

MELSEC A Series

Programmable Logic Controller

User's Manual

AJ71AP21/R21

AJ72P25/R25

Data Link Unit

● SAFETY PRECAUTIONS ●

(Read these precautions before using.)

When using Mitsubishi equipment, thoroughly read this manual and the associated manuals introduced in this 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.

[Precautions Relating To Design]



DANGER

- Install safety circuit external to the PC that keeps the entire system safe even when there are problems with the external power supply or the PC main unit.

Otherwise, trouble could result from erroneous output or erroneous operation.

- (1) Outside the PC, construct mechanical damage preventing interlock circuits such as emergency stop, protective circuits, positioning upper and lower limit switches and interlocking forward/reverse operations.

- (2) When the PC detects the following problems, it will stop calculation and turn off all output.

- The power supply unit has an over current protection unit and over voltage protection unit.
- The PC CPUs self diagnostic functions, such as the watchdog timer error, detect problems. In addition, all output will be turned on when there are problems that the PC CPU cannot detect, such as in the I/O controller. Build a fail safe circuit exterior to the PC that will make sure the equipment operates safely at such times.

Refer to the CPU unit's user manual for example fail safe circuits.

- (3) Output could be left on or off when there is trouble in the output unit's relay or transistor. So build an external monitoring circuit that will monitor any single output that could cause serious trouble.

[Design Precautions]



DANGER

- Build a circuit that turns on the external power supply when the PC main unit power is turned on. If the external power supply is turned on first, it could result in erroneous output or erroneous operation.
- When there are communication problems with the data link, the communication problem station will enter the following condition.

Build an interlock circuit into the PC program that will make sure the system operates safely by using the communication state information. Not doing so could result in erroneous output or erroneous operation.

(1) For the data link data, the data prior to the communication error will be held.

(2) The MELSECNET (II, /B, /10) remote I/O station will turn all output off.

(3) The MELSECNET/MINI-S3 remote I/O station will hold the output or turn all output off depending on the E.C. mode setting.

Refer to the data link manuals regarding the method for setting the communication problem station and the operation state when there are communication problems.

[Design Precautions]



CAUTION

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other.

They should be installed 100mm(3.94inch) or more from each other. Not doing so could result in noise that would cause erroneous operation.

[Installation Precautions]



CAUTION

- Use the PC in an environment that meets the general specifications contained in this manual. Using this PC in an environment outside the range of the general specifications could result in electric shock, fire, erroneous operation, and damage to or deterioration of the product.

[Wiring Precautions]



DANGER

- Completely turn off the external power when installing or placing wiring. Not completely turning off all power could result in electric shock or damage to the product.

[Wiring Precautions]



- Be sure to ground the FG terminals and LG terminals with a special PC ground of Type III or above. Not doing so could result in electric shock or erroneous operation.
- When wiring in the PC, be sure that it is done correctly by checking the product's rated voltage and the terminal layout. Connecting a power supply that is different from the rating or incorrectly wiring the product could result in fire or damage.
- Tighten the terminal screws with the specified torque. If the terminal screws are loose, it could result in short circuits, fire, or erroneous operation.

[Wiring Precautions]



- Be sure there are no foreign substances such as sawdust or wiring debris inside the unit. Such debris could cause fires, damage, or erroneous operation.

[Startup and Maintenance Precautions]



- Do not touch the terminals while power is on. Doing so could cause shock or erroneous operation.
- Turn the power off when cleaning the unit or tightening the terminal screws. Conducting these operations when the power is on could result in electric shock.

[Startup and Maintenance Precautions]



- Do not disassemble or modify the units. Doing so could cause trouble, erroneous operation, injury, or fire.

[Disposal Precautions]



- When disposing of this product, treat it as industrial waste.

REVISIONS

* The manual number is given on the bottom left of the back cover.

Print Date	*Manual Number	Revision
Oct., 1991	IB (NA) 66343-A	First edition
Jun., 1997	IB (NA) 66343-B	<p data-bbox="646 342 826 376"><input type="checkbox"/> Correction</p> <p data-bbox="646 380 1034 443">Chapter 1, Section 2.2, 3.1, 3.3, 4.1, APP. 1</p> <p data-bbox="646 454 826 488"><input type="checkbox"/> Deletion</p> <p data-bbox="646 492 790 519">Section 3.2.2</p> <p data-bbox="646 566 917 593">"AJ71AP22/R22" deleted</p> <p data-bbox="646 600 1013 627">"SAFETY PRECAUTIONS" added</p>

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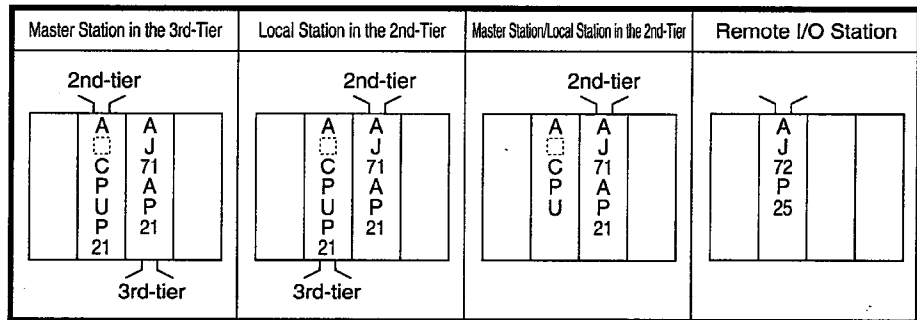
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1. INTRODUCTION

- (1) This manual gives the specifications, parts identification and selfdiagnosis function of the AJ71AP21/R21 data link unit (hereinafter called "the AJ71AP21/R21") and the AJ72P25/R25 data link unit (hereinafter called "the AJ72P25/R25") to be used with the MELSEC-A series MELSECNET(II) data link system.
- (2) Use, cables and loading slot of the AJ71AP21/R21 and the AJ72P25/R25 are as shown below.

