MITSUBISHI

PROGRAMMABLE CONTROLLER

MELSEC-A

User's Manual

MELSECNET/B data link module type A1SJ71AT21B (Hardware)

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.

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Specifications subject to change without notice

1. GENERAL DESCRIPTION

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(1) This manual describes the specifications, part names, and self-diagnostic tests of the A1SJ71AT21B.

An A1SJ71AT21B is used with an AnSCPU for the MELSECNET/B data link system.

(2) The followings give the application, applicable cable, and installation location of the A1SJ71AT21B:

- Application : As a master or local station
- Applicable cable : Twisted paired cable
- Module installation location : I/O slot of a main or extension base unit

(3) The following manual gives details about the MELSECNET/B data link system:

MELSECNET, MELSECNET/B data link system reference manual

(4) Be sure that the following items are included in the package.

Item	Quantity
A1SJ71AT21B data link module	1
Terminal resistance (110 Ω, 1/2 W)	1

Refer to the section 3.2 about connection for terminal registance.

2. SPECIFICATIONS

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2.1 General Specifications

Item	Specifications				
Operating ambient temperature	0 to 55°C (See the important notice described below)				
Storage ambient temperature	–20 to 75°C				
Operating ambient humidity	10 to 90% RH, non-condensing				
Storage ambient humidity	10 to 90% RH, non-condensing				
Vibration resistance	Conforms to *2JIS C 0911	Frequency	Acceleration	Amplitude	Sweep Count
		10 to 55 Hz	—	0 075 mm (0 003 inch)	*1 10 times (1 octave /minute)
		55 to 150 Hz	9 8 m/s^2 (1g)	—	
Shock resistance	Conforms to *2JIS C 0912 (98 m/s^2 (10g) x 3 times in 3 directions)				
Noise durability	By noise simulator of 1500 Vpp noise voltage, 1 μs noise width and 25 to 60 Hz noise frequency				
Dielectric withstand voltage	1500 VAC for 1 minute across AC external terminals and ground 500 VAC for 1 minute across DC external terminals and ground				
Insulation resistance	5 MΩ or greater by 500 VDC insulation resistance tester across AC external terminals and ground				
Grounding	Class 3 grounding, Ground to the panel if proper grounding is not available				
Operating ambience	Free of corrosive gases Dust should be minimal				
Cooling method	Self-cooling				

REMARKS

(1) One octave marked *1 indicates a change from the initial frequency to double or half frequency For example, any of the changes from 10 to 20 Hz, from 20 to 40 Hz, or 20 to 10 Hz are referred to as one octave.

(2) *2JIS· Japanese Industrial Standard

IMPORTANT

Restriction for UL Standard approved products

In order to be recognized as UL listed products, the following restrictions apply;

(1) Operating ambient temperature is limited from 0 to 50°C

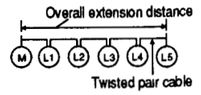
(2) A class 2 power supply recognized by the UL Standard must be used.

2.2 Performance Specifications

Item		Specifications
Model		A1SJ71AT21B
Max number of I/O points for the data link	Input (X) Output (Y)	Depends on the max number of I/O points of the utilized PC CPU
Max number of link devices allocated to per system	B	4096 (512 bytes)
	W	4096 (8192 bytes)
Max number of link points per station		$\frac{Y\,(points)+B\,(points)}{8}+2\times W\,(points)\leq 1024$ bytes
Current consumption (5 VDC)		0 66 A
Weight		0 22 kg
Allowable momentary power failure time		20 msec
Communication speeds		125K bps/250K bps/500K bps/1 M bps
Communication method		Half duplex bit serial method
Synchronous method		Frame synchronous method
Transmission path method		Bus type
Overall extension distance		Varies according to the communication speed
Number of connected stations		Max 32 units (1 master station, 31 local stations)
Modulation method		NRZI method
Transmission format		Conforms to HDLC (frame method)
Error control system		Retry due to CRC (generating polynomial X16 + X12 + X5 + 1) and timeout
RAS function		Diagnostic function such as host link line
Connecting terminal		Terminal block
Applicable cable		Shielded twisted wire pair cable (KNPEV-SB 0 5SQ x 1P)
Number of occupied I/O points		32 points

