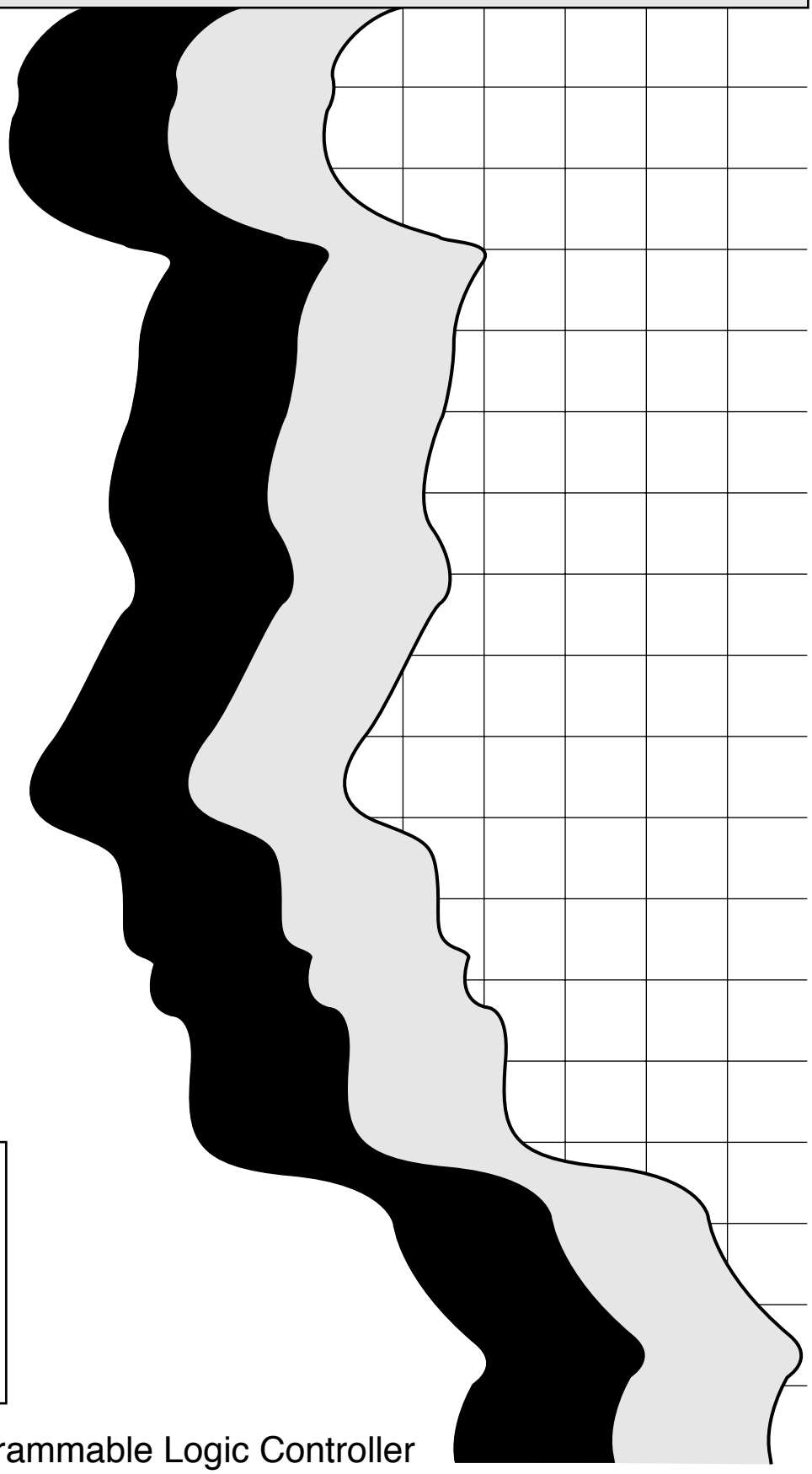
MITSUBISHI

MELSEC-I/O Link Remote I/O System Master Module
Type AJ51T64/A1SJ51T64

User's Manual



MELSEC

Mitsubishi Programmable Logic Controller

● 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 PLC 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.

[DESIGN PRECAUTIONS]

⚠ DANGER

- Provide safety circuits external to the PLC that ensure that the system as a whole will continue to operate safely even in the event of an external power supply fault or PLC failure.
  Failure to provide such circuits may lead to accidents caused by erroneous outputs or malfunction.
  (1) Configure emergency stop circuits, protective circuits, interlock circuits for opposing operations such as forward/reverse, and interlock circuits to prevent damage to the machine - such as those for upper and lower positioning limits - external to the PLC.
  (2) If the PLC detects either of the following error statuses it stops operation and turns all outputs OFF:
    - Actuation of the power supply module's overcurrent protection device or overvoltage protection device
    - Error detected by the self-diagnosis function at the PLC CPU, such as a watchdog timer error.

⚠ DANGER

In addition, faults in the output control section of output modules, which cannot be detected by the PLC CPU, may cause all outputs to go ON. A failsafe circuit must therefore be configured external to the PLC to ensure that the machinery will operate safely. For examples of failsafe circuits, refer to the User's Manual for the CPU module.

(3) Failures of output module relays and transistors may lead to outputs going ON or OFF. Provide external circuits to monitor output signals whose failure could result in serious accidents.

- When a data link communication error occurs, the status shown below will be established at the faulty station. In order to ensure that the system operates safely at such times, configure an interlock circuit in the sequence program. Failure to provide such a circuit may lead to accidents caused by erroneous outputs or malfunction.

  (1)All inputs from remote I/O stations go OFF

  (2)All outputs from remote I/O stations go OFF

⚠ CAUTION

- Do not bundle control lines or communication wires together with main circuit or power lines, or lay them close to these lines.
  As a guide, separate the lines by a distance of at least 100 mm, otherwise malfunctions may occur due to noise.

[INSTALLATION PRECAUTIONS]

⚠ CAUTION

- Use the PLC in an environment that conforms to the general specifications in the manual. Using the PLC in environments outside the ranges stated in the general specifications will cause electric shock, fire, malfunction, or damage to/deterioration of the product.
- When using an A1SJ51T64 master module, make sure that the module fixing projection on the base of the module is properly engaged in the fixing hole in the base unit before mounting the module, and then tighten the module mounting screws to the stipulated torque. Failure to mount or secure the module properly could result in malfunction, failure, or in the module falling. When using an AJ51T64 master module, make sure that the module fixing projection on the base of the module is properly engaged in the fixing hole in the base unit before mounting the module. Failure to mount the module properly could result in malfunction, failure, or in the module falling.
- Secure remote I/O modules properly on a DIN rail or with mounting screws. If a module is not secured properly, it could fall.
- Tighten screws to within the stipulated torque range. Loose screws could cause falling of the module, short circuits, and malfunction. Overtightening could damage the screws or module, and cause falling of the module, short circuits, and malfunction.

[WIRING PRECAUTIONS]

⚠ DANGER

- Switch off all phases of the power supply externally before starting installation or wiring work. Failure to do so could result in electrical shocks and equipment damage.
- After installation and wiring is completed, be sure to attach the terminal cover provided before switching the power ON and starting operation. Failure to do so could result in electrical shock.

⚠ CAUTION

- Be sure that the communication cable connected to the module is kept in ta duct or fixed with cramps.
  Failure to do so may cause a damage to the module or cables due to dangling, shifting or inadevertent handing of cables, or misoperation because of bad cable contacts.
- You must ground the FG terminal to a ground exclusive to the PLC.
- Carry out wiring to the PLC correctly, checking the rated voltage and terminal arrangement of the product.
  Using a power supply that does not conform to the rated voltage, or carrying out wiring incorrectly, will cause fire or failure.
- Tighten the terminal screws to the stipulated torque.
  Loose screws will cause short circuits, fire, or malfunctions.
  Overtightening could damage the screws or module, and cause falling of the module, short circuits, and malfunction.
- Do not grab on the cable when removing the communication cable connected to the module.
  When removing the cable with a connector, hold the connector on the side that is connected to the module.
  Pulling the cable that is still connected to the module may cause a damage to the module or cable, or misoperation due to bad cable contacts.
- Tighten screws to within the stipulated torque range. Loose screws could cause falling of the module, short circuits, and malfunction. Overtightening could damage the screws or module, and cause falling of the module, short circuits, and malfunction.

[STARTING AND MAINTENANCE PRECAUTIONS]

⚠ DANGER

- Do not touch terminals while the power is ON.
  This will cause malfunctions.
- Switch off all phases of the power supply externally before starting cleaning or re-tightening the terminal screws. Carrying out this work while the power is ON will cause failure or malfunction of the module. Loose screws could cause short circuits, fire, and malfunction. Overtightening could damage the screws or module, and cause falling of the module, short circuits, and malfunction.

⚠ CAUTION
• Read the manual thoroughly and confirm safety before connecting a peripheral device to the CPU during operation and performing an online operation (particularly program change, forced output, or operation status change). Misoperation could damage the machine and cause accidents. • Do not disassemble or modify any module. This will cause failure, malfunction, injuries, or fire. • Switch the power OFF before mounting or removing the module. Mounting or removing it with the power ON can cause failure or malfunction of the module. • Before touching the module, be sure to touch ground metal or similar material to discharge static electricity from human body, etc. Failure to do so can cause the module to fail or malfunction.

[DISPOSAL PRECAUTIONS]

⚠ CAUTION
• When disposing of this product, handle it as industrial waste.

REVISIONS

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

Print Date	*Manual Number	Revision
Aug., 1995	IB (NA) 66574-A	First edition
Jun., 1996	IB (NA) 66574-B	Model name added on release of AJ51T64. Addition to module specifications on release of AJ55TB[ ][ ]-16[ ][ ] Partial addition Section 5.1
Aug., 1997	IB (NA) 66574-C	Partial correction SAFETY PRECAUTIONS, Section 2.1, 3.4, 4.2.1, 4.2.2, 8.1, 8.9
Nov., 1998	IB (NA) 66574-D	Partial correction SAFETY PRECAUTIONS, Section 2.1, 5.1, 5.2, 5.3
May, 2003	IB (NA) 66574-E	Partial correction Section 5.3, 8.1
Dec., 2003	IB (NA) 66574-F	Partial correction SAFETY PRECAUTIONS, Section 5.1
Apr., 2006	IB (NA) 66574-G	Partial correction SAFETY PRECAUTIONS, Section 2.1, 2.2, 3.2, 3.3, 4.2.1, APPENDIX 1.2

Japanese Manual Version SH-3535-H

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.

CONTENTS

1. GENERAL DESCRIPTION

This user's manual describes the specifications, connection, and programming of the AJ51T64/A1SJ51T64 MELSEC-I/O LINK Remote I/O System Master Module (hereafter called the "master module").

1.1 Features

MELSEC-I/O LINK is an easily programmable remote I/O system which has simple wiring and does not require troublesome parameter settings.

(1) Up to 128 I/O points can be controlled
When used with an 8-point/16-point I/O unit (AJ55TB32-8[ ][ ], AJ55TB32-16[ ][ ]), a single master module can control a maximum of 128 points (input: 64 points, output: 64 points).

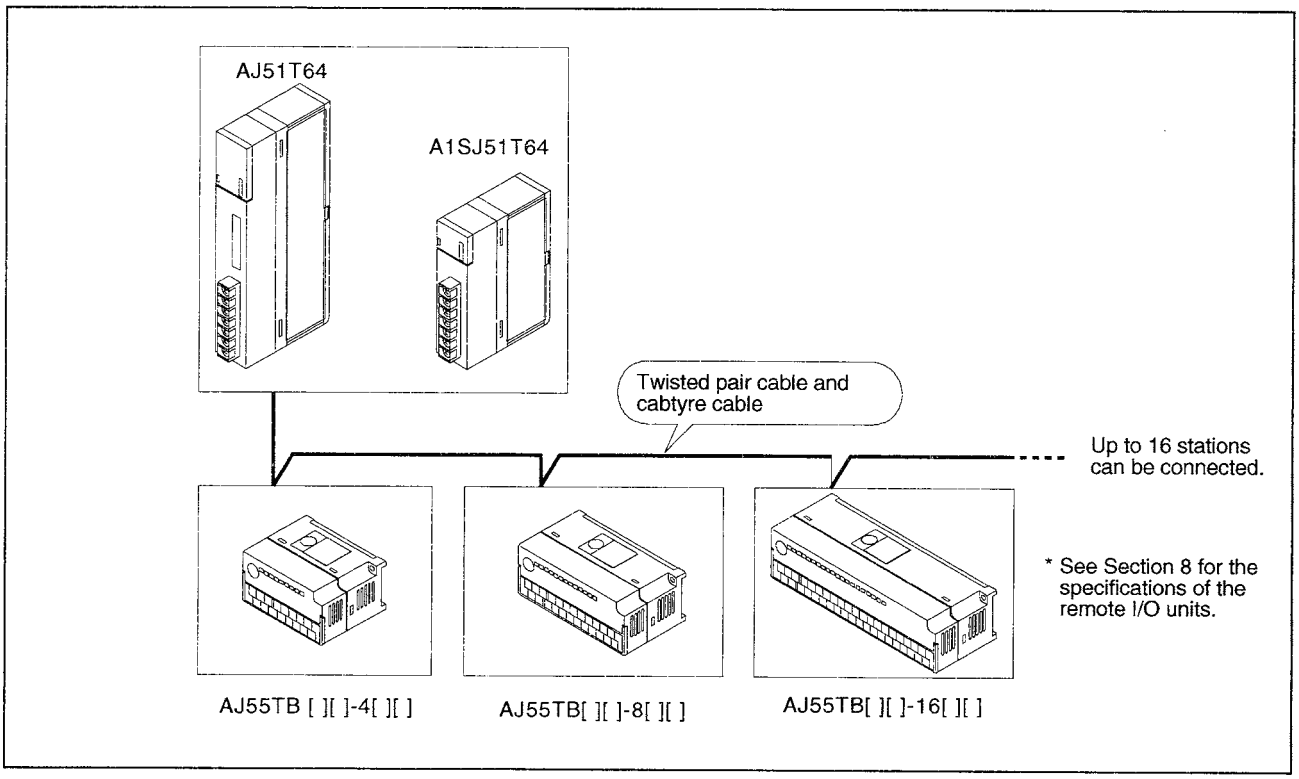
(2) Flexible connection
Bus connection allows T-junctions and makes terminal resistors unnecessary, so connection is flexible.

(3) Prevention of communication system malfunctions
Bus connection prevents the entire system from going down simply because one station is down.

(4) Programming is simple.
Programming is possible using X/Y devices only.

2. SYSTEM CONFIGURATION

2.1 System Configuration



(1) Applicable CPUs
The master modules can be used with the following PLC CPUs (including PLC CPUs with link functions).

(a) When using AJ51T64:

• A0J2CPU*1	• A0J2HCPU*1	• A1CPU
• A2CPU(S1)	• A3CPU	• A1NCPU
• A2NCPU(S1)	• A3NCPU	• A3MCPU
• A3HCPU	• A2ACPU(S1)	• A3ACPU
• A2UCPU(S1)	• A3UCPU	• A4UCPU
• A73CPU(S3)	• A81CPU	
• Q2ACPU(S1)	• Q3ACPU	• Q4ACPU

* When using the AJ51T64 in combination with one of the PLC CPUs marked *1, mount it to a type A6□B extension base unit.

(b) When using A1SJ51T64:

• A1SCPU(S1)	• A1SCPUC24-R2	• A1SJCPU(S3)
• A2SCPU(S1)	• A1SHCPU	• A1SJHCPU
• A2SHCPU(S1)	• A2ASCPU(S1)	
• A52GCPU(T21B)*2	• Q2ASCPU(S1)	• Q2ASHCPU(S1)

* When using the A1SJ51T64 in combination with one of the PLC CPUs marked *2, mount it to a type A1S6□B extension base unit.

(2) Number of modules that can be loaded
Any number of modules that does not exceed the number of I/O points of the applicable CPU can be used.

(3) Loading slot
The master module can be loaded into any slot of the base unit except in the following cases.
Note that the power capacity may become insufficient if the module is loaded onto an extension base unit without a power supply module (A1S52B(S1), A1S55B(S1), or A1S58B(S1)).
If loading the master module on an extension base unit that does not have a power supply module, select a power supply module, a main base unit, an extension base unit, and extension cable, by considering the following points.

1) Current capacity of the main base unit
2) Voltage drop in the main base unit
3) Voltage drop in the extension base unit
4) Voltage drop in the extension cable

(4) Data link system
The master module can be loaded at any master, local, or remote I/O stations in data link system.

(5) Network system
The master module can be mounted at any control, normal, master, or remote I/O station in the network system.

REMARK

For details on calculating the number of I/O units that can be loaded and the voltage drop, refer to the user's manual for the PLC CPU to be used.

2.2 Notes on Configuring a System

With an I/O link, consider the following points when designing the system to prevent erroneous inputs/outputs to/from the remote I/O units.

(1) Measures against erroneous input and output when the power is turned ON or OFF

(a) When turning on the power

Recommendation 1: Switch ON both the power supply to the remote I/O unit and the external power supply to the master module before switching ON the power supply to the PLC CPU.

Recommendation 2: Simultaneously switch on the power supplies of the remote I/O unit and the master module and the power supply to the PLC CPU.

(b) When turning off the power supply

Recommendation 1: Switch off the power supply to the PLC CPU before switching off both the power supply to the remote I/O unit and the external power supply to the master module.

Recommendation 2: Simultaneously switch off the power supply to the remote I/O unit, the power supply to the PLC CPU, and the external power supply to the master module.

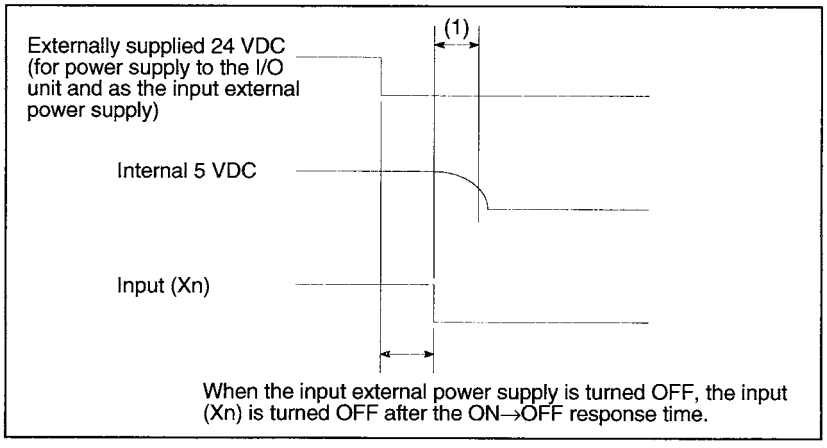
(2) Measures against erroneous input due to momentary power interruption

Erroneous input may occur if the power to a remote I/O unit is momentarily interrupted.

(a) Cause
The hardware of the remote I/O units internally converts the 24 VDC power supply for the I/O unit into 5 V DC before use.
If a momentary power interruption occurs at a remote I/O unit, the following condition applies:

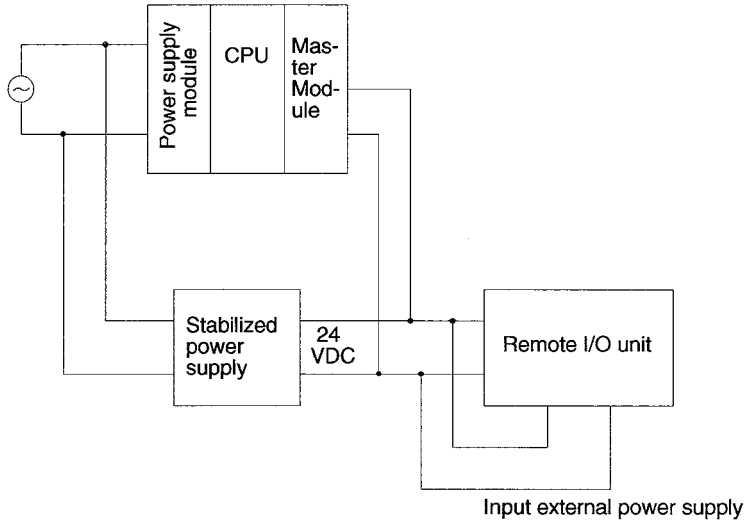
(Time lapse until the internal 5 VDC of the remote I/O unit is turned OFF) < (ON→OFF response time of the I/O unit).

This will cause erroneous input if an I/O refresh occurs during period (1) as shown in the chart below.



When the input external power supply is turned OFF, the input (Xn) is turned OFF after the ON→OFF response time.

(b) Measures against erroneous input
Connect the power supply module and the stabilized power supply to the same power supply.



3. SPECIFICATIONS

This section gives the general specifications and performance specifications.

3.1 General Specifications

Table 3.1 gives the general specifications of A-series programmable controllers.

