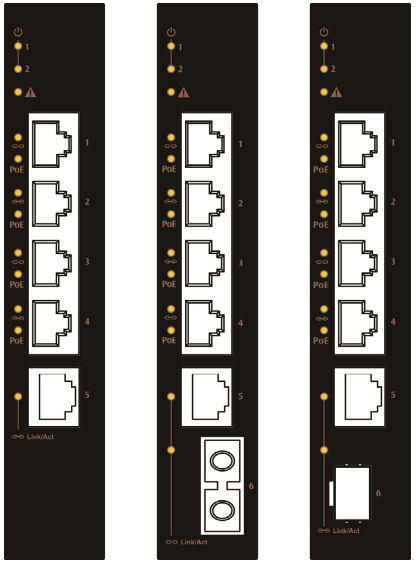
Quick Start Guide

This quick start guide describes how to install and use the Hardened PoE Ethernet Switch. Capable of operating at temperature extremes of -40°C to +75°C, this is the switch of choice for harsh environments constrained by space.

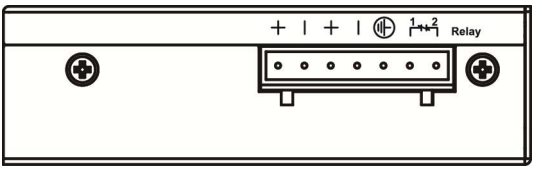
Physical Description

The Port Status LEDs



LED	State	Indication
⏻ Power (Green)	Steady	Power on.
	Off	Power off.
⚠ Fault (Red)	Steady	Relay starts alarm.
	Off	Relay non-alarm.
10/100TX Ports		
Link/Act (Green)	Steady	A valid network connection established.
	Blinking	Transmitting or receiving data. Act stands for Activity.
	Off	No link.
PoE (Amber)	Steady	Powered Device is connected.
	Off	Powered Device is disconnected.
	Blinking	While Powered Device over 30W.
Gigabit Port		
Link/Act (Amber)	Steady	A valid network connection established.
	Blinking	Transmitting or receiving data. Act stands for Activity.
	Off	No link.

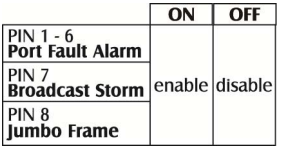
The Terminal Block and Power Inputs



Power Input Assignment			
Power1	+	24/48VDC	Terminal Block
	−	Power Ground	
Power2	+	24/48VDC	
	−	Power Ground	
⏚		Earth Ground	
Relay Output Rating			1A @ 250VAC

DC Terminal Block Power Input: The DC Terminal Block power input can be used to power up this Switch.

DIP Switch Settings

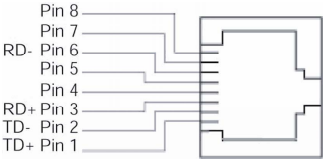


DIP No.	On	Off
1	Port 1 Alarm Enable.	Port 1 Alarm Disable.
2	Port 2 Alarm Enable.	Port 2 Alarm Disable.
3	Port 3 Alarm Enable.	Port 3 Alarm Disable.
4	Port 4 Alarm Enable.	Port 4 Alarm Disable.
5	Port 5 Alarm Enable.	Port 5 Alarm Disable.
6 (Only for EX42315)	Port 6 Alarm Enable.	Port 6 Alarm Disable.
7	Broadcast Storm Enable.	Broadcast Storm Disable.
8	Jumbo Frame Enable.	Jumbo Frame Disable.

The 10/100Base-TX (PoE) and Gigabit Ethernet Connectors

1. The 10/100Base-TX Connections

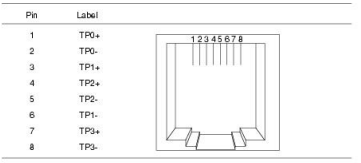
The following lists the pinouts of 10/100Base-TX ports.



