

# MITSUBISHI

## PROGRAMMABLE CONTROLLER

# MELSEC-A

User's Manual

## MELSECNET/MINI-S3 master module type A1SJ71PT32-S3/A1SJ71T32-S3 (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.



IB (NA) 66492-A

## 1. GENERAL DESCRIPTION

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This manual describes specifications and names of parts of the A1SJ71PT32-S3/A1SJ71T32-S3 MELSEC-NET/MINI-S3 master module (to be referred as A1SJ71PT32-S3/A1SJ71T32-S3) for use with MELSEC-NET/MINI-S3 data link system (to be referred to as MINI-S3 link in this manual)

- (1) The A1SJ71PT32-S3/A1SJ71T32-S3 may be used with the following PC CPUs
  - A1SJCPU • A1SCPU • A2SCPU
  - A2USCPU(S1) • A52GCPU(T21B)
- (2) The table below lists the differences between the A1SJ71PT32-S3 and the A1SJ71T32-S3

Item	Difference	
	Optical Data Link	Twisted-Wire-Pair Data Link
A1SJ71PT32-S3	○	○
A1SJ71T32-S3	—	○

Refer to the manual mentioned before if necessary when using this product  
SW0GP-MINIPE Operating manual IB-66226

## 2. PERFORMANCE SPECIFICATIONS

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The performance specifications of the A1SJ71PT32-S3/A1SJ71T32-S3 are given in the table below. For general specifications, refer to the user's manuals of the PC CPUs for use with the MELSECNET/MINI-S3 data link system.

		A1SJ71PT32-S3	
		Optical Data Link	Twisted-Pair Data Link
For one master module *1	Max number of link stations	64	
	Input (points)	512	
	Output (points)	512	
I/O refresh time (msec)		3.2 to 16 *2 (when 64 stations are connected)	
Communication speed (BPS)		1.5M	
Optical transmission level (dB)		-14.4 to -11.6	—
Optical receive level (dB)		-30 to -14	—
Optical wave length (mm)		660 (Visible radiation)	
Max inter-station transmission distance (m/ft) *3		1 to 50 (35)/ 3.28 to 164 (115) *5	1 to 100 (50)/ /3.28 to 328(164) *4
Number of I/O points occupied		I/O dedicated mode : 32 Extension mode : 48	
5V DC internal current consumption (A)	A1SJ71PT32-S3	0.35	
	A1SJ71T32-S3	0.3	
weight kg (lb)		0.3 (0.66)	

- \*1: No limit to the number of master modules used  
Number of input/output points = 8 per remote I/O station. Total number of input + output points = 512
- \*2: The I/O refresh time is determined by the number of remote modules connected in the system, their types, and the setting of the operation mode switch of the master module as indicated below

R: Total number of remote stations  
B: Number of AJ35PTF-128DT units connected  
T: Number of remote terminal units connected

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Specifications subject to change without notice

Mode Setting	Operation Mode Switch	I/O Refresh Time (msec)
I/O dedicated mode	Online automatic return (0)	I/O refresh time = 0 48 + (0 042xR) + (0 2xB)
	Online no-automatic return (1)	I/O refresh time = 0 46 + (0 053xR) + (0 2xB)
	Communication stop when error is detected (2)	I/O refresh time = 0 44 + (0 046xR) + (0 2xB)
Extension mode	Online automatic return (0)	I/O refresh time = 0 66 + (0 044xR) + (0 25xB) + (0 95xT)
	Online no automatic return (1)	I/O refresh time = 0 54 + (0 058xR) + (0 25xB) + (0 95xT)
	Communication stop when error is detected (2)	I/O refresh time = 0 54 + (0 051xR) + (0 25xB) + (0 95xT)

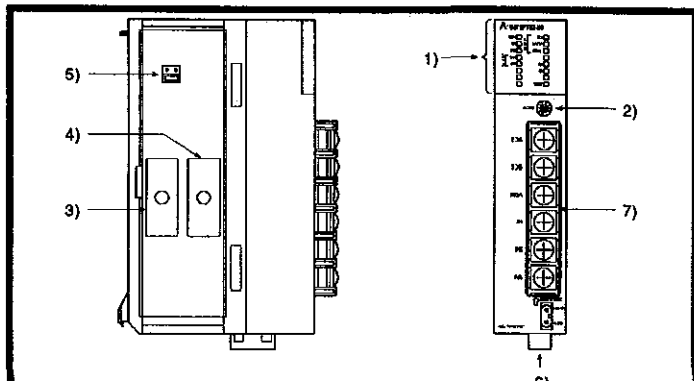
\*3: Overall loop distance: Max 10km (32810 ft)

\*4: The maximum inter station transmission distance depends on the twisted pair cable diameter as follows:  
0 2 mm<sup>2</sup> (0 00031 in<sup>2</sup>) to less than 0 5 mm<sup>2</sup> (0 00077 in<sup>2</sup>)                      50 m (164 ft)  
0 5 mm<sup>2</sup> (0 00077 in<sup>2</sup>) or more    100 m (328 ft)

