EKI-2728MI

6G + 2G Fiber Port Industrial Unmanaged Gigabit Ethernet Switch

User Manual

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Acknowledgements

Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Technical Support and Assistance

Step 1.   Visit the Advantech web site at **www.advantech.com/support** where you can find the latest information about the product.

Step 2.   Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
- Product name and serial number
- Description of your peripheral attachments
- Description of your software (operating system, version, application software, etc.)
- A complete description of the problem
- The exact wording of any error messages

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User's Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.
    d. The equipment does not work well, or you cannot get it to work according to the user's manual.
    e. The equipment has been dropped and damaged.
    f.   The equipment has obvious signs of breakage.

15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -40℃ (-40℉) OR ABOVE 85℃ (185℉). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

1. To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
2. Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

Contents

Overview

Sections include:

- Introduction
- Features
- Specifications
- Packing List
- Safety Precaution

Chapter 1   Overview

1.1   Introduction

The EKI-2728MI is a full industrial Gigabit Ethernet switch. Featuring 6G + 2G Fiber ports, the EKI-2728MI is designed not only to handle data intensive applications, the EKI-2728MI can handle voice, video, and even large multimedia transmissions at Gigabit high speeds.

1.1.1   High-Speed Transmissions

The EKI-2728MI includes a switch controller that can automatically sense transmission speeds (10/100/1000 Mbps). The RJ-45 interface can also be auto-detected, so MDI or MDI-X is automatically selected and a crossover cable is not required. All Ethernet ports have memory buffers that support the store-and-forward mechanism. This assures that data is properly transmitted.

1.1.2   Dual Power Input

EKI-2728MI redundant power input design is with power reserve protection to prevent the switch device broken by wrong power wiring. When one of power input is fail, P-Fail LED will turn on and send an alarm through a relay output for notifying user.

1.1.3   Flexible Mounting

EKI-2728MI is compact (59.6 x 105 x 152 mm) and can be mounted on a DIN-rail or a panel, so it is suitable for any space-constrained environment.

1.1.4   Advanced Protection

EKI-2728MI supports up to 3,000 VDC surge protection for power line, and also supports 4,000V ESD for Ethernet ports. With these 2 strong protections, it can secure equipment against unregulated voltage and make systems safer and more reliable. Further, EKI-2728MI provides currency overload protection with a resettable fuse to ensure that the device component won't be damaged by overload current.

1.1.5   Green Power

The EKI-2728MI has a special function. The switch will automatically detect Ethernet ports status and Cable Length and adjust power efficiency. It saves 5.49% power consumption for cable length 20m.

1.1.6   Industrial Operating Temperature

The operating temperature of the EKI-2728MI is between -40 ~ 75℃. With such a application range, you can use the EKI-2728MI in some of the harshest industrial environments that exist.

1.1.7   Easy Troubleshooting

LED indicators make troubleshooting quick and easy. Each 10/100/1000Base-TX port has 2 LEDs that display the link status, transmission speed and collision status. Also the three power indicators P1, P2 and P-Fail help you diagnose the status immediately.

1.2 Features

- Provides 6 Gigabit Ethernet ports with Auto Negotiation and 2 Gigabit Fiber ports
- Supports 10/100/1000Mbps Auto Negotiation
- Provides surge (EFT) protection 3,000 V_{DC} for power line
- Supports 4,000 V_{DC} Ethernet ESD protection
- Provides Slim size, DIN-rail with IP30 metal mechanism
- Supports Redundant 12 ~ 48 V_{DC} , 24 V_{AC} power input and P-Fail Relay
- Supports operating temperature between -40 ~ 75℃
- Support Green Power, saving 5.49% power consumption

1.3 Specification

Communications

Standard	IEEE 802.3, 802.3u, 802.3x, 802.3ab, 802.3z
LAN	10/100/1000Base-TX
Transmission Distance	Up to 100m (4-wire Cat.5e, Cat 6 RJ-45 cable)
Transmission Speed	Up to 1000Mbps

