MITSUBISHI

PROGRAMMABLE CONTROLLER

MELSEC-A

User's Manual

MELSECNET/MINI-S3 master module type AJ71PT32-S3/AJ71T32-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

MITSUBISHI ELECTRIC

IB (NA) 66564-A

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1. GENERAL DESCRIPTION

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This manual describes specifications and names of parts of the AJ71PT32-S3/AJ71T32-S3 MELSECNET/MINI-S3 master module (to be referred as AJ71PT32-S3/AJ71T32-S3) for use with MELSECNET/MINI-S3 data link system (to be referred to as MINI-S3 link in this manual)

(1) The table below lists the differences between the AJ71PT32-S3 and the AJ71T32-S3

Item	Difference	
	Optical Data Link	Twisted-Wire-Pair Data Link
AJ71PT32-S3	O	O
AJ71T32-S3	—	O

2. PERFORMANCE SPECIFICATIONS

2. PERFORMANCE SPECIFICATIONS

The performance specifications of the AJ71PT32-S3/AJ71T32-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

Item		Performance Specifications		Remarks
		Optical Data Link	Twisted-Pair Data Link	
For one master module	Max number of link stations	64		No limit to the number of master modules used
	Input (points)	512		Number of input output points = 8 per remote I/O station Total number of input + output points = 512
	Output (points)	512		
I/O refresh time (msec)		3 2 to 18 *1 (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)		50 (35) *3	100 (50) *4	No limit overall distance
Number of I/O points occupied		I/O dedicated mode : 32 Extension mode : 48		Will be changed by the setting of mode switching jumbper pins.
5V DC internal current consumption (A)	AJ71PT32-S3	0 35		
	AJ71T32-S3	0 3		
weight kg (lb)		0 6 (1 32)		

*1 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

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)

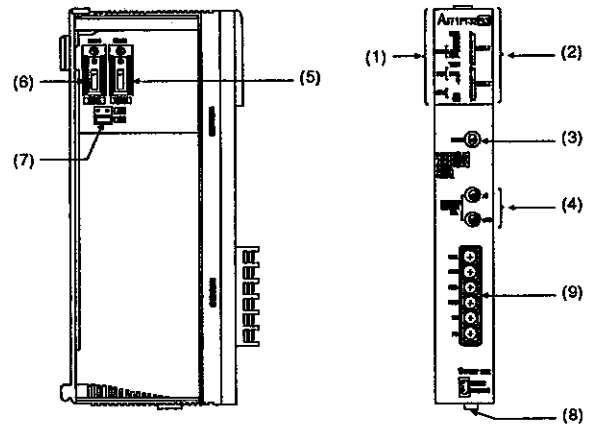
*2: The maximum inter-station transmission distance depends on the twisted-pair cable diameter as follows:
0 2 mm² (0 00031 in²) to less than 0 5 mm² (0 00077 in²) 50 m (164 ft)
0 5 mm² (0 00077 in²) or more 100 m (328 ft)

*3: 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 17 m (55 76 ft), or 17 m (55 76 ft) or more For details, refer to the MELSECNET/MINI-S3 Master Module User's Manual

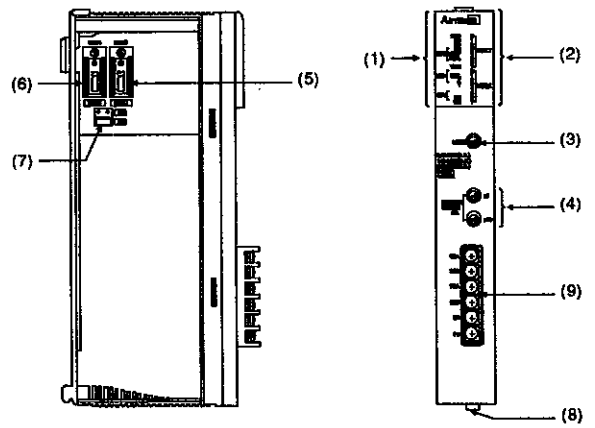
3. NOMENCLATURE

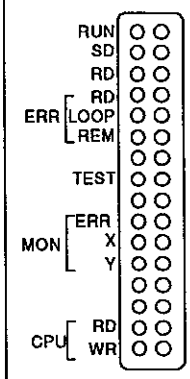
3 NOMENCLATURE

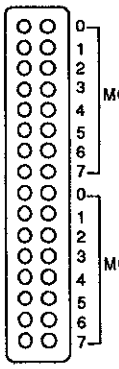
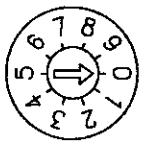
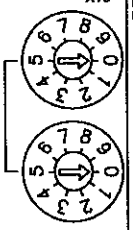
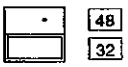
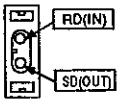
AJ71PT32-S3



AJ71T32-S3



No	Name	Description
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. 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 occured ERR LOOP: ON indicates that a line error has occured ERR REM: ON indicates that a station is faulty TEST: ON indicates test mode. MON ERR: ON indicates that the remote I/O station selected by the monitor station number setting switch is faulty MON X: ON indicates that the remote II/O station selected by the monitor station number setting switch is an input unit MON Y: ON indicates that the remote I/O station selected by the monitor station number setting switch is an output unit

