



Model EIS-308 Unmanaged, 8-Port, 10Base-T/100Base-TX Industrial Ethernet Rail Switch

User's Manual



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Introduction

The following topics are covered in this chapter:

- **Overview**
- **Product Features**
- **Package Checklist**

Overview

This switch includes eight 10/100M, auto-crossing switch ports. This model was designed to provide a simple, cost-effective solution for basic Ethernet switching under harsh environmental conditions. This switch has a wide operating ambient range and includes redundant power inputs with reverse polarity protection. Optionally, this unit includes a DC-IN jack and may be powered from an AC-DC wall transformer for Small Office/Small Home (SOHO) applications. It is packaged in a rugged, IP-30 aluminum enclosure for increased protection from extreme temperature, rough handling, vibration, and dust and debris. This switch has also passed several safety certifications to help ensure safe and reliable data transmission for industrial applications.

Product Features

- 8-port 10Base-T/100Base-TX hardened industrial switch
- Non-blocking, store-and-forward switch architecture
- Supports IEEE 802.3 10Base-T, 802.3u 100Base-TX
- Provides redundant dual DC power inputs
- Provides an optional AC-DC wall transformer power input for SOHO applications
- Supports automatic MDI/MDI-X crossover
- Includes 1024K of embedded memory
- Includes IEEE 802.3x flow controls for full-duplex mode
- Includes back pressure control for half-duplex mode
- Packaged in a rugged, IP30 aluminum case for increased protection
- Utilizes a 2K entry MAC address table
- Versatile DIN-Rail, surface, or wall-mountable design

Package Contents

This product is shipped with the following items:

- Industrial 8-port Ethernet Rail Switch
- One DIN-Rail clip (attached to the rear of the switch)
- One wall mounting plate and six screws (separate accessory)
- User's manual CD-ROM
- Quick Installation Guide

If any of these items are missing or damaged, please contact your local sales representative for replacement or repair.

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Hardware Installation

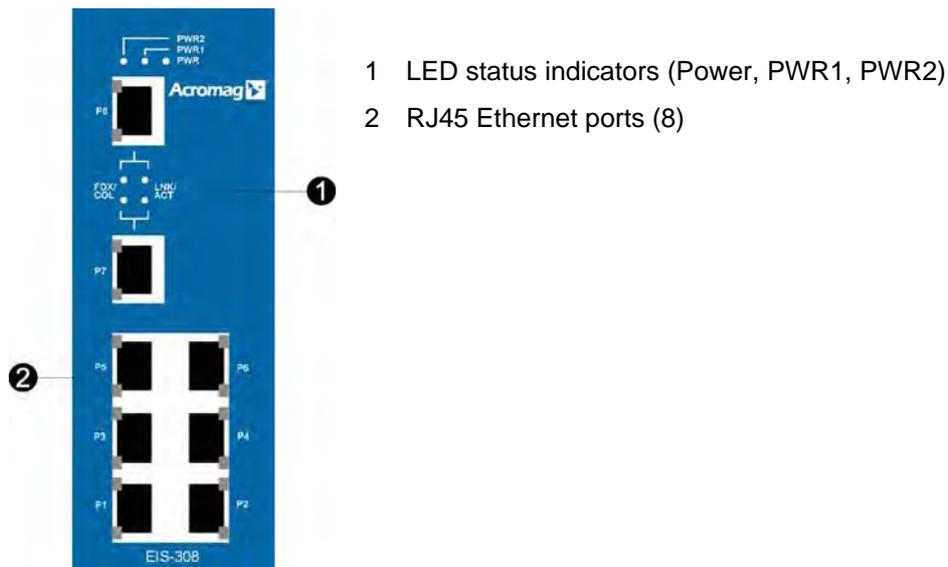
This chapter includes the following topics for installation and configuration:

- **Introduction**
 - Panel Layout
 - Dimensions
 - LED Indicators
- **Connecting to Input Power**
- **Connecting to the Ethernet Ports**
- **Cabling**
- **DIN-Rail Mounting Installation**
- **Wall Mounting Installation**