\*5: The inter-station transmission distance of the optical fiber cable is between 1 m (3 28 ft) and 50 m (164 ft) Normal communication cannot be guaranteed for distances less than 1 m  
Assembling method of optical fiber cable differs depending on cable length: 1 m (3 28 ft) to less than 5 m (16 4 ft), or 5 m (16 4 ft) or more

### 3. NOMENCLATURE

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1) Operating status indicator LEDs

LED	Definition
RUN	ON indicates that the master module is normal. OFF indicates a hardware fault.
SD	Flicker indicates that data is being transmitted.
RD	Flicker indicates that data is being received.
CPU	RD: ON indicates that the FROM instruction has been executed from the PC CPU. WR: ON indicates that the TO instruction has been executed from the PC CPU.
ERR	RD: ON indicates that a receive data error has occurred. LOOP: ON indicates that a line error has occurred. REM: ON indicates that a station is faulty.
32	ON indicates I/O dedicated mode (32 points)
48	ON indicates extension mode (48 points)
TEST	ON indicates test mode

2) Operation mode setting switch

Switch Position	Mode	Description
0	ONLINE (A.R.)	Online automatic return
1	ONLINE (U.R.)	Online no automatic return
2	ONLINE (E.S.)	Communication stop at online error detection
3	TEST 1	Line check mode
4	TEST 2	Luminous energy check mode *1
5 to 9	—	Not used

3) Installation socket for the initial data ROM

ROM1 INITL.

This socket is used to install the ROM containing the initial data when the master module is used in the extension mode.

4) Installation socket for the message ROM

ROM2 MESSG.

This socket is used to install the ROM containing message data used for display on the LCD of the operating box when the operating box is used in the MINI-S3 link.

5) Jumper for the use mode switch

This jumper determines whether the master module operates in the extension mode or the I/O dedicated mode.

Extension mode: Jumper is placed in the "48" position.  
I/O dedicated mode: Jumper is placed in the "32" position.

6) Connector for the optical fiber cable

RD(IN) : Connected to SD (OUT) of the previous station.  
SD (OUT) : Connected to RD (IN) of the succeeding station.

7) Twisted pair cable terminal block

This connector is used for a twisted-pair cable when communication with remote modules is conducted in a twisted pair data link.

SDA : Connected to RDA of the succeeding station.  
SDB : Connected to RDB of the succeeding station.  
RDA : Connected to SDA of the previous station.  
RDB : Connected to SDB of the previous station.  
SG : Connected to SG of the succeeding and previous stations.  
FG : Connection of shield of shield cable and grounding wire.

\*1: This mode is not available with the A1SJ71PT32-S3/A1SJ71T32-S3. When the Operation Mode Setting Switch is set to "4", the TEST LED lights. However, this does not indicate a fault.

### 4. WIRING

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##### 4.1 Connection of Optical Fiber Cables

(1) Connect the optical fiber cables as shown in Fig 4.1

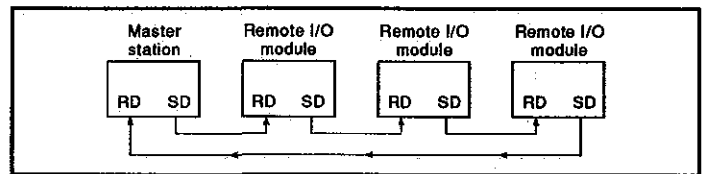


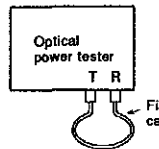
Fig 4.1 Connection of Optical Fiber Cables

##### POINTS

- Remote number setting can be done independently of the order in which the data link cable is connected.
- Before connecting a fiber-optic cable to the module, always check the optical conductivity of the cable. Optical conductivity can be checked by an optical power tester. For details about optical power testers, consult your nearest Mitsubishi representative. Optical conductivity is checked as shown below.

##### [Connection]

Connect both ends of the fiber optic cable to the T and R connectors of the tester.



##### [Results]

If the green lights of -27dBm or higher (LEDs on the front of the tester) go ON, the cable works properly.

If these lights do not go ON, check the following:

- Is the end face of the cable properly cut?
- Is the end face clean?
- Is the length of the cable 50 m or less (composite cable 35 m or less)?

##### 4.2 Connection of Twisted-Pair Cables

Connect the twisted-pair shield cables as shown in Fig 4.2. The terminal arrangement of the remote I/O station is given in the MELSECNET/mini-S3 Remote I/O User's Manual.

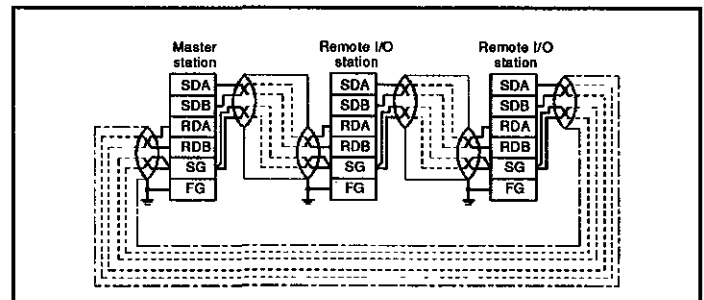


Fig 4.2 Connection of Twisted-Pair Cables

##### REMARKS

- The twisted-pair shield cable terminal block uses M4 (0.16) screws. Use appropriate solderless terminals.
- Tightening torque is 78 to 137 N cm (6.93) to 14 kg cm (12.1 lb inch).

