

## **EKI-4524I**

**24-port 10/100TX Ethernet  
Switch with AC/DC Power  
Input**

**User Manual**

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## **Product Warranty (2 years)**

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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, network 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 merchandise 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](http://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°C (-40°F) OR ABOVE 85°C (185°F). 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 equipment chassis before you work on it.
2. Disconnect power before making any configuration changes.

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## Overview

Sections include:

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

# Chapter 1 Overview

## 1.1 Introduction

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The EKI-4524I is a cost-effective solution, which meets the high reliability requirements demanded by industrial applications. The equipment supports both DC and AC power inputs. Besides, the EKI-4524I is designed for the applications supposed to have certain electric interference. Equipped with isolated power and isolated communication ports, the device has high resistance toward electrical noise. It has been proved to work well for any harsh applications.

### 1.1.1 High-Speed Transmissions

The EKI-4524I includes a switch controller that can automatically sense transmission speeds (10/100 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 19" Rack Mounting

The EKI-4524I comes with a rack-mounted kit and can be mounted in an EIA standard size, 19-inch Rack. The Switch can be placed in a wiring closet with other equipment.

### 1.1.3 Advanced Protection

The power line of EKI-4524I supports up to 4,000 V<sub>DC</sub> EFT protection, which secures equipment against unregulated voltage and makes systems safer and more reliable, while 8,000 V<sub>DC</sub> ESD protection for Ethernet ports makes the equipment more suitable for harsh environments.

### 1.1.4 Easy Troubleshooting

LED indicators make troubleshooting quick and easy. Each 10/100 Base-TX port has LED indicators that display the link status, transmission speed and collision status.

## 1.2 Features

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- System Interface/Performance
  - RJ-45 ports support Auto MDI/MDI-X Function
  - Store-and-Forward Switching Architecture
  - Back-plane (Switching Fabric): 4.8Gbps
  - 4Mbits Packet Buffer
  - 8K MAC Address Table
- Power Supply
  - 100 ~ 240 V<sub>AC</sub>, 50/60Hz
  - 100 ~ 240 V<sub>DC</sub>
- Case/Installation
  - IP-30 Protection
  - 19-inch Rack-Mount Design
- Provides EFT protection 4,000 VDC for power line
- Supports 8,000 VDC Ethernet ESD protection

## 1.3 Specifications

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### Communications

<b>IEEE Standard LAN</b>	IEEE 802.3, 802.3u, 802.3x
<b>Transmission Distance</b>	10/100Base-TX
<b>Transmission Speed</b>	Up to 100m 10/100Mbps, Auto-Negotiation

### Interface

<b>Connectors</b>	24 x RJ-45 10-pin barrier terminal block
<b>LED Indicators</b>	System: PWR 10/100TX: LNK/ACT, Speed

### Power

<b>Power Consumption</b>	14.5 Watts max. @ 110 V <sub>AC</sub> 11.04 Watts max. @ 110 V <sub>DC</sub>
<b>Power Input</b>	100 ~ 240 V <sub>AC</sub> , 50/60Hz 100 ~ 240 V <sub>DC</sub>
<b>Relay Alarm</b>	1 Relay Output

### Mechanism

<b>Dimensions (WxHxD)</b>	440 x 44 x 224 mm
<b>Enclosure</b>	IP30, metal shell with solid mounting kits
<b>Mounting</b>	19-inch Rack Mount

### Protection

<b>ESD (Ethernet)</b>	8,000 V <sub>DC</sub>
<b>EFT (Power)</b>	4,000 V <sub>DC</sub>
<b>Reverse Polarity</b>	Present
<b>Overload Current Protection</b>	Present

### Environment

<b>Operating Temperature</b>	-40 ~ 75°C (-40 ~ 167°F)
<b>Operating Humidity</b>	5 ~ 95% (non-condensing)
<b>Storage Temperature</b>	-40 ~ 85°C (-40 ~ 185°F)
<b>Storage Humidity</b>	5 ~ 95% (non-condensing)

## Certifications

**EMC**  
**Freefall**  
**Shock**  
**Vibration**

CE, FCC Class A  
IEC60068-2-32  
IEC60068-2-27  
IEC60068-2-6

## 1.4 Packing List

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- 1 x EKI-4524I Industrial Unmanaged Fast Ethernet Switch
- 1 x eAutomation Industrial Communication CD-ROM and User manual
- 2 x Rack Mounting Bracket and Screws
- 1 x EKI-4524I Startup Manual

## 1.5 Safety Precaution

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

# CHAPTER 2

## Installation

Sections include:

- LED Indicators
- Dimensions
- Mounting
- Network Connection
- Wiring Power Input
- Wiring Relay Alarm

## Chapter 2 Installation

In this chapter, you will be given an overview of the EKI-4524I hardware installation procedures.

