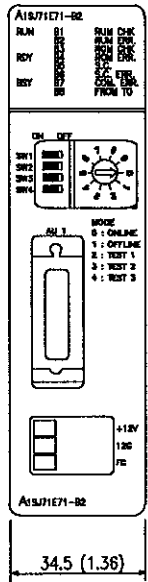
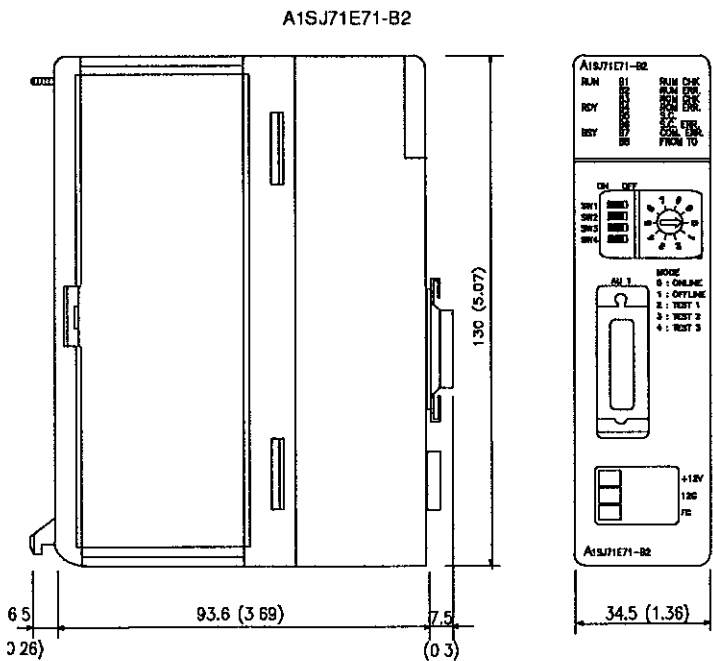
**IMPORTANT**

- (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.



Unit : mm(inch)