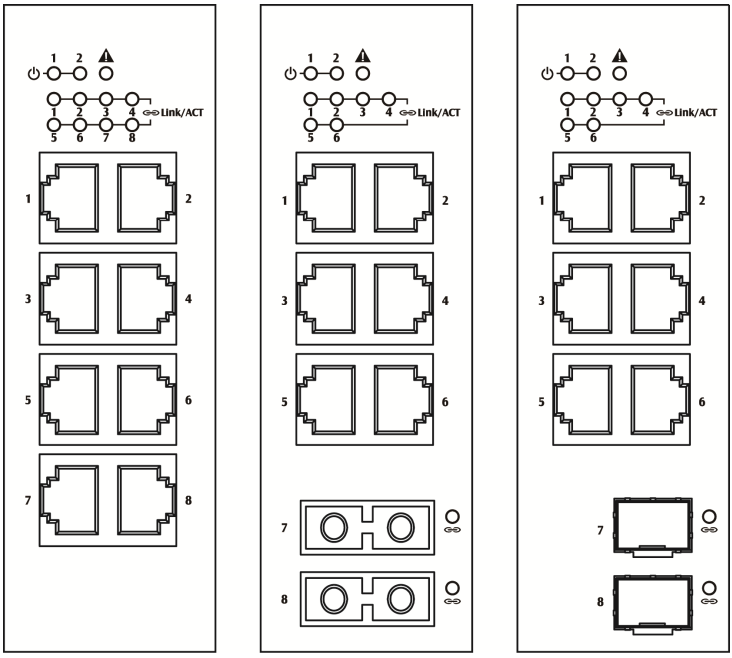
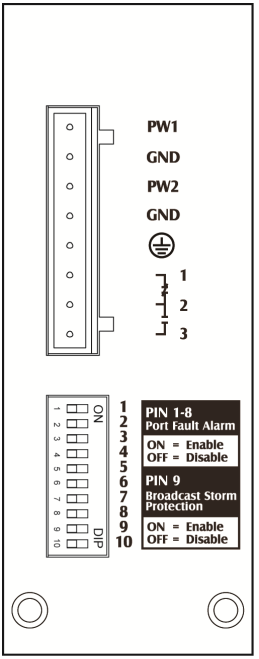
Quick Start Guide

This quick start guide describes how to install and use the Hardened Ethernet Switch. This is the switch of choice for harsh environments constrained by space.

Physical Description

The Port Status LEDs





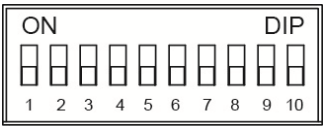
LED	State	Indication
⏻ **Power 1, 2 (Green)**	Steady	Power on.
	Off	Power off.
⚠ **Fault (Red)**	Steady	Relay starts alarm.
	Off	Relay non-alarm.
Ports		
⇔ **Link/ACT (Green)**	Steady	A valid network connection established.
	Blinking	Transmitting or receiving data. ACT stands for Activity.
	Off	No link.

The Terminal Block and Power Inputs

Power Input Assignment			
Power 1	+	12~48VDC	Terminal Block
	−	Power Ground	
Power 2	+	12~48VDC	
	−	Power Ground	
⏚		Earth Ground	
Relay Output Rating			1A @ 250VAC

DC Terminal Block Power Inputs: The DC Terminal Block power inputs can be used to power up this Switch.

DIP Switch Settings

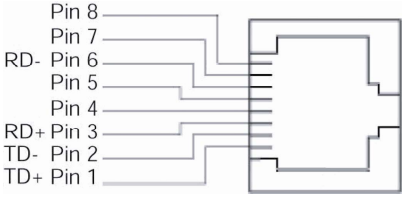


DIP No.	On	Off
1	Port 1 Alarm Enable.	Port 1 Alarm Disable.
2	Port 2 Alarm Enable.	Port 2 Alarm Disable.
3	Port 3 Alarm Enable.	Port 3 Alarm Disable.
4	Port 4 Alarm Enable.	Port 4 Alarm Disable.
5	Port 5 Alarm Enable.	Port 5 Alarm Disable.
6	Port 6 Alarm Enable.	Port 6 Alarm Disable.
7	Port 7 Alarm Enable.	Port 7 Alarm Disable.
8	Port 8 Alarm Enable.	Port 8 Alarm Disable.
9	Broadcast Storm Protection Enable. (Broadcast Storm will be dropped off when more than 3000pps.)	Broadcast Storm Protection Disable.
10	Reserved	