Interface

Connectors	6 x RJ-45
	2 x Fiber sockets (SC)
	6-pin removable screw terminal (power & relay)
LED Indicators	Unit: P1, P2, P-Fail, Link/Active for fiber
	Port: Link/Active, Speed

Power

Power Consumption	Max. 9.3W
Power Input	2 x Unregulated 12 ~ 48 V_{DC} and 24 V_{AC}
Fault Output	1 Relay Output

Mechanism

Dimensions (WxHxD)	59.6 x 105 x 152 mm
Enclosure	IP30, Metal shell with solid mounting kits
Mounting	DIN-rail, Wall

Protection

ESD (Ethernet)	4,000 V_{DC}
Surge (EFT for power)	3,000 V_{DC}
Power Reverse	Present

Environment

Operating Temperature	-40 ~ 75 ℃ (-40 ~ 175℉)
	-40 ~ 60 ℃ (non-air-flow environment)
Operating Humidity	5 ~ 95% (non-condensing)
Storage Temperature	-40 ~ 85 ℃ (-40 ~ 185℉)
Storage Humidity	5 ~ 95% (non-condensing)
MTBF	505863 hrs

Certifications

Safety	UL508, Class 1 Division 2
EMC	FCC Class A
	EU: EN61000-6-2/4
	EN61000-3/3/3
	EN61000-4-2/3/4/5/6/8/11/12
Freefall	IEC60068-2-32
Shock	IEC60068-2-27
Vibration	IEC60068-2-6

1.4　Packing List

- 1 x EKI-2728MI Industrial Ethernet Switch
- 1 x eAutomation Industrial Communication CD-ROM and User manual
- 2 x Wall Mounting Bracket and Screws
- 1 x DIN-rail Mounting Bracket and Screws
- 1 x EKI-2728MI Startup Manual
- 1 x DC Jack Cable φ 2.0/150mm

1.5　Safety Precaution

Attention　　*IF DC voltage is supplied by an external circuit, please use a protection device on the power supply input.*

Installation

Sections include:

- LED Indicators
- Dimensions
- Mounting
- Network Connection
- Power Connection

Chapter 2   Installation

In this chapter, you will be given an overview of the EKI-2728MI hardware installation procedures.

2.1   LED Indicators

There are few LEDs display the power status and network status located on the front panel of EKI-2728MI, each of them has their own specific meaning as below table.

| Table 2.1: EKI-2728MI LED Definition			
LED	**Color**	**Description**	
PWR1	Green	On	Power input 1 is active
		Off	Power input 1 is inactive
PWR2	Green	On	Power input 2 is active
		Off	Power input 2 is inactive
P-Fail	Red	On	Power input 1 or 2 is inactive
		Off	Power input 1 and 2 are both active, or no power input
Link/Active (1~6)	Green	On	Connected to network
		Flashing	Networking is active
		Off	Not connected to network
Speed (1~6)	Green	On	Connected to network at speed of 1000Mbps
		Off	Not connected to network or not working at speed of 1000Mbps
Link/Active for Fiber (7~8)	Green	On	Connected to network
		Flashing	Networking is active
		Off	Not connected to network