### 2.1 LED Indicators

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The LED indicators located on the panel display the power status and network status of EKI-4524I; each has its own specific meaning as the table shown below.

<i>Table 2.1: EKI-4524I LED Definition</i>			
LED	Color	Description	
PWR	Green	On	Power input is active
		Off	Power input is inactive
LNK/ACT	Green	On	Connected to network
		Flashing	Networking is active
		Off	Not connected to network
SPEED	Amber	On	100M
		Off	10M or link-down



## 2.2 Dimensions (units: mm)

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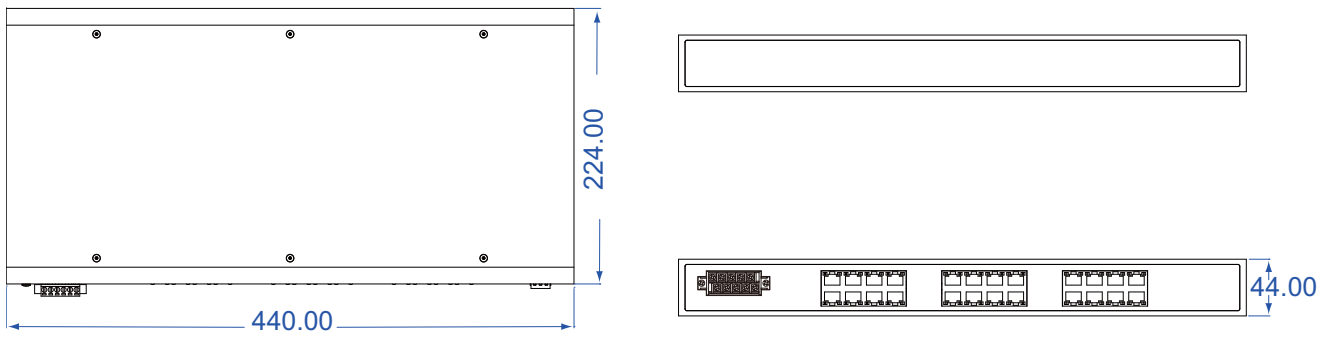


Figure 2.1: EKI-4524I Mechanical Dimensions

## 2.3 Mounting

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### 2.3.1 Rack mounting

EKI-4524I comes with a rack-mounted kit and can be mounted in an EIA standard size, 19-inch rack. The Switch can be placed in a wiring closet with other equipment.

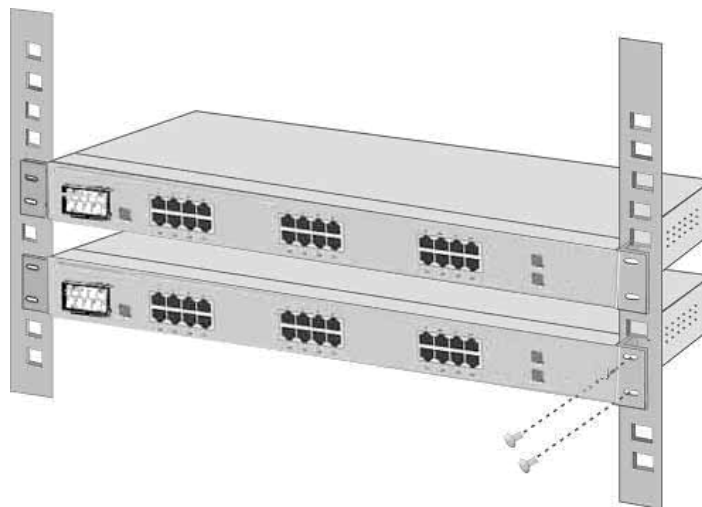
Perform the following steps to rack-mount the switch:

1. Position one bracket to align with the holes on one side of the switch and secure it with the smaller bracket screws. Then attach the remaining bracket to the other side of the Switch.



*Figure 2.2: Attach mounting brackets with screws*

2. After attaching the mounting brackets, position the EKI-4524I in the rack by lining up the holes in the brackets with the appropriate holes on the rack. Secure the Switch to the rack by a screwdriver with the rack-mounting screws.



*Figure 2.3: Mount the switch in the 19" rack*

**Note:** For proper ventilation, allow about at least 4 inches (10 cm) of clearance on the front and 3.4 inches (8 cm) on the back of the Switch. This is especially important for enclosed rack installation.

## 2.4 Network Connection

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The EKI-4524I has 24 x RJ-45 ports that support connection to 10 Mbps Ethernet, or 100 Mbps Fast Ethernet, and half or full duplex operation. EKI-4524I can be connected to other hubs or switches via a twisted-pair straight-through or crossover cable up to 100m long. The connection can be made from any TX port of the EKI-4524I (MDI-X) to another hub or switch either MDI-X or uplink MDI port.