Table 3.1 General Specifications

<table>
<tr><th>Item</th><th colspan="5">Specifications</th></tr>
<tr><td>Operating ambient temperature</td><td colspan="5">0 to 55°C</td></tr>
<tr><td>Storage ambient temperature</td><td colspan="5">-20 to 75°C</td></tr>
<tr><td>Operating ambient humidity</td><td colspan="5">10 to 90 %RH, no dewing</td></tr>
<tr><td>Storage ambient humidity</td><td colspan="5">10 to 90 %RH, no dewing</td></tr>
<tr><td rowspan="3">Vibration resistance</td><td rowspan="3">Conforms to *2 JIS C 0911</td><td>Frequency</td><td>Acceleration</td><td>Amplitude</td><td>Sweep Count</td></tr>
<tr><td>10 to 57 Hz</td><td>——</td><td>0.075 mm (0.003 in.)</td><td rowspan="2">10 times *1(1 octave/minute)</td></tr>
<tr><td>57 to 150 Hz</td><td>9.8 m/s^2(1 g)</td><td>——</td></tr>
<tr><td>Shock resistance</td><td colspan="5">Conforms to JIS C 0912 (15 g x 3 times in 3 directions) *2</td></tr>
<tr><td>Noise durability</td><td colspan="5">By noise simulator at 1500 Vpp noise voltage, 1 μs noise width and 25 to 60 Hz noise frequency</td></tr>
<tr><td>Withstanding voltage</td><td colspan="5">1500 VAC for 1 minute across AC external terminals and ground
500 VAC for 1 minute across DC external terminals and ground</td></tr>
<tr><td>Insulation resistance</td><td colspan="5">5 MΩ or greater measured with 500 VDC insulation resistance tester across AC external terminals and ground</td></tr>
<tr><td>Grounding</td><td colspan="5">Class 3 grounding. If proper grounding impossible, connect the grounding wire to the panel.</td></tr>
<tr><td>Operating atmosphere</td><td colspan="5">Free of corrosive gases. Dust should be minimal.</td></tr>
<tr><td>Cooling method</td><td colspan="5">Self-cooling</td></tr>
</table>

REMARKS

*1 One octave means a change from the initial frequency to double or half frequency.
For example, all of the following are changes of one octave: 10 Hz to 20 Hz, 20 Hz to 40 Hz, 40 Hz to 20 Hz, and 20 Hz to 10 Hz.

*2 JIS stands for Japan Industrial Standards.

3.2 Performance Specifications

The Performance specifications of the MELSEC-I/O LINK (Master Module) are listed below.

Table 3.2 Performance Specifications

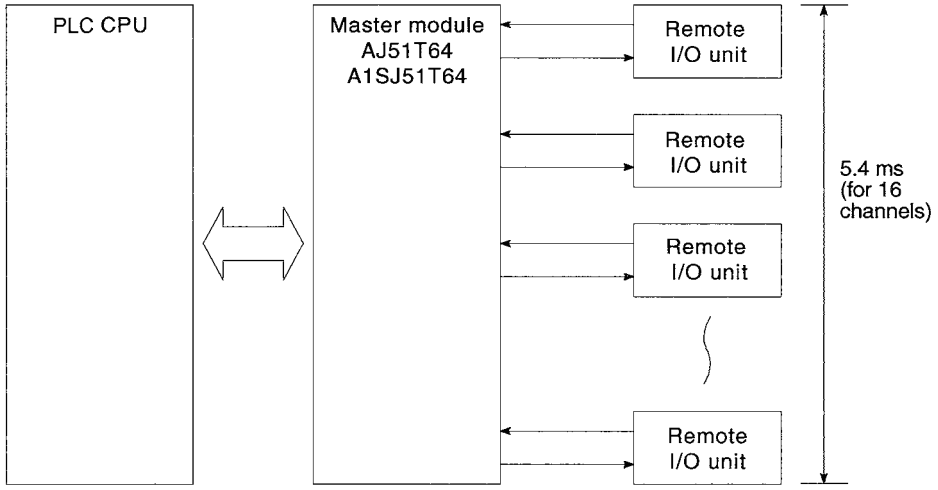
Items		Specifications	
		AJ51T64	A1SJ51T64
Max. number of control I/O points		128 points (if the same numbers are used for X and Y.)	
I/O refresh time		Approx. 5.4 ms (regardless of the number of points)	
Communication cable		0.75 mm^2 or larger twisted pair cable 0.75 mm^2 or larger cabtyre cable	
Communication specifications	Communication speed	38400 bps	
	Communication method	Register insertion method	
	Synchronization method	Combination of frame synchronization and bit synchronization methods	
	Error control system	Parity check	
	Transmission channel	Bus (T-junctions possible, terminal resistors unnecessary)	
	Transmission distance	Overall distance: 200 m (656 ft.)	
	Max. number of remote I/O units connectable as stations	16 stations per master module	
Error (RUN) indication/output		Indication by LEDs The PC CPU detects errors as "blown fuse". External output with RUN A/RUN B	
Number of occupied I/O points		64 points (I/O allocation: 64 output points)*	
External power supply voltage		21.6 to 27.6 VDC (for the transmission channel)	
External power supply current consumption		90 mA (TYP 24 VDC)	
Internal current consumption (5 VDC)		115 mA	115 mA
Weight (kg)[lb]		0.35 [0.77]	0.3 [0.66]

* If only a few remote I/O units are used, perform I/O allocation with a peripheral device to decrease the number of occupied I/O points to 16, 32, or 48.

For details on the noise durability, dielectric withstand voltage, insulation resistance, etc., of a PLC system that uses the AJ51T64/A1SJ51T64, refer to the power supply module specifications in the CPU module User's Manual.

REMARK

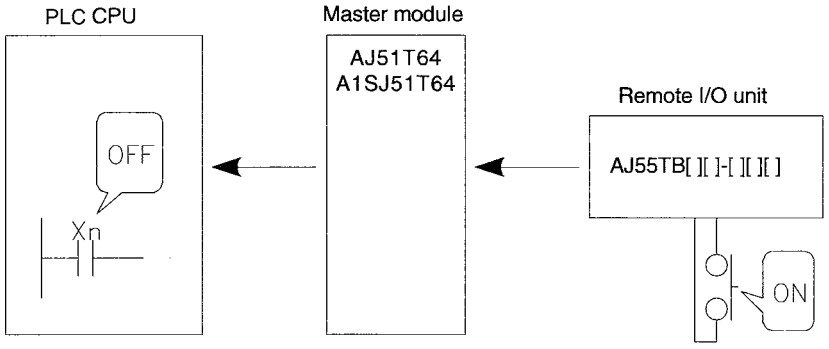
The following is a schematic illustration explaining the system of communication. The illustration shows that the PLC CPU and master module always communicate to each other the I/O data received from and to be sent to the 16 stations.



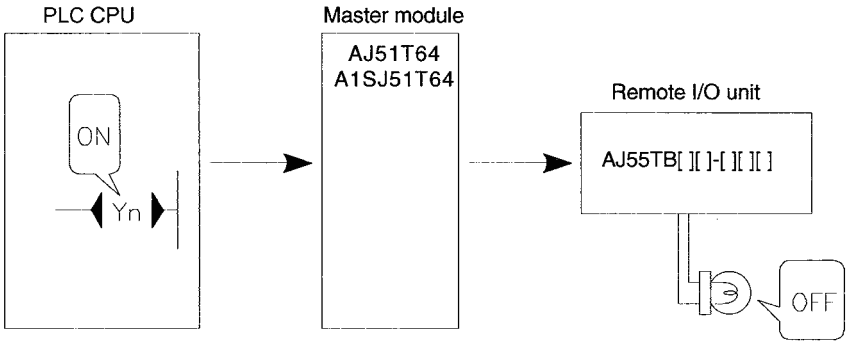
3.3 Handling of I/O Data of Faulty Stations

All I/O data of a remote I/O unit that has become a faulty station due to a disconnection or other problem is "OFF".

[Input]



[Output]



3.4 Cable Specifications

This section gives the specifications of the twisted pair cables and the cabtyre cables.

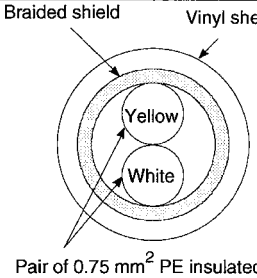
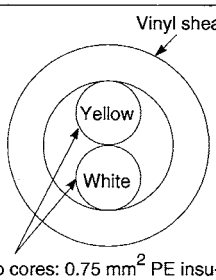
(1) Cable specifications
Table 3.3 shows the specifications of the twisted pair cables and cabtyre cables.

Table 3.3 Cable Specifications

Item	Specifications	
Cable type	Shielded twisted pair cable	Cabtyre cable
Logarithm	0.75 mm^2 x 1P	0.75 mm^2 x 2C
Conductor resistance (20 °C)	29 Ω/km or less	
Electrostatic capacity (1 kHz)	75 nF/km or less	——
Characteristic impedance (100 kHz)	100 Ω on the average	——
Insulation resistance	500 MΩ/km or greater	
Withstanding voltage	500 VDC/minute or greater	
Outside dimensions	ϕ8.5 mm or smaller	ϕ9 mm or smaller

(2) Recommended cables
This section gives the model names, specifications, and manufacturers of the recommended cables.

Table 3.4 Recommended Cables

Item	Specifications	
Model	KNPEV-SB 0.75SQ x 1P	KNEV-SB 0.75SQ x 2C
Cable type	Shielded twisted pair cable	Unshielded cabtyre cable
Logarithm	0.75 mm^2 x 1P	0.75 mm^2 x 2C
Conductor resistance (20 °C)	26.3 Ω/km or less	
Electrostatic capacity (1 kHz)	60 nF/km or less	——
Characteristic impedance (100 kHz)	90 Ω on average	——
Insulation resistance	10,000 MΩ/km or greater	
Withstanding voltage	1000 VAC	
Cross-section	 Pair of 0.75 mm^2 PE insulated conductors	 Two cores: 0.75 mm^2 PE insulated conductors
External dimensions	ϕ7.5 mm or less	ϕ7 mm or less

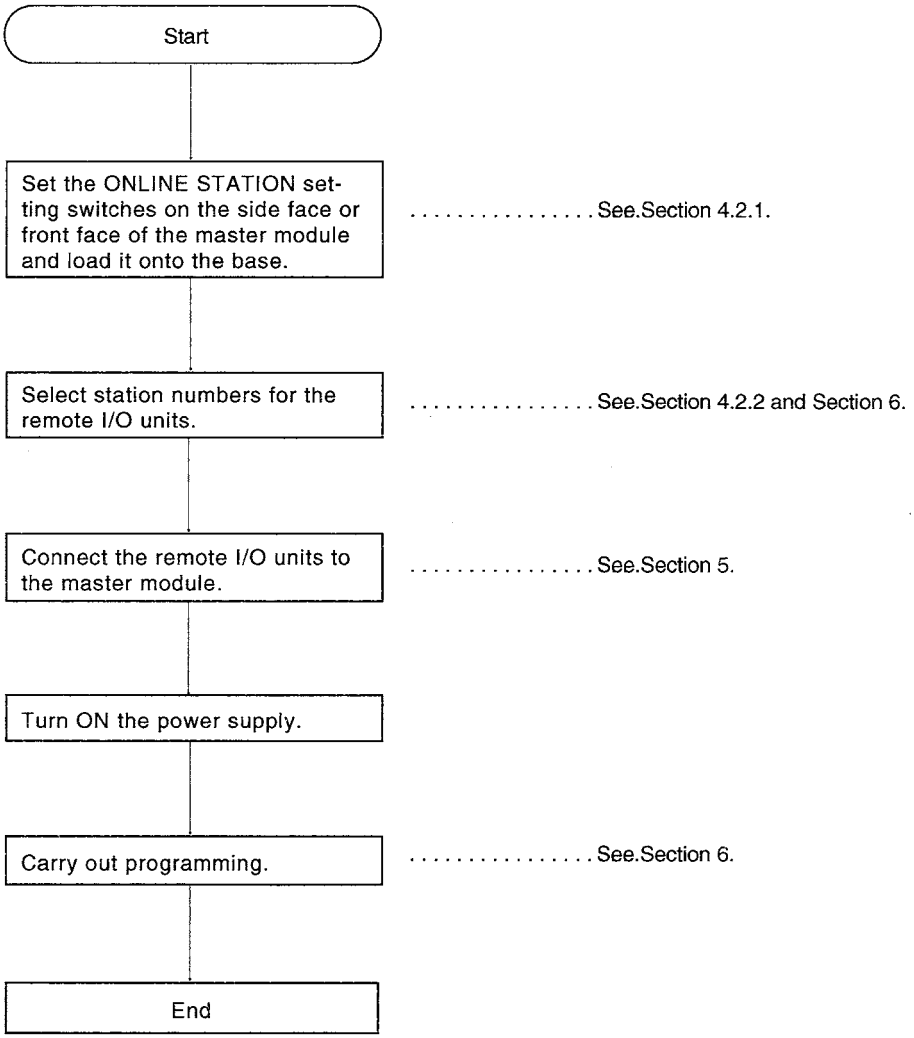
The following are the other recommended cables and their manufacturers.

Model	Type
SPEV(SB)-0.75-1P	Shielded twisted pair (1P)
KMPEV-SB CWS-178 0.75SQ x 1P	Shielded twisted pair (1P)
2PNCT 0.75SQ x 2C	Two-core cabtyre
DPEV SB 0.75 x 1P	Shielded twisted pair (1P)
VCT 0.75 x 2C	Two-core cabtyre
D-KPEV-SB 0.75 x 1P	Shielded twisted pair (1P)
IPEV-SB 1P x 0.75	Shielded twisted pair (1P)

4. PRE-OPERATION SETTINGS AND PROCEDURES

4.1 Pre-Operation Procedures

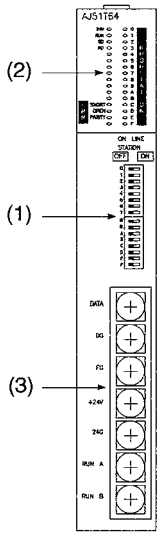
The following flowchart shows the pre-operation settings and procedures.



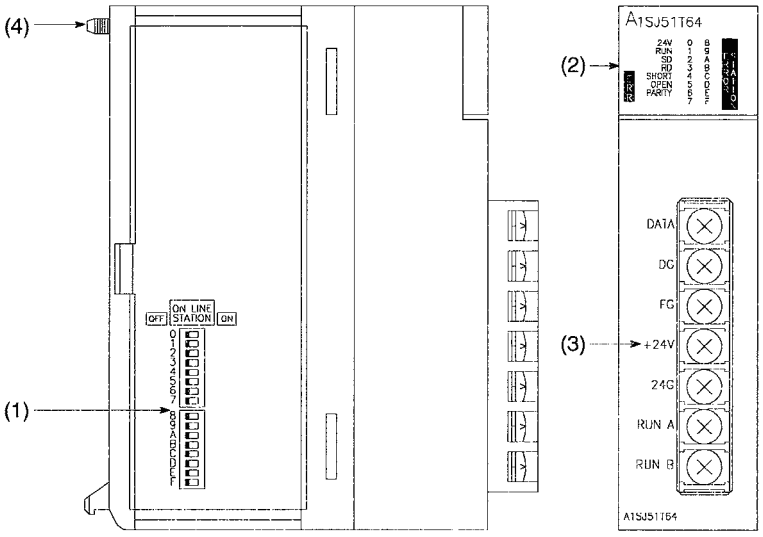
4.2 Nomenclature and Settings

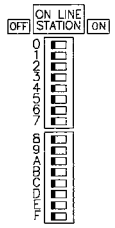
4.2.1 Master module

(1) AJ51T64

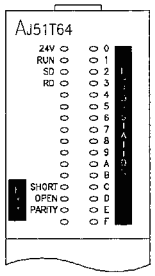


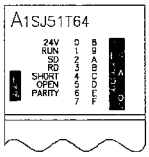
(2) A1SJ51T64



<table>
<tr><th>No.</th><th>Name and Appearance</th><th colspan="4">Description</th></tr>
<tr><td>(1)</td><td>ON LINE STATION
 
</td><td colspan="4">Select station numbers for the connected remote I/O units. (Factory setting: all ON)
"0" to "F" in the drawing to the left represent the 16 station numbers.

ON : Communication performed (with error check)
OFF: Communication not performed (no error check)

* To prevent communication errors, turn OFF the station number switches for the unconnected station numbers.</td></tr>
<tr><td>(2)</td><td>LED
 

 
</td><td colspan="4"><table>
<tr><th>Name</th><th></th><th>LED status</th><th>Description</th></tr>
<tr><td rowspan="2">24 V</td><td></td><td>ON</td><td>External power supply voltage (24 VDC) is normal.</td></tr>
<tr><td></td><td>OFF</td><td>External power supply voltage (24 VDC) is insufficient.</td></tr>
<tr><td rowspan="2">RUN *1</td><td></td><td>ON</td><td>All data received from the remote I/O units activated with the ONLINE STATION switches is normal.</td></tr>
<tr><td></td><td>OFF</td><td>Abnormal data has been received from a remote I/O station ("SHORT", "OPEN", or "PARITY" error has occurred). Meanwhile, communication is continued with normal stations.</td></tr>
<tr><td>SD</td><td></td><td>ON</td><td>Data is being transferred</td></tr>
<tr><td>RD *2</td><td></td><td>ON</td><td>Data is being received.</td></tr>
<tr><td rowspan="3">ERR.</td><td>SHORT</td><td>ON</td><td>Short between DATA and DG.</td></tr>
<tr><td>OPEN</td><td>ON</td><td>Disconnection in transmission line, faulty remote I/O station, or power (24 VDC) OFF.</td></tr>
<tr><td>PARITY</td><td>ON</td><td>Abnormal data has been received from a remote I/O station.</td></tr>
<tr><td>ERROR STATION</td><td>0 to F</td><td>ON</td><td>Indicates the station number of the remote I/O unit with which communication is not possible</td></tr>
</table></td></tr>
</table>

*1: The RUN "OFF" status can also be confirmed with "Blown Fuse (M9000, D9000, and D9100 to 9107)" at the PLC CPU.

M9000..... RUN status (blown fuse detected)
(SM60)*

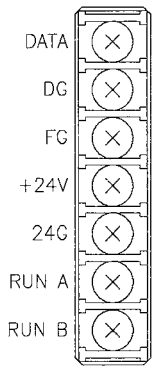
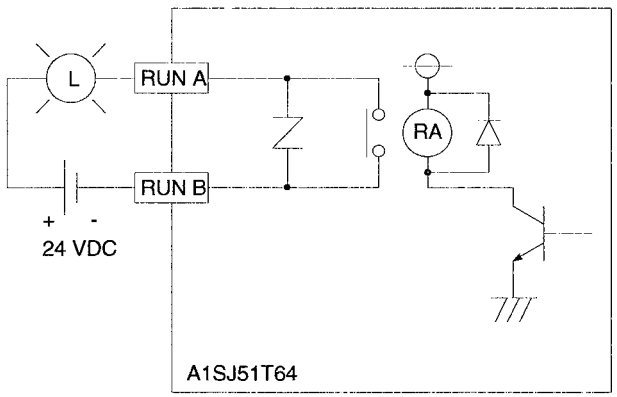
D9000..... First I/O No. of master module (module No. with blown fuse)
(SD60)*

D9100 to 9107 ..... Module No. with blown fuse (details)
(SD1300 to SD1307)*

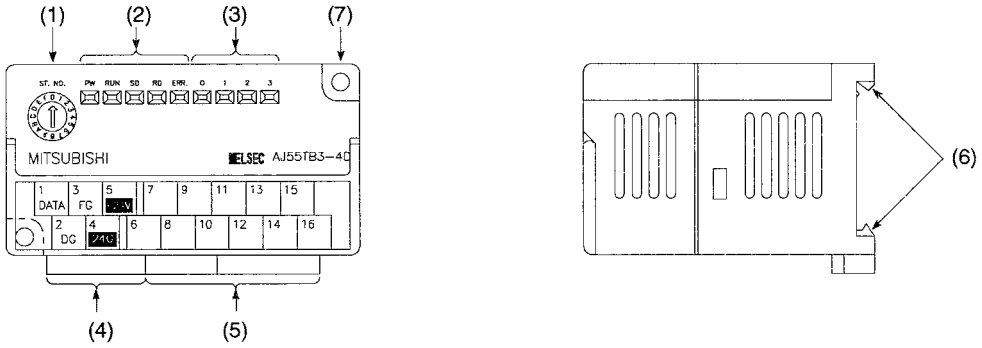
* : Special relays/special registers when using QnACPU

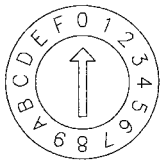
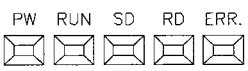
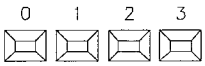
Note: This does not enable identification of remote I/O modules that are down.

*2: The brightness of RD differs according to the number of connected stations. (The fewer the stations, the dimmer it is.)