The 10/100Base-TX and 100Base-FX/BX Connectors

1. The 10/100Base-TX Connections

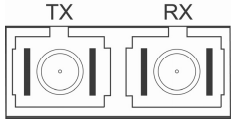
The following lists the pinouts of 10/100Base-TX ports.



Pin	Regular Ports	Uplink port
1	Output Transmit Data +	Input Receive Data +
2	Output Transmit Data -	Input Receive Data -
3	Input Receive Data +	Output Transmit Data +
4	NC	NC
5	NC	NC
6	Input Receive Data -	Output Transmit Data -
7	NC	NC
8	NC	NC

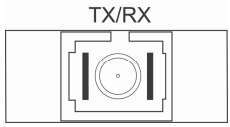
2. The 100Base-FX Connections

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.



3. The WDM 100Base-BX Connections

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



4. The 100Base-FX/BX SFP Socket Connections

The SFP socket for fiber optic expansion.

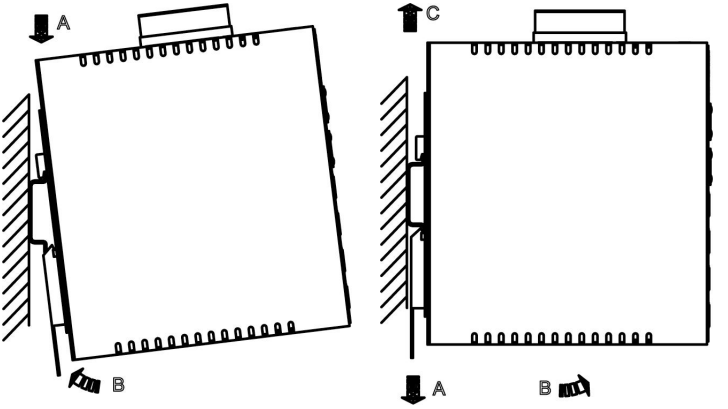
Functional Description

- Meets EN61000-6-2 & EN61000-6-4 EMC Generic Standard Immunity for industrial environment.
- Supports 802.3/802.3u/802.3x. Auto-negotiation: 10/100Mbps, full/half-duplex. Auto MDI/MDIX.
- 100Base-FX: Multi mode/Single mode SC or ST type. 100Base-BX: WDM Multi mode/Single mode SC type.
- SFP socket for fiber optic expansion.
- Supports 1024 MAC addresses. Provides 448K bits memory buffer.
- Alarms for power and port link failure by relay output 1A @ 250VAC.
- Power consumption: 6W Max.
- Power Supply: Redundant 12~48VDC Terminal Block power inputs.
- -40°C to 75°C (-40°F to 167°F) operating temperature range. Tested for functional operation @ -40°C to 85°C (-40°F to 185°F).
- Supports 4KV Surge Protection.
- Supports DIN-Rail or Panel Mounting installation.

Assembly, Startup, and Dismantling

- Assembly: Place the device on the DIN Rail from above using the slot. Push the front of the device toward the mounting surface until it audibly snaps into place.

- Startup: Connect the supply voltage to start up the device via the terminal block.
- Dismantling: Pull out the lower edge and then remove the device from the DIN Rail.



Preface

A member of the growing family of rugged switches, this switch addresses a need for a smaller switch. This switch provides an affordable solution for rugged and outdoor environment, transportation road-side cabinet, industrial floor shop, multitenant dwellings or Fiber To The Home (FTTH) applications. Capable of operating at temperature extremes of -40°C to +75°C, this is the switch of choice for harsh environments constrained by space.

Plug-and-Play Solution:
The switch is a plug-and-play Fast Ethernet Switch in compact size. It doesn't have any complicated software to set up.