	Use	Cables *		Loading slot
		Fiber Optic cable	Coaxial cable	
AJ71AP21 AJ71AR21	For the master and local station	○	○	I/O slot of the main base unit or extension base unit
AJ72P25 AJ72R25	For remote I/O stations	○	○	CPU slot of the main base unit

The following shows the configuration of the master station/local station, and remote I/O station. With the modules using coaxial cable (AJ71AR21 and AJ72R25), the configuration is the same as shown below.



NOTE: Only one module of AJ71AP21/AR21 can be used in one CPU unit.

- (3) The AJ71AP21/R21 is used without a PC CPU link unit.
- (4) The AJ71AP21/R21 can replace the AJ71AP22/R22, the AJ71P22/R22 (master station module in the three-tier system applicable to the MELSECNET).
- (5) Refer to the manual mentioned below for details of the MELSECNET data link system.
MELSECNET, MELSECNET/B Data Link System Reference Manual IB-66350

REMARK

*The AJ71AP21/R21 and AJ72P25/R25 can use the cables indicated with a circle.

2. SPECIFICATIONS

2. SPECIFICATIONS

2.1 General Specifications

The table below shows the general specifications of the data link system.

Item	Specifications				
Operating ambient temperature	0 to 55° C				
Storage ambient temperature	-20 to 75° C				
Operating ambient humidity	10 to 90% RH (No condensation)				
Storage ambient humidity	10 to 90% RH (No condensation)				
Vibration resistance	Conforms to *JIS C 0911	Frequency	Acceleration	Amplitude	Sweep Count 10 times **(1 octave/ minute)
		10 to 55 Hz	-	0.075 mm (0.003 in)	
		55 to 150 Hz	9.8m/s ² {1g}	-	
Shock resistance	Conforms to JIS C 0912 (9.8m/s ² {10g} x 3 times in 3 directions)				
Noise durability	By noise simulator of 1500 Vpp noise voltage, 1μs noise width and 25 to 60 Hz noise frequency				
Dielectric withstand voltage	1500 VAC for 1 minute across AC external terminals and ground				
Insulation resistance	5MΩ or larger by 500 VDC insulation resistance tester across AC external terminals and ground				
Operating atmosphere	Free of corrosive gases. Dust should be minimal.				
Cooling-method	Self-cooling				

REMARK

The term "octave" (marked with two asterisks) describes a change from an initial frequency to half or double that frequency.

For example, the following changes are referred to as 1 octave:

10 Hz to 20 Hz
 20 Hz to 40 Hz
 40 Hz to 20 Hz
 20 Hz to 10 Hz

Note:*JIS: Japanese Industrial Standard

2. SPECIFICATIONS



2.2 Performance Specifications

This section gives the performance specifications for each link unit.

Item		Optical Data Link		Coaxial Data Link	
Type		AJ71AP21	AJ72P25	AJ71AR21	AJ72R25
Maximum I/O points		—	512 points	—	512 points
Maximum points usable for link per station	Input (X)	—	512 points (64 bytes)	—	512 points (64 bytes)
	Output (Y)	—	512 points (64 bytes)	—	512 points (64 bytes)
MELSECNET mode	Maximum link points in one system	B	1024 points (128 bytes)	—	1024 points (128 bytes)
		W	1024 points (2048 bytes)	—	1024 points (2048 bytes)
	Maximum points usable for link in one station	*1	*2	*3	*4
MELSECNET II mode	Maximum link points in one system	B	4096 points (512 bytes)	—	4096 points (512 bytes)
		W	4096 points (8192 bytes)	—	4096 points (8192 bytes)
	Maximum points usable for link in one station	*5	—	*6	—
MELSECNET II composite mode	Maximum link points in one system	B	4096 points (512 bytes)	—	4096 points (512 bytes)
		W	4096 points (8192 bytes)	—	4096 points (8192 bytes)
	Maximum points usable for link in one station	*7	*8	*9	*10
Current consumption (5 VDC)		0.5 A	2.3 A	0.9 A	2.6 A
Weight kg (lb)		0.52 (1.14)	0.77 (1.69)	0.55 (1.21)	0.8 (1.76)
Allowable instantaneous power failure time		< 20ms			
Communication speed		1.25MBPS			
Communication method		Half duplex, bit serial method			
Synchronous method		Frame synchronous method			
Transmission path		Duplex loop			
Overall loop distance		Maximum 10 km (32810 ft) (1 km (3281 ft) between stations)		Maximum 10 km (3281 ft) (500 m (1640.5 ft) between stations)	

2. SPECIFICATIONS

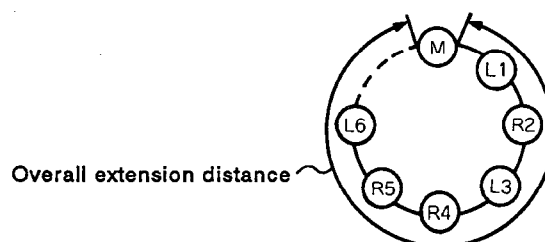
Item	Optical Data Link		Coaxial Data Link	
	AJ71AP21	AJ72P25	AJ71AR21	AJ72R25
Number of connected stations	Maximum of 65 units/loop (1 master station, 64 local/remote I/O stations)			
Modulation method	CMI method			
Transmission format	Conforms to HDLC (Frame format)			
Error control method	CRC (generating polynomial $X^{16} + X^{12} + X^5 + 1$) and retry after time-out			
RAS function	Loopback function on error detection or cable breakage, diagnostic functions such as link check			
Connector	Two-core optical connector plug (CA9003)		-	
Cable	SI-200/250		3C-2V, 5C-2V or equivalent	
Transmission loss	Maximum 12dBm/km		-	
Sending level	-17 to -11dBm (peak value)		-	
Receiving level	-32 to -11dBm (peak value)		-	
Number of I/O occupied points	32	-	32	-

