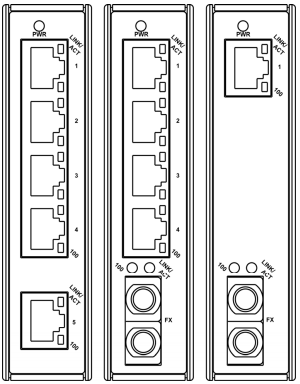
Quick Start Guide

This quick start guide describes how to install and use the Industrial Ethernet Switch. Capable of operating at temperature extremes of -10°C to +60°C, this is the switch of choice for harsh environments constrained by space.

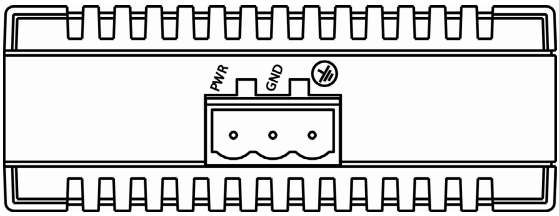
Physical Description

The Port Status LEDs



LED	State	Indication
10/100TX or 100FX/BX		
LINK/ACT	Steady	A valid network connection established. LINK stands for LINK.
	Flashing	Transmitting or receiving data. ACT stands for ACTIVITY.
100	Steady	The port is transferring at 100Mbps.
	Off	The port is transferring at 10Mbps If this LED is dark.

The Terminal Block and Power Input



The Terminal Block	
PWR	Power Input
GND	Power Ground
⏚	Earth Ground

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

CAUTION: This equipment is designed to permit the connection of the earthed conductor of the DC supply circuit to the earthing conductor at the equipment.

If this connection is made, all of the following conditions must be met:

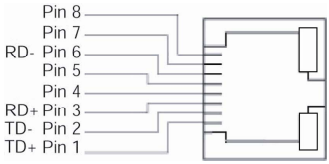
- This equipment shall be connected to directly to the DC supply system earthing electrode conductor or to a bonding jumper from an earthing terminal bar or bus to which the DC supply system earthing electrode conductor is connected.
- This equipment shall be located in the same immediate area (such as, adjacent cabinets) as any other equipment that has a connection between the earthed conductor of the same DC supply circuit and the earthing conductor, and also the point of earthing of the

- The DC supply source is to be located within the same premises as the equipment.
- Switching or disconnecting devices shall not be in the earthed circuit conductor between the DC source and the point of connection of the earthing electrode conductor.

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

1. The 10/100Base-TX Connections

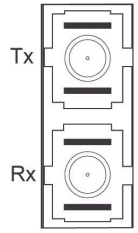
The following lists the pinouts of 10/100Base-TX ports.



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

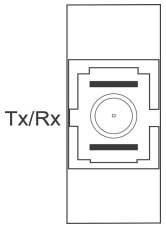
2. The 100Base-FX Connections

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 Single mode or Multi mode optical fiber is required to transmit and receive data.



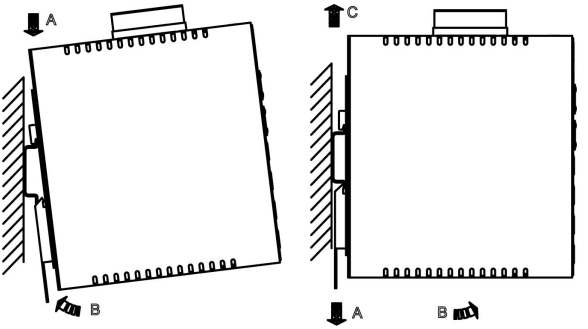
Functional Description

- Complies with EN61000-6-2 & EN61000-6-4 EMC Generic standard immunity for industrial environment.
- Supports IEEE802.3az 10Base-Te only. 10Base-T is not supported. 10Base-Te is fully interoperable with 10Base-T over 100m of class D (Category 5) or better cabling as specified in ISO/IEC 11801:1995.
- Supports 802.3az/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.
- 100Base-BX: WDM Multi mode or Single mode SC type.
- Supports 1024 MAC addresses, 448K bits buffer memory.

- IEEE802.3x Flow control for Full-duplex, Back pressure for Half-duplex.
- None-blocking architecture and full wire-speed forwarding rate.
- Supports IEEE802.1p QoS with two priority queues.
- Supports IEEE802.3az Energy Efficient Ethernet (EEE).
- Supports Max. length of frame up to 1552 Bytes.
- Power consumption: 2.12W Max.
- Power Supply: DC Terminal Block power input, 12-48VDC.
- Operating temperature ranges from -10°C to 60°C (14°F to 140°F).
- Plastic compact DIN-Rail industrial case design.

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 -10°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 Industrial 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.