This manual describes how to install and use the Hardened Ethernet Switch. This switch integrates full wire speed switching technology. This switch brings the answer to complicated hardened networking environments.

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

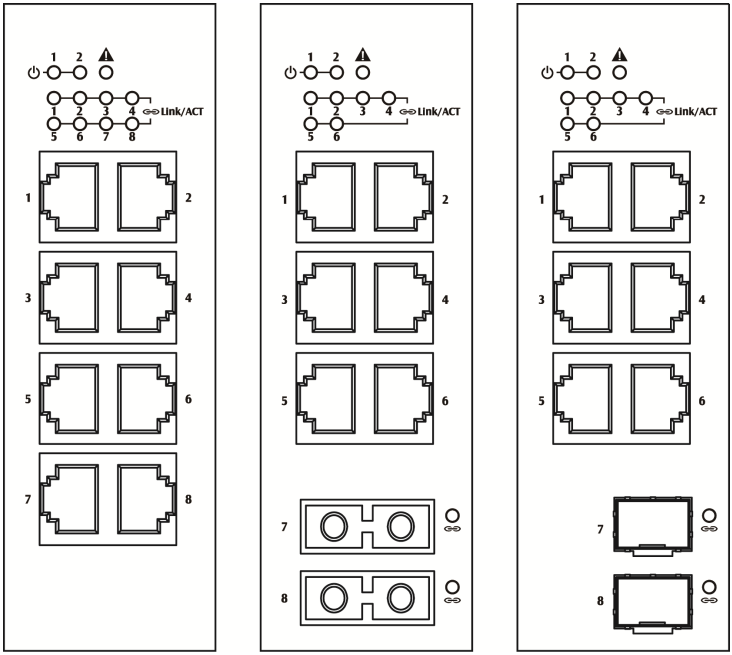
In this manual, you will find:

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

Table of Contents

Product Overview

Hardened 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.

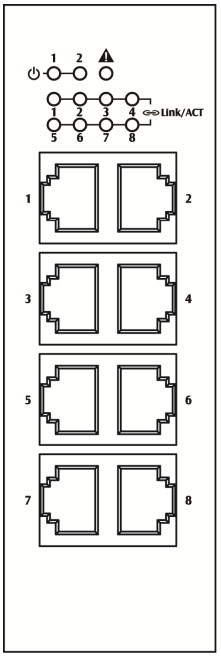
- ✓ ***This Switch***
- ✓ ***User's Manual***

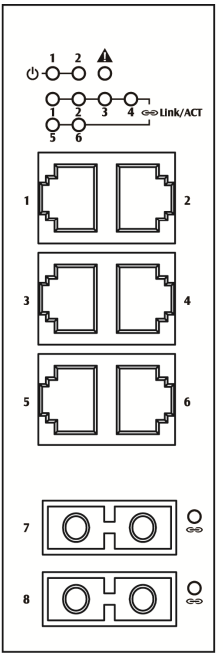
Product Highlights

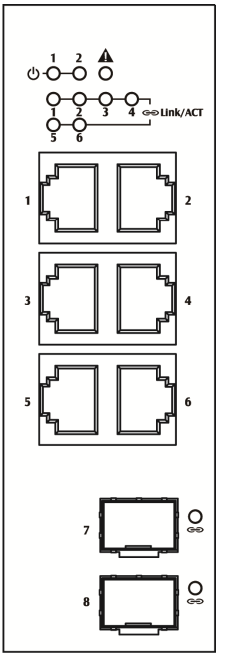
Basic Features

- Meets EN61000-6-2 & EN61000-6-4 EMC Generic Standard Immunity for industrial environment.
- Supports 802.3/802.3u/802.3x. Auto-negotiation: 10/100Mbps, full/half-duplex. Auto MDI/MDIX.
- 100Base-FX: Multi mode/Single mode SC or ST type. 100Base-BX: WDM Multi mode/Single mode SC type.
- SFP socket for fiber optic expansion.
- Supports 1024 MAC addresses. Provides 448K bits memory buffer.
- Alarms for power and port link failure by relay output 1A @ 250VAC.
- Power consumption: 6W Max.
- Power Supply: Redundant 12~48VDC Terminal Block power inputs.
- -40°C to 75°C (-40°F to 167°F) operating temperature range. Tested for functional operation @ -40°C to 85°C (-40°F to 185°F).
- Supports 4KV Surge Protection.
- Supports DIN-Rail or Panel Mounting installation.