- *1 $\frac{B(\text{points}) + Y(\text{points})}{8} + 2 \times W(\text{points}) \leq 1024 \text{ bytes}$
- *2 $\frac{X(\text{points}) + Y(\text{points})}{8} + 2 \times W(\text{points}) \leq 512 \text{ bytes}$
- *3 $\frac{B(\text{points}) + Y(\text{points})}{8} + 2 \times W(\text{points}) \leq 1024 \text{ bytes}$
- *4 $\frac{X(\text{points}) + Y(\text{points})}{8} + 2 \times W(\text{points}) \leq 512 \text{ bytes}$
- *5 $\frac{Y(\text{points}) + B(\text{points})}{8} + 2 \times W(\text{points}) \leq 1024 \text{ bytes}$
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- *10 $\frac{B(\text{points})}{8} + 2 \times W(\text{points}) \leq 1024 \text{ bytes}$
- *11 $\frac{X(\text{points}) + Y(\text{points})}{8} + 2 \times W(\text{points}) \leq 512 \text{ bytes}$

REMARK

The overall loop distance refers to the distance from the master station sending port to the master station receiving port via slave stations.

For both the fiber optic cables and coaxial cables, the overall loop distance is a maximum of 10 km (32810 ft).



3. HANDLING

3.1 Handling Instructions

- (1) Do not subject the case of the unit to impact.
- (2) Do not touch the printed circuit board.
- (3) Prevent the entry of wire offcuts into the units.
- (4) Tighten screws as shown below.

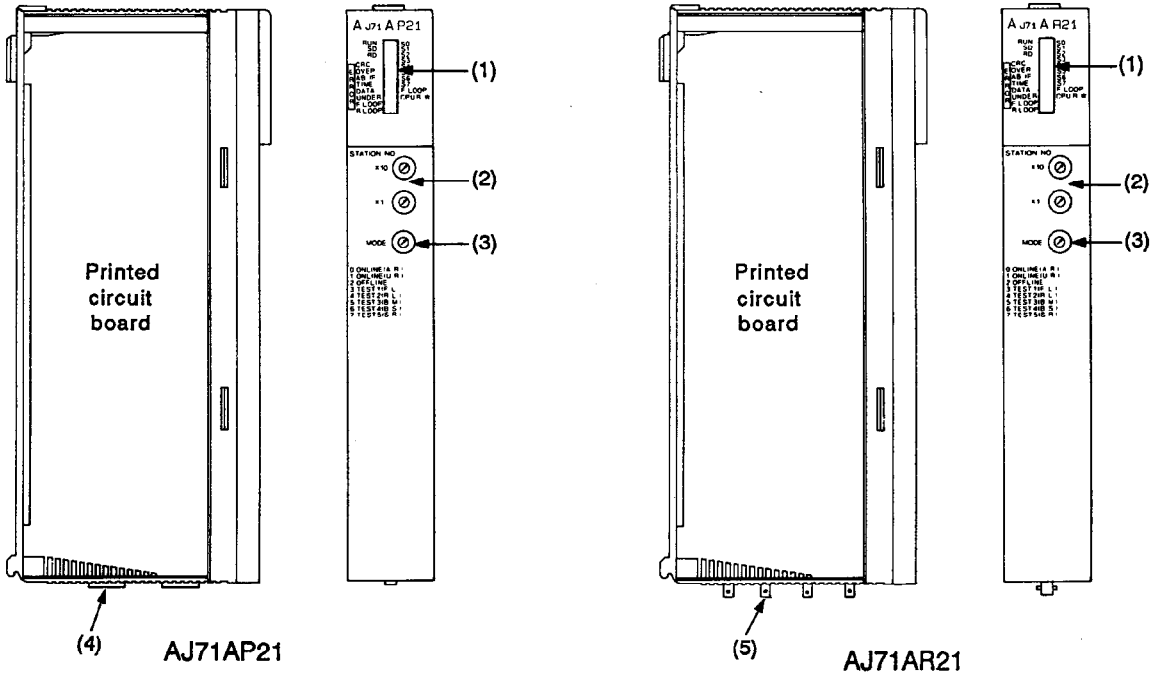
Screw	Tightening Torque Range N-cm (kg-cm) [lb-inch]
I/O unit terminal block screw (M4 screw)	78 to 117 (8 to 12) [6.93 to 10.4]

- (5) Do not touch the fiber optic core or the tip of the connector. If these are touched, clean them with a soft cloth. Dirt will cause excessive transmission losses.