<table>
<tr><th>No.</th><th>Name and Appearance</th><th colspan="5">Description</th></tr>
<tr><td rowspan="15">(3)</td><td rowspan="15">Terminal block
 
</td><td colspan="5">For connecting signals, a power supply, and RUN output to the module.
(Size: M4, clamp torque: 100 to 137 N·cm (10 to 14 kg·cm) [8.8 to 12.32 lb·inches]</td></tr>
<tr><td>Name</td><td colspan="4">Description</td></tr>
<tr><td>DATA</td><td colspan="3">Data</td><td rowspan="5">See Section 5 "CONNECTION OF THE MASTER MODULE TO REMOTE I/O UNITS" for details of connection.</td></tr>
<tr><td>DG</td><td colspan="3">Data ground</td></tr>
<tr><td>FG</td><td colspan="3">Frame ground</td></tr>
<tr><td>+24 V</td><td colspan="3">Power supply for 24 VDC transmission (positive)</td></tr>
<tr><td>24 G</td><td colspan="3">Power supply for 24 VDC transmission (negative)</td></tr>
<tr><td>RUN A
RUN B</td><td colspan="4">External output determining the ON/OFF status of RUN LED
ON : RUN LED lit
OFF : RUN LED unlit</td></tr>
<tr><td rowspan="12">Specifications</td><td colspan="2">Output type</td><td colspan="2">Contact output</td></tr>
<tr><td colspan="2">Insulation method</td><td colspan="2">Relay insulation</td></tr>
<tr><td colspan="2">Rated load voltage and current</td><td colspan="2">24 VDC (resistance load), 240 VAC (COSϕ=1), 2 A/point</td></tr>
<tr><td colspan="2">Min. switching load</td><td colspan="2">5 VDC 1mA</td></tr>
<tr><td colspan="2">Max. switching voltage</td><td colspan="2">250 VAC 110 VDC</td></tr>
<tr><td rowspan="2">Response time</td><td>OFF→ON</td><td colspan="2">10 ms or less</td></tr>
<tr><td>ON→OFF</td><td colspan="2">12 ms or less</td></tr>
<tr><td rowspan="4">Life</td><td>Mechanical</td><td colspan="2">20 million operations or more</td></tr>
<tr><td rowspan="3">Electrical</td><td colspan="2">100 thousand operations or more at the rated switching load and switching voltage</td></tr>
<tr><td colspan="2">100 thousand operations or more at 200 VAC and 1.5 A, or 240 VAC or 1 A (COSϕ=0.7)</td></tr>
<tr><td colspan="2">100 thousand operations or more at 200 VAC and 1 A, or 240 VAC and 0.5 A (COSϕ=0.35)</td></tr>
<tr><td colspan="2">Max. switching frequency</td><td colspan="2">3600 times/hour</td></tr>
<tr><td colspan="2">Surge suppressor</td><td colspan="2">Varistor</td></tr>
<tr><td>External connection</td><td colspan="4"> 
</td></tr>
</table>

4.2.2 Remote I/O Unit (AJ55TB[ ][ ]-[ ][ ])



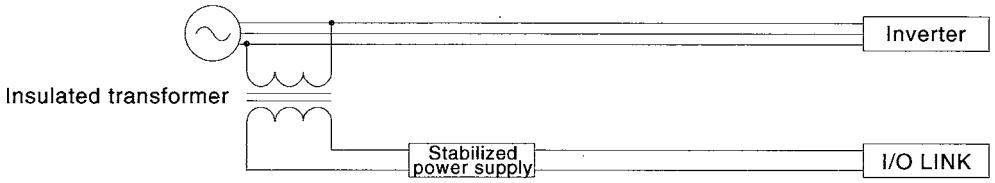
No.	Name and Appearance	Description		
(1)	STATION No. 	For selecting a station number between 0 and F. (Factory setting: 0) Also, set the ONLINE STATION setting switches on the master module to prevent errors at the unconnected station numbers. (See Section 4.2.1 for details.)		
(2)	LED 	**Name**	**LED status**	**Description**
		PW	ON	Internal 5 V source from the external power supply is normal.
			OFF	Internal 5 V source from the external power supply is abnormal.
		RUN	ON	Data reception from the master module is normal.
			OFF	Data reception from the master module is abnormal.
		SD	ON	Data is being transferred to the master module.
		RD	ON	Data is being received from the master module.
		ERR.	ON	Data received from the master module is abnormal.
(3)	LED 	Indicate the input/output status.		
(4)	Terminal block	For connecting signals and a power supply to the module. (Size: M3, clamp torque: 39 to 59 N·cm {4 to 6 kg·cm} [3.4 to 6.1 lb·inches])		
		Name	**Description**	
		DATA	Data	Refer to Section "5 CONNECTION OF THE MASTER MODULE TO REMOTE I/O UNITS" for details of connection.
		DG	Data ground	
		FG	Frame ground	
		+24 V	Power supply for transmitting 24 VDC (positive)	
		24 G	Power supply for transmitting 24 VDC (negative)	
(5)	Terminal block	For connection to receive/send input/output signals (Size: M3, clamp torque: 39 to 59 N·cm {4 to 6 kg·cm} [3.4 to 6.1 lb·inches]) Refer to Section 7 "SPECIFICATIONS OF REMOTE I/O UNITS" for details of connection.		
(6)	DIN rail mounting hooks	Hooks for mounting the unit on a DIN rail		
(7)	Unit mounting hole	Hole for mounting the unit on a panel (Size: M4, clamp torque: 78 to 118 N·cm {8 to 12 kg·cm} [6.9 to 10.4 lb·inches])		

5. CONNECTION OF THE MASTER MODULE TO REMOTE I/O UNITS

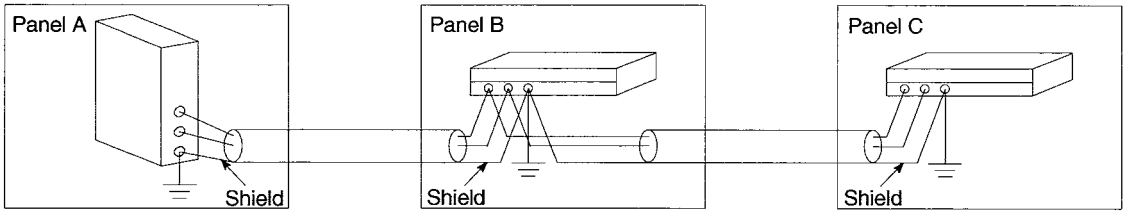
5.1 Notes on Connection

In order to prevent unnecessary noise trouble, design the system with the following considerations paid to the communication lines and grounding lines of the I/O link.

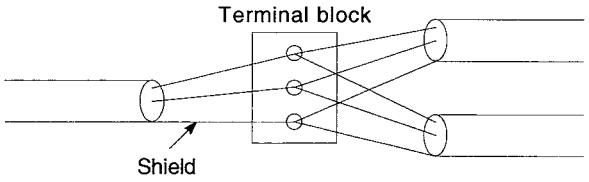
(1) The power supply feeding the stabilized power supply of the I/O link must be in a separate system from the power lines for motors and inverters, or separated by an insulated transformer.



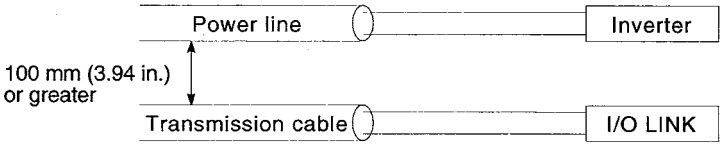
(2) In cases where equipment that generates high-frequency noise - such as an inverter - is installed in the same panelst, use twisted-pair cable for the transmission cables, and ground the wire shielding at the modules at both ends. (See Section (4).)



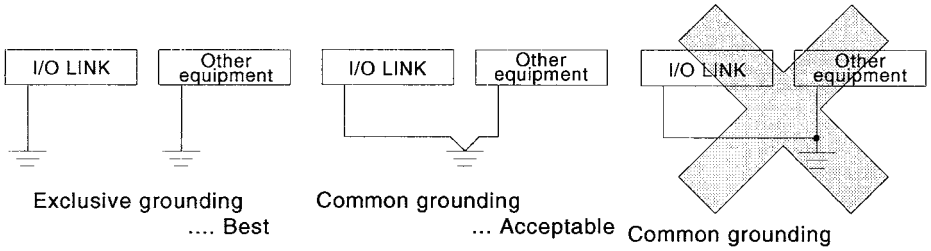
At T branches, connect the shielding with a terminal block. The shielding does not have to be grounded here.



(3) Keep transmission lines away from high-voltage power lines.
If they must be run close together, separate them with a steel shield.



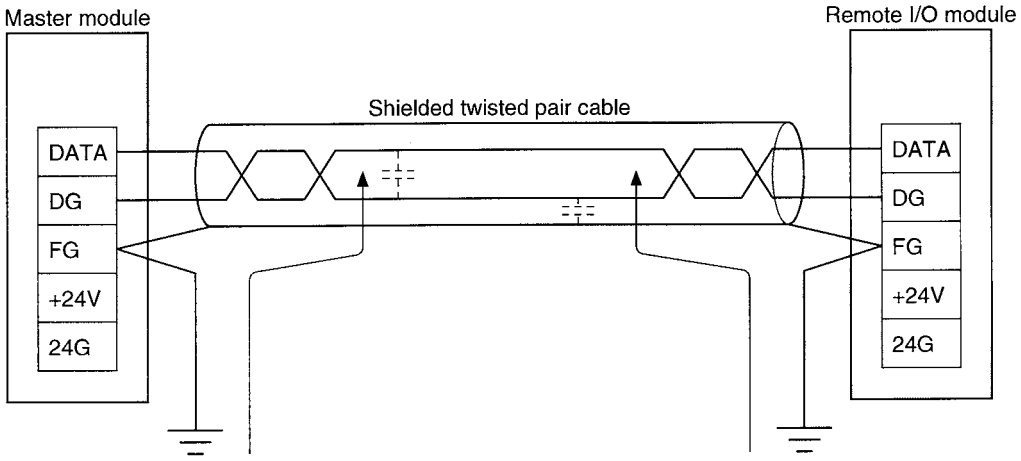
(4) Make the grounding wire connected to the FG terminal as thick as possible (2.0 mm^2).
Carry out grounding as shown below. In particular, avoid common grounding with equipment that generates high-frequency noise.



⚠ CAUTION

- If the 24 VDC is mistakenly applied to a signal line (DATA, DG), the module will be destroyed. Be sure to check that the connections are correct before turning on the external power supply (24 VDC).

(5) Precautionary notes when grounding the twisted pair cable shield
When the shield of a shielded transmission cable is grounded, the transmission waveform may be affected by the ground condition, and communication errors may be generated in long-distance systems.
This phenomenon is caused by the connection between the ground and transmission signals at a high frequency via a condenser due to the static electricity capacity held between the shield and transmission cable. This becomes more likely to occur as the transmission distance gets longer, since the static electricity capacity increases.
This phenomenon may also occur when only one side of the shield is grounded.



* There will be no effects from the ground if a cab tire cable is used, since it has no shield.

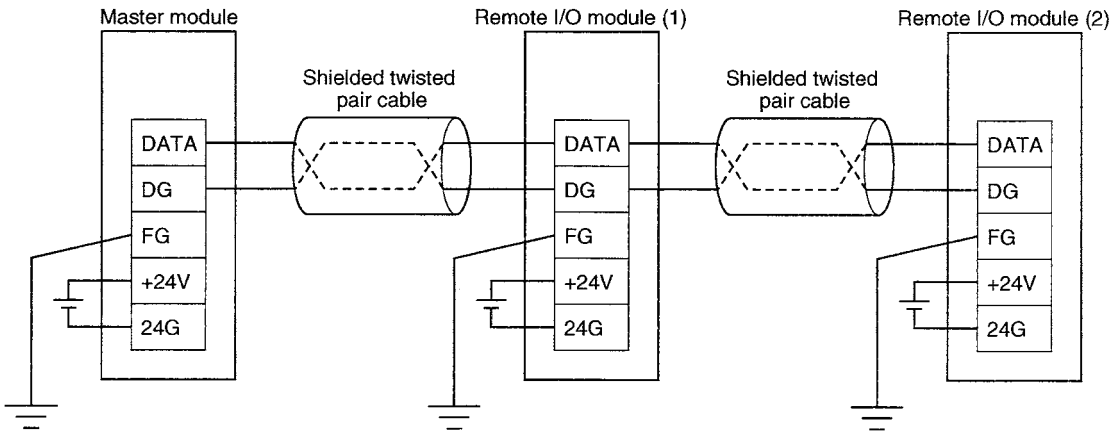
(a) Shield treatment

Effects from the grounded shield are dependent on the number of remote I/O modules connected and overall distance.
Do not ground the shield if your system has a configuration in which the combination of number of remote I/O modules connected and overall distance is as shown in the table below.

Number of remote I/O modules connected	Overall distance range where grounding of shield should be avoided
1	—
2	150 m (492.15 ft.) or more
3	130 m (426.53 ft.) or more
4	110 m (360.91 ft.) or more
5	100 m (328.1 ft.) or more
6	90 m (295.29 ft.) or more
7	85 m (278.89 ft.) or more
8	75 m (246.08 ft.) or more
9	70 m (229.67 ft.) or more
10	65 m (213.27 ft.) or more
11	60 m (196.86 ft.) or more
12	
13	55 m (180.46 ft.) or more
14	
15	
16	50 m (164.05 ft.) or more

The number of modules indicated in the "number of remote I/O modules" is not the number of stations.

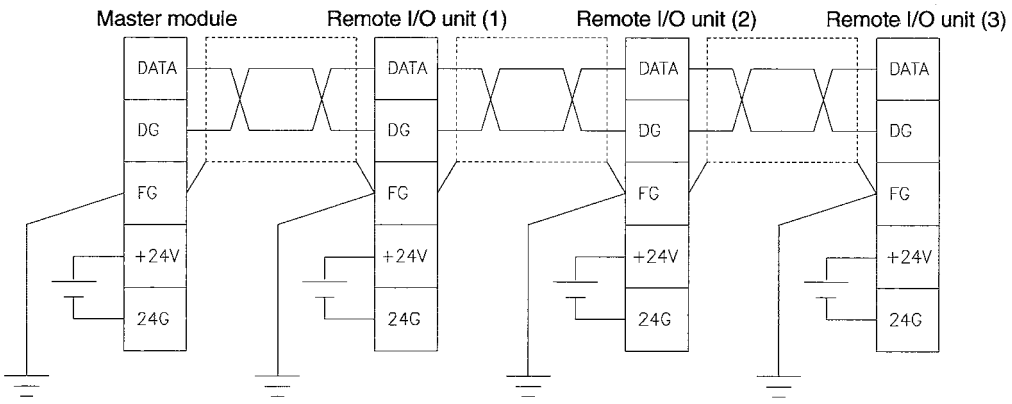
(b) Cable wiring



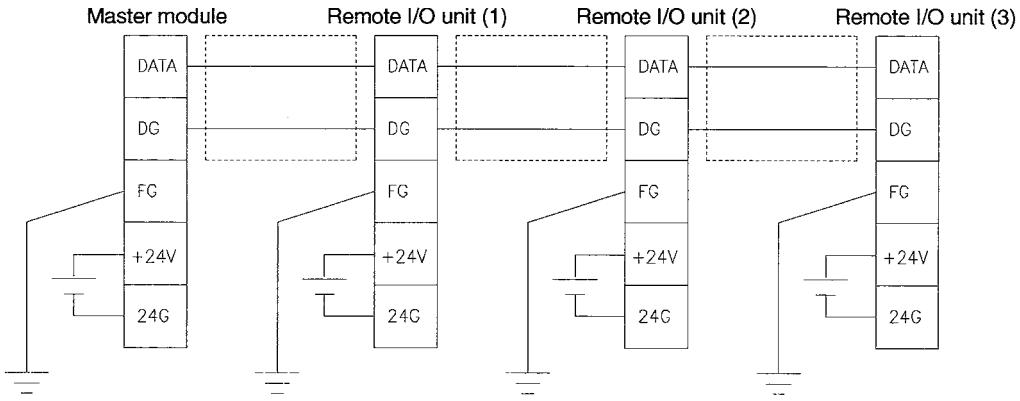
5.2 Connections

The connection methods when using twisted pair cable and when using cabtyre cable are shown below.

(1) Connection with twisted pair cables

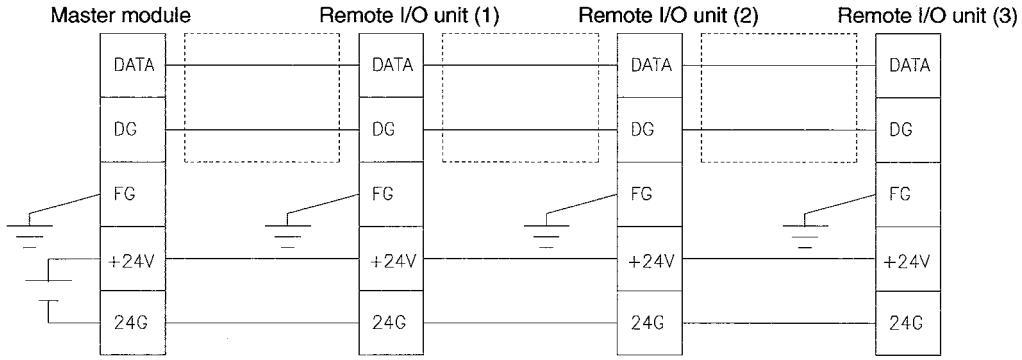


(2) Connection with cabtyre cables



REMARK

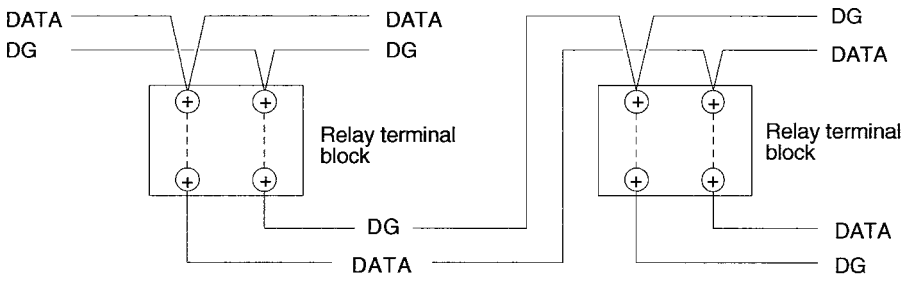
If one power supply provides power to multiple units, make sure that each unit receives sufficient voltage.



POINT

Connection methods using T-junctions are shown below.

Method for branching in the middle of a transmission line



It is possible to branch the transmission line again in another T-junction after it has already been branched once.
(However, note that the maximum overall line length is 200 m (656 ft.).)

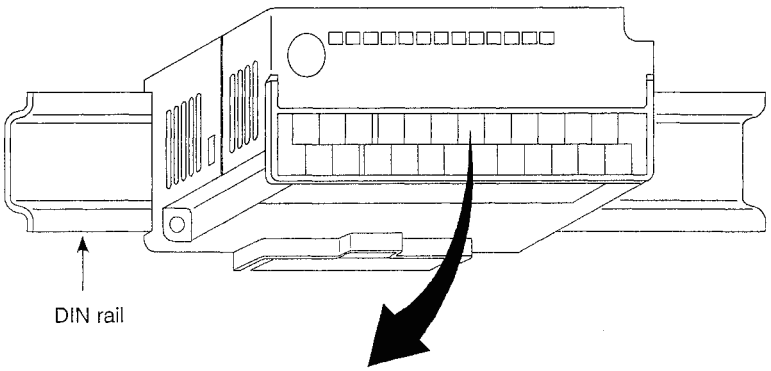
5.3 Mounting a Remote I/O Unit on a DIN Rail

This section describes how to mounting a remote I/O unit on a DIN rail.

(1) Mounting procedure

(a) Engage the groove of the upper hook with the upper rail flange by lowering the unit onto the rail.

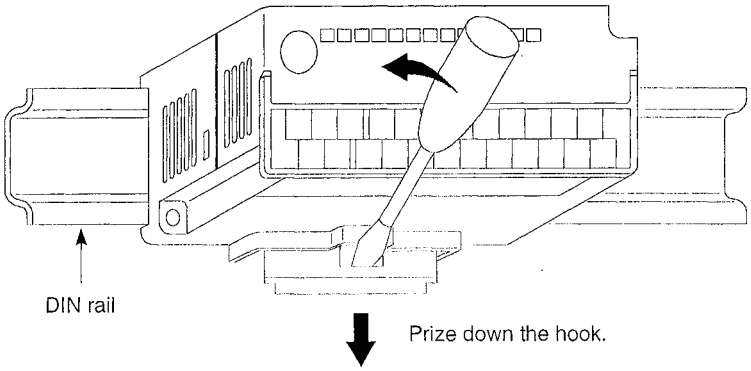
(b) Push the unit onto the rail and hook the lower hook onto the lower rail flange.



(2) Removal procedure

(a) Prize down the hook on the bottom of the unit with a flat-tipped screwdriver.

(b) Pull the unit off the rail while the hook is pulled down.



POINT

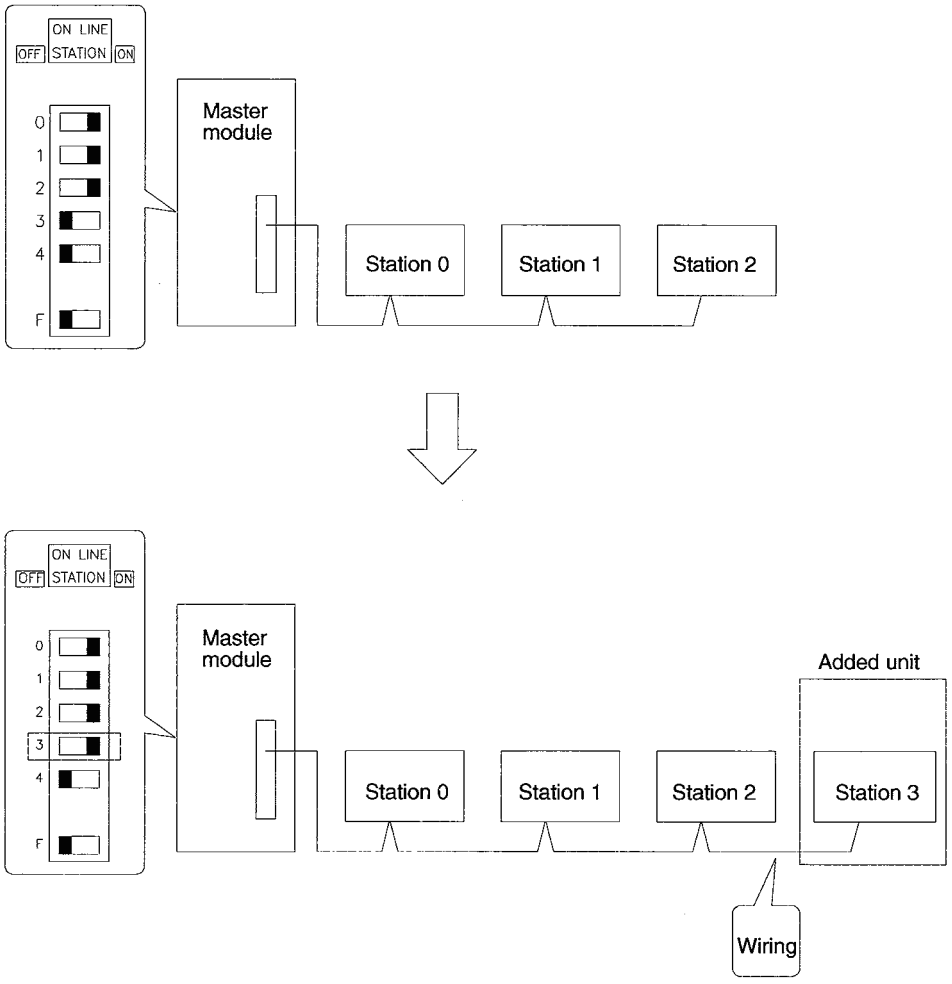
The remote I/O module requires heat radiation. Therefore, it has to be installed on the panel in the above installation direction to ensure ventilation. Do not install it in other direction.