2.2 Dimensions (units: mm)
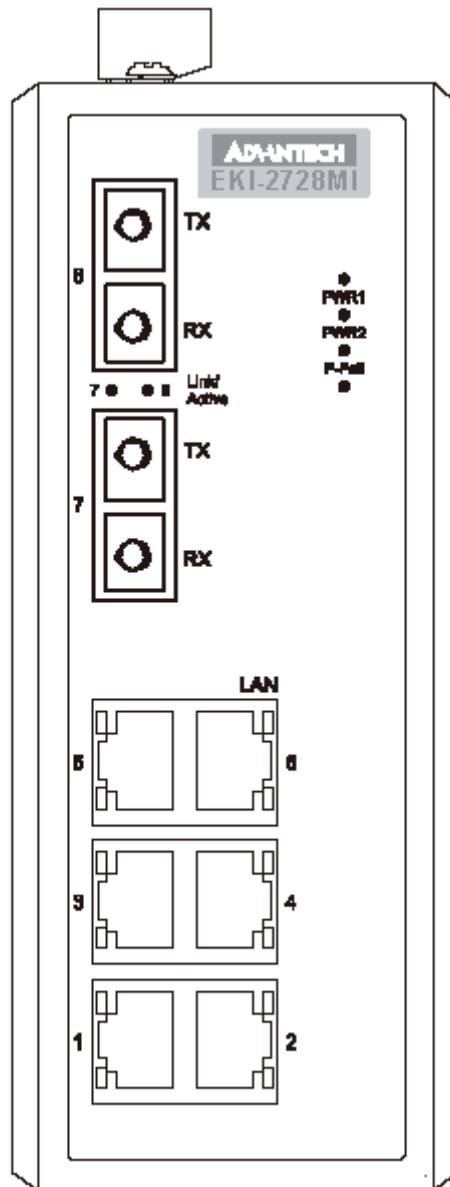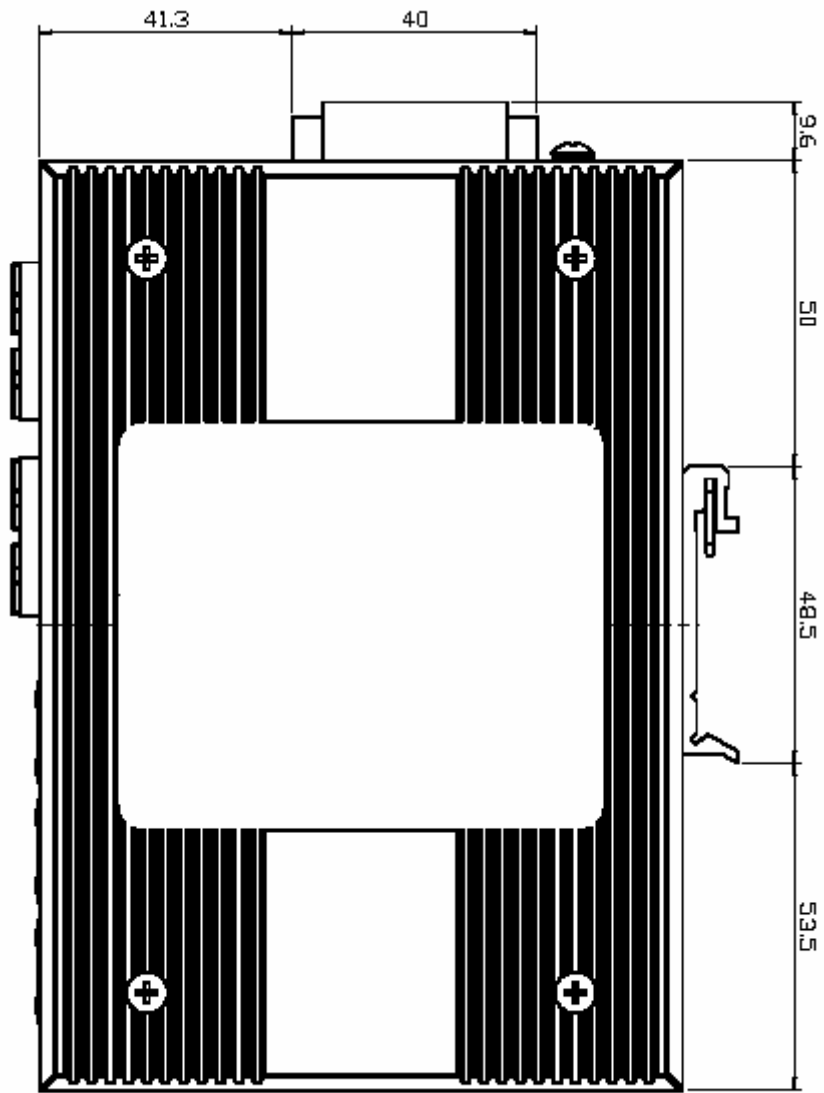

Figure 2.1: Front View of EKI-2728MI
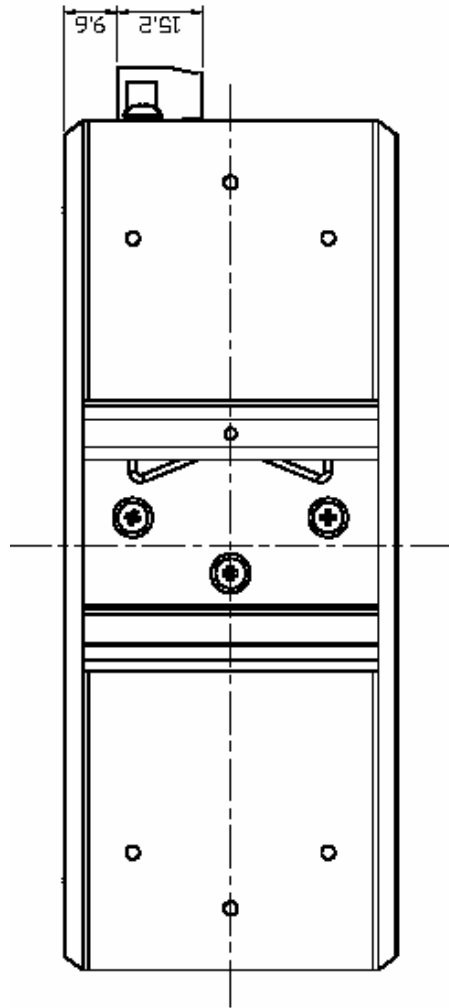
Figure 2.2: Side View of EKI-2728MI

Figure 2.3: Rear View of EKI-2728MI

The power & relay terminal block is located on the top. Please refer to page 16 for pin assignment.