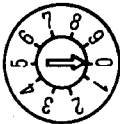
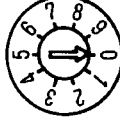

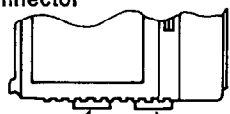
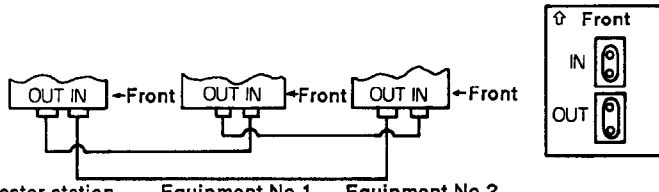
3.2 Part Identification

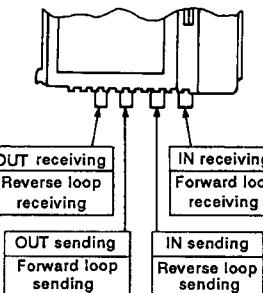
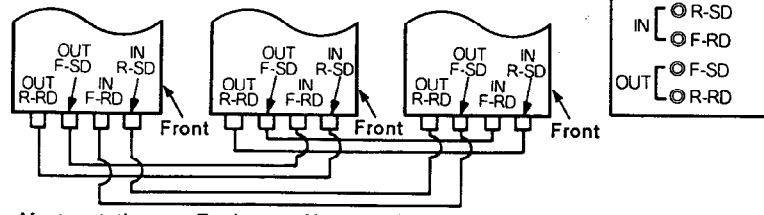
This section gives names and description of parts of the AJ71AP21/R21 and the AJ72P25/R25.

3.2.1 AJ71AP21 and AJ71AR21



No.	Name and Appearance	Description																																																	
(1)	<p>Operation and error indication LEDs</p>	<table border="1"> <thead> <tr> <th>LED</th> <th>Description</th> <th>LED</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>RUN</td> <td>Lit when data link is normal.</td> <td>S0</td> <td rowspan="4">Not used (Flickers during normal data link.)</td> </tr> <tr> <td>SD</td> <td>Lit during data sending</td> <td>S1</td> </tr> <tr> <td>RD</td> <td>Lit during data receiving</td> <td>S2</td> </tr> <tr> <td></td> <td>Not used (always off)</td> <td>S3</td> </tr> <tr> <td>CRC</td> <td>Lit at code check error time.</td> <td>S4</td> <td></td> </tr> <tr> <td>OVER</td> <td>Lit at data entry delay error time.</td> <td>S5</td> <td></td> </tr> <tr> <td>AB. IF</td> <td>Lit when all data are 1.</td> <td>S6</td> <td></td> </tr> <tr> <td>TIME</td> <td>Lit at time-out time.</td> <td>S7</td> <td></td> </tr> <tr> <td>DATA</td> <td>Lit at receiving data error time.</td> <td>F. LOOP</td> <td>Lit when data receiving line is a forward loop. OFF when reverse.</td> </tr> <tr> <td>UNDER</td> <td>Lit at sending data error time.</td> <td>CPU R/W</td> <td>Lit during communication with programmable controller CPU.</td> </tr> <tr> <td>F. LOOP</td> <td>Lit at forward loop receiving error time.</td> <td></td> <td>Not used (Always off)</td> </tr> <tr> <td>R. LOOP</td> <td>Lit at reverse loop receiving error time.</td> <td></td> <td>Not used (Always off)</td> </tr> </tbody> </table>	LED	Description	LED	Description	RUN	Lit when data link is normal.	S0	Not used (Flickers during normal data link.)	SD	Lit during data sending	S1	RD	Lit during data receiving	S2		Not used (always off)	S3	CRC	Lit at code check error time.	S4		OVER	Lit at data entry delay error time.	S5		AB. IF	Lit when all data are 1.	S6		TIME	Lit at time-out time.	S7		DATA	Lit at receiving data error time.	F. LOOP	Lit when data receiving line is a forward loop. OFF when reverse.	UNDER	Lit at sending data error time.	CPU R/W	Lit during communication with programmable controller CPU.	F. LOOP	Lit at forward loop receiving error time.		Not used (Always off)	R. LOOP	Lit at reverse loop receiving error time.		Not used (Always off)
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<p>For details of "CRC" to "R. LOOP", refer to the MELSECNET, MELSECNET/B Data Link Reference Manual.</p>																																																			

No.	Name and Appearance	Description																																							
(2)	<p>Station number setting switches</p> <p>STATION NO.</p> <p>X10 </p> <p>X1 </p>	<p>*Station number is set from 00 to 64. Master station 00 Local station 01 to 64</p> <p>*The upper digit is set using the "X10" switch. *The lower digit is set using the "X1" switch. *The factory setting is "00".</p>																																							
(3)	<p>Mode select switch</p> <p>MODE </p>	<p>By switching mode, the following function are available.</p> <table border="1" data-bbox="590 728 1364 1254"> <thead> <tr> <th>Setting Number</th> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Online</td> <td>Automatic return set during normal operation.</td> </tr> <tr> <td>1</td> <td>Online</td> <td>Automatic return not set during normal operation.</td> </tr> <tr> <td>2</td> <td>Offline</td> <td>Disconnect host station.</td> </tr> <tr> <td>3</td> <td>Test mode 1</td> <td>Forward loop test</td> </tr> <tr> <td>4</td> <td>Test mode 2</td> <td>Reverse loop test</td> </tr> <tr> <td>5</td> <td>Test mode 3</td> <td>Station-to-station test (master station)</td> </tr> <tr> <td>6</td> <td>Test mode 4</td> <td>Station-to-station test (slave station)</td> </tr> <tr> <td>7</td> <td>Test mode 5</td> <td>Self-loopback test</td> </tr> <tr> <td>8</td> <td>-</td> <td>Not used</td> </tr> <tr> <td>9</td> <td>-</td> <td>Not used</td> </tr> <tr> <td>A to C</td> <td>-</td> <td>Not usable</td> </tr> <tr> <td>C to F</td> <td>-</td> <td>Not used</td> </tr> </tbody> </table> <p>(Set at "0" before delivery.)</p>	Setting Number	Name	Description	0	Online	Automatic return set during normal operation.	1	Online	Automatic return not set during normal operation.	2	Offline	Disconnect host station.	3	Test mode 1	Forward loop test	4	Test mode 2	Reverse loop test	5	Test mode 3	Station-to-station test (master station)	6	Test mode 4	Station-to-station test (slave station)	7	Test mode 5	Self-loopback test	8	-	Not used	9	-	Not used	A to C	-	Not usable	C to F	-	Not used
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(4)	<p>Connector</p>  <p>OUT Forward loop sending Reverse loop receiving</p> <p>IN Reverse loop sending Forward loop receiving</p>	<p>AJ71AP21 *Optical fiber cable connector *Connect the cable as shown below.</p>  <p>Master station Equipment No.1 Equipment No.2</p> <p>IN: Connect to OUT of preceding station OUT: Connect to IN of next station</p>																																							