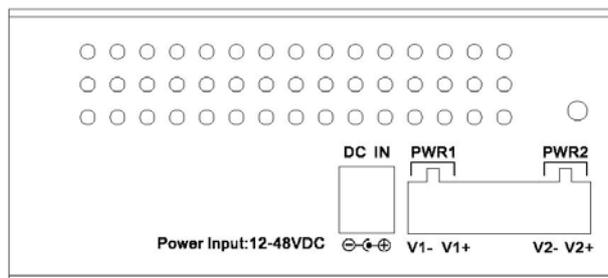
Introduction

Panel Layout

Front View



Bottom View



At the bottom of this switch is a grounding screw, a 6-position pluggable terminal block with two DC power inputs, and a DC-IN power jack for connecting power via an optional AC/DC power adapter (wall transformer type).

Dimensions

This switch measures 54mm wide x 135mm high x 105mm deep

LED Indicators

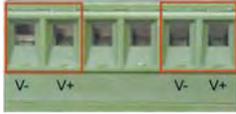
There are three switch status LED's, plus sixteen port LED's located on the front panel of the switch. The table below gives a description of each LED indicator.

LED	Status	Description
PWR	Green	Any power is ON (PWR1, PWR2, or DC-IN).
	OFF	No power is being supplied.
PWR1	Green	Power 1 is ON.
	OFF	No power 1 is being supplied.
PWR2	Green	Power 2 is ON.
	OFF	No power 2 is being supplied.
LNK/ACT of Ports 7 & 8	Green	A network device is detected.
	Blinks	The port is transmitting, or receiving packets from a transmitting device.
	OFF	No device is attached.
FDX/COL of Ports 7 & 8	Orange	The port is operating in full-duplex mode.
	Blinks	A collision of packets has occurred.
	OFF	The port is in half-duplex mode, or no device is attached.
Port Status (Port 1 to 6)	Yellow	The port is operating in full-duplex mode.
	Blinking Yellow	A collision of packets has occurred.
	OFF	The port is in half-duplex mode, or no device is attached.
	Green	A network device is detected.
	Blinking Green	The port is transmitting, or receiving packets from a transmitting device.
	OFF	No device is attached.

Connecting to Input Power

IMPORTANT: Turn off input power and unplug the power terminal block before making wire connections. Otherwise, your screwdriver blade can inadvertently short the terminal connections to the grounded enclosure.

1. Insert the positive and negative wires into the V+ and V- contacts of the terminal block connector while observing proper polarity. The DC input range is 12-48V. Use suitable wire from 12 to 24 AWG.



2. Tighten the terminal screws to prevent the wires from coming loose. The two center terminals are not used.

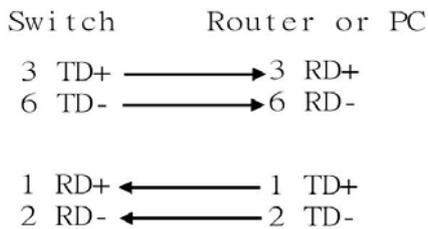


3. **OPTIONAL – DC IN:** This switch has an additional power jack for the connection of AC-DC power converters (wall-transformer type), like those used in SOHO (Small Office/Home Office) applications. Be sure that the adapter output voltage remains within the required 12-48V range under load and is of sufficient capacity to power the unit. Refer to the switch PWR LED to verify power via this jack.

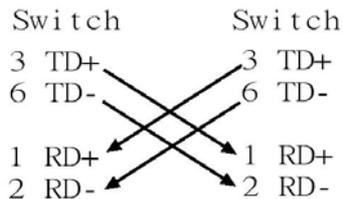
Note: If all three power inputs are connected (DC IN, PWR 1, PWR 2), the switch will be powered from the highest connected voltage supply.

