FiberPlex™ Model 1008E

10-Port Industrial Unmanaged Ethernet Switches (8*10/100/1000Tx + 2*100/1000 SFP Slot)

User Manual

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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This warranty is limited to defects in workmanship or materials, and does not cover customer damage, abuse or unauthorized modification. If the product fails to perform as warranted, your sole recourse shall be repair or replacement as described above. Under no condition shall Patton Electronics be liable for any damages incurred by the use of this product. These damages include, but are not limited to, the following: lost profits, lost savings and incidental or consequential damages arising from the use of or inability to use this product. Patton Electronics specifically disclaims all other warranties, expressed or implied, and the installation or use of this product shall be deemed an acceptance of these terms by the user.

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About This Guide

This guide describes the FiberPlex Model 1008E hardware, installation, and basic configuration.

Audience

This guide is intended for the following users:

- Operators
- Installers
- Maintenance technicians

Structure

This guide contains the following chapters and appendices:

- Chapter 1 on page 11 provides information about FP1008E features and capabilities
- Chapter 2 on page 13 describes the FP1008E hardware
- Chapter 3 on page 22 describes how to mount the FP1008E on a DIN-Rail or wall
- Chapter 4 on page 26 explains how to install the FP1008E hardware
- Chapter 5 on page 28 describes a typical FP1008E network application
- Chapter 6 on page 30 describes steps for troubleshooting problems that may arise with the FP1008E
- Chapter 7 on page 32 explains how to contact Patton for support
- Appendix A on page 35 provides compliance information for the FP1008E
- Appendix B on page 38 provides specifications for the FP1008E
- Appendix C on page 43 provides a table of optional accessories

For best results, read the contents of this guide *before* you install the FiberPlex 1151E.

Precautions

Notes and cautions, which have the following meanings, are used throughout this guide to help you become aware of potential Router modem problems. ***Warnings*** relate to personal injury issues, and ***Cautions*** refer to potential property damage.

Note A note presents additional information or interesting sidelights.

The alert symbol and IMPORTANT heading calls attention to important information.

The alert symbol and CAUTION heading indicate a potential hazard. Strictly follow the instructions to avoid property damage.

The shock hazard symbol and CAUTION heading indicate a potential electric shock hazard. Strictly follow the instructions to avoid property damage caused by electric shock.

The alert symbol and WARNING heading indicate a potential safety hazard. Strictly follow the warning instructions to avoid personal injury.

The shock hazard symbol and WARNING heading indicate a potential electric shock hazard. Strictly follow the warning instructions to avoid injury caused by electric shock.

Safety When Working With Electricity

- **For devices with an external power adapter, the power adapter shall be a listed Limited Power Source. The mains outlet that is utilized to power the device shall be within 10 feet (3 meters) of the device, shall be easily accessible, and protected by a circuit breaker in compliance with local regulatory requirements.**
- **For AC powered devices, ensure that the power cable used meets all applicable standards for the country in which it is to be installed.**
- **For AC powered devices which have 3 conductor power plugs (L1, L2 & GND or Hot, Neutral & Safety/Protective Ground), the wall outlet (or socket) must have an earth ground.**
- **For DC powered devices, ensure that the interconnecting cables are rated for proper voltage, current, anticipated temperature, flammability, and mechanical serviceability.**
- **Do not work on the device or connect or disconnect cables during periods of lightning activity.**

In accordance with the requirements of council directive 2002/96/EC on Waste of Electrical and Electronic Equipment (WEEE), ensure that at end-of-life you separate this product from other waste and scrap and deliver to the WEEE collection system in your country for recycling.

WARNING

This device contains no user serviceable parts. This device can only be repaired by qualified service personnel.

CAUTION

Electrostatic Discharge (ESD) can damage equipment and impair electrical circuitry. It occurs when electronic printed circuit cards are improperly handled and can result in complete or intermittent failures. Do the following to prevent ESD:

- Always follow ESD prevention procedures when removing and replacing cards.
- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to an unpainted surface of the chassis frame to safely channel unwanted ESD voltages to ground.
- To properly guard against ESD damage and shocks, the wrist strap and cord must operate effectively. If no wrist strap is available, ground yourself by touching the metal part of the chassis.

Chapter 1 General information

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Overview

Patton's FP1008E industrial gigabit unmanaged Ethernet switch are IP30 rated and DIN-Rail mountable. Each unit is designed with 8 gigabit Ethernet ports and 2 dual rate (100/1000) SFP slots, making it ideal for applications that demand high bandwidth and long distance communication.

This product provides high EFT and ESD protection to prevent any unregulated voltage and is suitable for harsh environments. It supports the power redundancy feature using a dual power input design with reverse polarity protection. In addition, the built-in relay warning function alerts maintainers when power failures occur.

The FP1008E includes two models: one with standard operating temperature range of 14 to 158°F (-10 to 70°C), and the other one with an extended operating temperature range of -40 to 167°F (-40 to 75°C). It is a perfectly designed product to fulfill any special needs for industrial automation, outdoor applications and harsh weather environments.