5.4 Adding Remote I/O Units to an Existing System

This section explains how to add remote I/O units to an existing system.

Three-step procedure

(1) Connect a cable to the remote I/O unit to be added.
(2) Select a station number for the remote I/O unit.
(3) Set the ONLINE STATION setting switches of the master module.



6. SETTING STATION NUMBERS AND PROGRAMMING

This section describes how to set station numbers for and program control of remote I/O units.

6.1 Setting a Station Number

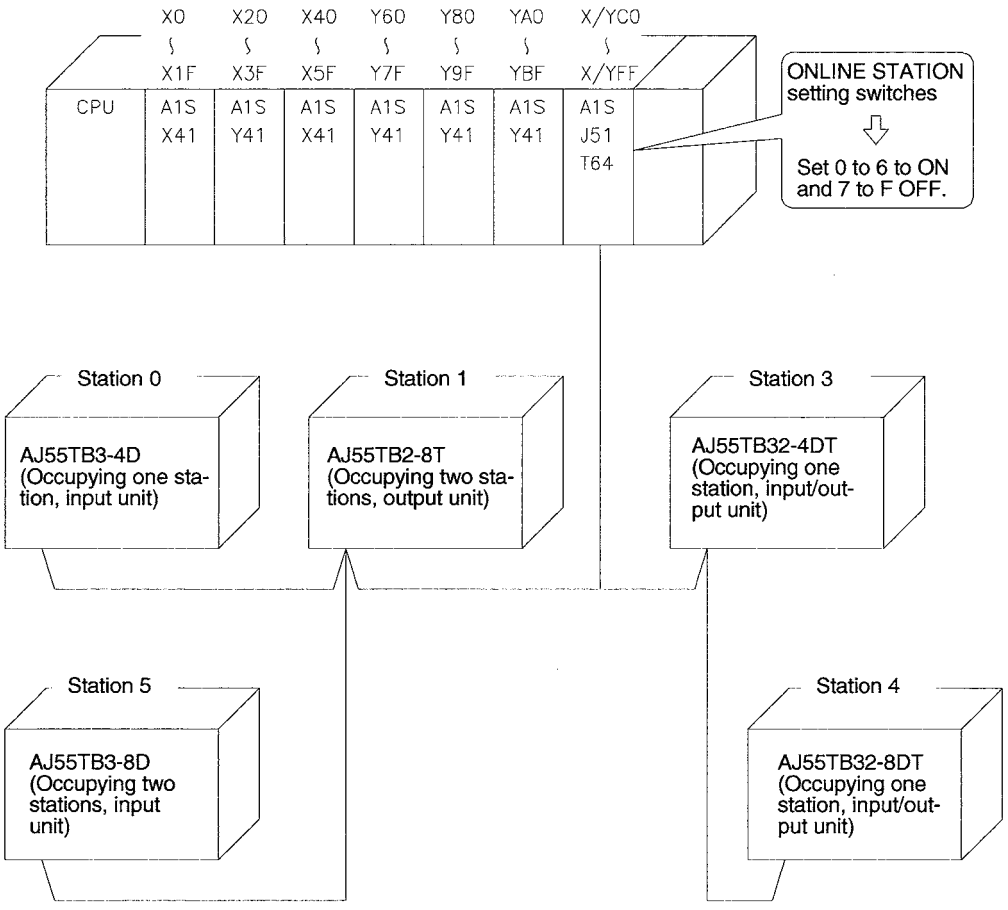
(1) Select a station number between 0 to F.
Station numbers do not have to be select in the order of connection.
Do not assign the same number to multiple units.

(2) Set the ONLINE STATION setting switches accordingly.

6.2 Programming

The addresses used in a sequence program are determined by the I/O numbers of the master station and the station numbers of the remote I/O units. The I/O numbers of the master station are assigned the head addresses while the station numbers of the remote I/O units are sequentially assigned the following addresses.

[Example system configuration]



The following chart shows the addresses assigned to remote I/O units.

Station No. of each remote I/O unit	Addresses (hexadecimal notation)	Device X	Device Y	Remark
0	C0 1 2 3			AJ55TB3-4D (input 4-point unit)
1	4 5 6 7			AJ55TB2-8T (output 8-point unit)
2	8 9 A B			
3	C D E F			AJ55TB32-4DT (input 2-point/output 2-point unit) (4-point I/O combination units can use the first half two X and Y points only, not the second half two points.)
4	D0 1 2 3			AJ55TB32-8DT (input 4-point/output 4-point unit)
5	4 5 6 7			AJ55TB3-8D (input 8-point unit)
6	8 9 A B			
	C			

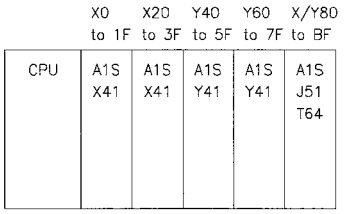
The device used is indicated by ▒.

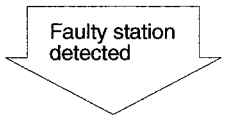
REMARK

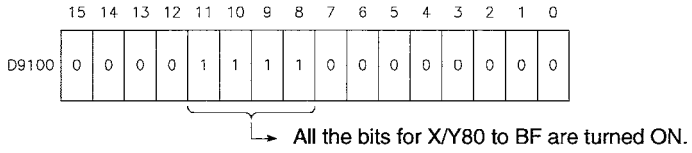
Separate comments be assigned to X and Y devices with the same address (such as X10 and Y10) by using the extension comment function.

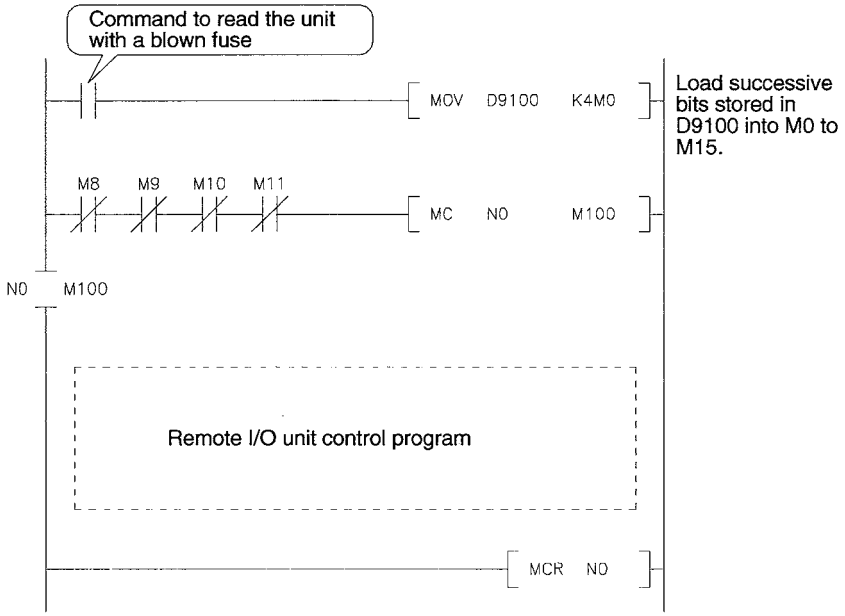
POINT

The following is an example of a program to suspend communication with all remote I/O units if even one station becomes a faulty station.









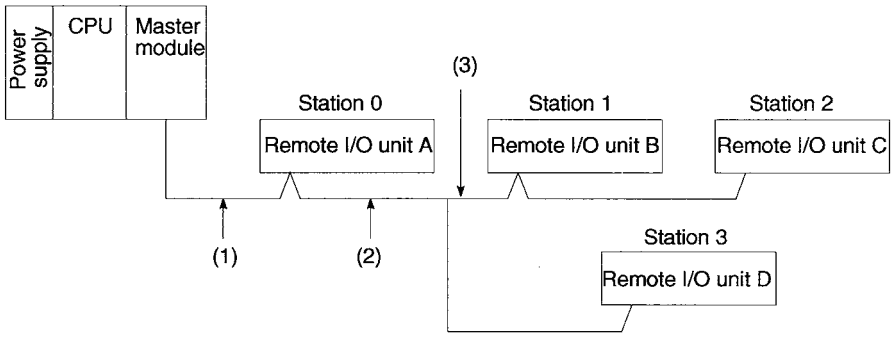
7. TROUBLESHOOTING

This section describes how to troubleshoot communication problems (when input cannot be received or output cannot be sent).

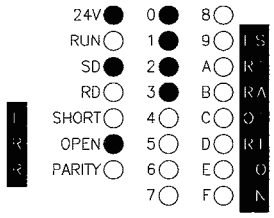
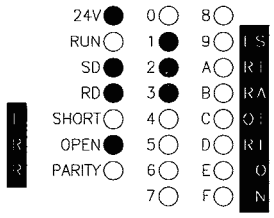
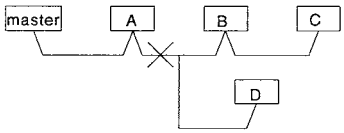
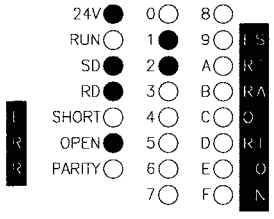
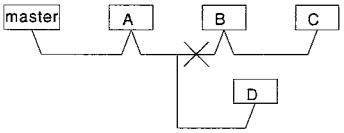
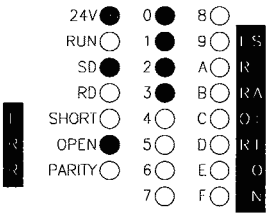
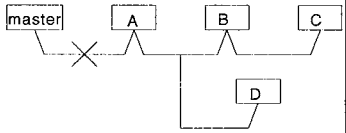
Location	Condition	Corrective action
LED of the master module	"24 V" is OFF.	Apply a voltage of 21.6 to 27.6 VDC to "+24, 24G".
	"RUN" is OFF.	Abnormal communication has occurred with a remote I/O unit that was assigned a station number with ONLINE STATION setting switches. Identify the cause with the "SHORT", "OPEN", and "PARITY" indicators.
	"SHORT" is ON.	Check the cable for a short between DATA and DG.
	"OPEN" is ON.	Check for disconnection in a signal line (DATA or DG). Also check if the power supply to any remote I/O unit is OFF. Identify the faulty station with "ERROR STATION".
	"PARITY" is ON.	Consider the possibility of noise interference since data received from a remote I/O unit is abnormal.
	A LED between "0" and "F" of the ERROR STATION is ON.	Check the remote I/O unit corresponding to the LED.
ONLINE STATION setting switches of the master module	One of the switches for a connected remote I/O unit is OFF.	Turn ON the switch.
"ST. No." of remote I/O unit	The same station number is assigned to multiple units.	Change the setting.

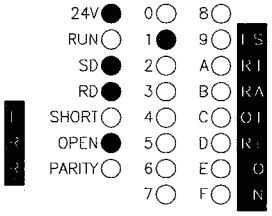
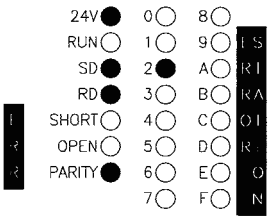
REMARK

The table below shows the error conditions that can be considered possible in the following system configuration based on LED statuses. It may help to identify errors in other system configurations.



	LED Status (● : ON, O : OFF)					System Status
	Master Module	Remote I/O Units				
		A	B	C	D	
	24V● RUN● SD● RD● SHORT○ OPEN○ PARITY○ 0○ 1○ 2○ 3○ 4○ 5○ 6○ 7○ 8○ 9○ A○ B○ C○ D○ E○ F○ I/R SERIAL NO.	PW● RUN● SD● RD● ERR○	PW● RUN● SD● RD● ERR○	PW● RUN● SD● RD● ERR○	PW● RUN● SD● RD● ERR○	Normal
"24 V" is ON.	24V○ RUN○ SD● RD○ SHORT○ OPEN● PARITY○ 0● 1● 2● 3● 4○ 5○ 6○ 7○ 8○ 9○ A○ B○ C○ D○ E○ F○ I/R SERIAL NO.	PW● RUN○ SD○ RD○ ERR○	PW● RUN○ SD○ RD○ ERR○	PW● RUN○ SD○ RD○ ERR○	PW● RUN○ SD○ RD○ ERR○	Indicates power is not supplied or insufficient between +24V and -24G.
"SHORT" is ON.	24V● RUN○ SD● RD● SHORT● OPEN○ PARITY● 0● 1● 2● 3● 4○ 5○ 6○ 7○ 8○ 9○ A○ B○ C○ D○ E○ F○ I/R SERIAL NO.	PW● RUN○ SD○ RD● ERR○	PW● RUN○ SD○ RD● ERR○	PW● RUN○ SD○ RD● ERR○	PW● RUN○ SD○ RD● ERR○	Probably indicates a short between DATA and DG, but may indicate that DATA and DG have been connected the wrong way round.

	LED Status (● : ON, O : OFF)						System Condition
	Master Module		Remote I/O Units				
			A	B	C	D	
"OPEN" is ON.		PW○ RUN○ SD○ RD○ ERR○	PW○ RUN○ SD○ RD○ ERR○	PW○ RUN○ SD○ RD○ ERR○	PW○ RUN○ SD○ RD○ ERR○	Indicates disconnection, malfunction of a remote I/O unit, or power supply OFF. Since the PWs of all the remote I/O units are OFF in this case, the power supply module may have been either turned OFF or failed.
		PW● RUN● SD● RD● ERR○	PW● RUN○ SD○ RD○ ERR○	PW● RUN○ SD○ RD○ ERR○	PW● RUN○ SD○ RD○ ERR○	Indicates disconnection, malfunction of a remote I/O unit, or power supply OFF. Since the PWs of all the remote I/O units are ON, there must be a disconnection at the position marked by the cross. 
		PW● RUN● SD● RD● ERR○	PW● RUN○ SD○ RD○ ERR○	PW● RUN○ SD○ RD○ ERR○	PW● RUN● SD● RD● ERR○	Indicates disconnection, malfunction of a remote I/O unit, or power supply OFF. Since the PWs of all the remote I/O units are ON, there must be a disconnection at the position marked by the cross. 
		PW● RUN○ SD○ RD○ ERR○	PW● RUN○ SD○ RD○ ERR○	PW● RUN○ SD○ RD○ ERR○	PW● RUN○ SD○ RD○ ERR○	Indicates disconnection, malfunction of a remote I/O unit, or power supply OFF. Since the PWs of all the remote I/O units are ON, there must be a disconnection at the position marked by the cross. 

	LED Status (● : ON, O : OFF)					System Status
	Master Module	Remote I/O Units				
		A	B	C	D	
"OPEN" is ON.		PW● RUN● SD● RD● ERR○	PW○ RUN○ SD○ RD○ ERR○	PW● RUN● SD● RD● ERR○	PW● RUN● SD● RD● ERR○	Indicates disconnection, malfunction of a remote I/O unit, or power supply OFF. Since the PWs of all the remote I/O units are OFF, the power supply must have been turned OFF or failed.
"PARITY" is ON.		PW● RUN● SD● RD● ERR○	PW● RUN● SD● RD● ERR○	PW● RUN○ SD○ RD● ERR●	PW● RUN● SD● RD● ERR○	A remote I/O unit is abnormal. Since the ERROR LED of remote I/O unit C is lit, this unit is considered unable to receive data from the master module correctly (possibly due to noise interference).

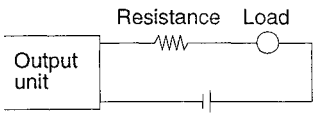
8. SPECIFICATIONS OF REMOTE I/O UNITS

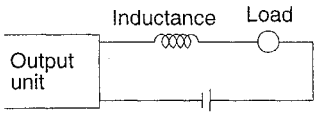
8.1 Notes on Using Remote I/O Units

(1) If a frequently-switching load or a coil load such as an electromagnet with a large capacity or a low power factor is used together with a contact output unit, the life of the output unit will be shortened.

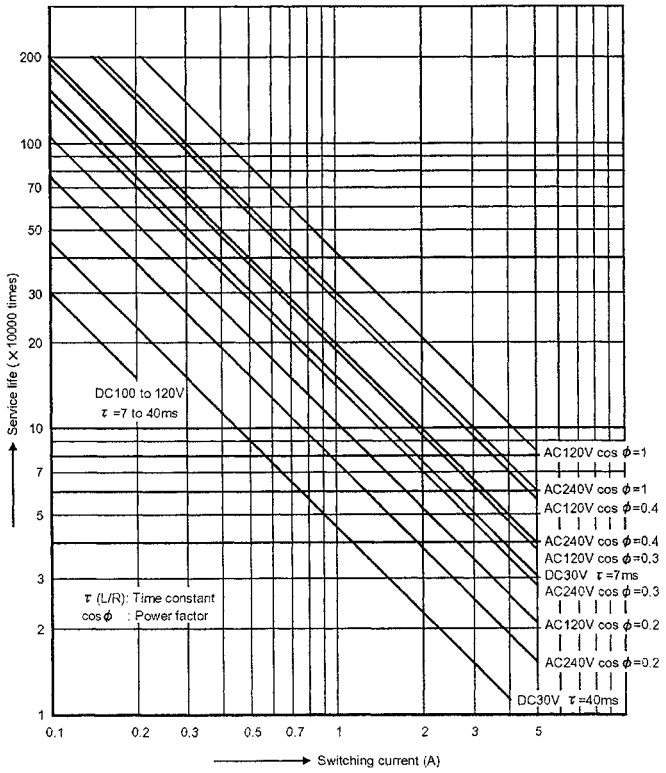
(2) The switching frequency for driving a load, L, in an output unit should never exceed "ON for at least 1 second and OFF for at least 1 second".

(3) If a timer or counter is used with a DC/DC converter as the load, a rush current occurs either when the power supply is turned ON or at regular intervals during operation. This may cause a fault if a unit is selected by considering only the average current and not rush current. Accordingly, if such a load is used, connect a resistance or inductance in series with the load to decrease the influence of the rush current.

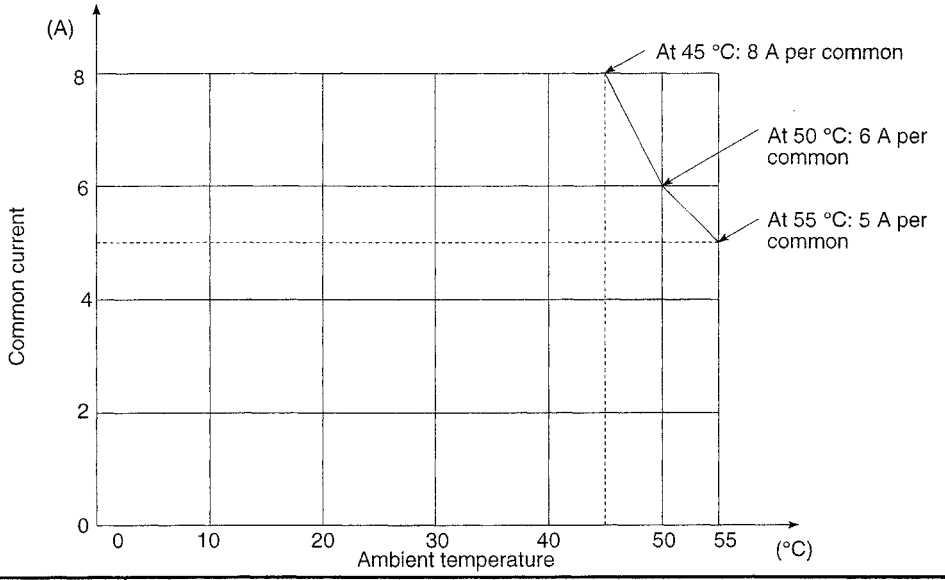




(4) The following chart shows the relationship between the relay life of contact output units and the magnitude of switching currents.
Applicable units: AJ55TB2-4R, AJ55TB2-8R, AJ55TB2-16R, AJ55TB32-4DR, AJ55TB32-8DR, and AJ55TB32-16DR



(5) With AJ55TB2-16T, the amount of current that can flow to one common varies according to the ambient temperature.



Point

(1) When using the module for the application in which the relay contact is frequently switched, the relay life span should be considered. Therefore, it is recommended to use a triac output module.