Pin	Signal Name	Signal Definition
1	TD＋	Output Transmit Data ＋
2	TD－	Output Transmit Data －
3	RD＋	Input Receive Data ＋
4	PoE	Positive (VCC＋)
5	PoE	Positive (VCC＋)
6	RD－	Input Receive Data －
7	PoE	Negative (VCC－)
8	PoE	Negative (VCC－)

2. The 10/100/1000Base-TX Connections

The following lists the pinouts of 10/100/1000Base-TX ports.



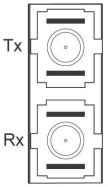
Pin	Regular Ports	Uplink port
1	TP0＋	Transmit and Receive Data 0 ＋
2	TP0－	Transmit and Receive Data 0 －
3	TP1＋	Transmit and Receive Data 1 ＋
4	TP2＋	Transmit and Receive Data 2 ＋
5	TP2－	Transmit and Receive Data 2 －
6	TP1－	Transmit and Receive Data 1 －
7	TP3＋	Transmit and Receive Data 3 ＋
8	TP3－	Transmit and Receive Data 3 －

3. The SFP Socket Connections

The SFP socket for Gigabit fiber optic expansion.

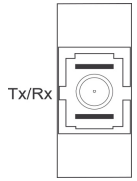
4. The 1000Base-SX/LX Connections

The fiber port pinouts: The Tx (transmit) port of device I is connected to the Rx (receive) port of device II, and the Rx (receive) port of device I to the Tx (transmit) port of device II.



5. The WDM 1000Base-BX Connections

The fiber port pinouts: Only one optical fiber is required to transmit and receive data.

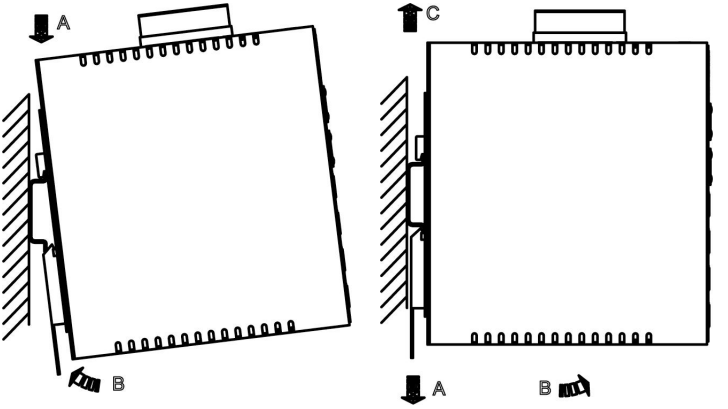


Functional Description

- Complies with EN61000-6-2 & EN61000-6-4 EMC Generic standard immunity for industrial environment.
- Supports 802.3/802.3u/802.3ab/802.3z/802.3x. Auto-negotiation: 10/100/1000Mbps, Full/Half-duplex. Auto MDI/MDIX.
- 1000Base-SX/LX: Multi mode SC or ST type, Single mode SC type. 1000Base-BX: WDM Single mode SC type.
- Supports 8192 MAC addresses, 1M bits buffer memory.
- Supports IEEE802.3az Energy Efficient Ethernet (EEE).
- High speed, non-blocking four traffic class QoS switch fabric.
- Supports Jumbo frame up to 10K Bytes on Gigabit port.
- Enable Broadcast Storm Protection by DIP Switch No. 7 to limit 15,000 packets per second.
- Port 1~4 support IEEE802.3at Power over Ethernet (PoE) Power Sourcing Equipment (PSE) and provide power up to 30W.
- Power consumption: 7W Max (Device only, without PoE).
- PoE power budget: 120W.
- Power Supply: Redundant 24/48VDC Terminal Block power inputs.
- Operating temperature ranges from -40°C to 75°C (-40°F to 167°F).
- Slim design with DIN-Rail mount installation.

Assembly, Startup, and Dismantling

- Assembly: Place the switch on the DIN rail from above using the slot. Push the front of the switch toward the mounting surface until it audibly snaps into place.
- Startup: Connect the supply voltage to start up the switch via the terminal block.
- Dismantling: Pull out the lower edge and then remove the switch from the DIN rail.