Connecting to the Ethernet Ports

This switch has eight 10/100Mbps, auto-sensing ports for 10Base-T or 100Base-TX device connections. These ports will automatically detect 10Base-T and 100Base-TX connections and include automatic MDI/MDI-X crossover. The crossover function allows you to connect to other switches, hubs, or workstations without having to change between straight-through or crossover cables. A crossover cable simply crosses the transmit lines at each end to the receiving lines at the other end. See the figures below for the schematic diagram of straight-through and crossover cabling.



Straight-through Cabling Schematic



Crossover Cabling Schematic

All ports of this switch support automatic MDI/MDI-X. When you use an Ethernet cable to connect to other devices (computers, switches, or hubs), pins 1, 2, 3, and 6 of the 8-pin RJ45 connector are used to transfer signals between connected devices and the signals of these pins are automatically crossed by the MDI-X function, as shown in the table below.

Pin MDI-X	Signals	MDI Signals
1	RD+	TD+
2	RD-	TD-
3	TD+	RD+
6	TD-	RD-

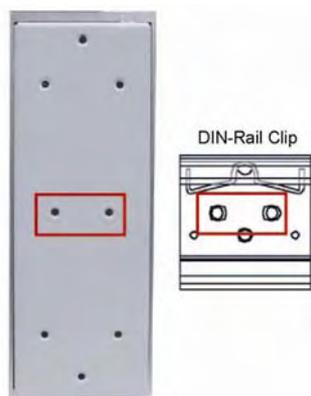
Cabling

The cable length between these switches and attached devices (other switches, hubs, workstations, etc.) must be less than 100 meters (328 feet). Category 3, 4, 5 Ethernet cables are suitable for systems with 10Mbps transmission speed. For systems at 100 Mbps, you should only use Category 5 or better Ethernet cables. Shielded patch cables are further recommended.

DIN-Rail Mounting Installation

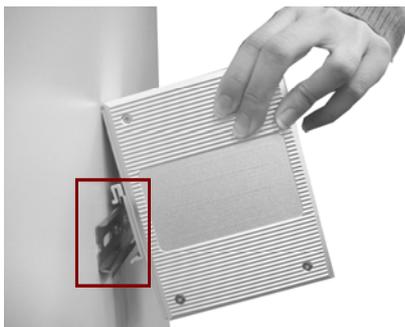
The DIN-Rail clip is attached to the rear of the switch via two screws. This clip may be removed for surface or wall mounting. If the DIN-Rail clip is not already attached, follow these instructions and to attach the DIN-Rail clip.

1. Use the two screws provided to attach the DIN-Rail clip to the rear panel of the switch where shown below (note that the spring side of the DIN clip is positioned at the top).
2. For flat surface or wall mounting, you can remove the DIN-Rail clip in similar fashion.



Follow these steps to mount the switch to the DIN-Rail track.

1. Insert the upper end (spring side) of the DIN-Rail clip onto the upper lip of the DIN rail track as shown below.



2. Push the bottom of the switch inward by tilting it downward until it snaps onto the track. Check that the unit is firmly secured to the track.

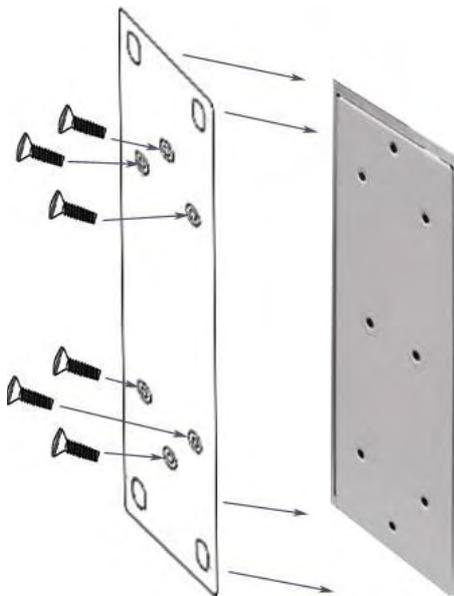


3. To remove the switch from the track, push downward on the unit to compress the spring, and pull the bottom outward from the track to disengage the unit and lift it off the track.

