

EKI-2728I

**8-port Industrial Unmanaged
Gigabit Ethernet Switch**

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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.

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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 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.

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Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from Advantech. Please contact your local supplier for ordering information.

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

Note: 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

1. Visit the Advantech web site at www.advantech.com/support where you can find the latest information about the product.
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 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:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well, or you cannot get it to work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.
15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
16. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.
17. The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Safety Precaution - Static Electricity

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

- 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.
- 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.

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Chapter 1

Overview

1.1 Introduction

The EKI-2728I is a full industrial Gigabit Ethernet switch. Featuring 8 x 10/100/1000Base-TX ports, EKI-2728I is designed not only to handle data intensive applications, but also featuring the "Jumbo Frames" function with an MTU (Maximum Transmission Unit) up to 9720 bytes in one frame, the switch can handle voice, video, and even large multimedia transmissions at Gigabit high speeds.

1.1.1 High-Speed Transmissions

The EKI-2728I 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.

1.1.2 Dual Power Inputs

EKI-2728I redundant power input design is with power reverse protection to prevent the switching device broken by wrong power wiring. When one of power inputs fails, P-Fail LED will turn on and the relay output changes status for warning applications.

1.1.3 Flexible Mounting

EKI-2728I is extremely compact (37 x 140 x 95 mm) and can be mounted on a DIN-rail or a panel, so it is suitable for any space-constrained environments.

1.1.4 Wide Operating Temperature

The operating temperature of the EKI-2728I is between -40 ~ 75° C. With such a wide range, you can use it in some of the harshest industrial environments that exist.

1.1.5 Easy Troubleshooting

LED indicators make troubleshooting quick and easy. Each 10/100 Base-T port has 2 LED indicators that display the link status, transmission speed and collision status. Also the system indicators P1, P2 and P-Fail help diagnose the switch immediately.

1.2 Features

- Provides 8 x 10/100/1000Base-T Mbps Ethernet ports
- Store-and-Forward switching architecture
- Back-plane (switching fabric): 16Gbps
- Third-generation Broadcom switch with AV function
 - Guaranteed latency
 - Guaranteed BW
 - Synchronous timing
- Provides 192Kbits memory buffer
- 4K-entry MAC address table
- 9720 bytes jumbo frame
- Supports full/half duplex flow control
- Supports broadcast storm protection
- Supports MDI/MDI-X auto-crossover
- Supports redundant +12 ~ 48 VDC power input
- Provides flexible mounting: DIN-rail, Panel Mounting
- Supports operating temperatures from -40 ~ 75°C

1.3 Specifications

Communications

- Compatibility: IEEE 802.3, 802.3u, 802.3ab, 802.3x
- LAN: 10/100/1000Base-T
- Backplane (Switching Fabric): 16 Gbps
- Packet Throughput (Full-duplex): 23.8Mpps @ 64bytes
- Transmission Distance: Up to 100 m
- Transmission Speed: Up to 1000 Mbps
- Broadcast Storm Rate Limit: 250,000 pps (default)

Interface

- Connectors:
 - 8 x RJ-45 (8-port 10/100/1000TX)
 - 6-pin removable screw terminal (power & relay)
- LED Indicators:
 - Unit: P1, P2, Fault
 - Ethernet port: Link/Active (100Mbps)
 - Speed (1000Mbps)

Power

- Power Consumption
 - 5.28W
- Power Input: 2 x Unregulated +12 ~ 48 VDC
- Relay Output: 1 Relay Output

Mechanism

- Dimensions (WxHxD): 36.6 x 140 x 95 mm
- Enclosure: IP-30, Metal shell with solid mounting kits
- Mounting: DIN-rail, Wall

Environment

- Operating Temperature: -40 ~ 75° C
- Operating Humidity: 5~95% (non-condensing)
- Storage Temperature: -40 ~ 85° C

Certifications

- Safety: CE EN60950-1
- Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C and D
- EMC: FCC Class A,
 - CE EN61000-4-2 (ESD)
 - CE EN61000-4-3 (RS)
 - CE EN61000-4-4 (EFT)
 - CE EN61000-4-5 (Surge)
 - CE EN61000-4-6 (CS)
 - CE EN61000-4-8
 - CE EN61000-4-11
 - CE EN61000-4-12
 - CE EN61000-6-2
 - CE EN61000-6-4
- Free Fall: IEC60068-2-32
- Shock: IEC60068-2-27
- Vibration: IEC60068-2-6

Packing List

- 1 x EKI-2728I Industrial 8-port Unmanaged Gigabit Ethernet Switch
- 1 x Industrial Communication CD-ROM with software, and User manual
- 2 x Wall Mounting Bracket and Screws
- 1 x DIN-rail Mounting Bracket and Screws
- 1 x EKI-2728I Startup Manual
- 1 x DC Jack Cable 2.0/150mm

Chapter 2

Installation

2.1 LED Indicators

The LED indicators located on the front panel display the power status and network status of EKI-2728I. Each of them has its own specific meaning as the table shown below.