REMARK

(1) The overall extension distance is the distance between both end stations in the MELSECNET /B data link system



(2) Relationship between communication speeds and the overall distance is shown below

	Communication Speeds			
	125K bps	250K bps	500K bps	1M bps
Overall distance	1200 m (3936 ft)	600 m (1968 ft)	400 m (1312 ft)	200 m (656 ft)

3. HANDLING

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3.1 Handling Instructions

Handle the A1SJ71AT21B as indicated below·

(1) Protect the case from impact, since it is made from resin.

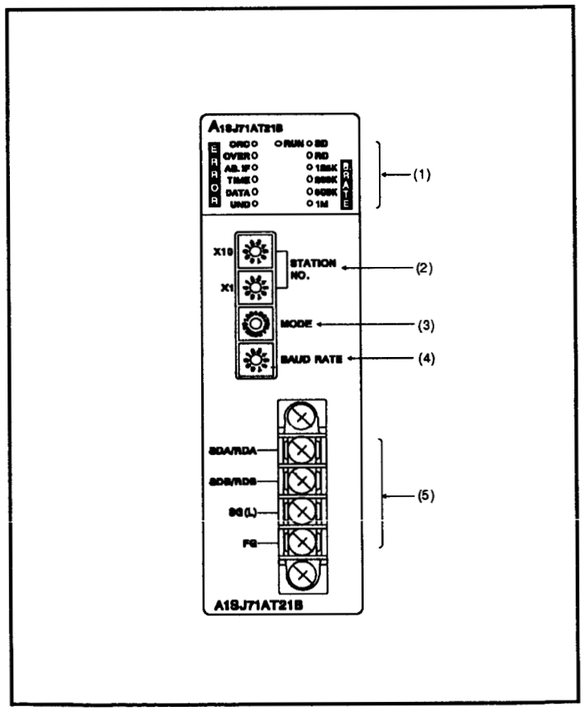
(2) Do not touch or remove the printed circuit boards from the case

(3) When wiring, make every effort to keep wire offcuts from entering the module Make sure to remove any which do enter the module

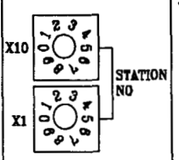
(4) To install the module to the base unit, tighten the screws as indicated:

Screw Location	Tightening Torque Range N-cm (kg-cm) [lb-inch]
Cable terminal screw (M3 5 screw)	59 to 88 (6 to 9) [5 2 to 7 79]
Terminal block mounting screw (M3 5 screw)	59 to 88 (6 to 9) [5 2 to 7 79]
Module mounting screw (M4 screw)	78 to 112 (8 to 12) [6 93 to 10 39]

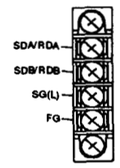
3.2 Nomenclature

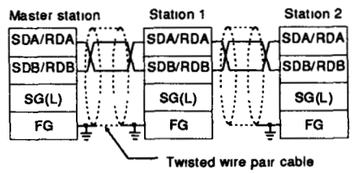


No.	Name (Enlarged View)	Descriptions			
(1)	Operation Status and Error Indication LED	LED	Operation	LED	Operation
	ERROR: CRC, OVER, AB.IF, TIME, DATA, UNDER; RUN, SD, RD, 125K, 250K, 500K, 1M; BAUD RATE	CRC	Goes ON when a code check error is detected	RUN SD	ON during data transmission
		OVER	Goes ON when a data read is delayed	RD	ON during data transmission
		AB IF	ON when all data consists of 1s	125K	Indication of baud rate
		TIME	Goes ON when a timeout occurs	250K	
		DATA	Goes ON when a data error occurs	500K	
		UNDER	Goes ON when an underrun error occurs	1M	
(2)	Station Number Switch	• When this station is used as the master station, set these switches to 00 • When this station is used as a local station, set these switches within the range of 01 to 31			