(2) The relay life curve shows the value based on actual use, which is not guaranteed. Therefore, make sure to allow for a margin of error. The relay life span differs according to the specifications as follows:

Rated switching voltage, current load	100 thousand operations
200VAC 1.5A, 240VAC 1A (COS ϕ =0.7)	100 thousand operations
200VAC 1A, 240VAC 0.5A (COS ϕ =0.35)	100 thousand operations
24VDC 1A, 100VDC 0.1A (L/R=7ms)	100 thousand operations

(3) Relay life is substantially affected by the load type and inrush current characteristics. The inrush current may cause the contact welding. Therefore, consideration should be given to it as well asconstant current.

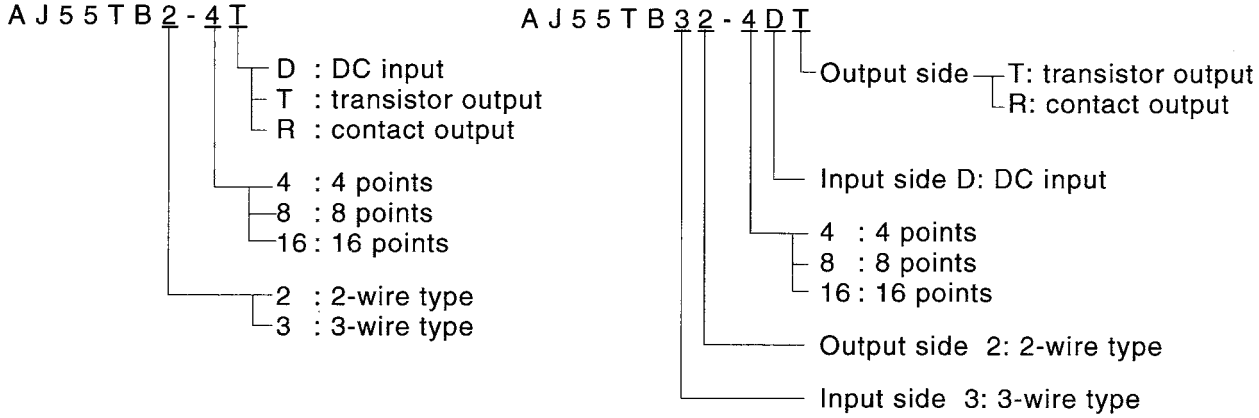
(a) Inductive load
When the inductive load such as electromagnetic contactor or solenoid is shut off, high counter-electromotive force is generated between thecontacting materials to produce an arc discharge. Consideration should be made especially when the power factor is low, as it may decrease the life period.In addition, make sure to consider the contact melting, as the inrush current equivalent to 5 to 15 times of constant current flows when the module is powered on.

(b) Lamp load
Make sure to consider the contact melting, as the inrush current equivalent to 10 to 15 times of constant current flows in the lamp circuit.

(c) Capacitive load
Make sure to consider the contact melting when a device such as condenser is used in a load circuit, as the inrush current equivalent to 20 to 40 times of constant current may flow in the circuit.Also, pay full attention to the wire capacity if long length of wire is routed.

8.2 How to Read Model Names

A guide to reading model names is presented below.



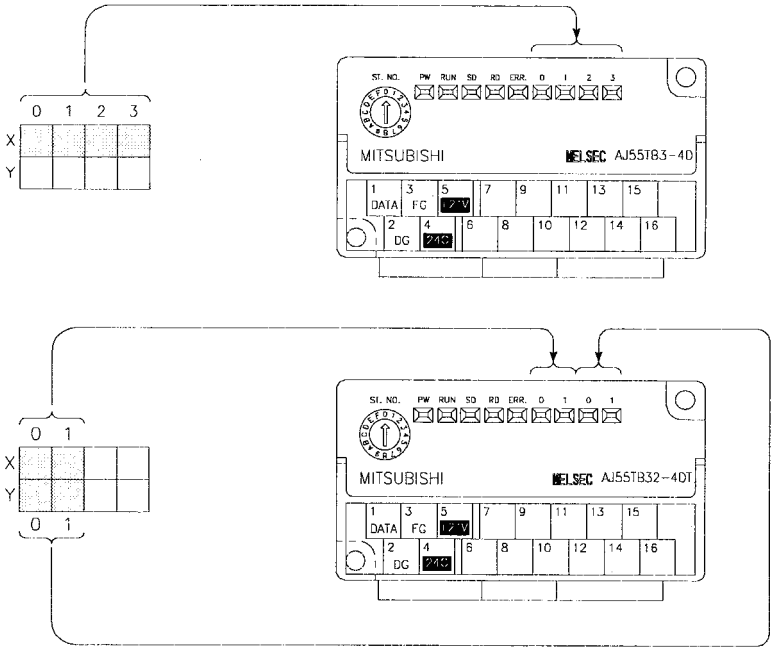
POINT

A remote I/O unit occupies one station for every four points.
However, although an 8-point I/O combination unit has eight points, it occupies one station.

8.3 How to Read Specification Tables

This section describes how to read the "Number of occupied stations" in the specification table of each remote I/O unit.

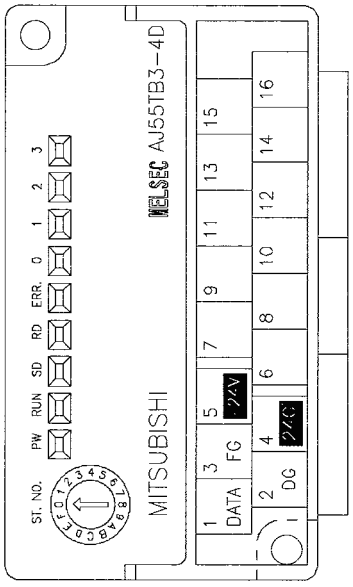
The shaded boxes indicates the number of addresses from "0" assigned to the unit.
The lower example below indicates an I/O combination assigned the same addresses for X and Y.



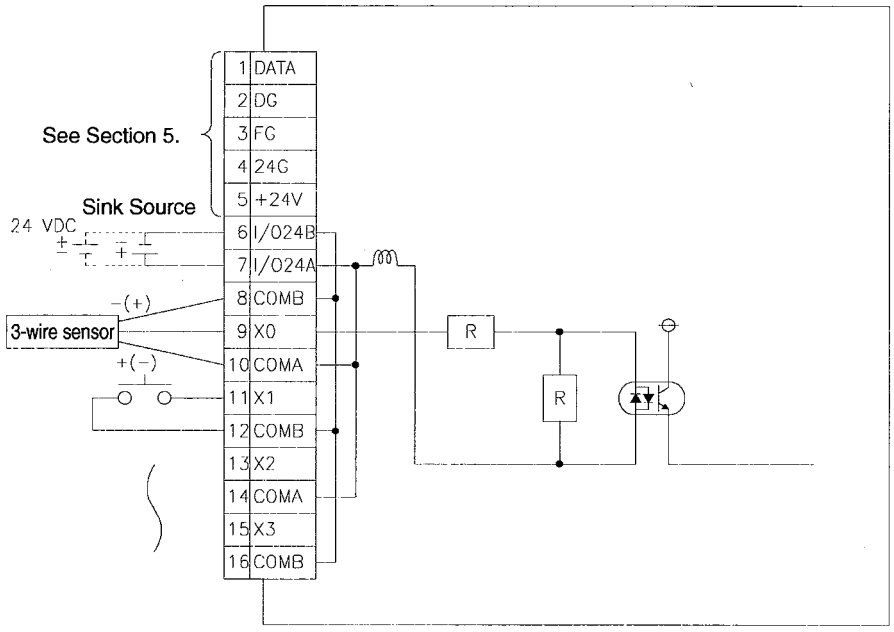
8.4 AJ55TB3-4D DC Input Unit

Specification \ Type		DC Input Unit (Sink/Source Common Type) AJ55TB3-4D
Number of input points		4 points
Insulation method		Photocoupler
Rated input voltage		24 VDC
Rated input current		Approx. 7 mA
Operating load voltage range (I/O 24A, I/O 24B)		19.2 to 26.4 VDC (ripple: less than 5 %)
Max. simultaneous input points		100 %
ON voltage/ON current		14 V or greater/3.5 mA or greater
OFF voltage/OFF current		6 V or less/1.7 mA or less
Input resistance		Approx. 3.3 kΩ
Response time	OFF→ON	10 ms or less
	ON→OFF	10 ms or less
Common method		4 points/common (3-wire terminal block)
Number of occupied stations		1 station (0 1 2 3 / X / Y)
I/O unit power supply (+24, 24G)	Voltage	15.6 to 27.6 VDC (peak voltage: 27.6 VDC)
	Current	35 mA
Weight (kg)[lb]		0.2 [0.44]
External wiring system		16-point terminal block connector (M3 screws) including a transmission circuit
Applicable wire size		0.75 to 2 mm^2
Applicable solderless terminals		1.25-3, 1.25-YS3A, 2-S3, 2-YS3A, V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A

Appearance



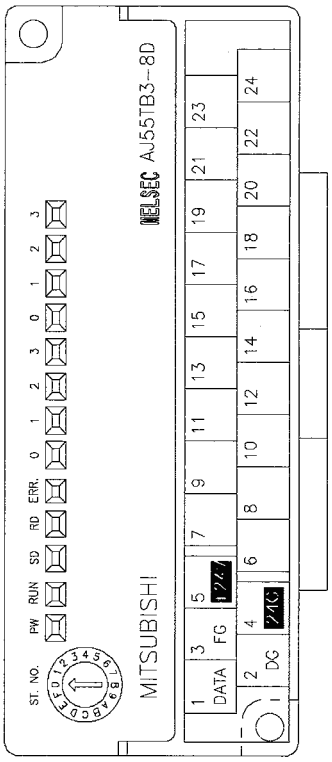
External Connections



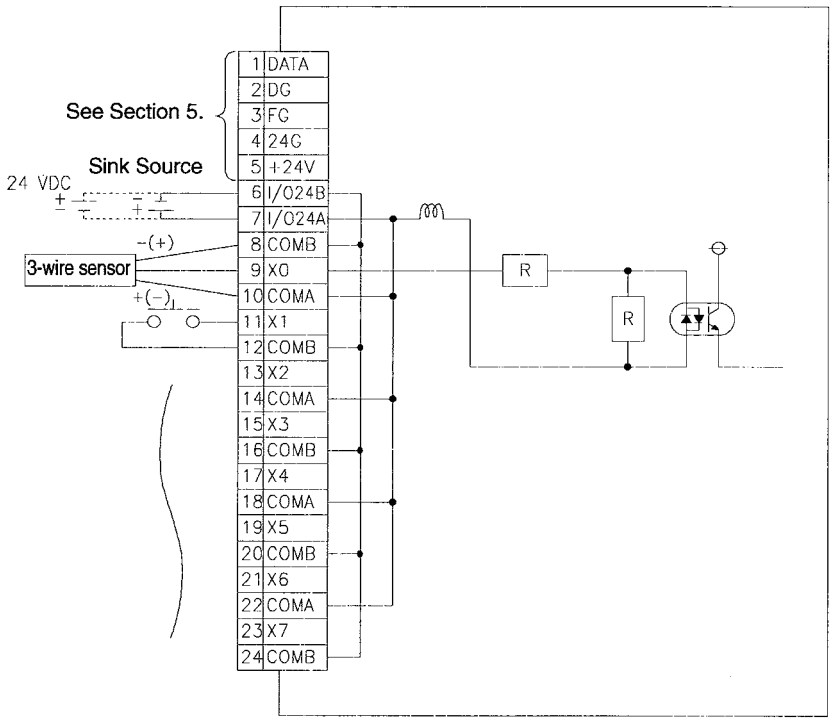
Terminal No.	Signal Name
TB1	DATA
TB2	DG
TB3	FG
TB4	24G
TB5	+24V
TB6	I/O24B
TB7	I/O24A
TB8	COMB
TB9	X0
TB10	COMA
TB11	X1
TB12	COMB
TB13	X2
TB14	COMA
TB15	X3
TB16	COMB

* Connect this to the COMB side if the sensor is a 2-wire type.

8.5 AJ55TB3-8D DC Input Unit

Specification \ Type		DC Input Unit (Sink/Source Common Type)	
		AJ55TB3-8D	Appearance
Number of input points		8 points	
Insulation method		Photocoupler	
Rated input voltage		24 VDC	
Rated input current		Approx. 7 mA	
Operating load voltage range (I/O 24A, I/O 24B)		19.2 to 26.4 VDC (ripple: less than 5 %)	
Max. simultaneous input points		100 %	
ON voltage/ON current		14 V or greater/3.5 mA or greater	
OFF voltage/OFF current		6 V or less/1.7 mA or less	
Input resistance		Approx. 3.3 kΩ	
Response time	OFF→ON	10 ms or less	
	ON→OFF	10 ms or less	
Common method		8 points/common (3-wire terminal block)	
Number of occupied stations		2 stations (X: 0 1 2 3 4 5 6 7 / Y: 0 1 2 3 4 5 6 7)	
I/O unit power supply (+24, 24G)	Voltage	15.6 to 27.6 VDC (peak voltage: 27.6 VDC)	
	Current	45 mA	
Weight (kg)[lb]		0.3 [0.66]	
External wiring system		24-point terminal block connector (M3 screws) including a transmission circuit	
Applicable wire size		0.75 to 2 mm^2	
Applicable solderless terminals		1.25-3, 1.25-YS3A, 2-S3, 2-YS3A, V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	

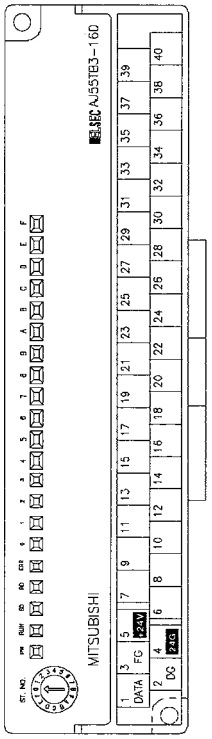
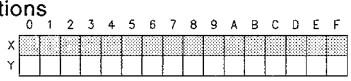
External Connections



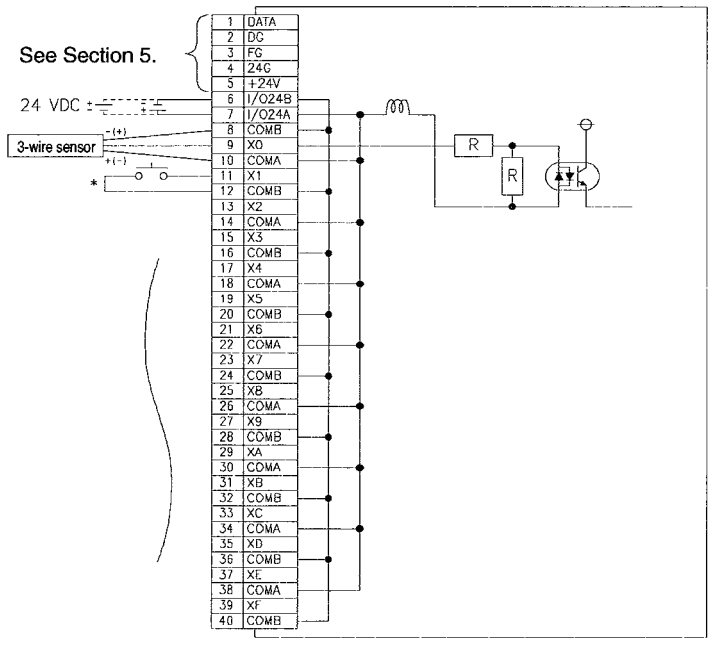
* Connect this to the COMB side if the sensor is a 2-wire type.

Terminal No.	Signal Name
TB1	DATA
TB2	DG
TB3	FG
TB4	24G
TB5	+24V
TB6	I/O24B
TB7	I/O24A
TB8	COMB
TB9	X0
TB10	COMA
TB11	X1
TB12	COMB
TB13	X2
TB14	COMA
TB15	X3
TB16	COMB
TB17	X4
TB18	COMA
TB19	X5
TB20	COMB
TB21	X6
TB22	COMA
TB23	X7
TB24	COMB

8.6 AJ55TB3-16D DC Input Unit

Specification \ Type		DC Input Unit (Sink/Source Common Type)	
		AJ55TB3-16D	Appearance
Number of input points		16 points	
Insulation method		Photocoupler	
Rated input voltage		24 VDC	
Rated input current		Approx. 7 mA	
Operating load voltage range (I/O 24A, I/O 24B)		19.2 to 26.4 VDC (ripple: less than 5 %)	
Max. simultaneous input points		100 %	
ON voltage/ON current		14 V or greater/3.5 mA or greater	
OFF voltage/OFF current		6 V or less/1.7 mA or less	
Input resistance		Approx. 3.3 kΩ	
Response time	OFF→ON	10 ms or less	
	ON→OFF	10 ms or less	
Common method		16 points/common (3-wire terminal block)	
Number of occupied stations		4 stations 	
I/O unit power supply (+24V, 24G)	Voltage	15.6 to 27.6 VDC (peak voltage: 27.6 VDC)	
	Current	60 mA	
Weight (kg)[lb]		0.4 [0.88]	
External wiring system		40-point terminal block connector (M3 screws) including a transmission circuit	
Applicable wire size		0.75 to 2 mm^2	
Applicable solderless terminals		1.25-3, 1.25-YS3A, 2-S3, 2-YS3A, V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	

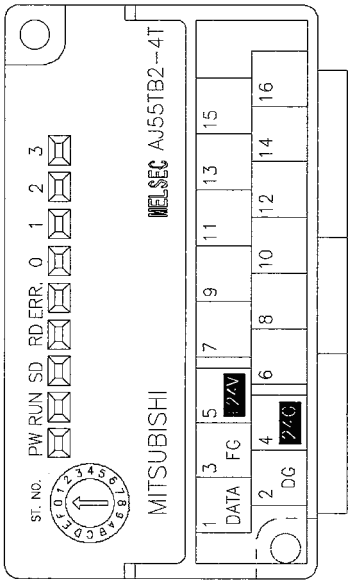
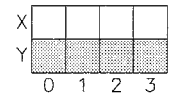
External Connections



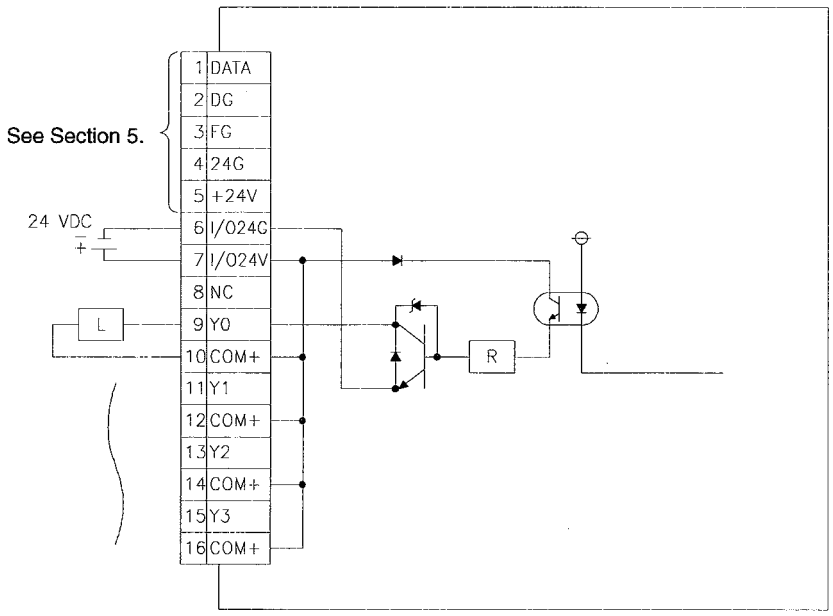
* Connect this to the COMB side if the sensor is a 2-wire type.