Preface

This manual describes how to install and use the Hardened PoE Ethernet Switch. This switch introduced here is capable of operating at temperature extremes of -40°C to +75°C, this is the switch of choice for harsh environments constrained by space.

Port 1 to port 4 on this switch supports IEEE802.3at Power over Ethernet (PoE) Power Sourcing Equipment (PSE) and can detect an IEEE802.3at compliant Powered Device (PD). Using external 48VDC power inputs through Terminal Block, data and power can be transmitted to a Powered Device (PD) over the same twisted-pair Ethernet cable through port 1 to port 4 on the switch.

To get the most out of this manual, you should have an understanding of Ethernet networking concepts.

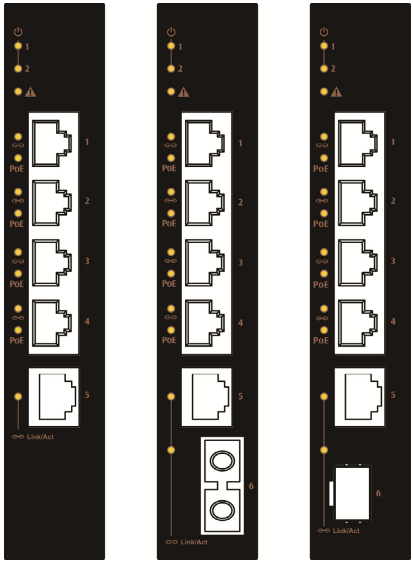
In this manual, you will find:

- Features on the switch
- Illustrative LED functions
- Installation instructions
- Specifications

Table of Contents

Product Overview

Hardened PoE Ethernet Switch



Package Contents

When you unpack the product package, you shall find the items listed below. Please inspect the contents, and report any apparent damage or missing items immediately to your authorized reseller.

- ✓ ***This Switch***
- ✓ ***User's Manual***

Product Highlights

Basic Features

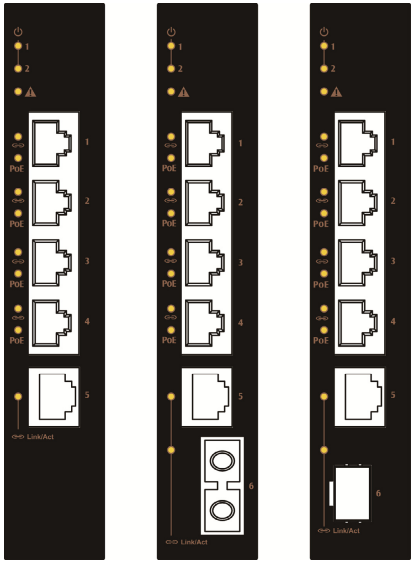
- Complies with EN61000-6-2 & EN61000-6-4 EMC Generic standard immunity for industrial environment.
- Supports 802.3/802.3u/802.3ab/802.3z/802.3x. Auto-negotiation: 10/100/1000Mbps, Full/Half-duplex. Auto MDI/MDIX.
- 1000Base-SX/LX: Multi mode SC or ST type, Single mode SC type. 1000Base-BX: WDM Single mode SC type.
- Supports 8192 MAC addresses, 1M bits buffer memory.
- Supports IEEE802.3az Energy Efficient Ethernet (EEE).
- High speed, non-blocking four traffic class QoS switch fabric.
  - 802.1Q VLAN Tag Based Priority, Class of Service.
  - Output Queue Schedule Mode: Weighted Round Robin (WRR) with 4 priority queues.
  - The configurations of QoS are as below:

CoS Field Value	Packet Count	Priority
0 or 1	1	Lowest
2 or 3	2	Low
4 or 5	4	High
6 or 7	8	Highest

- Supports Jumbo frame up to 10K Bytes on Gigabit port.
- Enable Broadcast Storm Protection by DIP Switch No. 7 to limit 15,000 packets per second.
- Port 1~4 support IEEE802.3at Power over Ethernet (PoE) Power Sourcing Equipment (PSE) and provide power up to 30W.
- Power consumption: 7W Max (Device only, without PoE).
- PoE power budget: 120W.