Front Panel Display







Status LEDs

LED	State	Indication
POWER		
PWR1 **PWR2** (Green)	Steady	Switch is properly connected to power and turned on.
	Off	Switch is not connected to power and is turned off.
FAULT		
FAULT (Red)	Steady	• Power redundant system failure occurred. • Port failure occurred (when port fault alarm dip switch is enabled).
	Off	• Power redundant system failure is not occurred. • Port failure is not occurred (when port fault alarm dip switch is enabled). • Port fault alarm dip switch is disabled.
10/100Base-TX or 100Base-FX/BX		
LNK/ACT (Green)	Steady	A valid network connection established. LNK stands for LINK.
	Flashing	Transmitting or receiving data. ACT stands for ACTIVITY.
100 (Yellow)	Steady	Light solid yellow for a port transferring at 100Mbps.
	Off	The port is transferring at 10Mbps If this LED is dark.

Physical Ports

This switch provides:
- Eight 10/100Base-TX ports
- Six 10/100Base-TX ports + two 100Base-FX/BX ports
- Six 10/100Base-TX ports + two 100Base SFP sockets

CONNECTIVITY
- RJ-45 connectors
- SC or ST connector on 100Base-FX fiber port
- SC connector on 100Base-BX fiber port
- SFP socket connection on 100Base-FX/BX fiber port.

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:

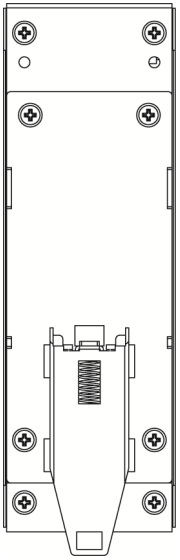
- The ambient temperature should be between -40 to 75 degrees Celsius.
- The relative humidity should be less than 95 percent, non-condensing.
- Surrounding electrical devices should not exceed the electromagnetic field (RFC) standards.
- Make sure that the switch receives adequate ventilation. Do not 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

Fix the DIN rail attachment plate to the back panel of the switch.

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.



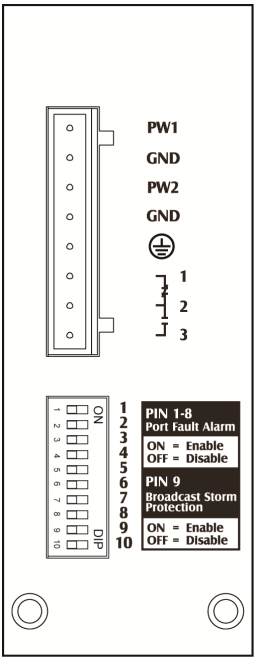
Connecting to Power

Redundant DC Terminal Block Power Inputs

There are two pairs of power inputs can be used to power up this device. You need to have two power inputs connected to run the device, but the FAULT LED indicator will light up to remind that the power redundant system functions abnormal in case either PWR1 or PWR2 is dead. This device, however, continues working normally even fault LED indicator lights up.

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.

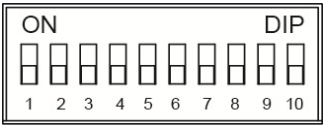
Step 2: Disconnect the power cord if you want to shut down the switch.



Alarms for Power and Port Failure

There are three pins on the terminal block are used for power failure detection. It provides the normally open or closed output when the power source is active. Use this as a dry contact application to send a signal for power failure detection.