Terminal No.	Signal Name	Terminal No.	Signal Name
TB1	DATA	TB21	X6
TB2	DG	TB22	COMA
TB3	FG	TB23	X7
TB4	24G	TB24	COMB
TB5	+24V	TB25	X8
TB6	I/O24B	TB26	COMA
TB7	I/O24A	TB27	X9
TB8	COMB	TB28	COMB
TB9	X0	TB29	XA
TB10	COMA	TB30	COMA
TB11	X1	TB31	XB
TB12	COMB	TB32	COMB
TB13	X2	TB33	XC
TB14	COMA	TB34	COMA
TB15	X3	TB35	XD
TB16	COMB	TB36	COMB
TB17	X4	TB37	XE
TB18	COMA	TB38	COMA
TB19	X5	TB39	XF
TB20	COMB	TB40	COMB

8.7 AJ55TB2-4T Transistor Output Unit

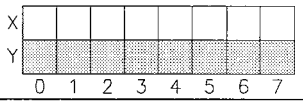
Specification \ Type		Transistor Output Unit (Sink Type) AJ55TB2-4T	Appearance
Number of output points		4 points	
Insulation method		Photocoupler	
Rated load voltage		12/24 VDC	
Operating load voltage range		10.2 to 30 VDC (peak voltage: 30 VDC)	
Max. load current		0.5 A/point, 2 A/common	
Max. rush current		4 A for 10 ms or less	
Leakage current (when OFF)		0.1 mA or less	
Max. voltage drop (when ON)		0.9 VDC or less (TYP) at 0.5 A, 1.5 VDC or less (MAX) at 0.5 A	
Response time	OFF→ON	2 ms or less	
	ON→OFF	2 ms or less (resistance load)	
External power supply (I/O24V, I/O24G)	Voltage	10.2 to 30 VDC	
	Current	30 mA (TYP. 24 VDC/common) not including the external load current	
Surge suppressor		Zener diode	
Common method		4 points/common (2-wire terminal block)	
Number of occupied stations		1 station 	
I/O unit power supply (+24V, 24G)	Voltage	15.6 to 27.6 VDC (peak voltage: 27.6 VDC)	
	Current	45 mA	
Weight (kg)[lb]		0.2 [0.44]	
External wiring system		16-point terminal block connector (M3 screws) including a transmission circuit	
Applicable wire size		0.75 to 2 mm^2	
Applicable solderless terminals		1.25-3, 1.25-YS3A, 2-S3, 2-YS3A, V1.25-3, V1.25-Y33A, V2-S3, V2-YS3A	

External Connections

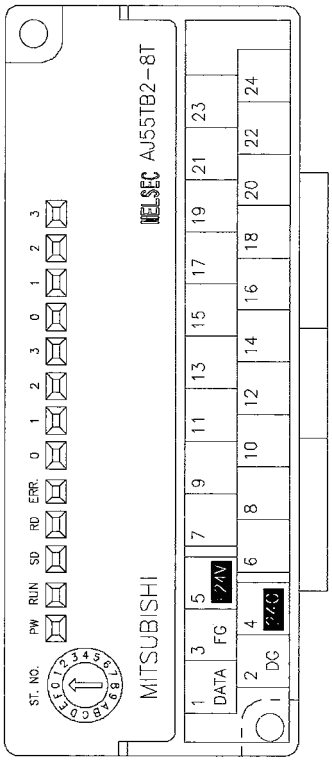


Terminal No.	Signal Name
TB1	DATA
TB2	DG
TB3	FG
TB4	24G
TB5	+24V
TB6	I/O24G
TB7	I/O24V
TB8	NC
TB9	Y0
TB10	COM+
TB11	Y1
TB12	COM+
TB13	Y2
TB14	COM+
TB15	Y3
TB16	COM+

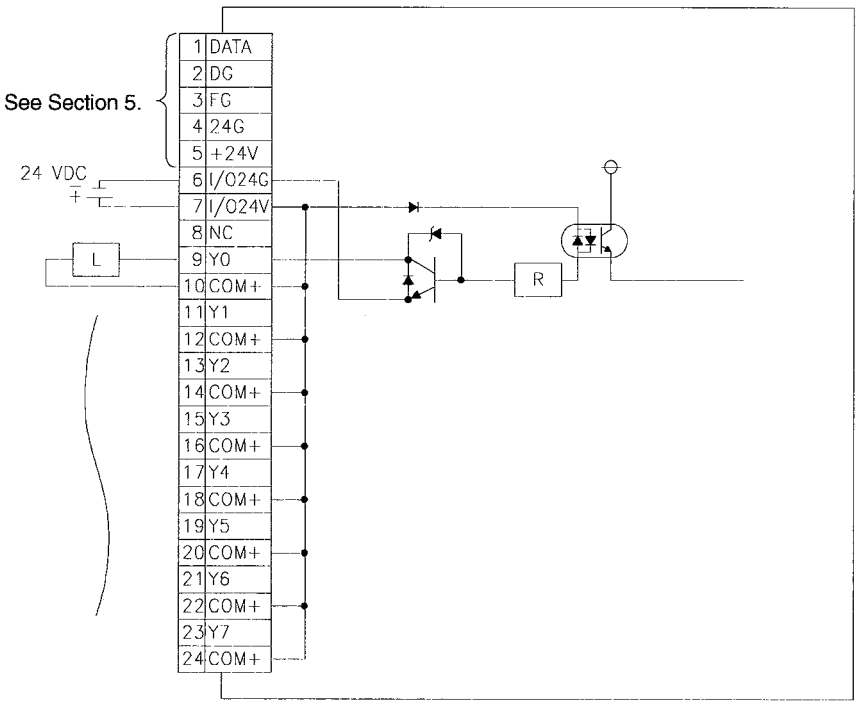
8.8 AJ55TB2-8T Transistor Output Unit

Specification \ Type		Transistor Output Unit (Sink Type) AJ55TB2-8T
Number of output points		8 points
Insulation method		Photocoupler
Rated load voltage		12/24 VDC
Operating load voltage range		10.2 to 30 VDC (peak voltage: 30 VDC)
Max. load current		0.5 A/point, 4 A/common
Max. rush current		4 A for 10 ms or less
Leakage current (when OFF)		0.1 mA or less
Max. voltage drop (when ON)		0.9 VDC or less (TYP) at 0.5 A, 1.5 VDC or less (MAX) at 0.5 A
Response time	OFF→ON	2 ms or less
	ON→OFF	2 ms or less (resistance load)
External power supply (I/O24V, I/O24G)	Voltage	10.2 to 30 VDC
	Current	60 mA (TYP. 24 VDC/common) not including the external load current
Surge suppressor		Zener diode
Common method		8 points/common (2-wire terminal block)
Number of occupied stations		2 stations 
I/O unit power supply (+24, 24G)	Voltage	15.6 to 27.6 VDC (peak voltage: 27.6 VDC)
	Current	55 mA
Weight (kg)[lb]		0.3 [0.66]
External wiring system		24-point terminal block connector (M3 screws) including a transmission circuit
Applicable wire size		0.75 to 2 mm^2
Applicable solderless terminals		1.25-3, 1.25-YS3A, 2-S3, 2-YS3A, V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A

Appearance

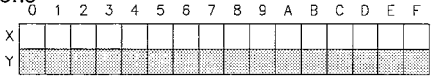


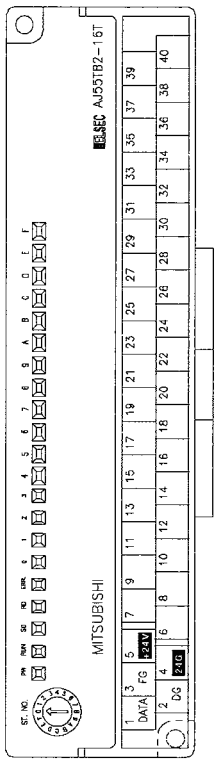
External Connections



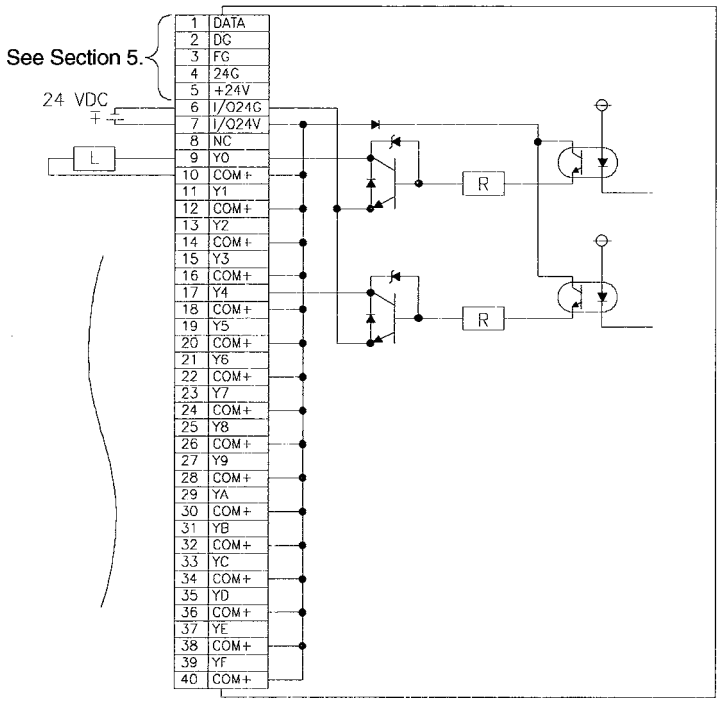
Terminal No.	Signal Name
TB1	DATA
TB2	DG
TB3	FG
TB4	24G
TB5	+24V
TB6	I/O24G
TB7	I/O24V
TB8	NC
TB9	Y0
TB10	COM+
TB11	Y1
TB12	COM+
TB13	Y2
TB14	COM+
TB15	Y3
TB16	COM+
TB17	Y4
TB18	COM+
TB19	Y5
TB20	COM+
TB21	Y6
TB22	COM+
TB23	Y7
TB24	COM+

8.9 AJ55TB2-16T Transistor Output Unit

Specification \ Type		Transistor Output Unit (Sink Type) AJ55TB2-16T	Appearance
Number of output points		16 points	
Insulation method		Photocoupler	
Rated load voltage		12/24 VDC	
Operating load voltage range		10.2 to 30 VDC (peak voltage: 30 VDC)	
Max. load current		0.5 A/point, 5 A/common	
Max. rush current		4 A for 10 ms or less	
Leakage current (when OFF)		0.1 mA or less	
Max. voltage drop (when ON)		0.9 V or less (TYP) at 0.5 A, 1.5 V or less (MAX) at 0.5 A	
Output type		Sink type	
Response time	OFF→ON	2 ms or less	
	ON→OFF	2 ms or less (resistance load)	
External power supply (I/O24V, I/O24G)	Voltage	10.2 to 30 VDC	
	Current	120 mA (TYP. 24 VDC/common) not including the external load current	
Surge suppressor		Zener diode	
Common method		16 points/common (2-wire terminal block)	
Number of occupied stations		4 stations 	
I/O unit power supply (+24V, 24G)	Voltage	15.6 to 27.6 VDC (peak voltage: 27.6 VDC)	
	Current	70 mA	
Weight (kg)[lb]		0.4 [0.88]	
External wiring system		40-point terminal block connector (M3 screws) including a transmission circuit	
Applicable wire size		0.75 to 2 mm^2	
Applicable solderless terminals		1.25-3, 1.25-YS3A, 2-S3, 2-YS3A, V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	

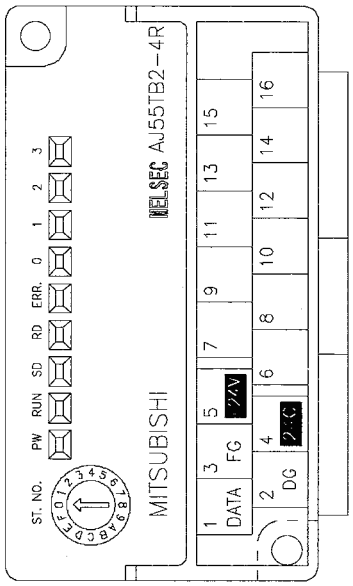
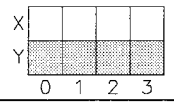


External Connections

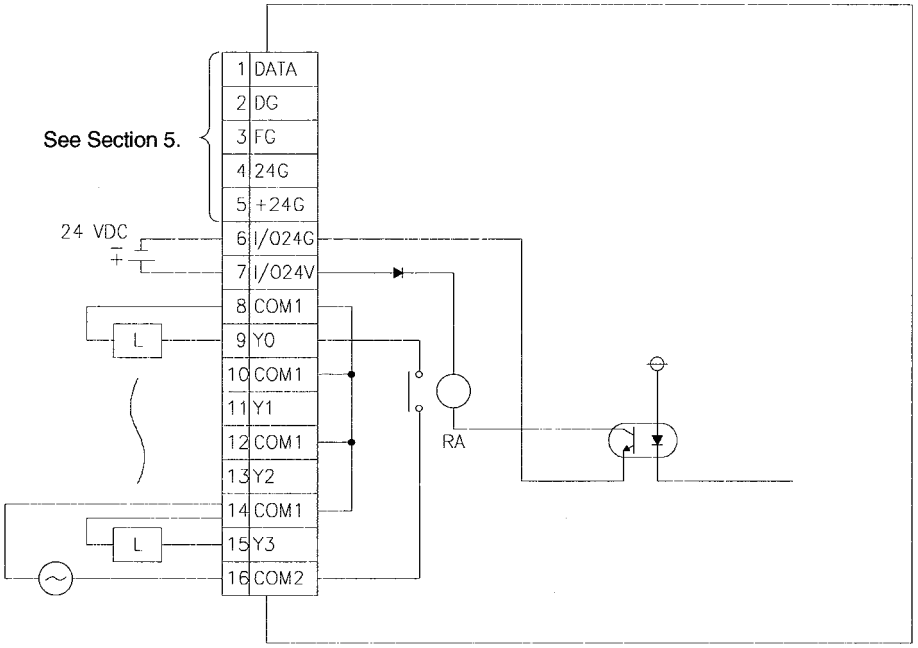


Terminal No.	Signal Name	Terminal No.	Signal Name
TB1	DATA	TB21	Y6
TB2	DG	TB22	COM+
TB3	FG	TB23	Y7
TB4	24G	TB24	COM+
TB5	+24V	TB25	Y8
TB6	I/O24G	TB26	COM+
TB7	I/O24V	TB27	Y9
TB8	NC	TB28	COM+
TB9	Y0	TB29	YA
TB10	COM+	TB30	COM+
TB11	Y1	TB31	YB
TB12	COM+	TB32	COM+
TB13	Y2	TB33	YC
TB14	COM+	TB34	COM+
TB15	Y3	TB35	YD
TB16	COM+	TB36	COM+
TB17	Y4	TB37	YE
TB18	COM+	TB38	COM+
TB19	Y5	TB39	YF
TB20	COM+	TB40	COM+

8.10 AJ55TB2-4R Contact Output Unit

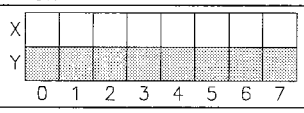
Specification \ Type		Contact Output Unit (Sink Type) AJ55TB2-4R	Appearance
Number of output points		4 points	
Insulation method		Photocoupler	
Rated load voltage/current		24 VDC (resistance load) 2 A/point 240 VAC (COSϕ=1) 8 A/common	
Min. switching load		5 VDC 1 mA	
Max. switching voltage		250 VAC 110 VDC	
Response time	OFF→ON	10 ms or less	
	ON→OFF	12 ms or less	
Life	Mechanical	20 million operations or more	
	Electrical	100 thousand operations or more at the rated switching voltage and current load.	
		100 thousand operations or more at 200 VAC and 1.5 A, or 240 VAC or 1 A (COSϕ=0.7)	
		100 thousand operations or more at 200 VAC and 1 A, or 240 VAC and 0.5 A (COSϕ=0.35)	
		100 thousand operations or more at 24 VDC and 1A, or 100 VDC and 0.1 A (L/R=7 ms)	
Max. switching frequency		3600 times/hour	
External power supply (I/O24V, I/O24G)	Voltage	24 VDC ±10 %, ripple: 4 Vp-p or less	
	Current	23 mA (TYP. 24 VDC, all points ON)	
Surge suppressor		None	
Common method		4 points/common	
Number of occupied stations		1 station 	
I/O unit power supply (+24V, 24G)	Voltage	15.6 to 27.6 VDC (peak voltage: 27.6 VDC)	
	Current	50 mA	
Weight (kg)[lb]		0.2 [0.44]	
External wiring system		16-point terminal block connector (M3 screws) including a transmission circuit	
Applicable wire size		0.75 to 2 mm^2	
Applicable solderless terminals		1.25-3, 1.25-YS3A, 2-S3, 2-YS3A, V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	

External Connections

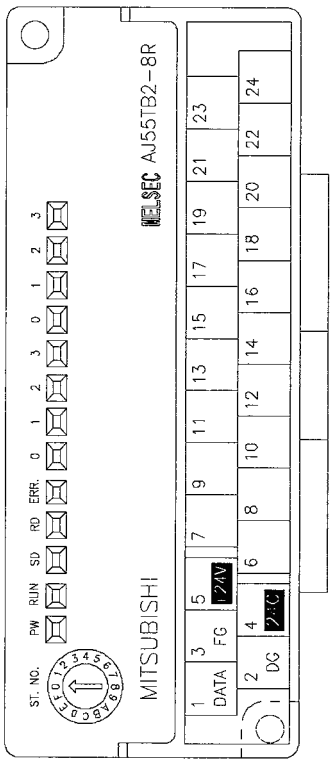


Terminal No.	Signal Name
TB1	DATA
TB2	DG
TB3	FG
TB4	24G
TB5	+24V
TB6	I/O24G
TB7	I/O24V
TB8	COM1
TB9	Y0
TB10	COM1
TB11	Y1
TB12	COM1
TB13	Y2
TB14	COM1
TB15	Y3
TB16	COM2

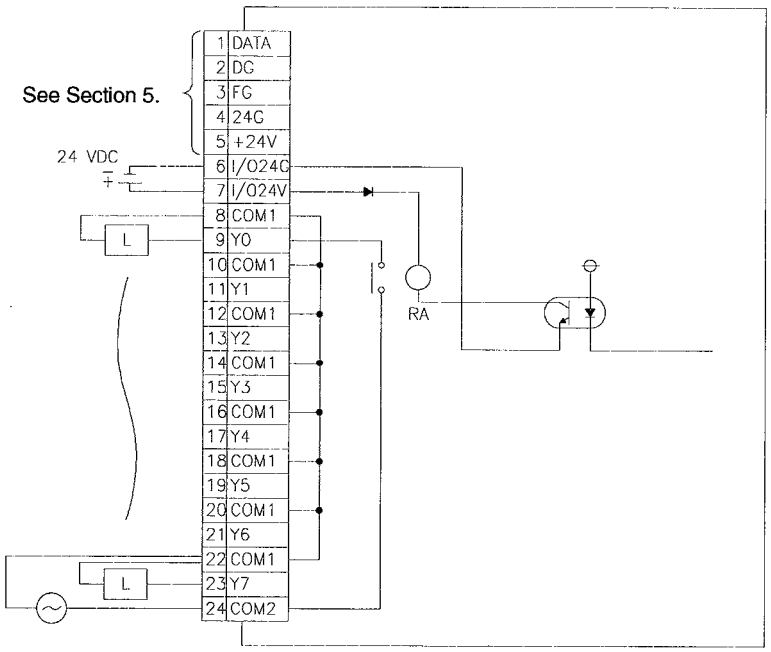
8.11 AJ55TB2-8R Contact Output Unit

Specification \ Type		Contact Output Unit (Sink Type) AJ55TB2-8R
Number of output points		8 points
Insulation method		Photocoupler
Rated load voltage/current		24 VDC (resistance load) 2 A/point 240 VAC (COSϕ=1) 8 A/common
Min. switching load		5 VDC 1 mA
Max. switching voltage		250 VAC 110 VDC
Response time	OFF→ON	10 ms or less
	ON→OFF	12 ms or less
Life	Mechanical	20 million operations or more
	Electrical	100 thousand operations or more at the rated switching voltage and current load.
		100 thousand operations or more at 200 VAC and 1.5 A, or 240 VAC or 1 A (COSϕ=0.7)
		100 thousand operations or more at 200 VAC and 1 A, or 240 VAC and 0.5 A (COSϕ=0.35)
		100 thousand operations or more at 24 VDC and 1A, or 100 VDC and 0.1 A (L/R=7 ms)
Max. switching frequency		3600 times/hour
External power supply (I/O24V, I/O24G)	Voltage	24 VDC ±10 %, ripple: 4 Vp-p or less
	Current	45 mA (TYP. 24 VDC, all points ON)
Surge suppressor		None
Common method		8 points/common
Number of occupied stations		2 stations 
I/O unit power supply (+24V, 24G)	Voltage	15.6 to 27.6 VDC (peak voltage: 27.6 VDC)
	Current	65 mA
Weight (kg)[lb]		0.3 [0.66]
External wiring system		24-point terminal block connector (M3 screws) including a transmission circuit
Applicable wire size		0.75 to 2 mm^2
Applicable solderless terminals		1.25-3, 1.25-YS3A, 2-S3, 2-YS3A, V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A

Appearance



External Connections

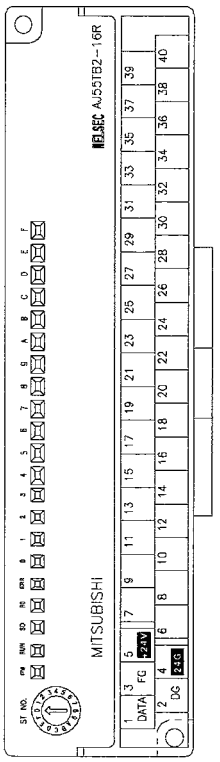


Terminal No.	Signal Name
TB1	DATA
TB2	DG
TB3	FG
TB4	24G
TB5	+24V
TB6	I/O24G
TB7	I/O24V
TB8	COM1
TB9	Y0
TB10	COM1
TB11	Y1
TB12	COM1
TB13	Y2
TB14	COM1
TB15	Y3
TB16	COM1
TB17	Y4
TB18	COM1
TB19	Y5
TB20	COM1
TB21	Y6
TB22	COM1
TB23	Y7
TB24	COM2