No	Name	Description
2)	Remote I/O station monitoring LEDs 	Indicates the I/O status of the corresponding remote I/O station selected by the monitor station number setting switch. I/O status of partical refersh type remote I/O units and remote terminal units cannot be monitored. MON Y0 to Y7: Indicates the transmission data of the remote I/O station selected by the monitor station number setting switch MON X0 to X7: Indicates the receive data of the remote station selected by the monitor station number setting switch
3)	Operation mode setting switch MODE 	Used to switch the link module mode Switch Position 0: ONLINE (A R) — Online automatic reutrn Switch Position 1: ONLINE (U.R.) — Online no automatic return Switch Position 2: ONLINE (E S) — Communication stop at online error detection Switch Position 3: TEST1 — Line check mode Switch Position 4: TEST1 — Luminous energy check mode *1 Switch Position 5 to 9: ------- — Not used Remark The TEST LED is lit when 5 is selected. The RUN and TEST LEDs are switched OFF when any of 6 to 9 is selected
4)	Monitor station number setting switch X10 MONITOR STATION No  X1	Sets the remote I/O station number to be monitored on the coresponding batch refresh type remote I/O station monitoring LED. For details refer to MELSECNET/MINI-S3 Master Module User's Manual • Set a station number in the range of 01 to 64 • X10: Left digit of a station number • X1: Right digit of a station number
5)	Installation socket for the initial data ROM SOC3  ROM3	This socket is used to install the ROM containing the initial data when the master module is used in the extension mode (The ROM need not be when the master module is used in the dedicated mode.) Initial data is written to the ROM using the SW[ ] MINIP type system floppy disk
6)	Installation socket for the message SOC4  ROM4	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 (The ROM need not be installed when the operating box is not used) Message data is written to the ROM using the SW[ ]-MINIP type system floppy disk
7)	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 REMARKS 1 The jumper is set in the 32 position when shipped from the factory 2 "32" and "48" are the number of I/O points in the master module when set in the corresponding mode
8)	Connector for the optical fiber cable 	This connector is used for an optical fiber cable when communication with remote units is conductued in an optical data link RD(IN): Connected to SD(OUT) of the previous station. SD(OUT): Connected to RD(IN) of the succeeding station

No	Name	Description
9)	Twisted-pair cable terminal block 	This connector is used for an twisted-pair cable when communication with remote units 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 RDB 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 Cannot be used with AJ71T32-S3
However, if switch position "4" is selected, the TEST LED will come on: this does not indicate an error

4. WIRING

4. WIRING

4 1 Connection of Optical Fiber Cables

This section explains how to connect and disconnect optical fiber cables

(1) Connect the optical fiber cables as shown in Fig 4 1

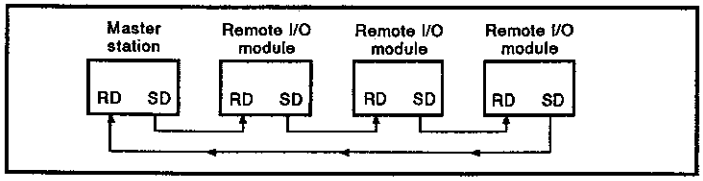


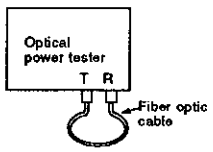
Fig 4 1 Connection of Optical Fiber Cables

POINTS

(1) Remote number setting can be done independently of the order in which the data link cable is connected For details, refer to the MELSECNET/MINI-S3 Master Module User's Manual

(2) 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 conductivelity 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

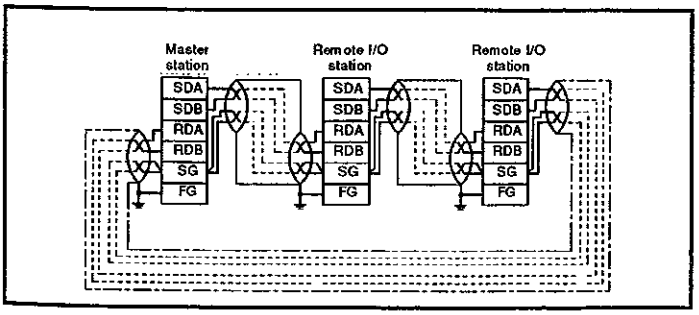


Fig 4 2 Connection of Twisted-Pair Cables

REMARKS

(1) The twisted-pair shield cable terminal block uses M4 (0 16) screws Use appropriate solderless terminals

(2) Tightening torque is 78 to 137 N cm[8 (6 93) to 14 kg cm (12 1 lb inch)]