Features

- System Interface/Performance
  - All RJ-45 ports support auto MDI/MDI-X function
  - Embedded 8*10/100/1000Tx and 2*100/1000 SFP slots
  - Store-and-forward switching architecture
  - 8K MAC address table
  - Jumbo frame supports: 9.6K
  - Power line EFT protection: 2,000 VDC; Ethernet ESD protection: 6,000 VDC
- Power Input
  - DC 12 ~ 48V redundant power
- Operating Temperature: -40 to 75°C
- Case/Installation
  - IP-30 protection
  - Installation in pollution degree to environment
  - DIN-Rail and wall mount design

Package Contents

- 1—10-port industrial gigabit unmanaged Ethernet switch, with 8*10/100/1000Tx + 2*100/1000 SFP slots
- 2—Wall mounting brackets and screws
- 1—DC cable -18 AWG & DC jack 5.5 x 2.1mm

Chapter 2 Hardware Description

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Front panel

The front panel of the FP1008E industrial gigabit unmanaged Ethernet switch is shown in figure 1.

Figure 1. FP1008E front panel

LED Indicators

There are LED light indicators located on the front panel of the industrial Ethernet switch that display the power status and network status. Each LED indicator has a different color and has its own specific meaning, see table 1.

Table 1. LED Indicators for FP1008E

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
Fault	Red	On	Power input 1 or 2 is inactive
		Off	Power input 1 and 2 are both functional, or no power, inputs/ports link is active/port alarm is disabled

Table 1. LED Indicators for FP1008E (Continued)

LED	Color	Description	
LNK/ACT (SFP Port)	Green	On	Connected to network
		Flashing	Networking is active
		Off	Not connected to network
LAN Port 1–5 (Left LED)	Green 	On	Connected to network, 1000 Mbps
		Flashing	Networking is active
		Off	Not connected to network
LAN Port 1–5 (Right LED)	Green 	On	Connected to network, 100 Mbps/10 Mbps
		Flashing	Networking is active
		Off	Not connected to network

Ethernet Ports

RJ-45 Ports (Auto MDI/MDIX): The RJ-45 ports are auto-sensing for 10Base-T, 100Base-TX or 1000Base-T devices connections. Auto MDI/MDIX means that the switch can connect to another switch or workstation without changing the straight-through or crossover cabling. See figure 2, figure 3, and figure 4 on page 16, and figure 5 and figure 6 on page 17 for straight-through and crossover cabling schematics.

Table 2. RJ-45 pin assignments

Pin Number	Assignment
1	Rx+
2	Rx-
3	Tx+
6	Tx-

Note "+" and "-" signs represent the polarity of the wires that make up each wire pair.

All ports on this industrial Ethernet switch support automatic MDI/MDI-X operation. Users can use straight-through cables (see) for all network connections to PCs, servers, other switches or hubs. With straight-through cable, pins 1, 2, 3, and 6, at one end of the cable, are connected straight through to pins 1, 2, 3 and 6 at the other end of the cable. table 3 shows the 10ase-T, 100Base-TX, 1000Base-TX MDI and MDI-X port pinouts.

Table 3. Ethernet signal pinouts

Pin MDI-X	Signal Name	MDI Signal Name
1	Receive Data plus (RD+)	Transmit Data plus (TD+)
2	Receive Data minus (RD-)	Transmit Data minus (TD-)
3	Transmit Data plus (TD+)	Receive Data plus (RD+)
6	Transmit Data minus (TD-)	Receive Data minus (RD-)

Figure 2 and figure 3show the cabling schematics for straight-through and crossover

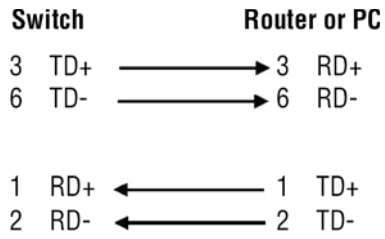

Figure 2. Straight-through cable schematic

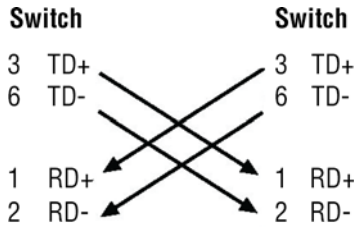

Figure 3. Crossover cable schematic

Figure 4, along with figure 5 and figure 6 on page 17 show the 10, 100, and 1000 Ethernet RJ-45 pinouts.