Wall-Mounting Installation

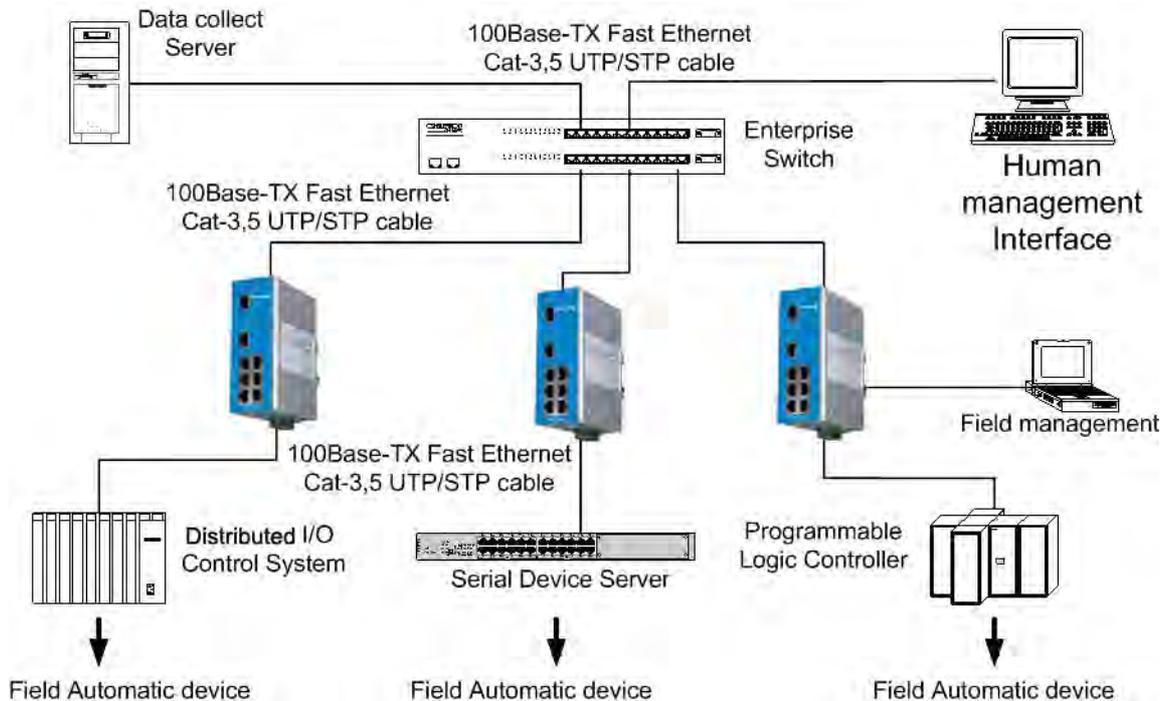
Follow these steps to mount the unit to a wall or other flat surface.

1. Use a screwdriver to remove the two screws that secure the DIN-Rail clip to the back of the switch.
2. Use a screwdriver to attach the wall-mounting plate to the rear panel of the switch using the six screws provided. Tighten these screws to secure the switch to the wall-mounting plate.
3. Use the slotted holes at each corner of the wall-mounting plate to attach the unit to the wall or other flat surface.
4. To remove the unit from the wall and from the wall-mounting plate, reverse steps 1-3.



Installation and Testing

The following figure illustrates a typical application of these switches.



1. Take your switch out of its box and inspect the contents (refer to Package Checklist).
2. Check that the DIN-Rail clip is attached to the back of the unit. If the DIN-Rail clip is not attached, refer to the DIN-Rail Mounting section for DIN-Rail installation. If you want to mount the switch to a wall or other flat surface, refer to the Wall Mounting Installation section to install it.
3. To mount the switch on the DIN-Rail track or wall, refer to the **Mounting Installation** section.
4. Unplug the power terminal block from the switch and wire DC power while observing proper polarity. Refer to the **Connecting Input Power** section for wiring instructions.
5. The power 1 (PWR1) and power 2 (PWR2) inputs can be simultaneously connected to separate power sources. When the primary power source fails (the default setting is PWR1), the system will automatically switch to the secondary power source (PWR2), preventing any power interruption.
6. Check the PWR1 and PWR2 LED's to make sure the switch is powered.