##### POINTS

When routing twisted-pair cables, pay cautions on the following points:

- Do not run or bundle the twisted-pair cable close to or with the main circuit, high-tension cables or load cables. Allow at least 100 mm (4 inch) clearance.
- When connecting the cables to the remote unit terminal block, run the twisted-pair cable as apart from the power supply or I/O cables as possible.
- Avoid using a part of the twisted-pair cables (1 pair of 3 pairs of twisted-pair cable) for the power supply cable if possible.

### 4.3 Connection of Units for both Optical Fiber and Twisted-Pair Data Links

Both the optical fiber and twisted-pair cables may be used in the same loop to connect any link unit for use as an optical fiber/twisted-pair data link model as shown in Fig 4.3

The POINT box in Section 4.2 gives details about precautions to take when using twisted-pair wire cables

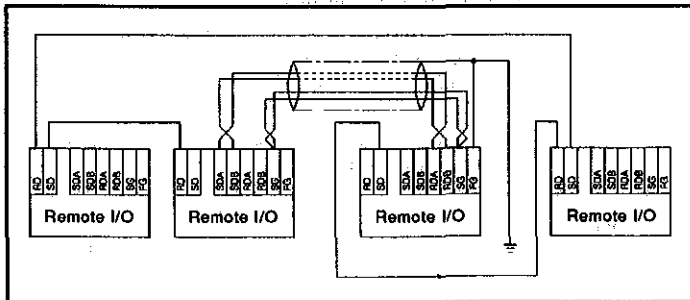
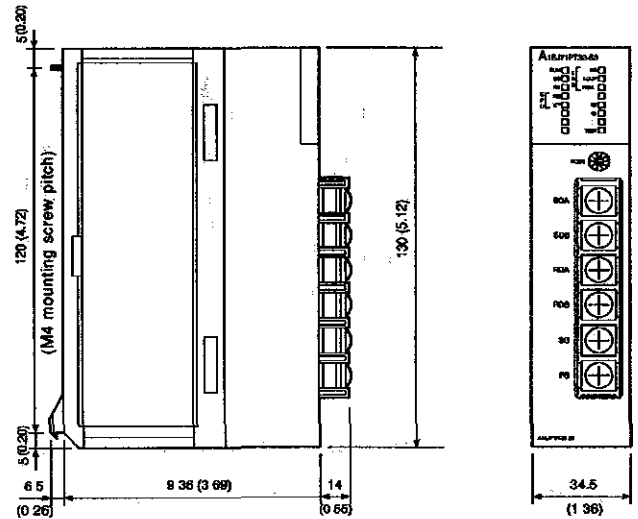


Fig 4.3 Connection of Cables for Optical Fiber/Twisted-Pair Data Link Modes

#### POINTS

- (1) Ground the shields of the receive or transmission terminals at one point
- (2) For the connection of an optical/twisted-pair data link model, use either optical or twisted-pair cable  
 Connection of the RD to a fiber-optic cable and the SD to a twisted-wire-pair cable, and vice versa, are possible  
 Connection using both of these cables is not allowed
- (3) Fit the attached protective caps to optical connectors when not in use; ambient light entering the optical connectors may cause a malfunction

A1SJ71T32-S3



Unit: mm (inch)

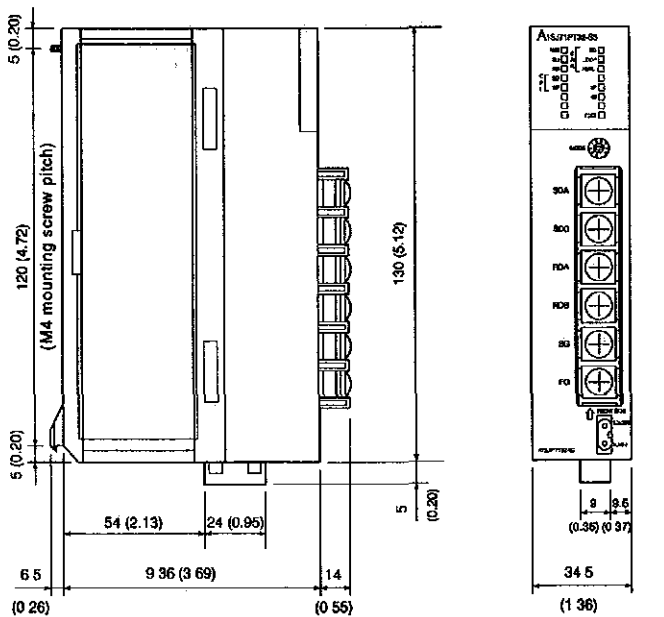
#### REVISIONS

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Jul., 1994	

## 5. OUTSIDE DIMENSIONS

### 5. OUTSIDE DIMENSIONS

A1SJ71T32-S3



Unit: mm (inch)

#### 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

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