- Power Supply: Redundant 24/48VDC Terminal Block power inputs.
- Operating temperature ranges from -40°C to 75°C (-40°F to 167°F).
- Slim design with DIN-Rail mount installation.

Front Panel Display



① Power Status (PWR)

This LED comes on when the switch is properly connected to power and turned on.

② Port Status LEDs

The LEDs display status for each respective port.

LED	State	Indication
⏻ Power (Green)	Steady	Power on.
	Off	Power off.
⚠ Fault (Red)	Steady	Relay starts alarm.
	Off	Relay non-alarm.
10/100TX Ports		
Link/Act (Green)	Steady	A valid network connection established.
	Blinking	Transmitting or receiving data. Act stands for Activity.
	Off	No link.
PoE (Amber)	Steady	Powered Device is connected.
	Off	Powered Device is disconnected.
	Blinking	While Powered Device over 30W.
Gigabit Port		
Link/Act (Amber)	Steady	A valid network connection established.
	Blinking	Transmitting or receiving data. Act stands for Activity.
	Off	No link.

Physical Ports

This switch provides:

- 4 x 10/100Base-TX ports (PoE) + 1-port 10/100/1000Base-TX
- 4 x 10/100Base-TX ports (PoE) + 1-port 10/100/1000Base-TX + 1-port 1000Base-SX/LX/BX/SFP

Connectivity

- RJ-45 connectors on TX ports
- ST or SC connector on 1000Base-SX/LX fiber port
- SC connector on 1000Base-BX fiber port
- Duplex LC connector on SFP 1000Base-SX/LX/BX fiber transceiver

Installation

This chapter gives step-by-step instructions about how to install the switch:

Selecting a Site for the Switch

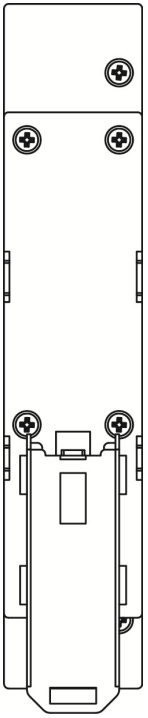
As with any electric device, you should place the switch where it will not be subjected to extreme temperatures, humidity, or electromagnetic interference. Specifically, the site you select should meet the following requirements:

- The ambient temperature should be between -40 to 75 degrees Celsius.
- The relative humidity should be less than 95 percent, non-condensing.
- Surrounding electrical devices should not exceed the electromagnetic field (RFC) standards.
- Make sure that the switch receives adequate ventilation. Do not block the ventilation holes on each side of the switch
- The power outlet should be within 1.8 meters of the switch.

DIN Rail Mounting

Installation: Place the switch on the DIN rail from above using the slot. Push the front of the switch toward the mounting surface until it audibly snaps into place.

Removal: Pull out the lower edge and then remove the switch from the DIN rail.

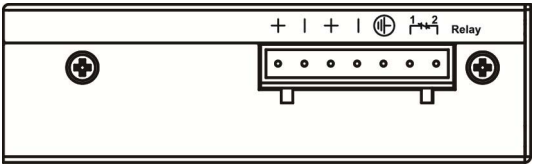


Connecting to Power

DC Terminal Block Power Inputs

Step 1: Connect the DC power cord to the plug-able terminal block on the switch, and then plug it into a standard DC outlet.

Step 2: Disconnect the power cord if you want to shut down the switch.



Power Input Assignment			
Power1	+	24/48VDC	Terminal Block
	−	Power Ground	
Power2	+	24/48VDC	
	−	Power Ground	
⏚		Earth Ground	
Relay Output Rating			1A @ 250VAC

Connecting to Your Network

Cable Type & Length

It is necessary to follow the cable specifications below when connecting the switch to your network. Use appropriate cables that meet your speed and cabling requirements.