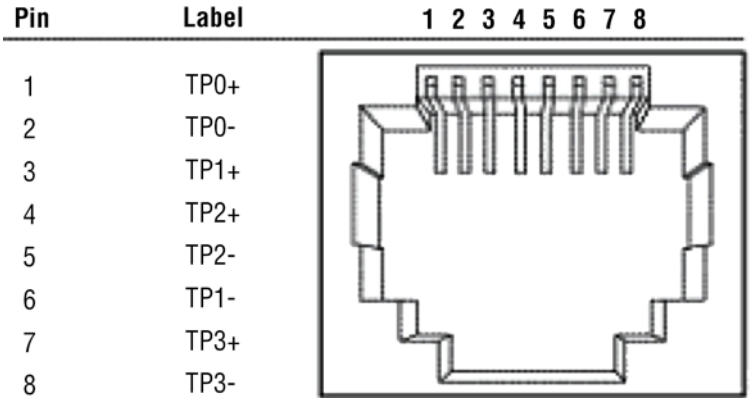

Figure 4. RJ-45 Ethernet port pinouts

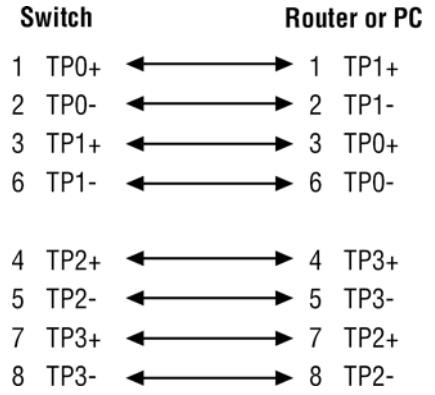

Figure 5. Straight-through cable schematic

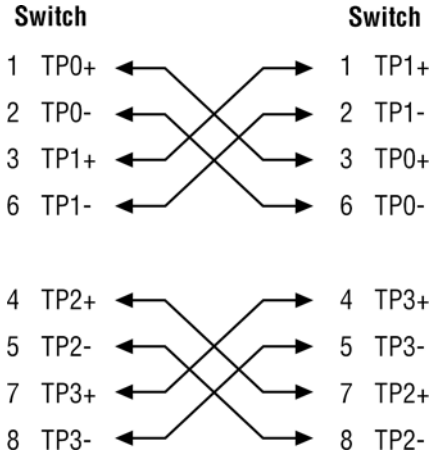

Figure 6. Crossover cable schematic

Cabling

Use the four twisted-pair, category 5e, or the above cabling for RJ-45 port connections. The cable between the switch and the link partner (switch, hub, workstation, etc.) must be less than 100 meters (328 ft.) long.

The small form-factor pluggable (SFP) is a compact optical transceiver used in optical communications for both telecommunication and data communication applications.

To connect the transceiver and LC cable, do the following:

1. Insert the SFP transceiver module into the SFP slot as shown in figure 7 on page 18. Figure 8 on page 18 shows the SFP transceiver module inserted into the slot.

Note The triangle mark is at the bottom of the SFP slot.

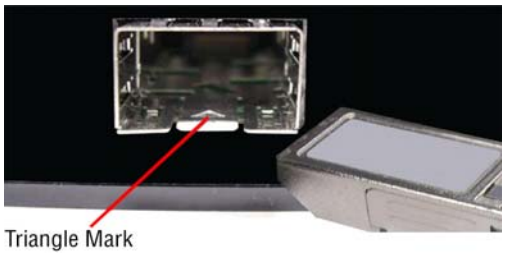

Figure 7. Transceiver to the SFP Module

Figure 8. Transceiver Inserted

2. Insert the fiber cable of the LC connector into the transceiver as shown in figure 9.

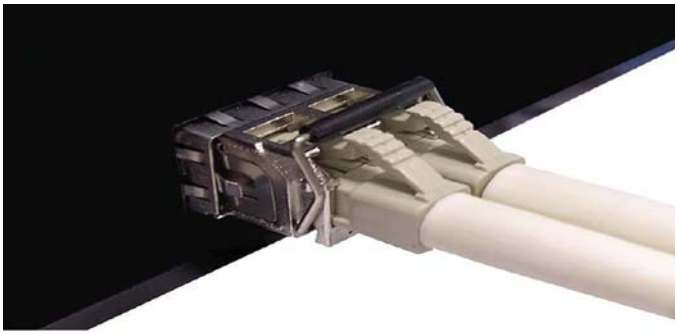

Figure 9. LC Connector to the Transceiver

To remove the LC connector from the transceiver, do the following:

1. Press the upper side of the LC connector from the transceiver and pull it out to release as shown in figure 10 on page 19.