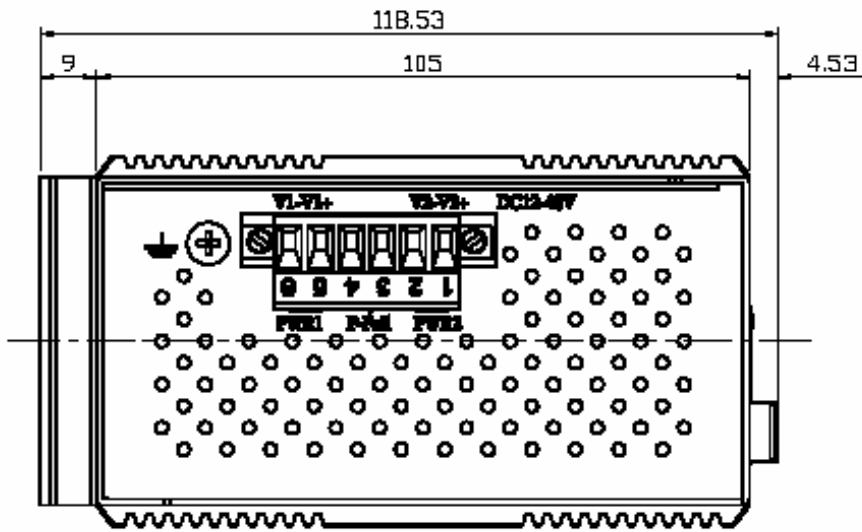

Figure 2.4: Top View of EKI-2728MI

2.3 Mounting

The EKI-2728MI supports two mounting methods: DIN-rail & Wall.

2.3.1   Wall mounting

EKI-2728MI can be wall-mounted by using the included mounting kit. Then, hang on the EKI-2728MI to the nails on the wall.