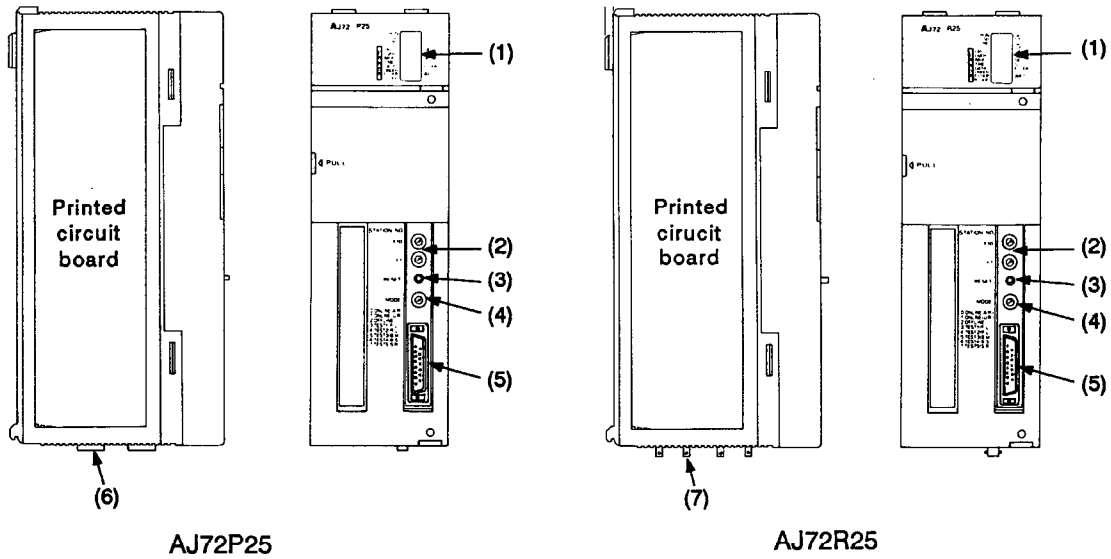
No.	Name and Appearance	Description
(5)	<p>Connector</p>  <p>OUT receiving Reverse loop receiving</p> <p>IN receiving Forward loop receiving</p> <p>OUT sending Forward loop sending</p> <p>IN sending Reverse loop sending</p>	<p>AJ71AR21 *Coaxial cable connector *Connect the cable as shown below.</p>  <p>↑ Front IN [●] R-SD [●] F-RD OUT [●] F-SD [●] R-RD</p> <p>Master station Equipment No.1 Equipment No.2</p> <p>IN-sending: Connect to OUT-receiving of preceding station IN-receiving: Connect to OUT-sending of preceding station OUT-sending: Connect to IN-receiving of succeeding station OUT-receiving: Connect to IN-sending of succeeding station</p>

REMARK

To perform the reset operation of AJ71P21/R21, use the "RESET key switch" on the CPU unit loaded in the same station.

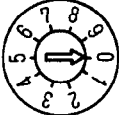
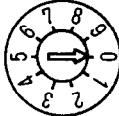



3. HANDLING

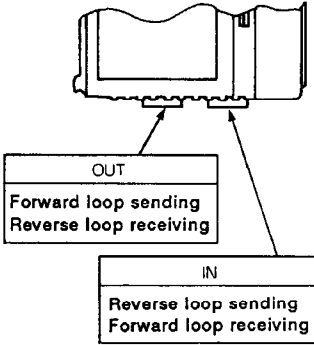
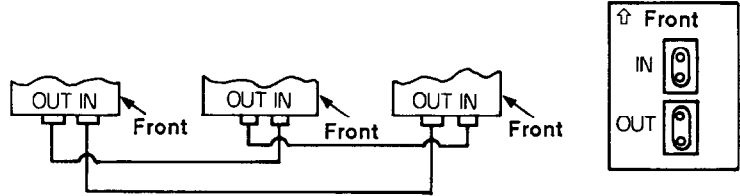
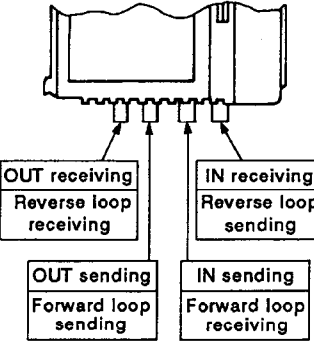
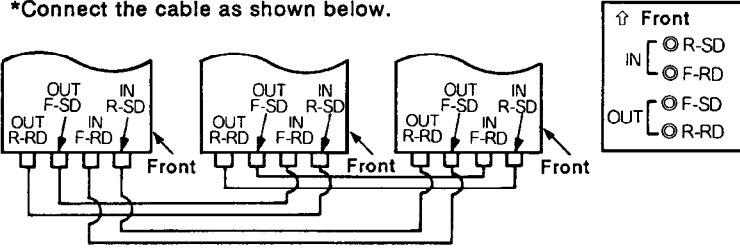
3.2.2 AJ72P25 and AJ72R25