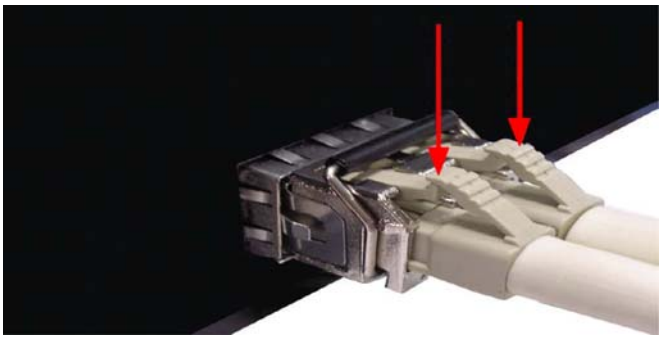

Figure 10. Remove LC Connector

2. Push down the metal clasp and pull the transceiver out by the plastic part as shown in figure 11.

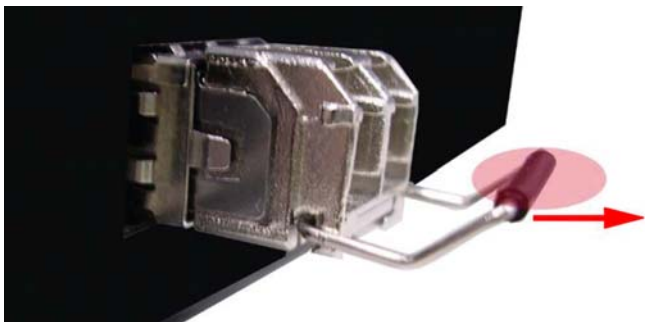

Figure 11. Pull Out from the SFP Module

Wiring the Power Inputs

Figure 12 shows the top panel of the FP1008E switch that is equipped with one 6-pin removal terminal block connector for dual DC power inputs (12~48VDC).

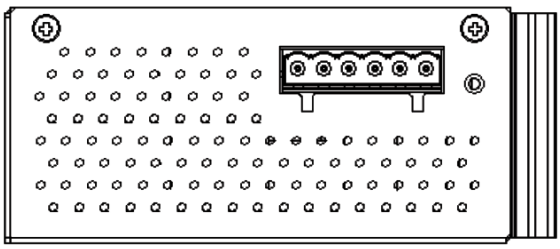

Figure 12. Top Panel View of FP1008E

Do the following to insert the power wire:

1. Insert the positive and negative wires into the PWR1 (V1+, V1-) and PWR2 (V2+, V2-) contacts on the terminal block connector as shown in figure 13 on page 20.

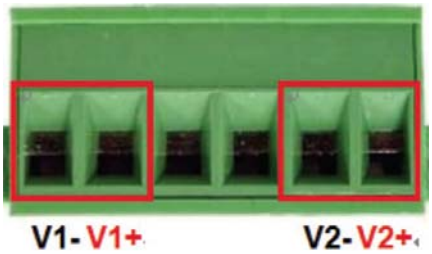

Figure 13. Power Terminal Block

2. Tighten the wire-clamp screws to prevent the wires from loosening, as shown in figure 14.

Figure 14. Power Terminal Block

IMPORTANT

Only use copper conductors, **60/75°C**, tightened to **5 lbs**.

The wire gauge for the terminal block should range between **18~20 AWG**.

Wiring the Fault Alarm Contact

The fault alarm contact is in the middle of the terminal block connector as shown in figure 15. By inserting the wires, it will detect the fault status including power failure or port link failure (managed industrial switch only) and form a normally open circuit. An application example for the fault alarm contact is shown in figure 15.

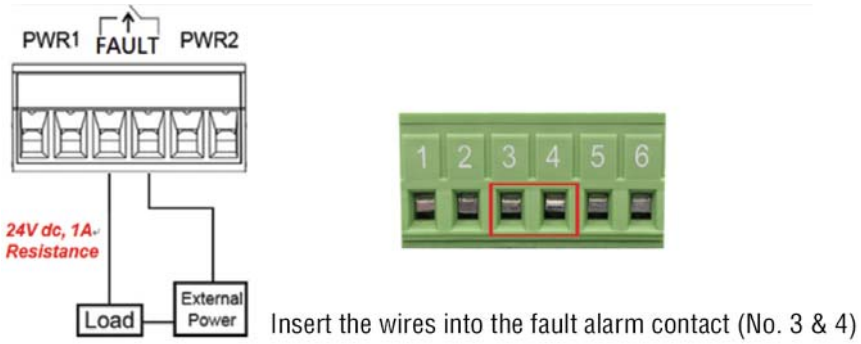

Figure 15. Wiring the Fault Alarm Contact

The wire gauge for the terminal block should range between **12 ~ 24 AWG**.

If only using one power source, jumper Pin 1 to Pin 5 and Pin 2 to Pin 6 to eliminate power fault alarm.

Chapter 3 Mounting Installation

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DIN-Rail Mounting

The DIN-Rail is pre-installed on the industrial Ethernet switch from the factory. If the DIN-Rail is not on the industrial Ethernet switch, see figure 16 to learn how to install the DIN-Rail on the switch.