Note: If you are using the DC IN power jack to supply power to the switch, please check only the PWR LED for power/operation status.

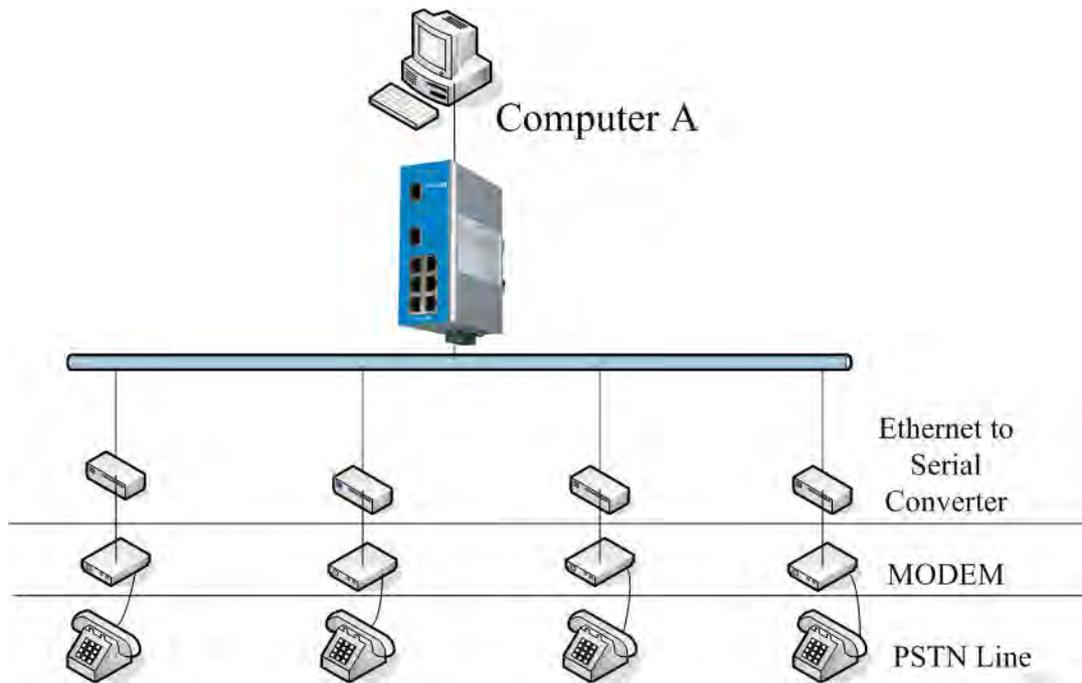
7. Even though this switch has automatic MDI/MDI-X crossover, it is good practice to use Category 5 or better, straight-through RJ45 Ethernet cables to connect to network devices.
8. Connect one side of the Ethernet cable to any switch port and the opposite side to the RJ45 Ethernet port of your network device.

Note: All Acromag Ethernet switches are auto MDI/MDI-X crossing. However, if your network happens to employ other switches/hubs removed from our own, then you should verify whether they support automatic MDI/MDI-X crossover. If they do not include this feature, then you must use a crossover Ethernet cable when making connections to them.

9. Check the port LINK status LED indicator (blinking green) to verify the network connection has been successfully established.

Before continuing, verify power to both PWR1 and PWR2. Temporarily disable PWR1 and the LED for PWR1 will go out. Note that if the ping command is still getting replies, this proves that the redundant input power function is working properly.

16. Exit the Command Line mode and reconnect PWR1 power. At this point, your switch has been tested and installation is complete.
17. Refer to the following illustration for one example of how to setup a network using switches. Note that Computer A needs to connect to several modems simultaneously in order to provide network access to many users. However, Computer A does not have the additional serial COM ports to connect to all of the modems, so we propose a network solution.