Table 2.1: EKI-2728I LED Definition

LED	Color	Description	
P1	Green	On	Power input 1 is active
		Off	Power input 1 is inactive
P2	Green	On	Power input 2 is active
		Off	Power input 2 is inactive
P-Fail	Red	On	Power failure occurs
		Off	Power input 1 and 2 are both active, or no power input
1 ~ 8 (Upper LED)	Green	On	Connected to network
		Flashing	Networking is active
		Off	Not connected to network
1 ~ 8 (Upper LED)	Green	On	1000Mbps
		Off	Not connected to network or not working at speed of 1000Mbps

2.2 Dimensions (units: mm)

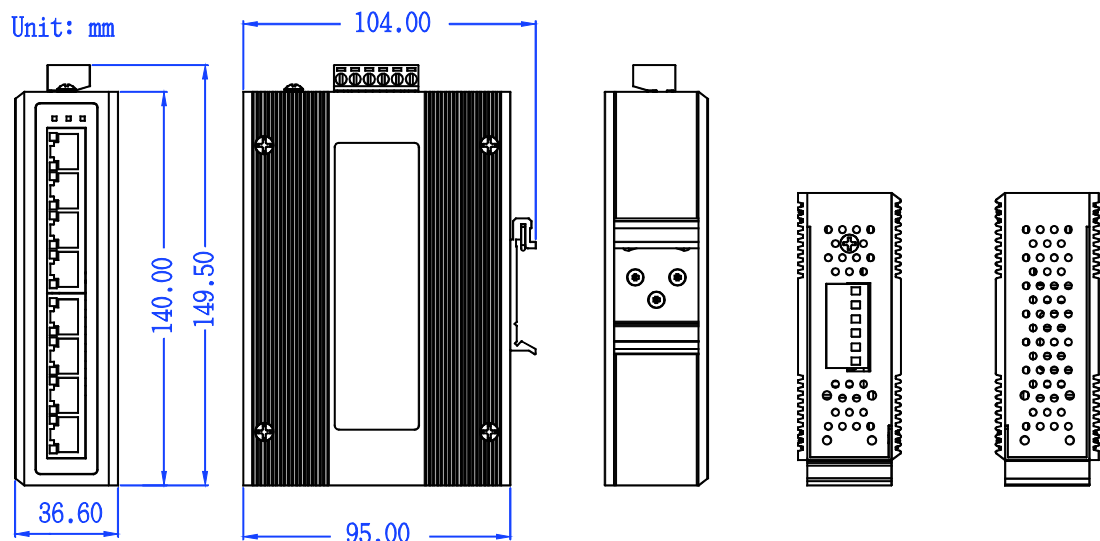


Figure 2.1 EKI-2728I Dimensions

2.3 Mounting

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

2.3.1 Wall mounting

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

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



Figure 2.2 Combining the Metal Mounting Kit

2.3.2 DIN-rail Mounting

You can also mount EKI-2728I on a standard DIN-rail by the steps as followsFirst,

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



hang the EKI-2728I over the DIN-rail with angle of inclination.



Figure 2.3 DIN-rail Installation Step 1

Then, let the device drop down straight to slide over the rail smoothly.



Figure 2.4 DIN-rail Installation Step 2

2.4 Network Connection

The EKI-2728I has 8 x RJ-45 ports that support connection to 10 Mbps Ethernet, 100 Mbps Fast Ethernet, or 1000 Mbps Gigabit Ethernet, and half or full duplex operation. EKI-2728I can be connected to other hubs/switches through the twisted-pair straight-through cable or the crossover cable up to 100m long. The connection can be made from any TX port of the EKI-2728I (MDI-X) to another hub or switch either MDI-X or uplink MDI port.

The EKI-2728I 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-2728I supports dual +12 ~ 48 VDC power inputs and power-fail relay output.

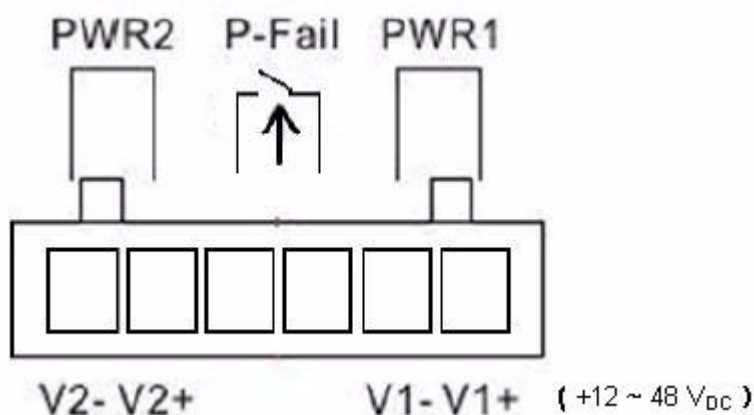


Figure 2.5 Power Connector

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).

Chapter 3

Troubleshooting

3.1 Troubleshooting

3.1.1 Power Input

Verify you are using the included or appropriate power cord/adaptor. Please don't use the power adaptor with DC output voltage higher than power rating of the device. Otherwise it will burn down.