POINT

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

(1) 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

(2) 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

(3) 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

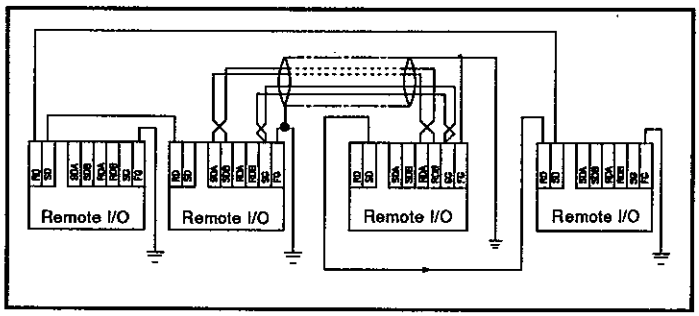


Fig 4 3 Connection of Cables for Optical Fiber/Twisted-Pair Data Link Modes

POINTS

(1) Ground the shields of the receive or transmission terminals at one point

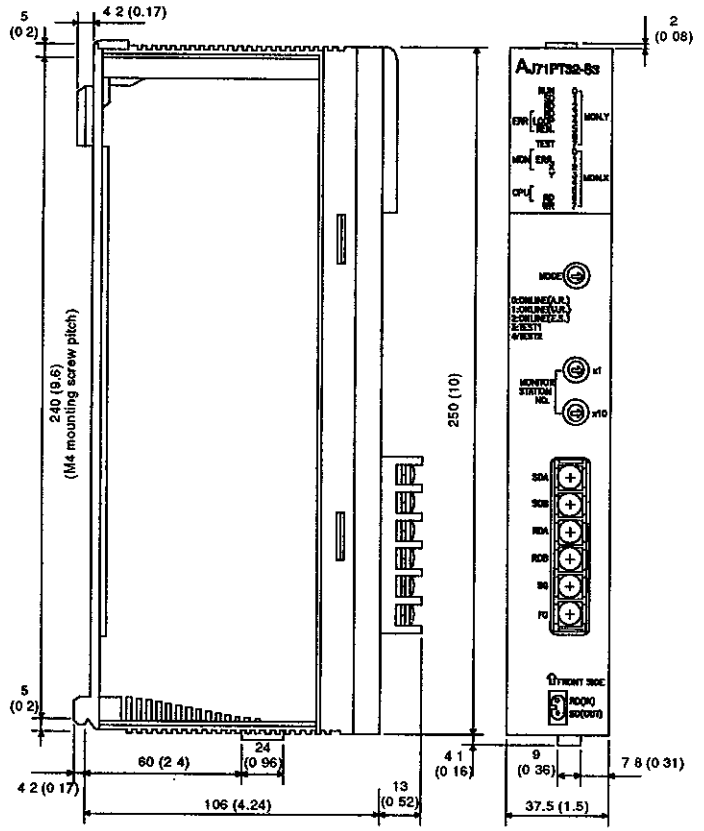
(2) For the connection of an optical/twisted-pair data link model, use either optical or twisted-pair cable
Connection of the RD to a fiber-optic cable and the SD to a twisted-wire-pair cable, and vice versa, are possible
Connection using both of these cables is not allowed

(3) Fit the attached protective caps to optical connectors when not in use; ambient light entering the optical connectors may cause a malfunction

5. OUTSIDE DIMENSIONS

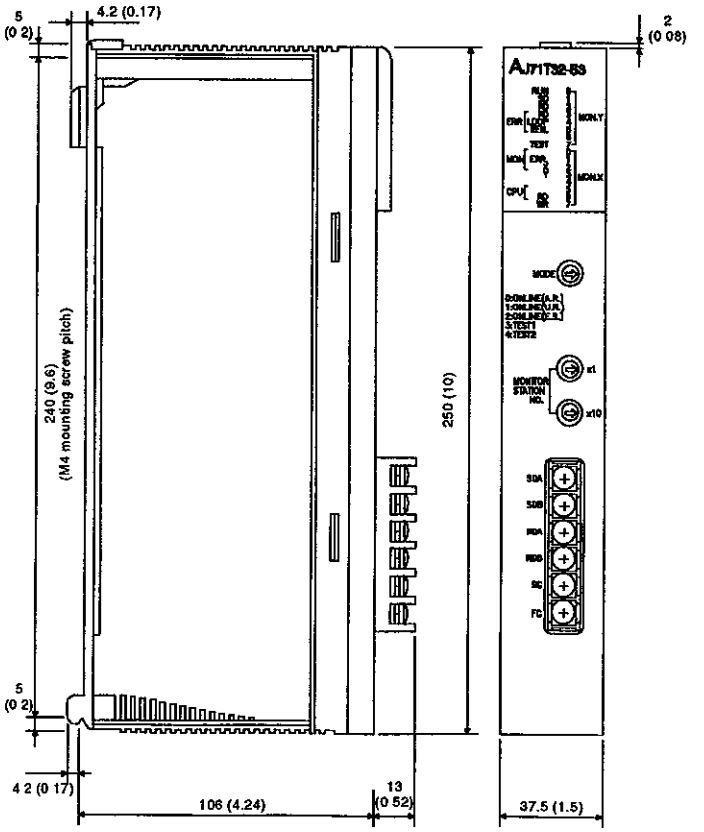
5. OUTSIDE DIMENSIONS

AJ71PT32-S3



Unit: mm (inch)

AJ71T32-S3



Unit: mm (inch)

REVISIONS

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Feb., 1995	

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