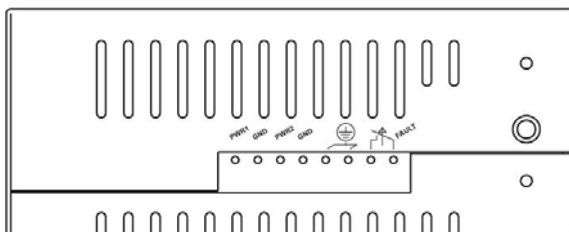# Quick Start Guide

This quick start guide describes how to install and use the hardened Ethernet Switch. Capable of operating at temperature extremes of -20°C to +60°C, this is the switch of choice for harsh environments constrained by space.

## Physical Description

### The Terminal Block and Power inputs

| The Terminal Block | |
| --- | --- |
| PWR1 | Power Input 1 (12 to 30VDC) |
| GND | Power Ground |
| PWR2 | Power Input 2 (12 to 30VDC) |
| GND | Power Ground |
| ⏚ | Earth Ground |
| FAULT | The relay opens if PWR1 or PWR2 fails (1A) |



| The DC Power Inputs | |
| --- | --- |
| 12VDC DC JACK | |
| FAULT | The relay opens if PWR1 or PWR2 fails (1A) |
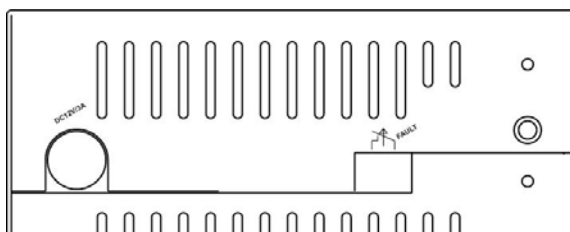
DC Terminal Block Power Inputs: There are two pairs of power inputs can be used to power up this media converter. Redundant power supplies function is supported. You only need to have one power input connected to run the Switch.

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

### 1. The 10/100Base-TX Connections

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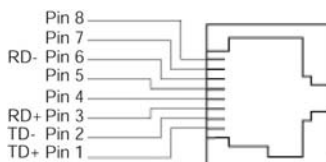


| Pin | Regular Ports | Uplink port |
|-----|---------------|-------------|
| 1 | Output Transmit Data + | Input Receive Data + |
| 2 | Output Transmit Data - | Input Receive Data - |
| 3 | Input Receive Data + | Output Transmit Data + |
| 4 | NC | NC |
| 5 | NC | NC |
| 6 | Input Receive Data - | Output 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.
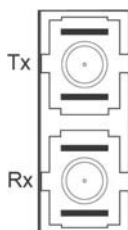
## The Port Status LEDs



| LED | State | Indication |
|---|---|---|
| **10/100TX or 100FX** | | |
| **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. |

# Functional Description

- Meets IEC61000-6-2 EMC Generic Standard Immunity for industrial environment.
- Support 802.3/802.3u/802.3x. Auto-negotiation: 10/100Mbps, Full/half-duplex; Auto MDI/MDIX.
- 100Base-FX: Multi mode SC or ST type; Single mode SC or ST type; WDM Single mode SC type.
- Support 2048 MAC addresses. Provides 768K bits memory buffer.
- Alarms for power failure by relay output.
- Operating voltage and Max. current consumption: 1.1A @ 12VDC, 0.55A @ 24VDC. Power consumption: 13.2W Max.
- Power Supply: Redundant DC Terminal Block power inputs or 12VDC DC JACK with 100-240VAC external power supply.
- Operating temperature ranges from -20℃ to 60℃.
- Supports DIN-Rail, Panel, or Rack Mounting 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 (or DC JACK).
- Dismantling: Pull out the lower edge and then remove the switch from the DIN rail.
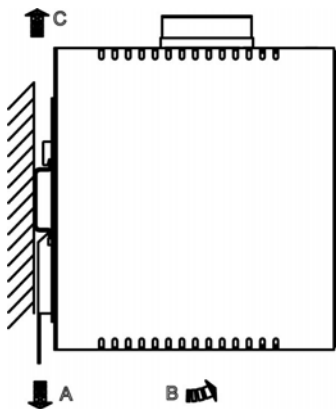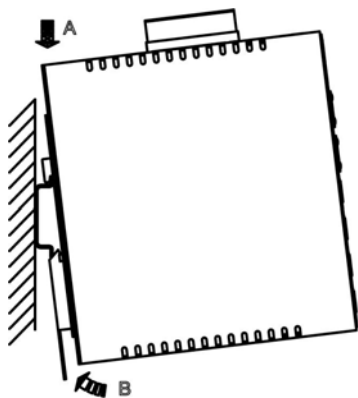
# Preface