3.1.2 Cable

Select the proper UTP cable to construct the network. Please check the cable being used. Prepare 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 or 100 Category 5 cable for 100 Mbps connections. Also, be sure that the length of any twisted-pair connection does not exceed 100 meters (328 feet).

Otherwise, use the 50/125 ~ 62.5µm fiber cable to connect the fiber port in multi-mode.

3.1.3 Diagnosing LED Indicators

The switch can be easily monitored through LED indicators to assist in identifying common problems users may encounter and where users can find possible solutions.

If the power indicator does not light up when the power cord is plugged in, users may have a problem with power cord. Then check for loose power connections, power losses or surges at power outlet. If users 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 Assignments & Wiring

A.1 Pin Assignments & Wiring

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

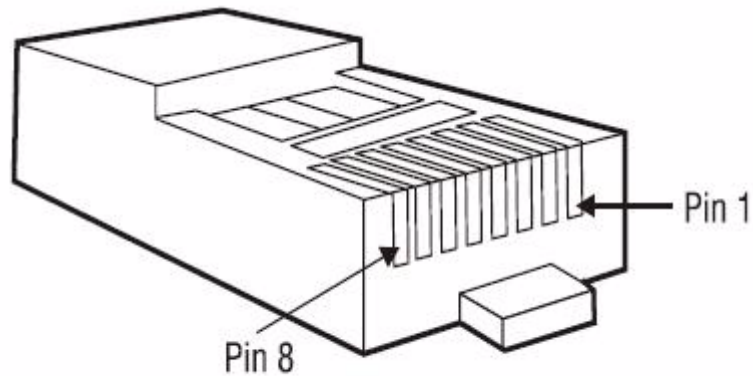


Figure A.1 RJ-45 Pin Assignments

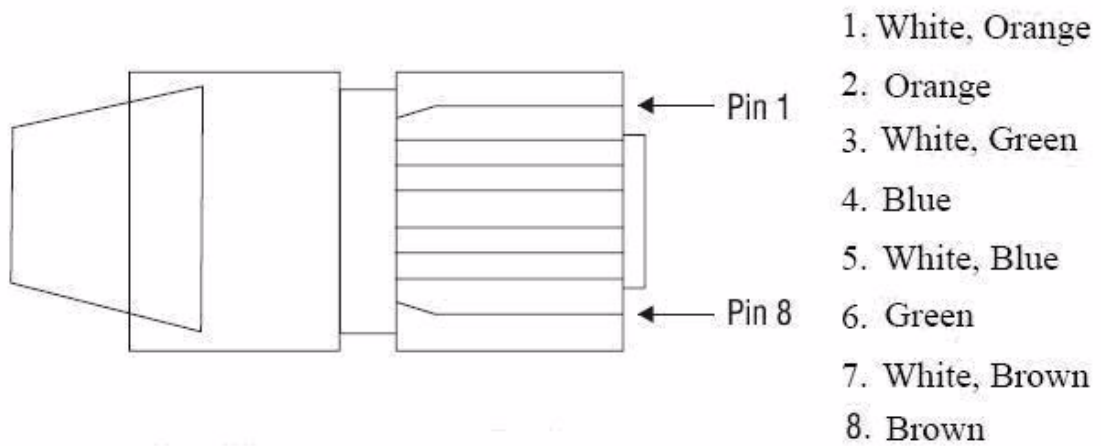


Figure A.2 EIA/TIA-568B

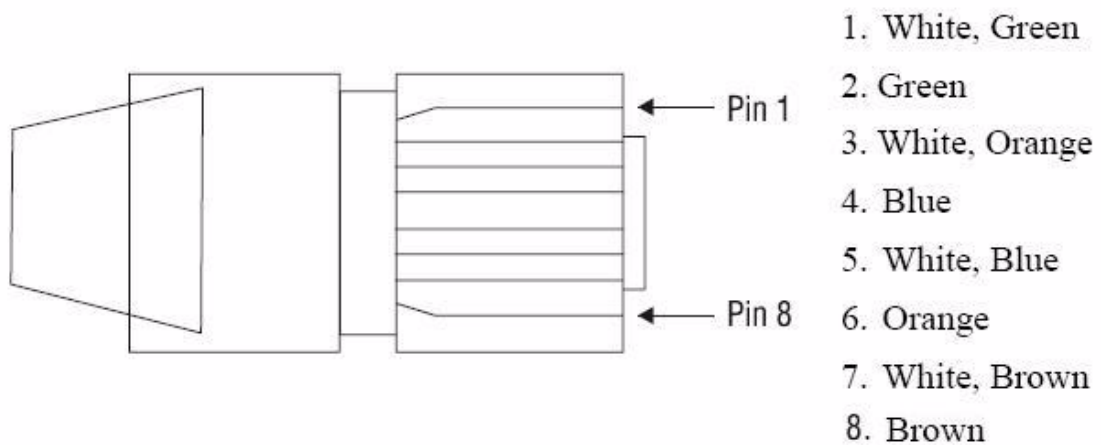


Figure A.3 EIA/TIA-568A

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