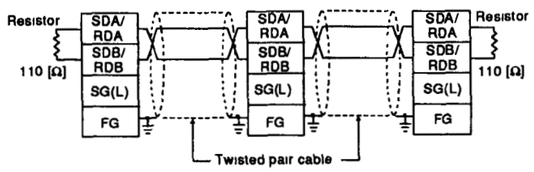
No.	Name (Enlarged View)	Application
(5)	Terminal Block	• How to wire the stations is shown in the POINT below *1





POINT

*1: Attach 110 [Ω] resistors to the terminal blocks of both end stations in the MELSECNET/B



No.	Name (Enlarged View)	Application		
(3)	Mode Selection Switch	Setting Number	Name	Description
	MODE	0	Online (A R)	Automatically returns when the module operates normally
		1	Online (U R)	Does not automatically return when the module operates normally
		2	Offline	Releases the self station
		3 4	—	Unused
		5	Test 1 (B M)	Inter-station test mode (master station)
		6	Test 2 (B S)	Inter-station test mode (slave station)
		7	Test 3 (S R)	Self-loopback test
		8 to F	—	Unusable
(4)	Baud Rate Switch	Setting Number	Baud Rate	
	BAUD RATE	0	125K bps	
		1	250K bps	
		2	500K bps	
		3	1M bps	
		4 to F	Unused*	
		* If the switch is set to any number from 4 to F, the LED (DATA) goes ON and the module goes into the offline state		

3.3 Settings of Each Part

(1) Set the link module in the data link system as shown below:

(a) Station number switch setting

Specify the station number of the A1SJ71AT21B within the range of 00 to 31.

(b) Mode switch setting

Select operation mode

(c) The link parameter

When an A1SJ71AT21B is used as a master station, the link parameter in the PC CPU is required

(2) The MELSECNET, MELSECNET/B data link reference manual gives details.

4. SELF-DIAGNOSTIC TESTING

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(1) Self-diagnostic tests check hardware of an A1SJ71-AT21B and twisted pair cable disconnections.

Select one of the three modes by the mode setting switch as shown below:

Switch Setting	Mode	Description
5	Inter-station test (master station)	Checks the line between the two stations Set one station as the master station and the other as the slave station, then execute the check
6	Inter-station test (slave station)	
7	Self-loopback test	Checks hardware of an A1SJ71AT21B itself

(2) Only the self-loopback test procedure is explained here. The MELSECNET, MELSECNET/B data link system reference manual gives details of other tests

4.1 Self-Loopback Test

(1) Test procedure

The self-loopback test procedure is shown below.

(2) Test results

The LEDs on the front of an A1SJ71AT21B show the test results.

(a) If the A1SJ71AT21B is working normally, the LED flashing begins with CRC, followed by OVER, AB.IF, TIME, DATA, and UNDER

(b) When the A1SJ71T21B works abnormally, the LED corresponding to the error goes ON If the test ends before completion, the hardware could be faulty.

5. OUTSIDE DIMENSIONS

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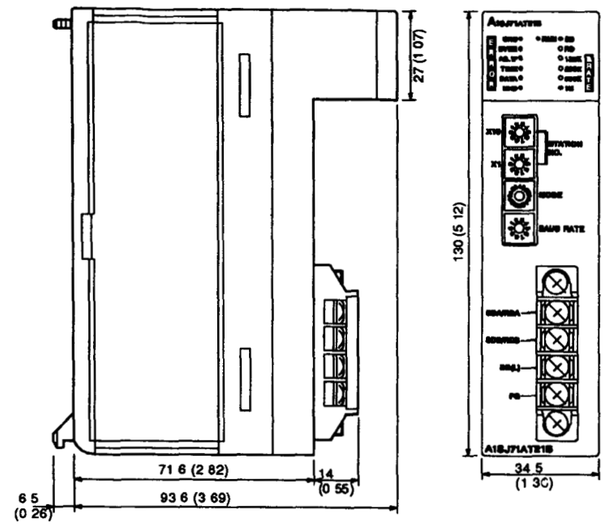

Unit mm (inch)

REVISIONS

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IMPORTANT

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

(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.