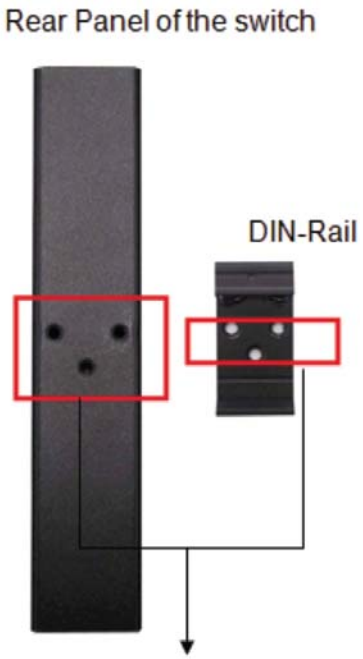

Figure 16. The Rear Side of the Switch and DIN-Rail Bracket

Do the following to learn how to hang the industrial Ethernet switch:

1. Use the screws to install the DIN-Rail bracket on the rear side of the industrial Ethernet switch.
2. To remove the DIN-Rail bracket, do the opposite from step 1.
3. After the DIN-Rail bracket is installed on the rear side of the switch, insert the top of the DIN-Rail on to the track as shown in figure 17 on page 24.

Figure 17. Insert the Switch on the DIN-Rail

4. Lightly pull down the bracket on to the rail as shown in figure 18.

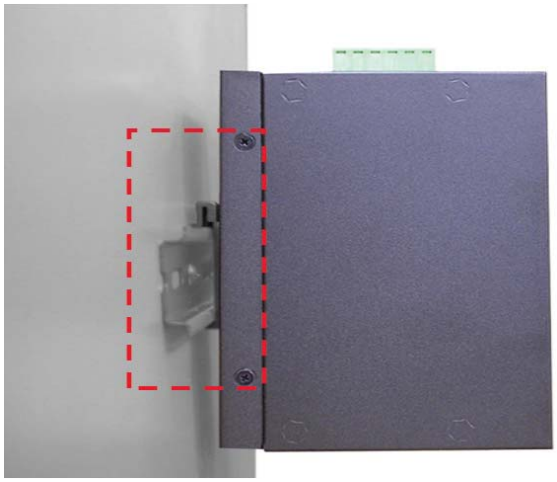

Figure 18. Stable the Switch on DIN-Rail

5. Check if the bracket is mounted tightly on the rail.
6. To remove the industrial Ethernet switch from the rail, do the opposite from the above steps.

Wall Mounting

Follow the steps below to mount the industrial Ethernet switch using the wall mounting bracket as shown in figure 19 on page 25.

1. Remove the DIN-Rail bracket from the industrial Ethernet switch by loosening the screws.
2. Place the wall mounting brackets on the top and bottom of the industrial Ethernet switch.
3. Use the screws to screw the wall mounting bracket on the industrial Ethernet switch.

4. Use the hook holes at the corners of the wall mounting bracket to hang the industrial Ethernet switch on the wall.
5. To remove the wall mount bracket, do the opposite from the steps above.

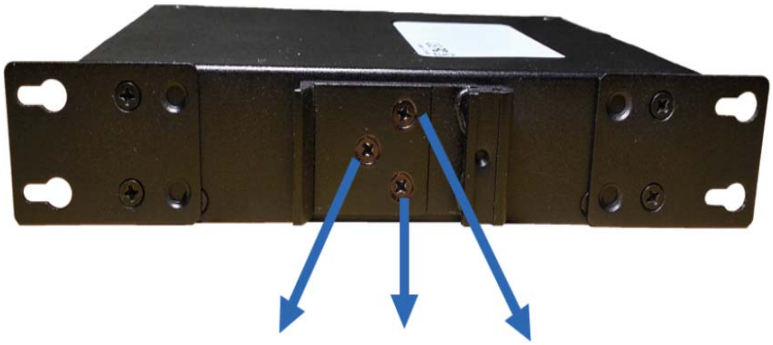

Figure 19. Remove DIN-Rail Bracket from the Switch

The dimensions of the wall mounting bracket are shown in figure 20.

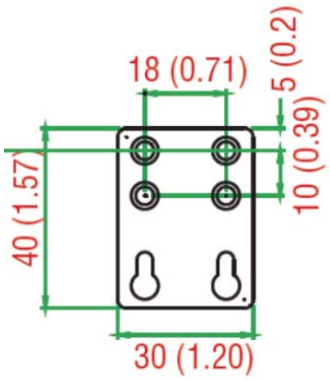

Figure 20. Wall Mounting Bracket Dimensions

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Installation Steps

This section will explain how to install Patton's FP1008E: 10-port industrial gigabit unmanaged Ethernet switch with 8*10/100/1000Tx + 2*100/1000 SFP slots.