No.	Name and Appearance	Description			
(1)	<p>Operation and error indication LEDs</p>	LED	Description	LED	Description
		RUN	Lit when data link is normal.	S0	Not used (Flickers during normal data link.)
		SD	Lit during data sending	S1	
		RD	Lit during data receiving	S2	
			Not used (always off)	S3	
		CRC	Lit at code check error time.	S4	
		OVER	Lit at data entry delay error time.	S5	
		AB. IF	Lit when all data are 1.	S6	
		TIME	Lit at time-out time.	S7	
		DATA	Lit at receiving data error time.	F. LOOP	Lit when data receiving line is a forward loop. OFF when reverse.
		UNDER	Lit at sending data error time.		Not used (Always off)
		F. LOOP	Lit at forward loop receiving error time.	WAIT	Lit during wait for the communication with special function module.
		R. LOOP	Lit at reverse loop receiving error time.		Not used (Always off)

For details of "CRC" to "R.LOOP", refer to the MELSECNET, MELSECNET/B Data Link System Reference Manual.

No.	Name and Appearance	Description																																										
(2)	<p>Station number setting switches</p> <p>STATION NO.</p> <p>X10 </p> <p>X1 </p>	<p>*Set station numbers, 00 to 64. *Set the number of tens of station number to "X10". *Set the number of units of station number to "X1". (Set at "00" before delivery.)</p>																																										
(3)	<p>Reset switch</p> <p>RESET </p>	<p>*Used to reset the hardware of its own station at data link error time. *After moving the station number setting switches and mode select switch, perform reset operation to erase the previous setting.</p>																																										
(4)	<p>Mode select switch</p> <p>MODE </p>	<p>By switching mode, the following function are available.</p> <table border="1" data-bbox="632 931 1407 1552"> <thead> <tr> <th>Setting Number</th> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Online</td> <td>Automatic return set during normal operation.</td> </tr> <tr> <td>1</td> <td>Online</td> <td>Automatic return not set during normal operation.</td> </tr> <tr> <td>2</td> <td>Offline</td> <td>Disconnect host station.</td> </tr> <tr> <td>3</td> <td>Test mode 1</td> <td>Forward loop test</td> </tr> <tr> <td>4</td> <td>Test mode 2</td> <td>Reverse loop test</td> </tr> <tr> <td>5</td> <td>Test mode 3</td> <td>Station-to-station test (main station)</td> </tr> <tr> <td>6</td> <td>Test mode 4</td> <td>Station-to-station test (subordinate station)</td> </tr> <tr> <td>7</td> <td>Test mode 5</td> <td>Self-loopback test</td> </tr> <tr> <td>8</td> <td>—</td> <td>Not used</td> </tr> <tr> <td>9</td> <td>—</td> <td>Not used</td> </tr> <tr> <td>A to C</td> <td>—</td> <td>Not usable</td> </tr> <tr> <td>C to F</td> <td>—</td> <td>Not used</td> </tr> <tr> <td>D to F</td> <td>—</td> <td>Not used</td> </tr> </tbody> </table> <p>(Set at "0" before delivery.)</p>	Setting Number	Name	Description	0	Online	Automatic return set during normal operation.	1	Online	Automatic return not set during normal operation.	2	Offline	Disconnect host station.	3	Test mode 1	Forward loop test	4	Test mode 2	Reverse loop test	5	Test mode 3	Station-to-station test (main station)	6	Test mode 4	Station-to-station test (subordinate station)	7	Test mode 5	Self-loopback test	8	—	Not used	9	—	Not used	A to C	—	Not usable	C to F	—	Not used	D to F	—	Not used
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D to F	—	Not used																																										
(5)	<p>RS-422 connector</p> 	<p>* Used to connect to peripheral devices. * Covered when not in use.</p>																																										

No.	Name and Appearance	Description
(6)	<p>Connector</p> 	<p>AJ72P25 *Optical fiber cable connector *Connect the cable as shown below.</p>  <p>Master station Equipment No.1 Equipment No.2</p> <p>IN: Connect to OUT of preceding station OUT: Connect to IN of next station</p>
(7)	<p>Connector</p> 	<p>AJ72R25 *Coaxial cable connector *Connect the cable as shown below.</p>  <p>Master station Equipment No.1 Equipment No.2</p> <p>IN-sending: Connect to OUT-receiving of preceding station IN-receiving: Connect to OUT-sending of preceding station OUT-sending: Connect to IN-receiving of succeeding station OUT-receiving: Connect to IN-sending of succeeding station</p>

3.3 Setting on Each Link Unit

- (1) The following three items can be set for each link unit in the data link system.
 - (a) Station number setting with the station number setting switches
 - 1) On the AJ71AP21/R21, set the station number at "00".
 - 2) On the AJ72P25/R25, set the station number between "01" and "64".
 - (b) Mode Setting with the Mode Select Switch
Select the appropriate operation and self-diagnosis test modes.
 - (c) Link parameter setting on the peripheral devices

If the AJ71AP21/R21 is used, set link parameters on the CPU module (local station in the two-tier link system).
- (2) For details of settings mentioned above in (1), refer to the MELSEC-NET, MELSECNET/B Data Link Reference Manual.

4. SELF-DIAGNOSIS

- (1) In self-diagnosis, the AJ71AP21/R21 and the AJ72P25/R25 hardware, fiber optic cable, and coaxial cable are checked for broken wires. Any of the following checks can be selected by changing the mode select switch position.