First, use the screws included in the package to combine the EKI-2728MI and metal mounting kit. And then you can install the device firmly via the components, please see Figure 2.5 as below.
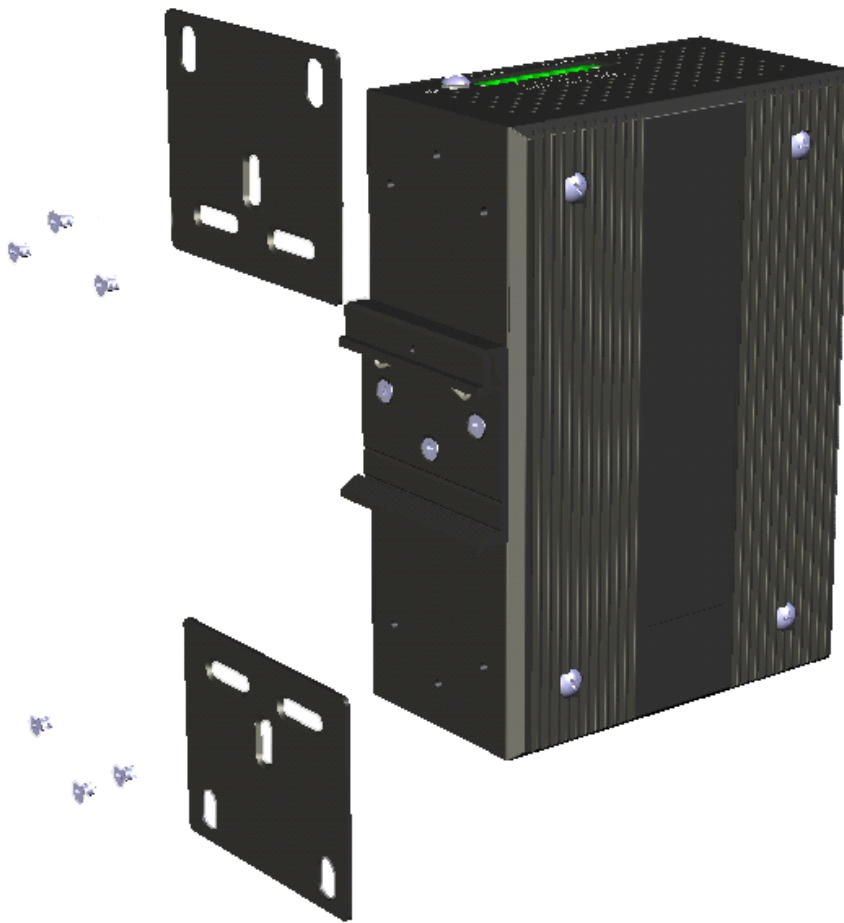

Figure 2.5: Combine the Metal Mounting Kit (units: mm)

2.3.2 DIN-rail Mounting

You can also mount EKI-2728MI on a standard DIN-rail by the steps below.

The DIN-rail kit is screwed on the industrial switch when out of factory. If the DIN-rail kit is not screwed on the industrial switch, please screw the DIN-rail kit on the switch first.

First, hang the EKI-2728MI to the DIN-rail with angle of inclination. See figure 2.6.

Figure 2.6: Installation to DIN-rail Step 1

Then, let the device down straight to slide over the rail smoothly. See Figure 2.7

Figure 2.7: Installation to DIN-rail Step 2

2.4   Network Connection

The EKI-2728MI has 6 x RJ-45 and 2 Fiber ports that support connection to 10 Mbps Ethernet, 100 Mbps Fast Ethernet, or 1000 Mbps Gigabit Ethernet, and half or full duplex operation. EKI-2728MI can be connected to other hubs/switches through a twisted-pair straight-through cable or a crossover cable up to 100m long. The connection can be made from any TX port of the EKI-2728MI (MDI-X) to another hub or switch either MDI-X or uplink MDI port.

The EKI-2728MI supports auto-crossover to make networking more easy and flexible. You can connect any RJ-45 (MDI-X) station port on the switch to any device such as a switch, bridge or router.

2.5   Power Connection

The EKI-2728MI supports dual +12 ~ 48 V_{DC} and 24 V_{AC} power inputs and power-fail relay output.