1. Unpack the industrial Ethernet switch from the original packing box.
2. Check if the DIN-Rail bracket is screwed on the industrial Ethernet switch.
   - If the DIN-Rail is not screwed on the industrial Ethernet switch, refer to section "DIN-Rail Mounting" on page 23 for DIN-Rail installation.
   - If you want to wall mount the industrial Ethernet switch, refer to section "Wall Mounting" on page 24 for wall mounting installation.
3. To hang the industrial Ethernet switch on a DIN-Rail or wall, refer to chapter 3 "Mounting Installation" on page 22.
4. Power on the industrial Ethernet switch and then the power LED light will turn on.
   - If you need help on how to wire power, refer to section "Wiring the Power Inputs" on page 19.
   - Refer to section "LED Indicators" on page 14 for LED light indications.
5. Prepare the twisted-pair, straight-through category 5 cable for Ethernet connection.
6. Insert one side of the RJ-45 cable into switch's Ethernet port and on the other side into the networking device's Ethernet port, e.g. switch PC or server. The Ethernet port's (RJ-45) LED on the industrial Ethernet switch will turn on when the cable is connected to the networking device.
   - Refer to section "LED Indicators" on page 14 for LED light indications.
7. When all connections are set and the LED lights all show normal, the installation is complete.

Chapter 5 Network Application

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Introduction

Figure 21 shows an example of an industrial Ethernet switch application.

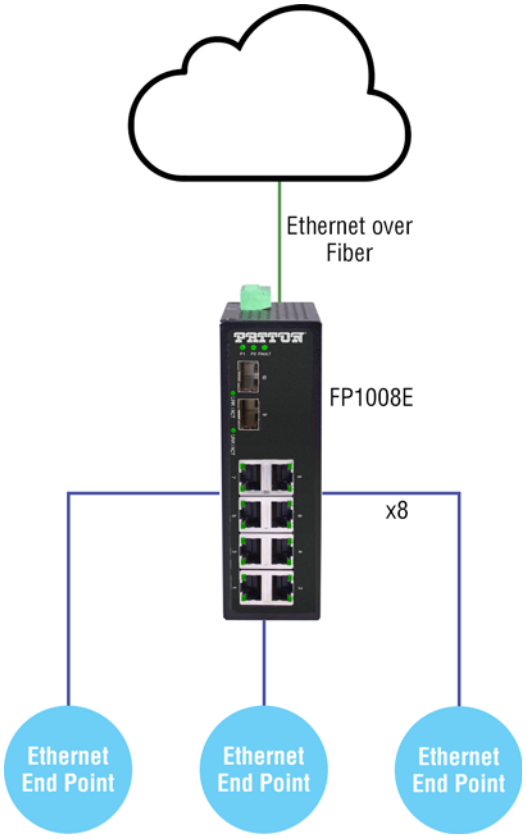

Figure 21. Industrial Ethernet Switch Application Reference

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Procedure

- Verify you have the right power cord or adapter. Never use a power supply or adapter with a non-compliant DC output voltage or it will burn the equipment.
- Select the proper UTP or STP cable in order to construct the network. Use an unshielded twisted-pair (UTP) or shield twisted-pair (STP) cable for RJ-45 connections: 100-ohm Category 5e for 10M/100Mbps. 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 with the LED indicators which help to identity if any problems exist.
  - Please refer to the LED Indicators section for LED light indication.
- If the power indicator LED does not turn on when the power cord is plugged in, the user may have a problem with the power cord. Check for loose power connections, power losses or surges at the power outlet.
  - Please contact Patton for technical support service, if the problem still cannot be resolved.
- If the industrial switch LED indicators are normal and the connected cables are correct but the packets still cannot transmit, please check the system's Ethernet devices' configuration or status.

Chapter 7 Contacting Patton for assistance

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Introduction

This chapter contains the following information:

- "Contact information"—describes how to contact Patton technical support for assistance.
- "Warranty Service and Returned Merchandise Authorizations (RMAs)"—contains information about obtaining a return merchandise authorization (RMA).

Contact information

Patton Electronics offers a wide array of free technical services. If you have questions about any of our other products we recommend you begin your search for answers by using our technical knowledge base. Here, we have gathered together many of the more commonly asked questions and compiled them into a searchable database to help you quickly solve your problems:

- Online support—available at **www.patton.com/returns/**
- E-mail support—e-mail sent to **support@patton.com** will be answered within 1 business day
- Telephone support—standard telephone support is available five days a week—from **8:00 am** to **5:00 pm EST** (**1300** to **2200 UTC**)—by calling **+1 (301) 975-1007**

Warranty Service and Returned Merchandise Authorizations (RMAs)

Patton Electronics is an ISO-9001 certified manufacturer and our products are carefully tested before shipment. All of our products are backed by a comprehensive warranty program.

> **Note** If you purchased your equipment from a Patton Electronics reseller, ask your reseller how you should proceed with warranty service. It is often more convenient for you to work with your local reseller to obtain a replacement. Patton services our products no matter how you acquired them.

Warranty Coverage

Our products are under warranty to be free from defects, and we will, at our option, repair or replace the product should it fail within one year from the first date of shipment. Our warranty is limited to defects in workmanship or materials, and does not cover customer damage, lightning or power surge damage, abuse, or unauthorized modification.

Out-of-Warranty Service

Patton services what we sell, no matter how you acquired it, including malfunctioning products that are no longer under warranty. Our products have a flat fee for repairs. Units damaged by lightning or other catastrophes may require replacement.