Switch Position	Mode Designation	Description
3	Forward loop test mode	In this mode, the fiber optic cable or coaxial cable line of the entire data link system is checked. The forward loop side on which normal linking is performed is checked.
4	Reverse loop test mode	In this mode, the fiber optic cable or coaxial cable line of the entire data link system is checked. The reverse loop side, on which loopback is performed in the event of an error, is checked.
5	Station-to-station test mode (master station)	In this mode, the line connecting the two stations is checked. Before checking, the station with the smaller station number is designated as the main station; the other is the subordinate station.
6	Station-to-station test mode (slave station)	
7	Self-loopback test mode	In the self-loopback test, the hardware containing the transmission and receiving circuits is checked on an individual link unit basis.

- (2) For tests other than the self-loopback test, see the MELSECNET, MELSECNET/B Data Link System Reference Manual.

4.1 Self-loopback Test

(1) Self-loopback test

- (a) The self-loopback test is intended to check the link unit hardware containing the transmission and receiving circuits (forward and reverse loops) on an individual link unit basis.
- (b) A distinction between normal and faulty conditions is made depending on whether the data sent from the send end can be received within the specified duration at the receive end of the forward and reverse loops.

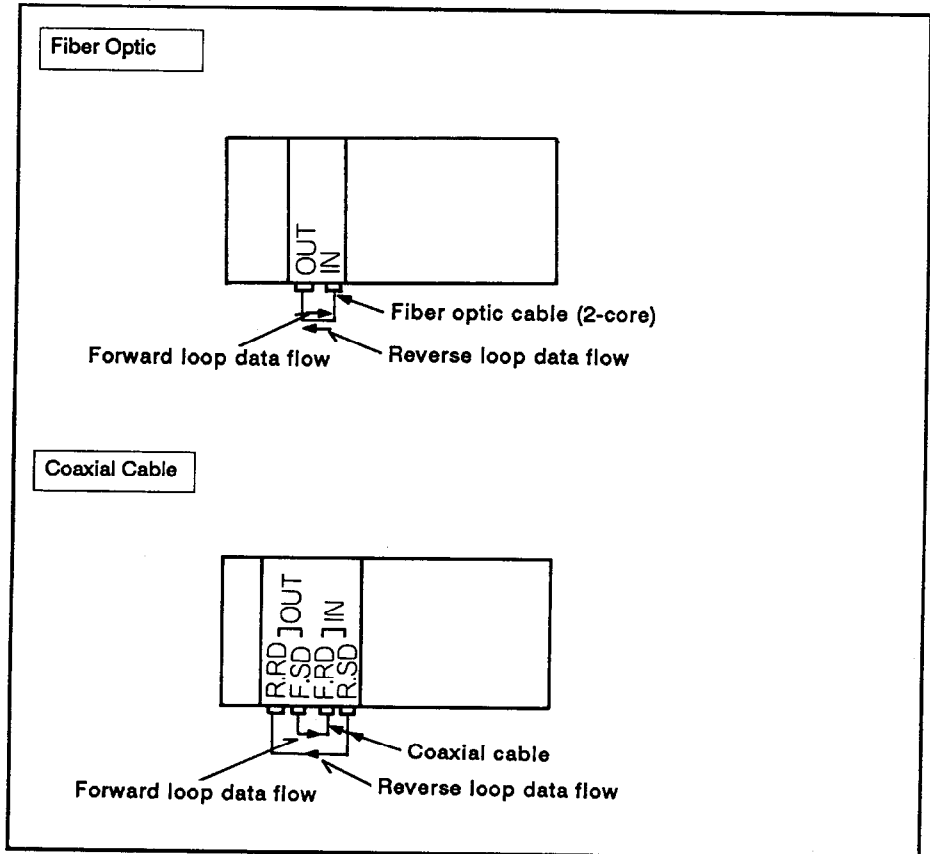
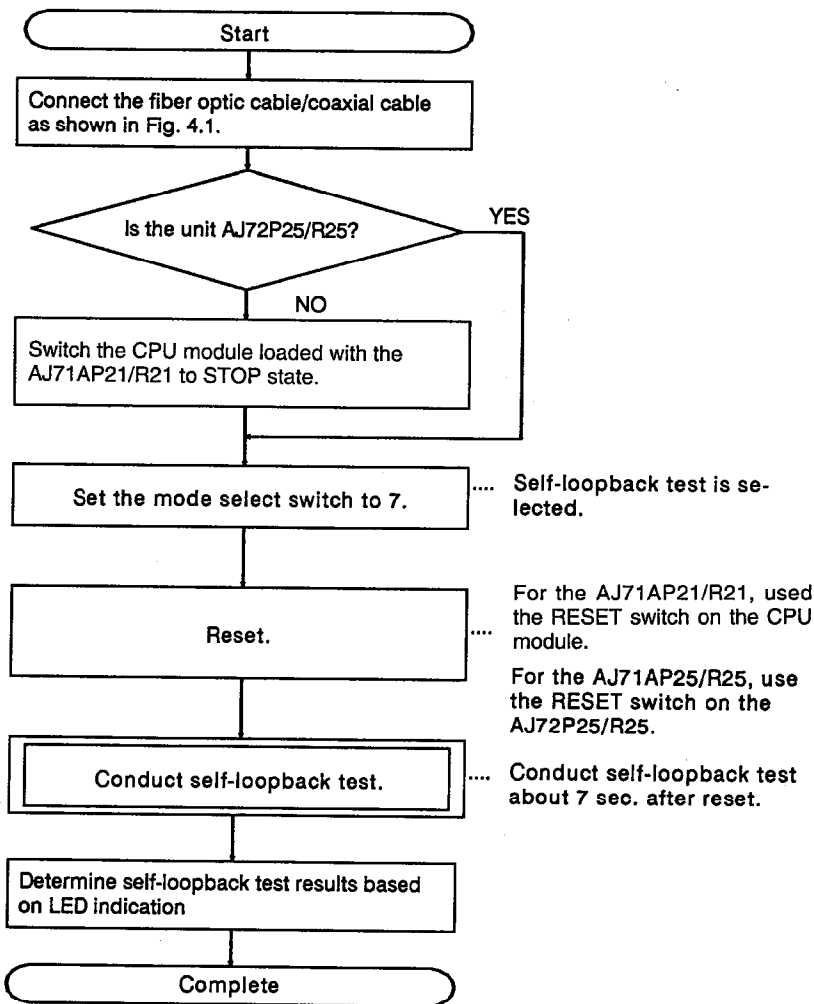