Terminal Block Front View for Fault Alarm Contact

24Vdc, 1A Resistance

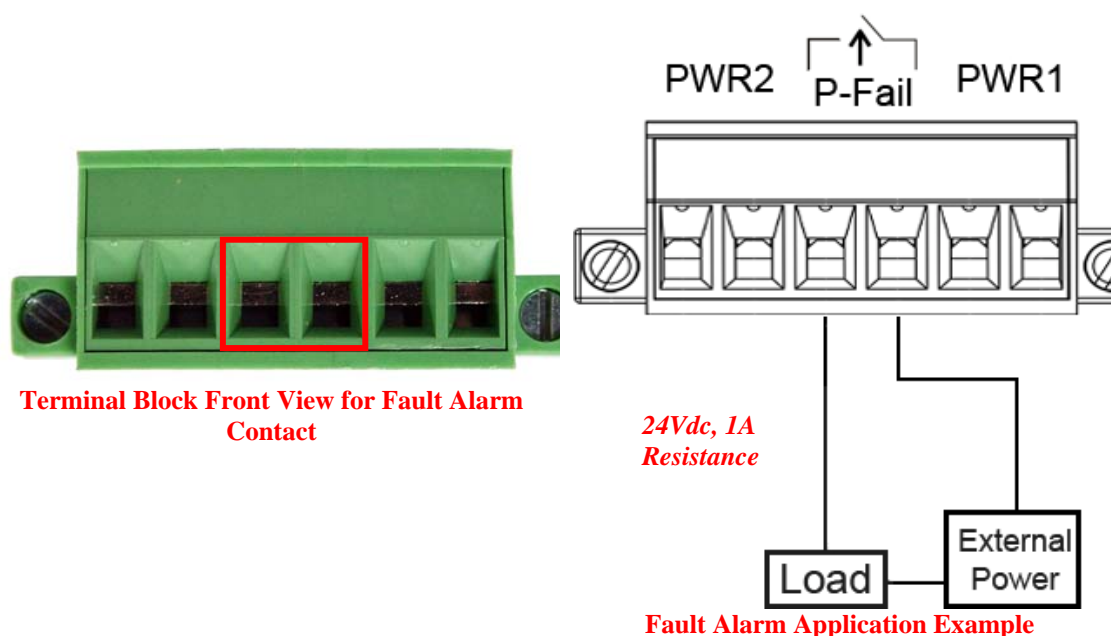**Fault Alarm Application Example**

Figure 2.8: Pin Assignment of the Power Connector

You can connect an alarm indicator, buzzer or other signaling equipment through the relay output. The relay opens if power input 1 or 2 fails ('Open' means if you connect relay output with an LED, the light would be off).

Troubleshooting

Chapter 3   Troubleshooting

1.   Power Input

Verify that is using the right power cord/adapter (+12~48 V_{DC} and 24 V_{AC}), please don't use the power adapter with DC output voltage higher than 48V, or it will burn this converter down.

2.   Cable

Select the proper UTP/STP cable to construct your network. Please check that you are using the right cable. Use Unshielded Twisted-Pair (UTP) or Shielded Twisted-Pair (STP) cable for RJ-45 connections: 100 Category 3, 4 or 5 cable for 10 Mbps connections, 100 Category 5 cable for 100 Mbps, or 100 Category 5e/above cable for 1000Mbps connections. Also, be sure that the length of any twisted-pair connection does not exceed 100 meters (328 feet).

3.   Diagnosing LED Indicators

The switch can be easily monitored through panel indicators, which describes common problems user may encounter and where user can find possible solutions, to assist in identifying problems.

If the power indicator does not light up when the power cord is plugged in, user may have a problem with power cord. Then check for loose power connections, power losses or surges at power outlet. If user still cannot resolve the problem, contact the local dealer for assistance.

If the Industrial switch LED indicators are normal and the connected cables are correct but the packets still cannot transmit, please check your system's Ethernet devices configuration or status.