Cable Specifications

Speed	**Connector**	**Port Speed Half/Full Duplex**	**Cable**	**Max. Distance**
10Base-T	RJ-45	10/20 Mbps	2-pair UTP/STP Cat. 3, 4, 5	100 m
100Base-TX	RJ-45	100/200 Mbps	2-pair UTP/STP Cat. 5	100 m
1000Base-TX	RJ-45	2000 Mbps	4-pair UTP/STP Cat. 5	100 m
1000Base-SX	SC, ST	2000 Mbps	MMF (62.5µm)	220 m 2 km
1000Base-SX	SC, ST	2000 Mbps	MMF (50µm)	550 m
1000Base-LX	SC	2000 Mbps	SMF (10µm)	10, 20, 50 km
1000Base-BX	SC	2000 Mbps	SMF (10µm)	20, 40 km
SFP				
1000Base-SX	Duplex LC	2000 Mbps	MMF (62.5µm)	550 m 2 km
1000Base-LX	Duplex LC	2000 Mbps	SMF (9µm)	10, 40, 60 km
1000Base-BX	Duplex LC	2000 Mbps	SMF (9µm)	70 km

Cabling

Step 1: First, ensure the power of the switch and end devices are turned off.

<Note> Always ensure that the power is off before any installation.

Step 2: Prepare cable with corresponding connectors for each type of port in use.

<Note> To connect two regular RJ-45 ports between switches or hubs, you need a straight or cross-over cable.

Step 3: Consult the previous section for cabling requirements based on connectors and speed.

Step 4: Connect one end of the cable to the switch and the other end to a desired device.

Step 5: Once the connections between two end devices are made successfully, turn on the power and the switch is operational.

Specifications

Hardened PoE Ethernet Switch	4 x 10/100Base-TX ports (PoE) + 1-port 10/100/1000Base-TX + 1-port 1000Base-SX/LX/BX/SFP
Applicable Standards	IEEE 802.3 10Base-T IEEE 802.3u 100Base-TX IEEE 802.3ab 1000Base-T IEEE 802.3z 1000Base-SX/LX IEEE 802.1x Full-duplex Flow Control IEEE 802.1az Energy Efficient Ethernet IEEE 802.1p Quality of Service (QoS)
Forwarding Rate 10Base-T: 100Base-TX: 1000Base-T/SX/LX:	 10 / 20Mbps half / full-duplex 100 / 200Mbps half / full-duplex 2000Mbps full-duplex
Performance	148,80pps for 10Mbps 148,810pps for 100Mbps 1,488,100pps for 1000Mbps
Cable 10Base-T: 100Base-TX: 1000Base-T: 1000Base-SX/LX:	 2-pair UTP/STP Cat. 3, 4, 5 2-pair UTP/STP Cat. 5 4-pair UTP/STP Cat. 5 MMF (50 or 62.5μm), SMF (9 or10μm)
LED Indicators	Per unit – Power, Fault Per port – Link/Act, PoE (For PoE ports)
Dimensions	30mm (W) × 100mm (D) × 149mm (H) (1.18” (W) × 4” (D) × 5.96” (H))
Net Weight	0.34Kg (0.75lb.)
Power	Terminal Block: 24-48VDC
Power Consumption	7W Max (Device only, without PoE)
PoE Power Budget	120W
Operating Temperature	-40°C to 75°C (-40°F to 167°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5%-95% non-condensing
EMI	FCC Part 15 Class A, VCCI Class A EN61000-6-4 EN55022 Class A

EMS	EN61000-6-2: EN61000-4-2 (ESD Standard) EN61000-4-3 (Radiated RFI Standards) EN61000-4-4 (Burst Standards) EN61000-4-5 (Surge Standards) EN61000-4-6 (Induced RFI Standards) EN61000-4-8 (Magnetic Field Standards)
Environmental Test Compliance	IEC60068-2-6 Fc (Vibration) IEC60068-2-27 Ea (Shock) FED STD 101C Method 5007.1 (Free Fall w/ package)