Returns for Credit

Customer satisfaction is important to us, therefore any product may be returned with authorization within 30 days from the shipment date for a full credit of the purchase price. If you have ordered the wrong equipment or you are dissatisfied in any way, please contact us to request an RMA number to accept your return. Patton is not responsible for equipment returned without a Return Authorization.

Return-for-Credit Policy

- Less than 30 days: No Charge. Your credit will be issued upon receipt and inspection of the equipment.
- 30 to 60 days: We will add a 20% restocking charge (crediting your account with 80% of the purchase price).
- Over 60 days: Products will be accepted for repairs only.

RMA Numbers

RMA numbers are required for all product returns. You can obtain an RMA by doing one of the following:

- Completing a request on the RMA Request page in the *Support* section at **www.patton.com/returns/**
- By calling **+1 (301) 975-1007** and speaking to a Technical Support Engineer
- By sending an e-mail to **returns@patton.com**

All returned units must have the RMA number clearly visible on the outside of the shipping container. Please use the original packing material that the device came in or pack the unit securely to avoid damage during shipping.

Shipping Instructions

The RMA number should be clearly visible on the address label. Our shipping address is as follows:

Patton Electronics Company
RMA#: xxxx
7622 Rickenbacker Dr.
Gaithersburg, MD 20879-4773 USA

Patton will ship the equipment back to you in the same manner you ship it to us. Patton will pay the return shipping costs.

Appendix A Compliance Information

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Regulatory Information

EMC Directive:

- EN 55032:2012/AC:2013 Class A
- EN 55024:2010
- EN 50581:2012
- EN 50564:2011

PSTN:

- This device is not intended nor approved for connection to the PSTN

Radio and TV Interference (FCC Part 15)

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 in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. It may cause harmful interference to radio communications if the equipment is not installed and used in accordance with the instructions. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

CE Declaration of Conformity

This device is in compliance with the essential requirements and other relevant provisions of Directive 2004/30/EC relating to electromagnetic compatibility. Council Directive 2011/65/EU on the approximation of the laws of the member states relating to RoHS compliance and Council Directive 2009/125/EC establishing a framework for the setting of ecodesign requirements for energy-related products. The Declaration of Conformity may be obtained from Patton Electronics, Inc at www.patton.com/certifications.

The safety advice in the documentation accompanying this device shall be obeyed. The conformity to the above directive is indicated by CE mark on the device.

Authorized European Representative

D R M Green
European Compliance Services Ltd
Greyfriars Court
Paradise Square
Oxford, OX1 1BE, UK

Service

All warranty and non-warranty repairs must be returned freight prepaid and insured to Patton Electronics. All returns must have a Return Materials Authorization number on the outside of the shipping container. This number may be obtained from Patton Electronics Technical Services at:

- Tel: +1 (301) 975-1007
- Email: **support@patton.com**
- URL: **http://www.patton.com**

Packages received without an RMA number will not be accepted.

Appendix B Specifications

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Standard

- IEEE 802.3 10BaseT Ethernet
- IEEE 802.3u 100BaseTX Fast Ethernet
- IEEE 802.3ab 1000BaseT
- IEEE 802.3z gigabit Fiber

EMI

- FCC Class A
- CE EN61000-4-2,3,4,5,6,8,11,12
- CE EN61000-6-2
- CE EN61000-6-4

Stability Testing

- IEC60068-2-32 (Free fall)
- IEC60068-2-27 (Shock)
- IEC60068-2-6 (Vibration)

Safety

- FCC, CE, UL 61010-1, UL 61010-2-201
- UL Class 1 Division 2, ISA 12.12.01

Protocol

CSMA/CD

Transmission Line

- 14,880pps for Ethernet port
- 148,800pps for fast Ethernet port
- 1,488,000pps for gigabit Ethernet port

Transmission Distance

Up to 100M (Fast Ethernet)

Transmission Speed

Up to 1000Mbps

MAC Address

8*10/100/1000Tx auto negotiation speed, full/half duplex mode, and auto MDI/MDI-X connection

RJ45 (Ethernet) Port

Up to 1000Mbps

SFP Slot

2*SFP slots support dual rate 100/1000

LED

- Power Unit: P1 (Green), P2 (Green), Fault (Red)
- Ethernet port: Link/active (Green), 1000Mbps
- SFP: Link/active (Green)

Network Cable

- 10BaseT: 2-pair UTP/STP Cat. 3, 4, 5 cable
- EIA/TIA-568 100-ohm (100m)
- 100BaseTX: 2-pair UTP/STP Cat. 5 cable
- EIA/TIA-568 100-ohm (100m)
- 1000BaseTX: UTP/STP Cat. 5/5E cable
- EIA/TIA-568 100-ohm (100m)

Over Current Protection

Single-blown fuse

Power Input

- Redundant power DC 12~48V with connective
- 1*6-pin removable terminal block

Fault Output

1 Relay output

Max Power Consumption

10 Watts

Installation

DIN-Rail mounting, wall mounting (optional)

Physical

Operating Temperature

- Standard: -10 to 70°C (14 to 158°F)
- EOT: -40 to 75°C (-40 to 167°F)

Storage Temperature

-40 to 85°C (-40 to 185°F)

Humidity

5 to 95% (Non-Condensing)

Weight

0.78 oz (22 g)

Dimensions

IP-30, 1.81W x 3.89D x 5.59H in. (46W x 99D x 142H mm)

Figure 22 on page 42 shows the physical dimensions of Patton's FP1008E: 10-port industrial gigabit unmanaged Ethernet switch with 8*10/100/1000Tx + 2*100/1000SFP slots.