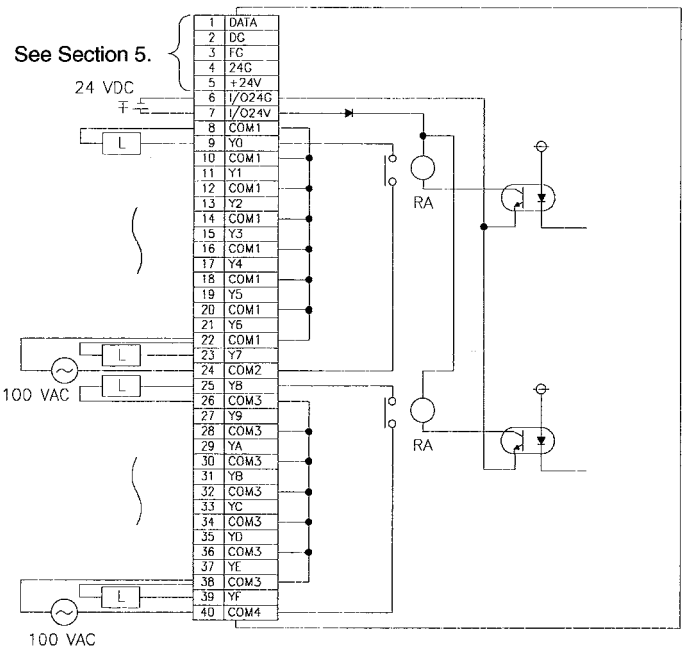
8.12 AJ55TB2-16R Contact Output Unit

Specification \ Type		Contact Output Unit (Sink Type) AJ55TB2-16R
Number of output points		16 points
Insulation method		Photocoupler
Rated load voltage/current		24 VDC (resistance load) 2 A/point 240 VAC (COSϕ=1) 8 A/common
Min. switching load		5 VDC 1 mA
Max. switching voltage		250 VAC 110 VDC
Response time	OFF→ON	10 ms or less
	ON→OFF	12 ms or less
Life	Mechanical	20 million operations or more
	Electrical	100 thousand operations or more at the rated switching voltage and current load.
		100 thousand operations or more at 200 VAC and 1.5 A, or 240 VAC or 1 A (COSϕ=0.7)
		100 thousand operations or more at 200 VAC and 1 A, or 240 VAC and 0.5 A (COSϕ=0.35)
		100 thousand operations or more at 24 VDC and 1A, or 100 VDC and 0.1 A (L/R=7 ms)
Max. switching frequency		3600 times/hour
External power supply (I/O24V, I/O24G)	Voltage	24 VDC ±10 %, ripple: 4 Vp-p or less
	Current	90 mA (TYP. 24 VDC, all points ON)
Surge suppressor		None
Common method		8 points/common
Number of occupied stations		4 stations 0 1 2 3 4 5 6 7 8 9 A B C D E F X Y
I/O unit power supply (+24V, 24G)	Voltage	15.6 to 27.6 VDC (peak voltage: 27.6 VDC)
	Current	85 mA
Weight (kg)[lb]		0.4 [0.88]
External wiring system		40-point terminal block connector (M3 screws) including a transmission circuit
Applicable wire size		0.75 to 2 mm^2
Applicable solderless terminals		1.25-3, 1.25-YS3A, 2-S3, 2-YS3A, V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A

Appearance



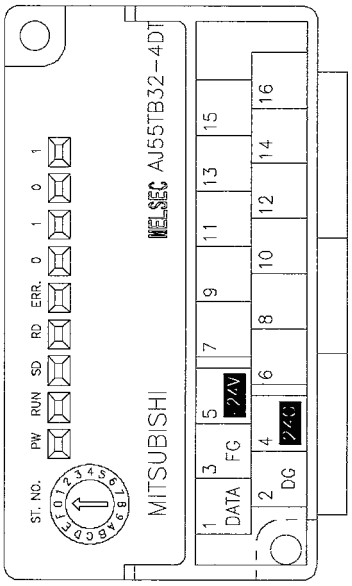
External Connections



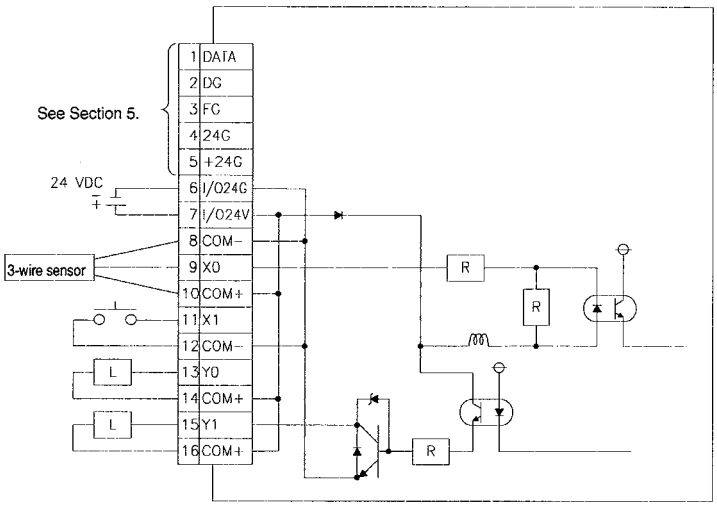
Terminal No.	Signal Name	Terminal No.	Signal Name
TB1	DATA	TB21	Y6
TB2	DG	TB22	COM1
TB3	FG	TB23	Y7
TB4	24G	TB24	COM2
TB5	+24V	TB25	Y8
TB6	I/O24G	TB26	COM3
TB7	I/O24V	TB27	Y9
TB8	COM1	TB28	COM3
TB9	Y0	TB29	YA
TB10	COM1	TB30	COM3
TB11	Y1	TB31	YB
TB12	COM1	TB32	COM3
TB13	Y2	TB33	YC
TB14	COM1	TB34	COM3
TB15	Y3	TB35	YD
TB16	COM1	TB36	COM3
TB17	Y4	TB37	YE
TB18	COM1	TB38	COM3
TB19	Y5	TB39	YF
TB20	COM1	TB40	COM4

8.13 AJ55TB32-4DT Input/Output Unit

Type / Specification	DC Input (Sink/Source Common Type)/Transistor Output Combination Unit				Appearance
	AJ55TB32-4DT				
Input Specifications		**Output Specifications**			
Number of input points	2 points	Number of output points		2 points	
Insulation method	Photocoupler	Insulation method		Photocoupler	
Rated input voltage	24 VDC	Rated load voltage		24 VDC	
Rated input current	Approx. 7 mA	Operating load voltage range		19.2 to 26.4 VDC (peak voltage: 26.4 V)	
Operating voltage range	19.2 to 26.4 VDC (ripple: less than 5 %)	Max. load current		0.5 A/point, 1 A/common	
Max. simultaneous input points	100%	Max. rush current		4 A for 10 msec. or less	
ON voltage/ON current	14 V or greater/3.5 mA or greater	Leakage current (when OFF)		0.1 mA or less	
OFF voltage/ OFF current	6 V or less/1.7 mA or less	Max. voltage drop (when ON)		0.9 VDC or less (TYP.: 0.5 A) 1.5 VDC or less (max.: 0.5 A)	
Input resistance	Approx. 3.3 kΩ				
Response time OFF→ON	10 ms or less	Response time OFF→ON		2 ms. or less	
Response time ON→OFF	10 ms or less	Response time ON→OFF		2 ms. or less (resistance load)	
Common method	2 points/common	External power supply (I/O24V, I/O24G)	Voltage	19.2 to 26.4 VDC	
			Current	15 mA (TYP. 24 V DC/common) not including the external load current	
		Surge suppressor		Zener diode	
		Common method		2 points/common	
Number of occupied stations	1 stations (0 1 / X / Y / 0 1) The latter two points connot be used.				
I/O unit power supply (+24v, 24G) Voltage	15.6 to 27.6 VDC (peak voltage: 27.6 VDC)				
I/O unit power supply (+24v, 24G) Current	40 mA				
Weight (kg)[lb]	0.2 [0.44]				
External wiring system	16-point terminal block connector (M3 screws) including a transmission circuit				
Applicable wire size	0.75 to 2 mm²				
Applicable solderless terminals	1.25-3, 1.25-YS3A, 2-S3, 2-YS3A, V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A				



External Connections

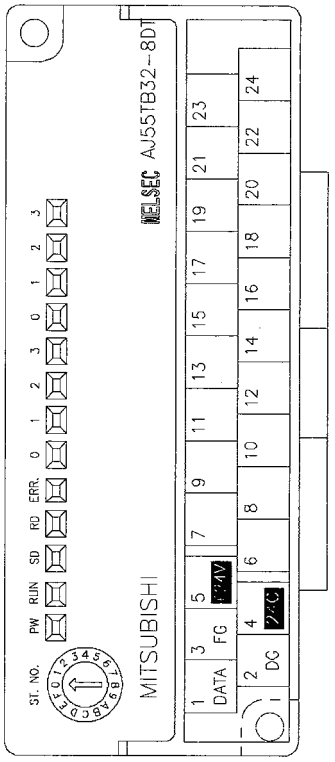


* Connect this to the COMB side if the sensor is a 2-wire type.

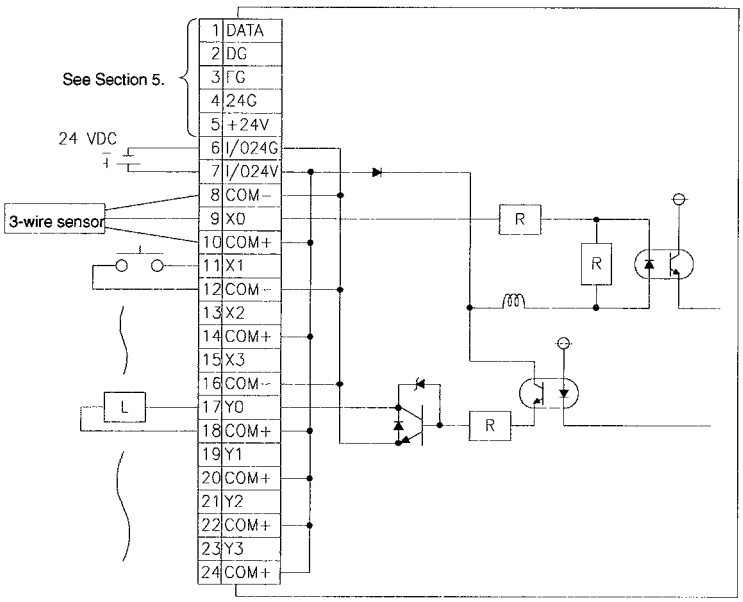
Terminal No.	Signal Name
TB1	DATA
TB2	DG
TB3	FG
TB4	24G
TB5	+24V
TB6	I/O24G
TB7	I/O24V
TB8	COM-
TB9	X0
TB10	COM+
TB11	X1
TB12	COM-
TB13	Y0
TB14	COM+
TB15	Y1
TB16	COM+

8.14 AJ55TB32-8DT Input/Output Unit

Type / Specification	DC Input (Sink/Source Common Type)/Transistor Output Combination Unit				Appearance
	AJ55TB32-8DT				
Input Specifications		**Output Specifications**			
Number of input points	4 points	Number of output points		4 points	
Insulation method	Photocoupler	Insulation method		Photocoupler	
Rated input voltage	24 VDC	Rated load voltage		24 VDC	
Rated input current	Approx. 7 mA	Operating load voltage range		19.2 to 26.4 VDC (peak voltage: 26.4 V)	
Operating voltage range	19.2 to 26.4 VDC (ripple: less than 5 %)	Max. load current		0.5 A/point, 2 A/ common	
Max. simultaneous input points	100 %	Max. rush current		4 A for 10 ms. or less	
ON voltage/ON current	14 V or greater/3.5 mA or greater	Leakage current (when OFF)		0.1 mA or less	
OFF voltage/ OFF current	6 V or less/1.7 mA or less	Max. voltage drop (when ON)		0.9 V DC or less (TYP.: 0.5 A) 1.5 VDC or less (max.: 0.5 A)	
Input resistance	Approx. 3.3 kΩ				
Response time OFF→ON	10 ms or less	Response time OFF→ON		2 ms. or less	
Response time ON→OFF	10 ms or less	Response time ON→OFF		2 ms. or less (resistance load)	
Common method	4 points/common	External power supply (I/O24V, I/O24G)	Voltage	19.2 to 26.4 VDC	
			Current	30 mA (TYP. 24 V DC/common) not including the external load current	
		Surge suppressor		Zener diode	
		Common method		4 points/common	
Number of occupied stations	1 stations (0 1 2 3 / X / Y / 0 1 2 3)				
I/O unit power supply (+24V, 24G) Voltage	15.6 to 27.6 VDC (peak voltage: 27.6 VDC)				
I/O unit power supply (+24V, 24G) Current	50 mA				
Weight (kg)[lb]	0.3 [0.66]				
External wiring system	16-point terminal block connector (M3 screws) including a transmission circuit				
Applicable wire size	0.75 to 2 mm²				
Applicable solderless terminals	1.25-3, 1.25-YS3A, 2-S3, 2-YS3A, V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A				



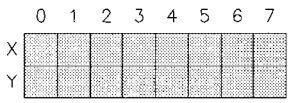
External Connections

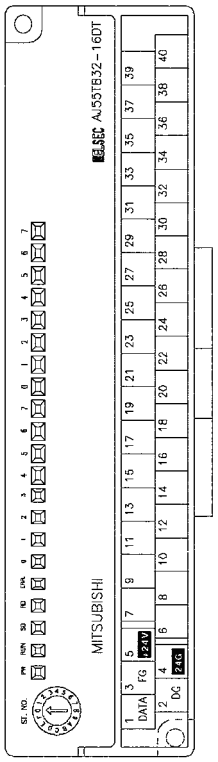


* Connect this to the COMB side if the sensor is a 2-wire type.

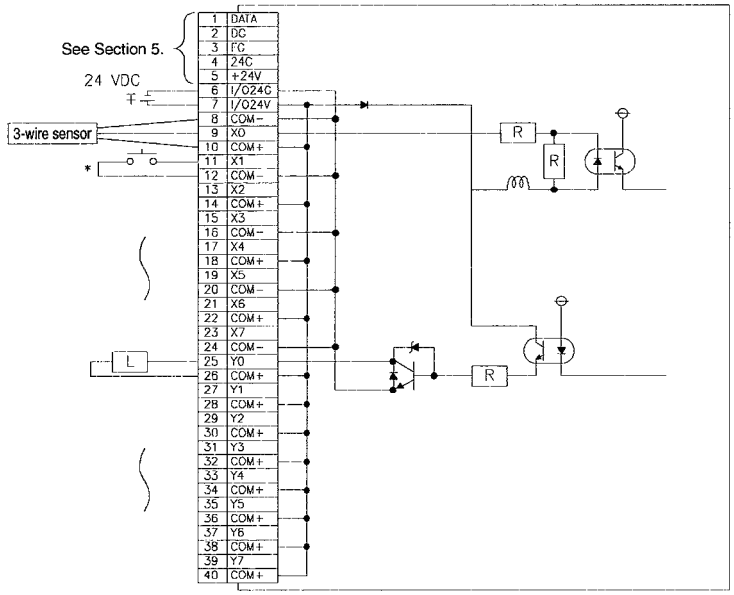
Terminal No.	Signal Name
TB1	DATA
TB2	DG
TB3	FG
TB4	24G
TB5	+24V
TB6	I/O24G
TB7	I/O24V
TB8	COM-
TB9	X0
TB10	COM+
TB11	X1
TB12	COM-
TB13	X2
TB14	COM+
TB15	X3
TB16	COM-
TB17	Y0
TB18	COM+
TB19	Y1
TB20	COM+
TB21	Y2
TB22	COM+
TB23	Y3
TB24	COM+

8.15 AJ55TB32-16DT Input/Output Unit

Specification \ Type	DC Input Transistor Output Combination Unit					Appearance
	AJ55TB32-16DT					
Input Specifications		**Output Specifications**				
Number of input points	8 points	Number of output points		8 points		
Insulation method	Photocoupler	Insulation method		Photocoupler		
Rated input voltage	24 VDC	Rated load voltage		24 VDC		
Rated input current	Approx. 7 mA	Operating load voltage range		19.2 to 26.4 VDC (peak voltage: 26.4 V)		
Operating voltage range	19.2 to 26.4 VDC (ripple: less than 5 %)	Max. load current		0.5 A/point, 4 A/ common		
Max. simultaneous input points	100 %	Max. rush current		4 A for 10 ms. or less		
ON voltage/ON current	14 V or greater/3.5 mA or greater	Leakage current (when OFF)		0.1 mA or less		
OFF voltage/ OFF current	6 V or less/1.7 mA or less	Max. voltage drop (when ON)		0.9 VDC or less (TYP.: 0.5 A) 1.5 VDC or less (MAX.: 0.5 A)		
Input resistance	Approx. 3.3 kΩ					
Response time OFF→ON	10 ms or less	Output type		Sink type		
Response time ON→OFF	10 ms or less	Response time	OFF→ON	2 ms or less		
			ON→OFF	2 ms or less (resistance load)		
Input type	Sink type	External power supply (I/O24V, I/O24G)	Voltage	19.2 to 26.4 VDC		
Common method	8 points/common		Current	60 mA (TYP. 24 VDC /common) not including the external load current		
		Surge suppressor		Zener diode		
		Common method		8 points/common		
Number of occupied stations	2 stations 					
I/O unit power supply (+24V, 24G) Voltage	15.6 to 27.6 VDC (peak voltage: 27.6 VDC)					
I/O unit power supply (+24V, 24G) Current	70 mA					
Weight (kg)[lb]	0.4 [0.88]					
External wiring system	40-point terminal block connector (M3 screws) including a transmission circuit					
Applicable wire size	0.75 to 2 mm^2					
Applicable solderless terminals	1.25-3, 1.25-YS3A, 2-S3, 2-YS3A, V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A					



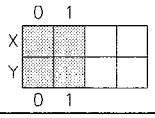
External Connections

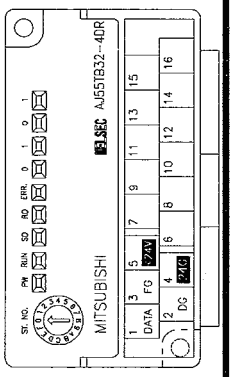


Terminal No.	Signal Name	Terminal No.	Signal Name
TB1	DATA	TB21	X6
TB2	DG	TB22	COM+
TB3	FG	TB23	X7
TB4	24G	TB24	COM-
TB5	+24V	TB25	Y0
TB6	I/O24G	TB26	COM+
TB7	I/O24V	TB27	Y1
TB8	COM-	TB28	COM+
TB9	X0	TB29	Y2
TB10	COM+	TB30	COM+
TB11	X1	TB31	Y3
TB12	COM-	TB32	COM+
TB13	X2	TB33	Y4
TB14	COM+	TB34	COM+
TB15	X3	TB35	Y5
TB16	COM-	TB36	COM+
TB17	X4	TB37	Y6
TB18	COM+	TB38	COM+
TB19	X5	TB39	Y7
TB20	COM-	TB40	COM+

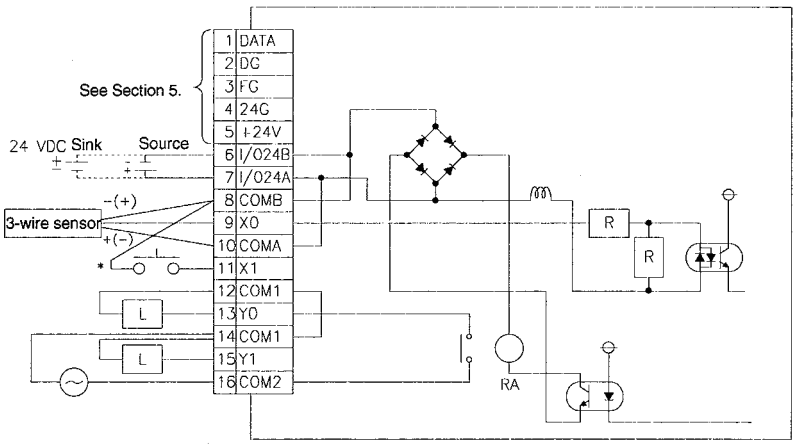
* Connect this to the COM- side if the sensor is a 2-wire type.

8.16 AJ55TB32-4DR Input/Output Unit

Type / Specification	DC Input (Sink/Source Common Type)/Transistor Output Combination Unit				Appearance
	AJ55TB32-4DT				
Input Specifications		**Output Specifications**			
Number of input points	2 points	Number of output points		2 points	
Insulation method	Photocoupler	Insulation method		Photocoupler	
Rated input voltage	24 VDC	Rated load voltage/current		24 VDC (resistance load) 40 VAC (COSϕ-1) 2 A/point, 4 A/common	
Rated input current	Approx. 7 mA	Min. switching load		5 VDC 1 mA	
Operating voltage range	21.6 to 26.4 VDC (ripple: less than 5 %)	Max. switching voltage		250 VAC 110 VDC	
Max. simultaneous input points	100 %	Response time	OFF→ ON	10 ms or less	
ON voltage/ON current	14 V or greater/3.5 mA or greater		ON→ OFF	12 ms or less	
OFF voltage/OFF current	6 V or less/1.7 mA or less	Life	Mechanical	20 million operations or more	
Input resistance	Approx. 3.3 kΩ		Electrical	100 thousand operations or more at the rated switching voltage and current load.	
Response time OFF→ ON	10 ms or less			100 thousand operations or more at 200 VAC and 1.5 A, or 240 VAC or 1 A (COSϕ=0.7)	
Response time ON→ OFF	10 ms or less			100 thousand operations or more at 200 VAC and 1 A, or 240 VAC and 0.5 A (COSϕ=0.35)	
Common method	2 points/common			100 thousand operations or more at 24 VDC and 1A, or 100 VDC and 0.1 A (L/R=7 ms)	
		Max. switching frequency		3600 times/hour	
		External power supply (I/O24V, I/O24G)	Voltage	24 V DC ±10 %, ripple (4 Vp-p or less)	
			Current	12 mA (TYP. 24 V DC, all points ON)	
		Surge suppressor		Zener diode	
		Common method		2 points/common	
Number of occupied stations	1 station  The latter two points connot be used.				
I/O unit power supply (+24, 24G) Voltage	15.6 to 27.6 VDC (peak voltage: 27.6 VDC)				
I/O unit power supply (+24, 24G) Current	40 mA				
Weight (kg)[lb]	0.2 [0.44]				
External wiring system	16-point terminal block connector (M3 screws) including a transmission circuit				
Applicable wire size	0.75 to 2 mm²				
Applicable solderless terminals	1.25-3, 1.25-YS3A, 2-S3, 2-YS3A, V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A				



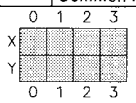
External Connections

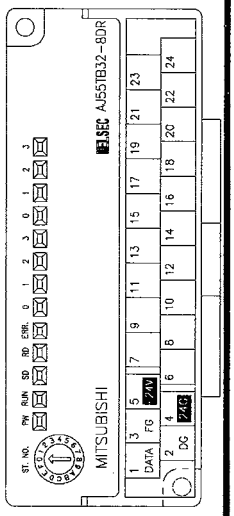


Terminal No.	Signal Name
TB1	DATA
TB2	DG
TB3	FG
TB4	24G
TB5	+24V
TB6	I/O24B
TB7	I/O24A
TB8	COMB
TB9	X0
TB10	COMA
TB11	X1
TB12	COM1
TB13	Y0
TB14	COM1
TB15	Y1
TB16	COM2

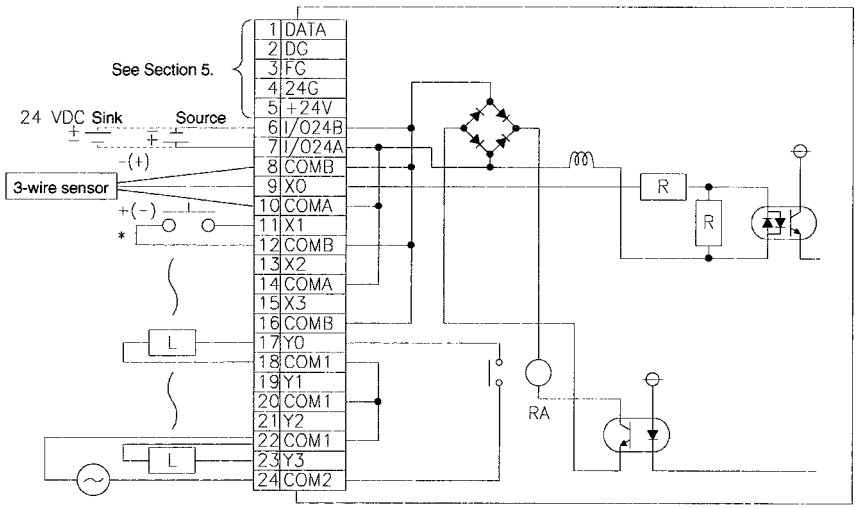
* Connect this to the COMB side if the sensor is a 2-wire type.