The EKI-4524I 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 Wiring Power Input

EKI-4524I comes equipped with a 10-position cross screw terminal block on where power input and fail-safe relay are located. Please follow the steps below to wire the power connection.

Pin Number	Description	Definition
1	N	<b>Neutral</b> pin is wired to the <i>Neutral</i> point of the AC power system, or to the negative (-) point of the DC power source.
2	GND	Grounding pin
3	L	<b>Live</b> pin is wired to the <i>Live</i> point of the AC power system, or to the positive (+) point of the DC power source.
4	GND	Grounding pin
5	-NA-	Not available
6	-NA-	Not available
7	-NA-	Not available
8	Alarm Contact	Used for wiring to an external self-powered warning device
9	-NA-	Not available
10	Alarm Contact	Used for wiring to an external self-powered warning device

1. Before wiring, make sure the power source is disconnected.
2. Prepare the bare wires or ring lugs for power connection.
3. Use a cross-head screw driver to loose the screws where the contacts are to be connected.
4. Attach the AC or DC power wires to the contacts and secure the screws firmly.

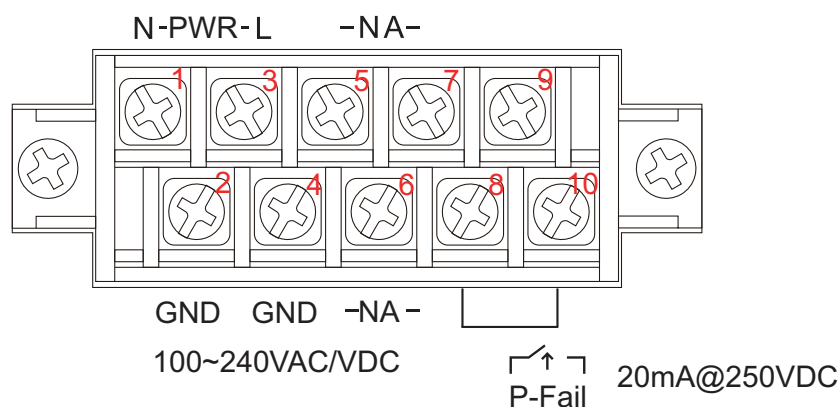
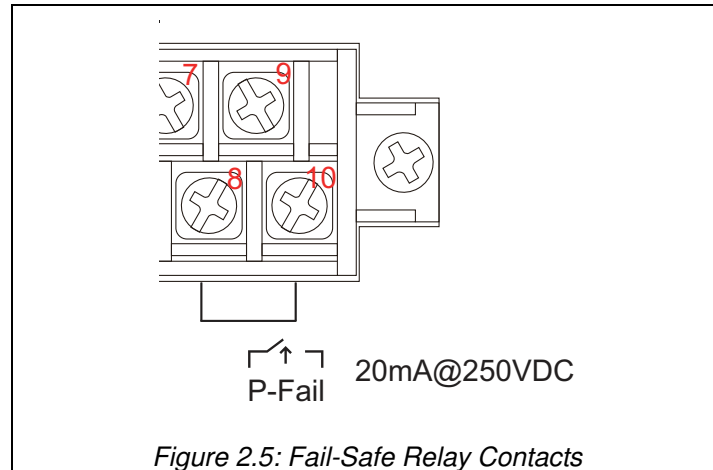


Figure 2.4: 10-position Cross Screw Terminal Block

## 2.6 Wiring Relay Alarm Contacts

The fail-safe relay alarm contacts are labeled as 8 and 10 as the figure shown below. With a **Normally Close** circuit formed by wiring with an external power and an alarm device (a buzzer or a flashing LED), system will detect the power failure event. If a failure event occurs, the relay inside EKI-4524I will act as an open switch, and therefore break the external circuit. The fail-safe design is intended for triggering the connected alarm device for warning purposes.



### Note

- Use Copper Conductors Only, **60/75°C**, tightening to **5 lb-in**
- The wire gauge for the terminal block should be in the range between **12~ 24 AWG**.



CHAPTER  
**3**

**Troubleshooting**

## Chapter 3 Troubleshooting

Verify that you are using the right power cord/adapter. Please don't use a power adapter with DC outputs higher than the power rating of this equipment, or it will be damaged.

Select the proper UTP cable to construct the user network. Use unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable for RJ-45 connections: 100  $\Omega$  Category 3, 4 or 5 cable for 10Mbps connections, 100  $\Omega$  Category 5 cable for 100Mbps connections, or 100  $\Omega$  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).