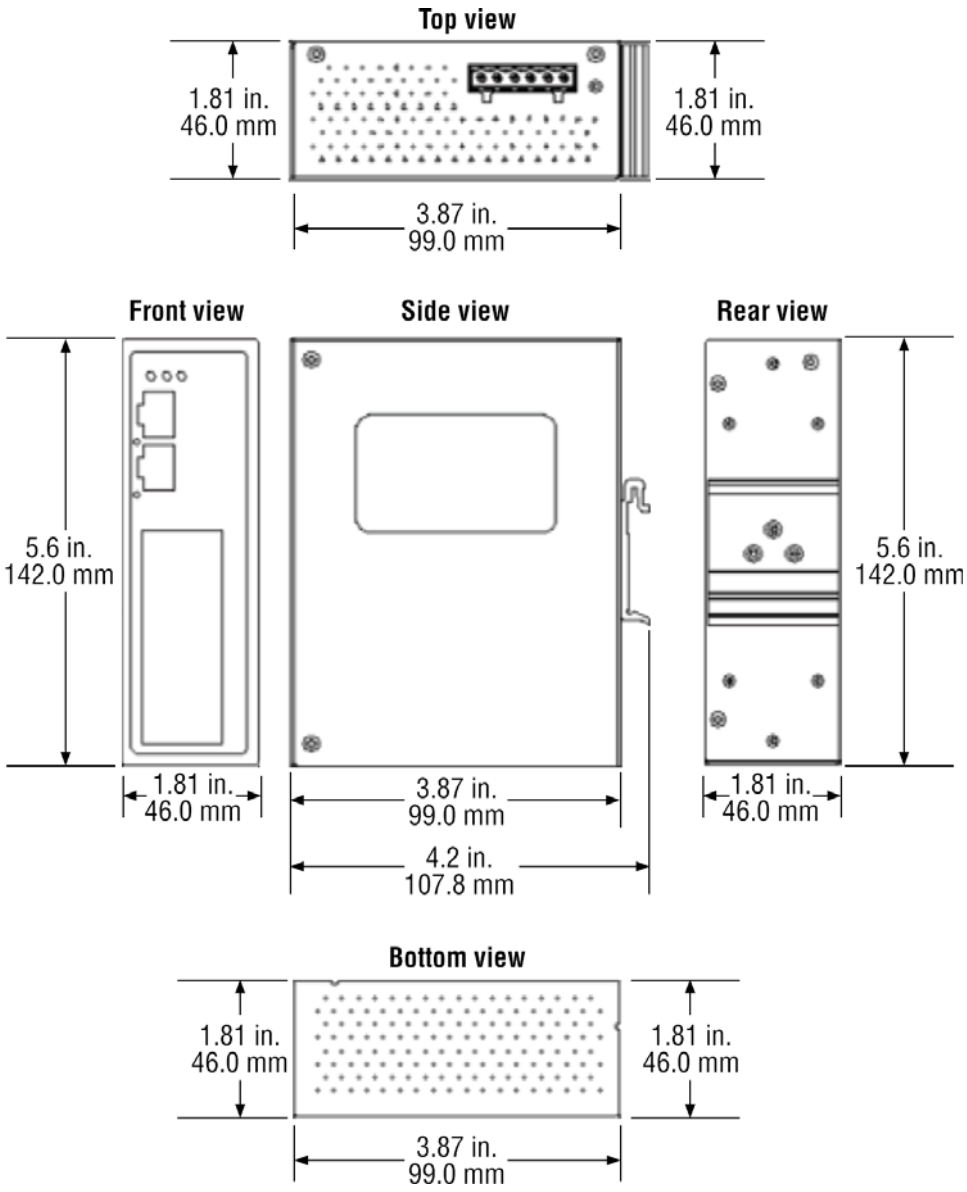

Figure 22. FP1008E Physical Dimensions

Appendix C Accessories

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Optional Accessories

Patton Model #	Description
PS-03671H1-002	AC/DC 12V, 2A Power Adapter (0 to 50°C)
PS-03671H1-020	AC/DC 21–27V, 15W Power Adapter (-40 to 85°C)
NS-1001R-19ADJDIN	19” Rackmount Adjustable Depth 35mm DIN Rail Kit