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 -20°C to +60°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*
- ✓ *External power adapter & Power Cord (Optional)*

# Product Highlights

## Basic Features

- Meets IEC61000-6-2 EMC Generic Standard Immunity for industrial environment.
- Support 802.3/802.3u/802.3X.
- Auto-negotiation: 10/100Mbps, Full/half-duplex; Auto MDI/MDIX.
- Support 2048 MAC addresses.
- Provides 768K bits memory buffer.
- Alarms for power failure by relay output.
- Operating voltage and Max. current consumption: 1.1A @ 12VDC, 0.55A @ 24VDC.
- Power consumption: 13.2W Max.
- Power Supply: Redundant DC Terminal Block power inputs or 12VDC DC JACK with 100-240VAC external power supply.
- Supports DIN-Rail, Panel, or Rack Mounting installation.

# Front Panel Display



## ① Power Status (PWR1, PWR2)
These LEDs come 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 |
|---|---|---|
| **10/100TX or 100FX** | | |
| **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
- Eight 10/100Base-TX ports + one 100Base-FX port
- Six 10/100Base-TX ports + two 100Base-FX ports
- Four 10/100Base-TX ports + four 100Base-FX ports

Connectivity
- RJ-45 connector
- SC or ST connector on 100Base-FX 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 -20 to 60 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.
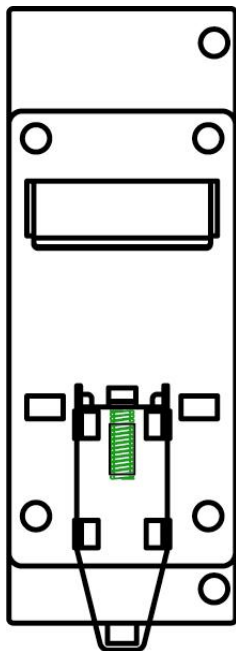
# Connecting to Power

Redundant DC Terminal Block Power Inputs or 12VDC DC Jack:

## 12VDC DC Jack

Step 1: Connect the supplied AC to DC power adapter to the receptacle on the topside of the switch.

Step 2: Connect the power cord to the AC to DC power adapter and attach the plug into a standard AC outlet with the appropriate AC voltage.
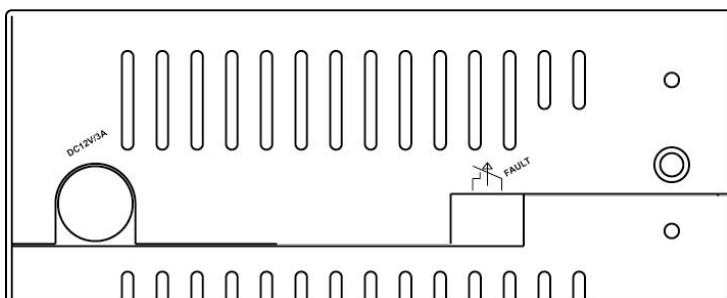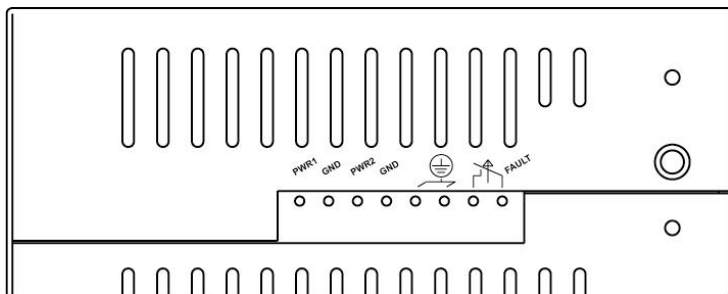


## Redundant DC Terminal Block Power Inputs

There are two pairs of power inputs can be used to power up this device. You only need to have one power input connected to run the switch.