Fig. 4.1 Self-loopback Test

(2) Testing method

The self-loopback test procedure is given below.



(3) Judgment on test results

The test results are indicated by the LEDs on the AJ71AP21/R21 and the AJ72P25A/R25 front panel.

(a) When the results are normal:

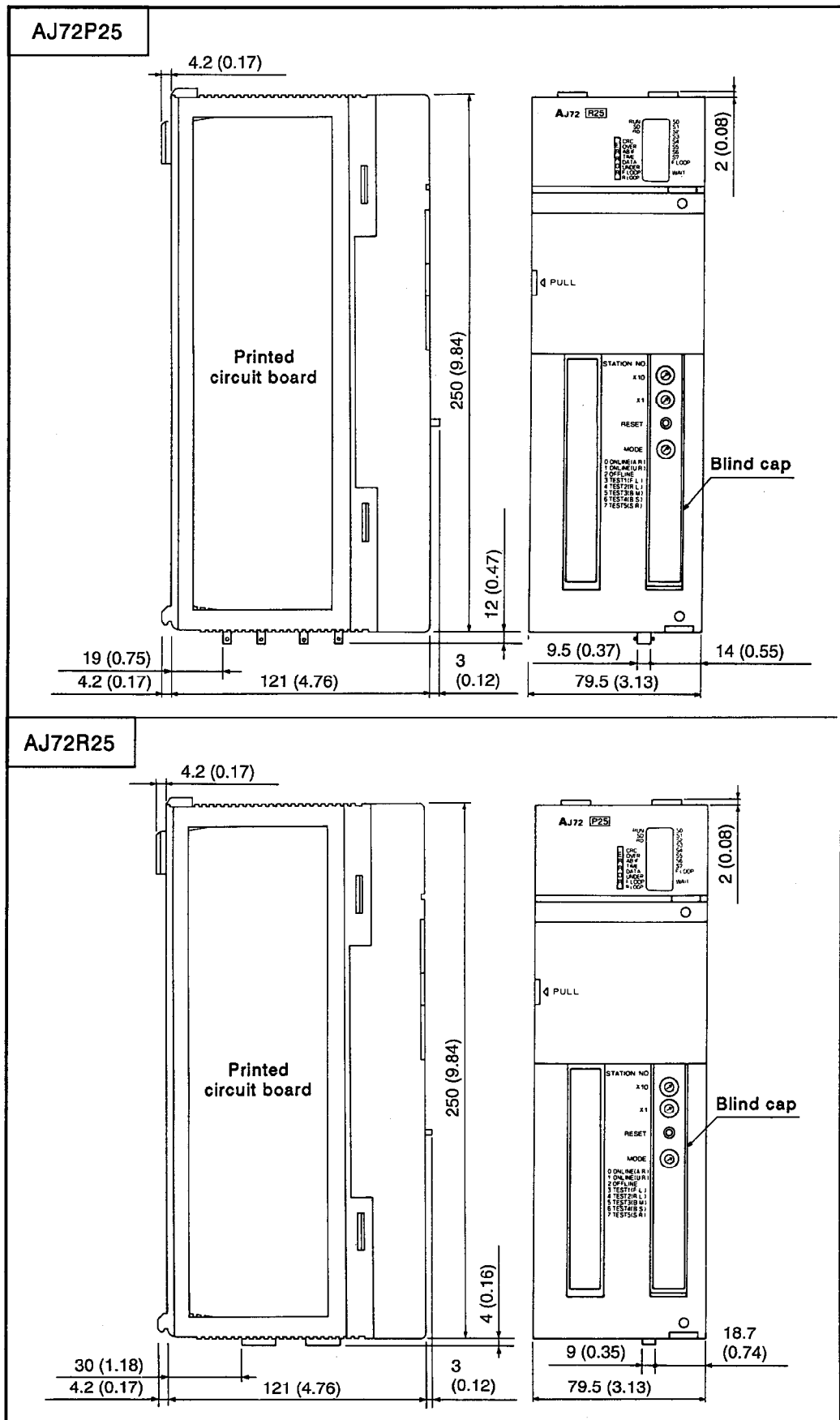
The CRC, OVER, AB.IF, TIME, DATA, and UNDER LEDs successively turn on and off.

(b) When the results are abnormal:

The LED indicating the error in question lights and the test is discontinued.

1) When the F.LOOP, R.LOOP, and TIME LEDs are lit:

- i) The forward loop cable is broken.
- ii) The forward loop send side and receive side are not connected.
- iii) The forward loop send side is connected with the reverse loop send side and the reverse loop receive side is connected with the forward loop receive side.



Unit=mm (inch)

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