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	Port 6 Alarm Enable.	Port 6 Alarm Disable.
7	Port 7 Alarm Enable.	Port 7 Alarm Disable.
8	Port 8 Alarm Enable.	Port 8 Alarm Disable.
9	Broadcast Storm Protection Enable. (Broadcast Storm will be dropped off when more than 3000pps.)	Broadcast Storm Protection Disable.
10	Reserved	

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
100Base-FX	SC, ST	200 Mbps	MMF (50 or 62.5µm)	2 km
100Base-FX	SC, ST	200 Mbps	SMF (9 or 10µm)	20 km
100Base-BX	SC	200 Mbps	SMF (9 or 10µm)	20 km
SFP				
100Base-FX	Duplex LC	200 Mbps	MMF (62.5µm)	2 km
100Base-FX	Duplex LC	200 Mbps	SMF (10µm)	20, 40, 75, 100 km
100Base-BX	Duplex LC	200 Mbps	MMF (62.5µm)	2, 5 km
100Base-BX	Duplex LC	200 Mbps	SMF (10µm)	20, 40 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.

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

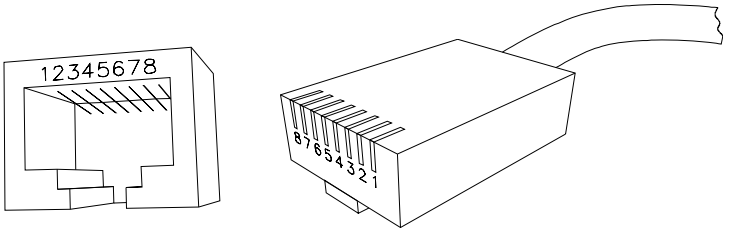
Hardened Ethernet Switch	10/100Base-TX auto-negotiating ports with RJ-45 connectors, 100Base-FX/BX fiber ports or 100Base SFP sockets
Applicable Standards	IEEE 802.3 10Base-T IEEE 802.3u 100Base-TX/FX
Switching Method	Store-and-Forward
Forwarding Rate 10Base-T: 100Base-TX: 100Base-FX/BX:	 10 / 20Mbps half / full-duplex 100 / 200Mbps half / full-duplex 200Mbps full-duplex
Performance	14,880pps for 10Mbps 148,810pps for 100Mbps
Cable 10Base-T: 100Base-TX: 100Base-FX/BX:	 2-pair UTP/STP Cat. 3, 4, 5 2-pair UTP/STP Cat. 5 Up to 100m (328ft) MMF (50 or 62.5µm), SMF (9 or 10µm)
LED Indicators	Per unit – Power status (Power 1, Power 2) FAULT Per port – 10/100TX or 100FX/BX - LNK/ACT
Dimensions	50mm (W) × 110mm (D) × 135mm (H) (1.97” (W) x 4.33” (D) x 5.31” (H))
Net Weight	0.8Kg (1.76lbs.)
Power	Terminal Block: 12-48VDC
Power Consumption	6W Max.
Operating Temperature	-40°C to 75°C (-40°F to 167°F) Tested for functional operation @ -40°C to 85°C (-40°F to 185°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5%-95% non-condensing
Safety	UL60950-1 UL ISA12.12.01 Class I Div. 2 / ATEX Zone 2 or hazardous locations
EMI	FCC Part 15B, Class A VCCI Class A EN61000-6-4: EN55022 Class A, EN61000-3-2, EN61000-3-3

EMS
EN61000-6-2:
EN61000-4-2 (ESD Standards)

EN61000-4-3 (Radiated RFI Standards)
EN61000-4-4 (Burst Standards)
EN61000-4-5 (Surge Standards) Signal ports: +/-4KV line-to-earth DC Power ports: +/-4KV line-to-earth, +/-2KV line-to-line
EN61000-4-6 (Induced RFI Standards)
EN61000-4-8 (Magnetic Field Standards)
Environmental Test Compliance
IEC60068-2-6 Fc (Vibration Resistance)
IEC60068-2-27 Ea (Shock)
FED STD 101C Method 5007.1 (Free fall w/ package) Tested with Cross Weight and Drop High standard table

Appendix A – Connector Pinouts

Pin arrangement of RJ-45 connectors:



RJ-45 Connector and Cable Pins

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

Pin	Regular Ports	Uplink port
1	Output Transmit Data +	Input Receive Data +
2	Output Transmit Data -	Input Receive Data -
3	Input Receive Data +	Output Transmit Data +
4	NC	NC
5	NC	NC
6	Input Receive Data -	Output Transmit Data -
7	NC	NC
8	NC	NC