18. In our example, we use serial-to-Ethernet converters to network enable the modems. Standard Ethernet cables are used to connect the switch to Computer A, and to connect to the switch to the serial converters. You can verify network operation by entering Windows Command Line Mode on Computer A, then using the ping command to verify each of the connections between Computer A and the converters, as described in steps 10 and 11.
19. You may go one step further and enter a Telnet program on Computer A. Type in the IP address of one of the converters, and configure the serial port's communication parameters. Follow this procedure to set up the other converters.
20. Install the virtual com port driver and enter the serial converters' IP addresses.
21. At computer A, click on Control Panel→Device Manager, and make sure that each converter's IP address is mapped to the corresponding com port.
22. At computer A, click on its Dialer and install the modem driver. Configure the modem's corresponding com port as a virtual com port, enter a set of telephone numbers, and start dialing. Verify that the modem did accomplish dial up, and that the serial port's communication parameters are correct. Follow this procedure to verify that each converter's parameters are correct.
23. Click on Computer A's dial out manager, and change the modem's setting from "dial up" to "dial in". Repeat this procedure to finish each modem's setting.

At this point, our example network has been successfully established. Computer A is now able to simultaneously connect to several modems and provide access to many users via its NIC port, a single Ethernet switch, and several Ethernet-to-serial converters.

3

Troubleshooting

This chapter includes some information on avoiding problems and general troubleshooting.

- Verify that your DC supply voltage or AC-DC power adapter is ON and within the required 12 to 48V DC range. Do not exceed 48V or you will damage the switch.
- Select Ethernet cables with specifications suitable for your application. In general, Ethernet cables are categorized into unshielded twisted-pair (UTP) and shielded twisted-pair (STP) types. Shielded cables are recommended. Category 3, 4, 5 Ethernet cables are suitable for systems with 10Mbps transmission speed. For systems at 100 Mbps, you should only use Category 5 or better Ethernet cables. Make sure that your cable length does not exceed 100 meters (328 feet).
- If the DC-IN power indicator (PWR) does not light when the power cord is plugged in, you may have a faulty power cord. Check for loose power connections and power loss or power surges at the AC power outlet. Verify that your AC-DC adapter is properly sized and outputs the correct voltage under load. If you cannot resolve the problem, contact your local dealer for assistance.

A

Specifications

Standards	IEEE 802.3 10BaseT Ethernet IEEE 802.3u 100BaseTX Fast Ethernet IEEE 802.3x Flow Control and Back Pressure
Protocols	CSMA/CD
Technology	Non-blocking, store-and-forward switching architecture
Transmission Rate	14880pps for 10Base-T, 148800pps for 100BaseTX
MAC address table size	2K MAC address table
Memory Buffer	1024Kbits
LED	<ul style="list-style-type: none">■ Per port: Green Link/Activity & Orange/Yellow Full-Duplex/Collision■ Per unit: Green Power, Power 1, and Power 2
Network Cables	10BaseT: Twisted-pair UTP/STP Cat. 3, 4, 5 cable EIA/TIA-568 100-ohm (100m maximum) 100BaseT(X): twisted-pair UTP/STP Cat. 5 cable EIA/TIA-568 100-ohm (100m)
Power Supply	12 to 48 VDC, redundant dual DC power inputs with reverse polarity protection, and a removable terminal block for master and slave VDC power inputs.
Power consumption	4.6 Watts
Packet Throughput	1.19Mpps with 64 bytes/packet and 8 active ports
Installation	DIN-Rail kit (attached) and wall mounting plate (included accessory)
Operating Temperature	-10°C to 70°C
Operating Humidity	5 to 95% (non-condensing)
Storage Temperature	-40°C to 85°C
Storage Relative Humidity	5 to 95% (non-condensing)
Dimensions	54 mm (W) x 135 mm (H) x 105mm (D)
EMI	FCC Class A
EMC	EN61000-4-2, EN61000-4-3, EN-61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11
Safety	UL, CUL, CE/EN60950, IP-30
Stability	IEC60068-2-32 (Free fall), IEC60068-2-27 (Shock), IEC60068-2-6 (Vibration)