APPENDIX

A

Pin Assignment & Wiring

Appendix A   Pin Assignment & Wiring

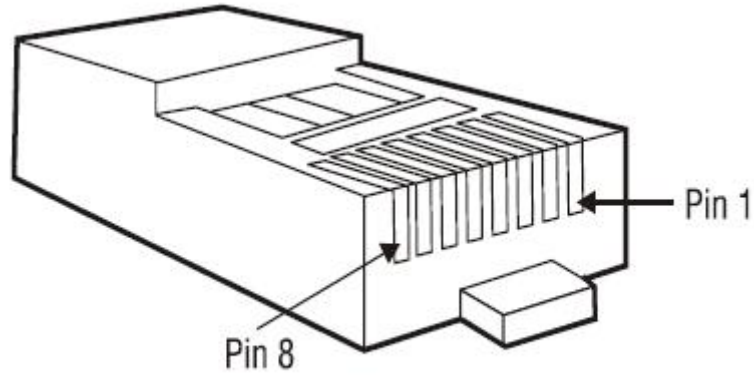It is suggested to adopt ELA/TIA as the wiring of the RJ-45.
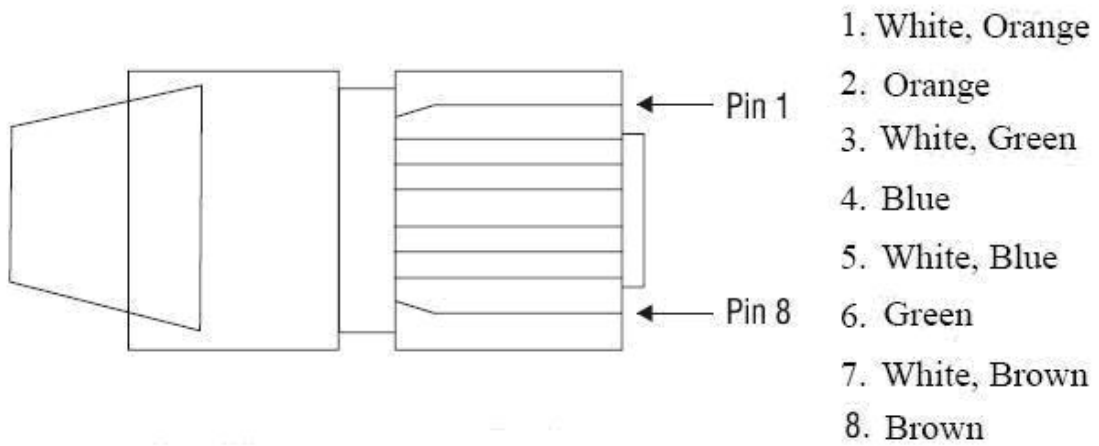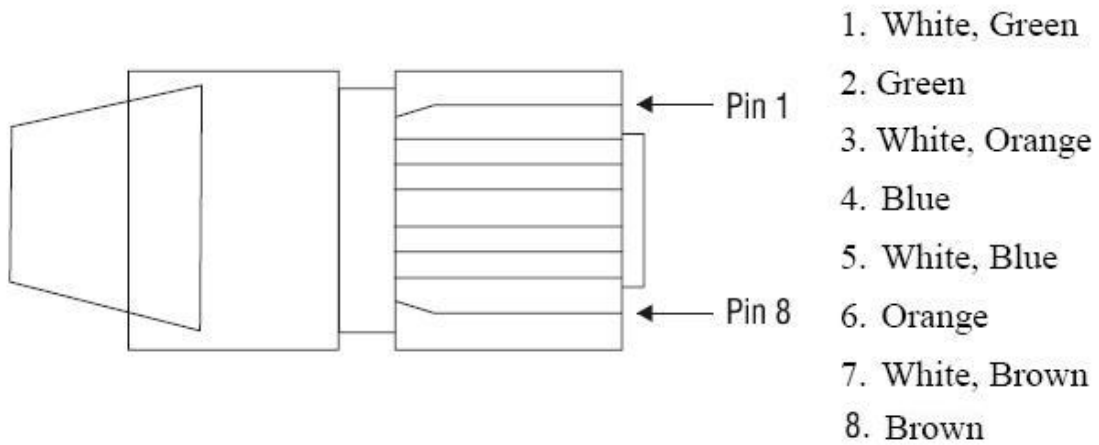

Figure A.1: RJ-45 Pin Assignment

1. White, Orange
2. Orange
3. White, Green
4. Blue
5. White, Blue
6. Green
7. White, Brown
8. Brown

Figure A.2: EIA/TIA-568B

1. White, Green
2. Green
3. White, Orange
4. Blue
5. White, Blue
6. Orange
7. White, Brown
8. Brown

Figure A.2: EIA/TIA-568A