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 Failure

Step 1: There are two pins on the terminal block are used for power failure detection. It provides the normally closed output when the power source is active. Use this as a dry contact application to send a signal for power failure detection.

| The Terminal Block | |
| --- | --- |
| PWR1 | Power Input 1 (12 to 30VDC) |
| GND | Power Ground |
| PWR2 | Power Input 2 (12 to 30VDC) |
| GND | Power Ground |
| ⏚ | Earth Ground |
| | The relay opens if PWR1 or PWR2 fails (1A) |

**Special note:**
**The relay output is normal open position when there is no power to the switch. Please do not connect any power source to this terminal to prevent the shortage to your power supply.**

# 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 | 100/200 Mbps | MMF (50 or 62.5µm) | 2 km |
| 100Base-FX | SC, ST | 100/200 Mbps | SMF (9 or 10µm) | 15, 40, or 75 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 Ethernet Switch | 10/100Base-TX auto-negotiating ports with RJ-45 connectors, 100Base-FX fiber ports |
| Applicable Standards | IEEE 802.3 10Base-T<br>IEEE 802.3u 100Base-TX/FX |
| **Switching Method** | Store-and-Forward |
| **Forwarding Rate**<br>10Base-T:<br>100Base-TX/FX: | <br>10 / 20Mbps half / full-duplex<br>100 / 200Mbps half / full-duplex |
| **Performance** | 148,80pps for 10Mbps<br>148,810pps for 100Mbps |
| **Cable**<br>10Base-T:<br>100Base-TX:<br><br>100Base-FX: | <br>2-pair UTP/STP Cat. 3, 4, 5<br>2-pair UTP/STP Cat. 5<br>Up to 100m (328ft)<br>MMF (50 or 62.5µm), SMF (9 or10µm) |
| **LED Indicators** | Per unit – Power status (PWR1, PWR2)<br>Per port –<br>  10/100TX or 100FX –<br>  LNK/ACT (Green), 100 (Yellow) |
| **Dimensions** | 50mm (W) × 125mm (D) × 135mm (H)<br>(1.97" (W) × 4.92" (D) × 5.31" (H)) |
| **Net Weight** | 0.8Kg (1.76lbs.) |
| **Power** | DC Jack: 12VDC, External AC/DC required<br>Terminal Block: 12-30VDC |
| **Operating Voltage & Max. Current Consumption** | 1.1A @ 12VDC, 0.55A @ 24VDC |
| **Power Consumption** | 13.2W Max. |
| **Operating Temperature** | -20℃ to 60℃ (-4℉ to 140℉) |
| **Storage Temperature** | -40℃ to 85℃ (-40℉ to 185℉) |
| **Humidity** | 5%-95% non-condensing |
| **Safety** | UL60950-1, EN60950-1, IEC60950-1 |
| **EMI** | FCC Part 15, Class A<br>EN61000-6-3:<br>EN55022, EN61000-3-2, EN61000-3-3 |

| 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) |
| | EN61000-4-11 (Voltage Dips Standards) |
| **Environmental Test Compliance** | IEC60068-2-6 Fc (Vibration Resistance) |
| | IEC60068-2-27 Ea (Shock) |
| | IEC60068-2-32 Ed (Free Fall) |

# Appendix A – Connector Pinouts

Pin arrangement of RJ-45 connectors:
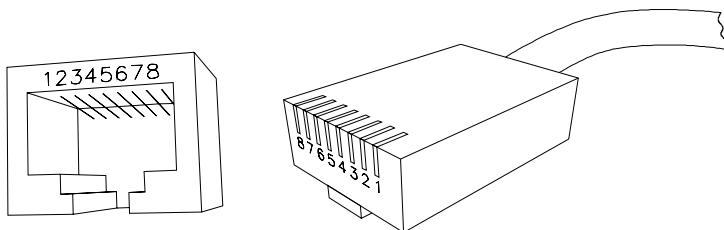


**RJ-45 Connector and Cable Pins**

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 |