8.17 AJ55TB32-8DR Input/Output Unit

Type / Specification	DC Input (Sink/Source Common Type)/Transistor Output Combination Unit				Appearance
	AJ55TB32-8DR				
Input Specifications		**Output Specifications**			
Number of input points	4 points	Number of output points		4 points	
Insulation method	Photocoupler	Insulation method		Photocoupler	
Rated input voltage	24 VDC	Rated load voltage/current		24 VDC (resistance load) 40 VAC (COSφ=1) 2 A/point, 8 A/common	
Rated input current	Approx. 7 mA	Min. switching load		5 VDC 1 mA	
Operating voltage range	21.6 to 26.4 VDC (ripple: less than 5 %)	Max. switching voltage		250 VAC 110 VDC	
Max. simultaneous input points	100 %	Response time	ON→OFF	10 ms. or less	
ON voltage/ON current	14 V or greater/3.5 mA or greater		ON→OFF	12 ms. or less	
OFF voltage/OFF current	6 V or less/1.7 mA or less	Life	Mechanical	20 million operations or more	
Input resistance	Approx. 3.3 kΩ		Electrical	100 thousand operations or more at the rated switching voltage and current load.	
Response time OFF→ON	10 ms or less			100 thousand operations or more at 200 VAC and 1.5 A, or 240 VAC or 1 A (COSφ=0.7)	
Response time ON→OFF	10 ms or less			100 thousand operations or more at 200 VAC and 1 A, or 240 VAC and 0.5 A (COSφ=0.35)	
Common method	4 points/common			100 thousand operations or more at 24 VDC and 1A, or 100 VDC and 0.1 A (L/R=7 ms.)	
		Max. switching frequency		3600 times/hour	
		External power supply (I/O24A, I/O24B)	Voltage	24 VDC ±10 %, ripple (4 Vp-p or less)	
			Current	23 mA (TYP. 24 VDC, all points ON)	
		Surge suppressor		Zener diode	
		Common method		4 points/common	
Number of occupied stations	1 station 				
I/O unit power supply (+24V, 24G) Voltage	15.6 to 27.6 VDC (peak voltage: 27.6 VDC)				
I/O unit power supply (+24V, 24G) Current	50 mA				
Weight (kg)[lb]	0.3 [0.66]				
External wiring system	24-point terminal block connector (M3 screws) including a transmission circuit				
Applicable wire size	0.75 to 2 mm²				
Applicable solderless terminals	1.25-3, 1.25-YS3A, 2-S3, 2-YS3A, V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A				



External Connections

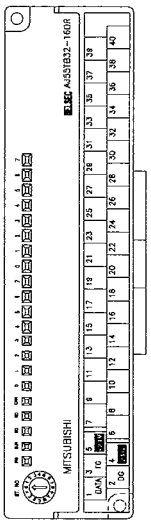


* Connect this to the COMB side if the sensor is a 2-wire type.

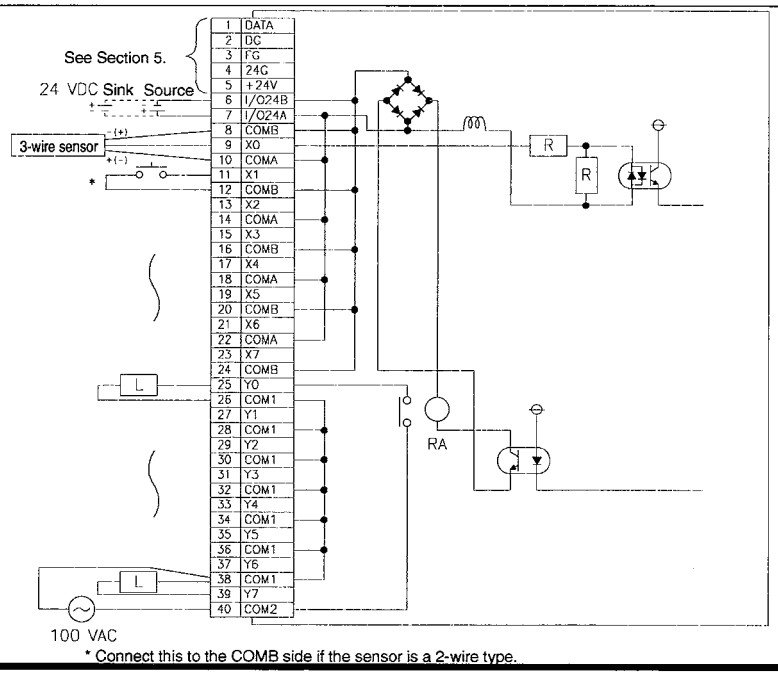
Terminal No.	Signal Name
TB1	DATA
TB2	DG
TB3	FG
TB4	24G
TB5	+24V
TB6	I/O24B
TB7	I/O24A
TB8	COMB
TB9	X0
TB10	COMA
TB11	X1
TB12	COMB
TB13	X2
TB14	COMA
TB15	X3
TB16	COMB
TB17	Y0
TB18	COM1
TB19	Y1
TB20	COM1
TB21	Y2
TB22	COM1
TB23	Y3
TB24	COM2

8.18 AJ55TB32-16DR Input/Output Unit

Specification \ Type	DC Input (Sink/Source Common Type)/Transistor Output Combination Unit				Appearance
	AJ55TB32-16DR				
Input Specifications		**Output Specifications**			
Number of input points	8 points	Number of output points		8 points	
Insulation method	Photocoupler	Insulation method		Photocoupler	
Rated input voltage	24 VDC	Rated load voltage/current		24 VDC (resistance load) 240 VAC (COSϕ=1) 2 A/point, 8 A/common	
Rated input current	Approx. 7 mA	Min. switching load		5 VDC 1 mA	
Operating voltage range	21.6 to 26.4 VDC (ripple: 4 Vp-p or less)	Max. switching voltage		250 VAC 110 VDC	
Max. simultaneous input points	100 %	Response time	OFF→ON	10 ms or less	
ON voltage/ON current	14 V or greater/3.5 mA or greater		ON→OFF	12 ms or less	
OFF voltage/OFF current	6 V or less/1.7 mA or less	Life	Mechanical	20 million operations or more	
Input resistance	Approx. 3.3 kΩ		Electrical	100 thousand operations or more at the rated switching voltage and current load.	
Response time OFF→ON	10 ms or less			100 thousand operations or more at 200 VAC and 1.5 A, or 240 VAC or 1 A (COSϕ=0.7)	
Response time ON→OFF	10 ms or less			100 thousand operations or more at 200 VAC and 1 A, or 240 VAC and 0.5 A (COSϕ=0.35)	
Input type	Sink/source common type				
Common method	8 points/common			100 thousand operations or more at 24 VDC and 1A, or 100 VDC and 0.1 A (L/R=7 ms)	
		Max. switching frequency		3600 times/hour	
		External power supply (I/O24A, I/O24B)	Voltage	24 VDC ±10 %, ripple (4 Vp-p or less)	
			Current	45 mA (TYP. 24 VDC, all points ON)	
		Surge suppressor		None	
		Common method		8 points/common	
Number of occupied stations	2 stations (0 1 2 3 4 5 6 7 / X / Y)				
I/O unit power supply (+24V, 24G) Voltage	15.6 to 27.6 VDC (peak voltage: 27.6 VDC)				
I/O unit power supply (+24V, 24G) Current	70 mA				
Weight (kg)[lb]	0.4 [0.88]				
External wiring system	40-point terminal block connector (M3 screws) including a transmission circuit				
Applicable wire size	0.75 to 2 mm²				
Applicable solderless terminals	1.25-3, 1.25-YS3A, 2-S3, 2-YS3A, V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A				



External Connections



* Connect this to the COMB side if the sensor is a 2-wire type.

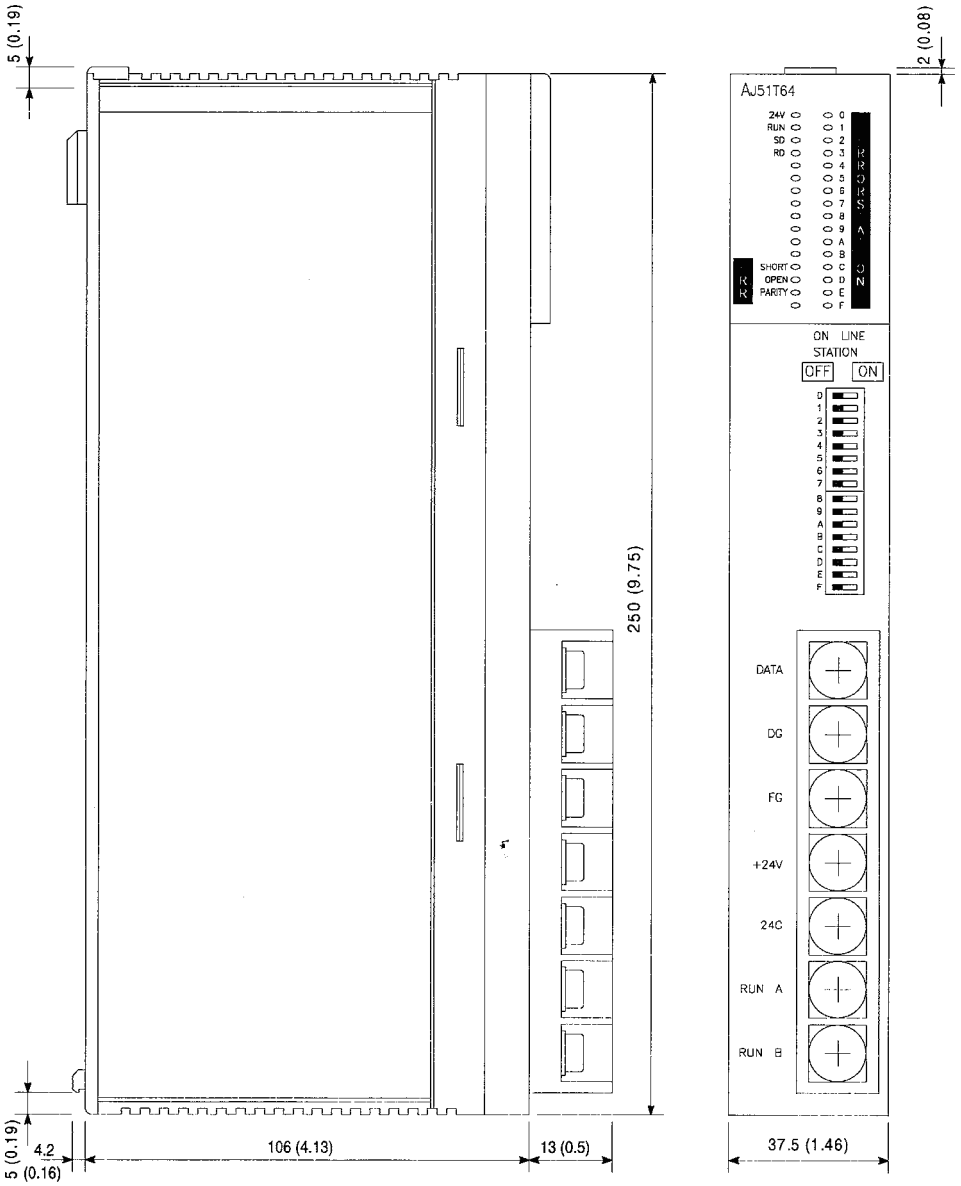
Terminal No.	Signal Name	Terminal No.	Signal Name
TB1	DATA	TB21	X6
TB2	DG	TB22	COMA
TB3	FG	TB23	X7
TB4	24G	TB24	COMB
TB5	+24V	TB25	Y0
TB6	I/O24B	TB26	COM1
TB7	I/O24A	TB27	Y1
TB8	COMB	TB28	COM1
TB9	X0	TB29	Y2
TB10	COMA	TB30	COM1
TB11	X1	TB31	Y3
TB12	COMB	TB32	COM1
TB13	X2	TB33	Y4
TB14	COMA	TB34	COM1
TB15	X3	TB35	Y5
TB16	COMB	TB36	COM1
TB17	X4	TB37	Y6
TB18	COMA	TB38	COM1
TB19	X5	TB39	Y7
TB20	COMB	TB40	COM2

APPENDICES

APPENDIX 1 EXTERNAL DIMENSIONS

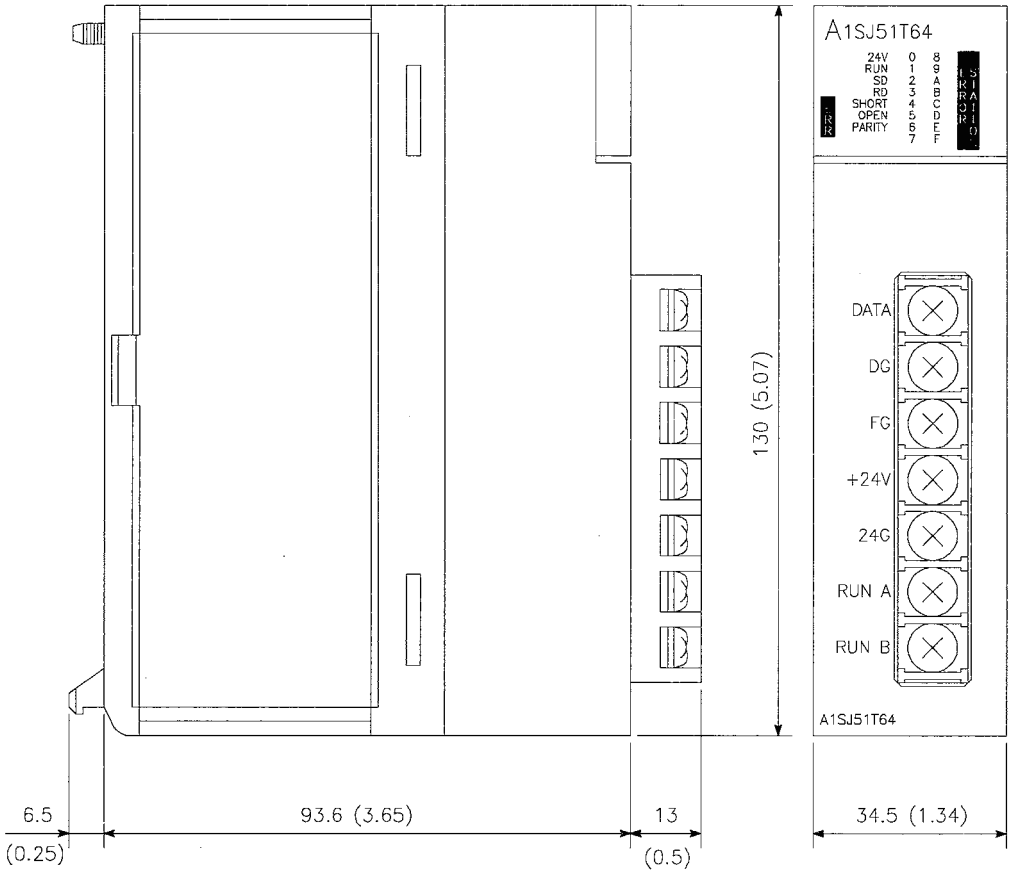
1.1 Master Module

(1) AJ51T64



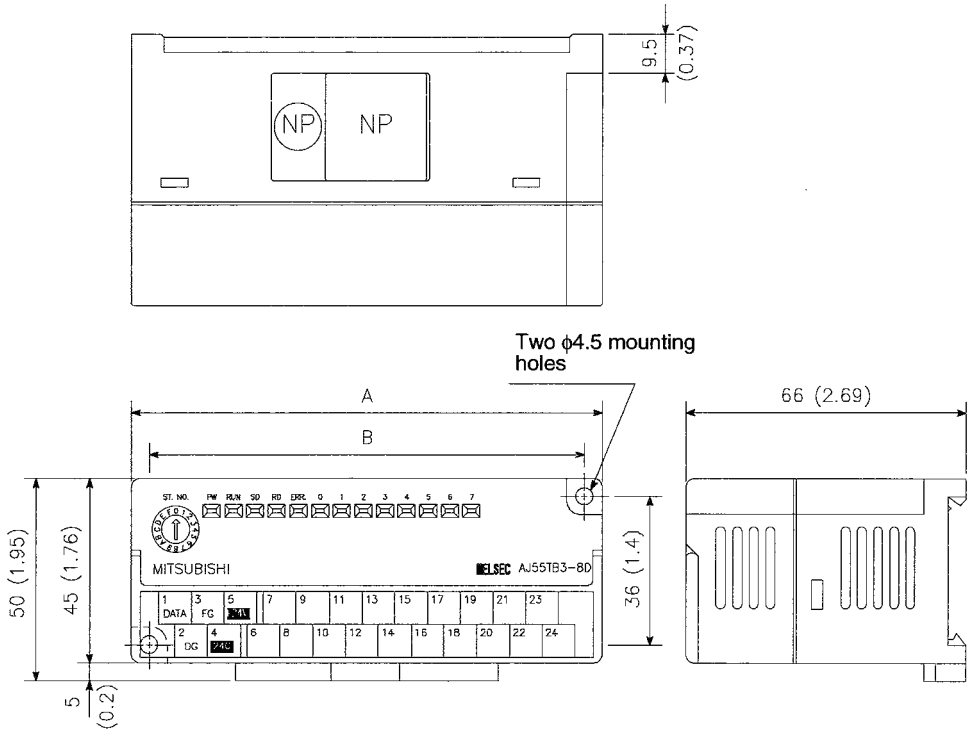
Unit: mm (inch)

(2) A1SJ51T64



Unit: mm (inch)

1.2 Remote I/O Unit



Model Name	Changed Dimensions	
	A	B
AJ55TB[ ][ ]-4[ ][ ]	82 (3.23)	73 (2.87)
AJ55TB[ ][ ]-8[ ][ ]	114 (4.4)	105 (4.09)
AJ55TB[ ][ ]-16[ ][ ]	177 (6.97)	168 (6.61)

Unit: mm (inch)

IMPORTANT

(1) Design the configuration of a system to provide an external protective or safety inter locking circuit for the PLCs.

(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 your body and the work bench.

(b) Do not touch the conductive areas of the printed circuit board and its electrical parts with non-grounded tools, etc.

WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.
However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.
Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.

1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.

(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not , compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

6. Product application

(1) In using the Mitsubishi MELSEC programmable logic controller, the usage conditions shall be that the application will not lead to a major accident even if any problem or fault should occur in the programmable logic controller device, and that backup and fail-safe functions are systematically provided outside of the device for any problem or fault.

(2) The Mitsubishi programmable logic controller has been designed and manufactured for applications in general industries, etc. Thus, applications in which the public could be affected such as in nuclear power plants and other power plants operated by respective power companies, and applications in which a special quality assurance system is required, such as for Railway companies or Public service purposes shall be excluded from the programmable logic controller applications.
In addition, applications in which human life or property that could be greatly affected, such as in aircraft, medical applications, incineration and fuel devices, manned transportation, equipment for recreation and amusement, and safety devices, shall also be excluded from the programmable logic controller range of applications.
However, in certain cases, some applications may be possible, providing the user consults their local Mitsubishi representative outlining the special requirements of the project, and providing that all parties concerned agree to the special circumstances, solely at the users discretion.

MELSEC-I/O Link Remote I/O System Master Module
Type AJ51T64/A1SJ51T64

User's Manual

MODEL	A1SJ51T64-U-E
MODEL CODE	13J748
IB(NA)-66574-G(0604)MEE	

MITSUBISHI ELECTRIC CORPORATION

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