### Diagnosing LED Indicators

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

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

If the LED indicators are normal and the connected cables are correct but the packets still cannot be transmitted, please check the user system's Ethernet devices' configuration or status.



**APPENDIX  
A**

**Pin Assignments &  
Wiring**

# Appendix A Pin Assignments & Wiring

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

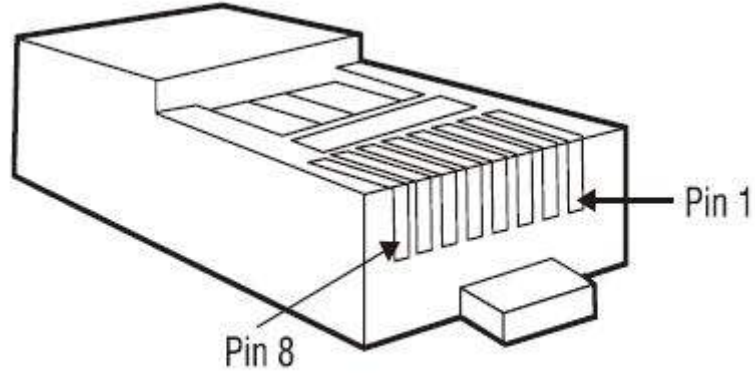


Figure A.1: RJ-45 Pin Assignments

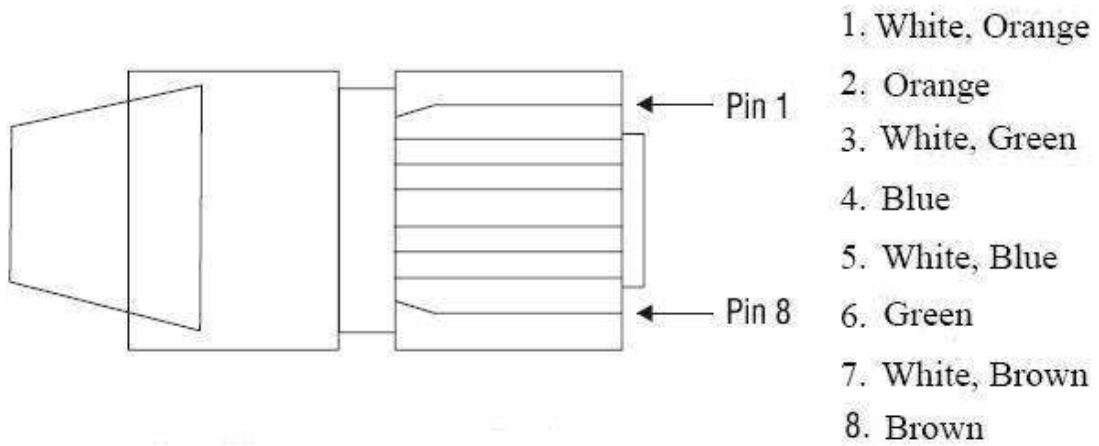


Figure A.2: EIA/TIA-568B

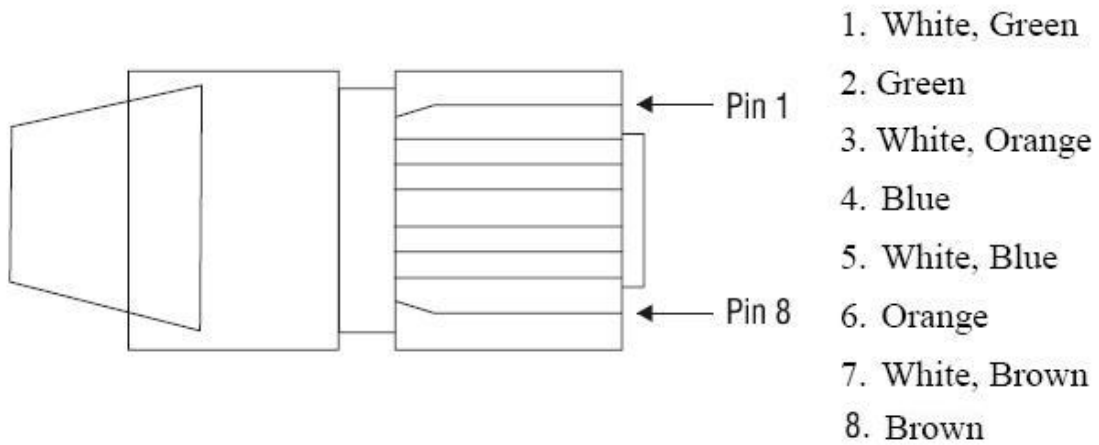


Figure A.2: EIA/TIA-568A