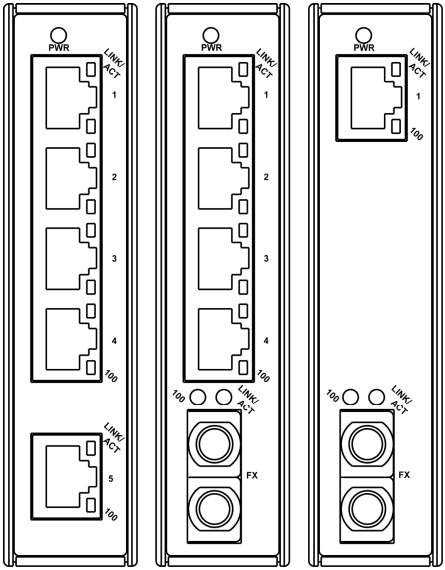
In this manual, you will find:

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

Table of Contents

Product Overview

Industrial 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

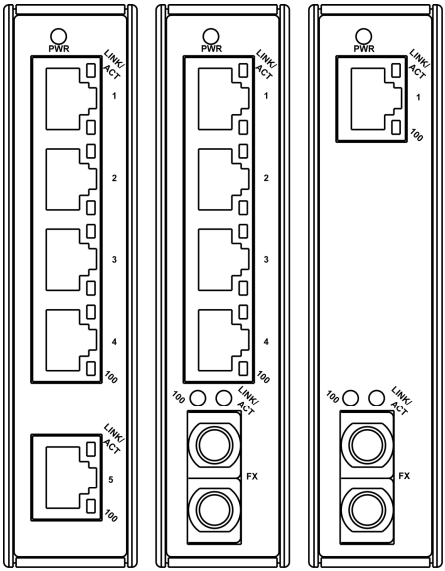
- Complies with EN61000-6-2 & EN61000-6-4 EMC Generic standard immunity for industrial environment.
- Supports IEEE802.3az 10Base-Te only. 10Base-T is not supported. 10Base-Te is fully interoperable with 10Base-T over 100m of class D (Category 5) or better cabling as specified in ISO/IEC 11801:1995.
- Supports 802.3az/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.
- 100Base-BX: WDM Multi mode or Single mode SC type.
- Supports 1024 MAC addresses, 448K bits buffer memory.
- IEEE802.3x Flow control for Full-duplex, Back pressure for Half-duplex.
- None-blocking architecture and full wire-speed forwarding rate.
- Supports IEEE802.1p QoS with two priority queues.
  - Untagged packets with low priority.
  - Output Queue Scheduling: High priority packet rate is 8 packets.
  - Two-priority queue based on CoS field value:

CoS Field Value	Priority
0, 1, 2, 3	Low
4, 5, 6, 7	High

- Supports IEEE802.3az Energy Efficient Ethernet (EEE).
- Supports Max. length of frame up to 1552 Bytes.
- Power consumption: 2.12W Max.
- Power Supply: DC Terminal Block power input, 12-48VDC.

- Operating temperature ranges from -10°C to 60°C (14°F to 140°F).
- Plastic compact DIN-Rail industrial case design.

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
10/100TX or 100FX/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:
- Five 10/100Base-TX ports
- Four 10/100Base-TX ports + one 100Base-FX/BX port
- One 10/100Base-TX port + one 100Base-FX/BX port

Connectivity
- RJ-45 connectors
- SC or ST connector on 100Base-FX fiber port
- SC connector on 100Base-BX fiber port

Installation

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

Selecting a Site for the Switch

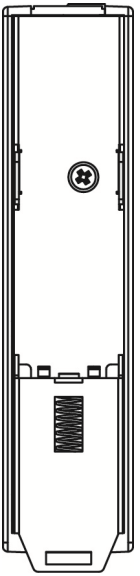
As with any electric device, you should place the switch where it will not be subjected to extreme temperatures, humidity, or electromagnetic interference. Specifically, the site you select should meet the following requirements:

- The ambient temperature should be between -10 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

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.

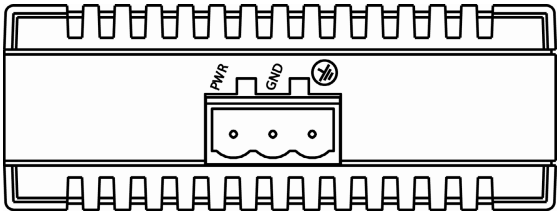


Connecting to Power

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.



The Terminal Block	
PWR	Power Input
GND	Power Ground
⏚	Earth Ground

CAUTION: This equipment is designed to permit the connection of the earthed conductor of the DC supply circuit to the earthing conductor at the equipment.

If this connection is made, all of the following conditions must be met:

- This equipment shall be connected to directly to the DC supply system earthing electrode conductor or to a bonding jumper from an earthing terminal bar or bus to which the DC supply system earthing electrode conductor is connected.

- This equipment shall be located in the same immediate area (such as, adjacent cabinets) as any other equipment that has a connection between the earthed conductor of the same DC supply circuit and the earthing conductor, and also the point of earthing of the DC system. The DC system shall not be earthed elsewhere.

- The DC supply source is to be located within the same premises as the equipment.

- Switching or disconnecting devices shall not be in the earthed circuit conductor between the DC source and the point of connection of the earthing electrode conductor.

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-Te	RJ-45	10/20 Mbps	2-pair UTP/STP Cat. 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 or 40 km
100Base-BX	SC	200 Mbps	MMF (50 or 62.5μm)	2 or 5 km
100Base-BX	SC	200 Mbps	SMF (9 or 10μm)	20 or 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.

<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.

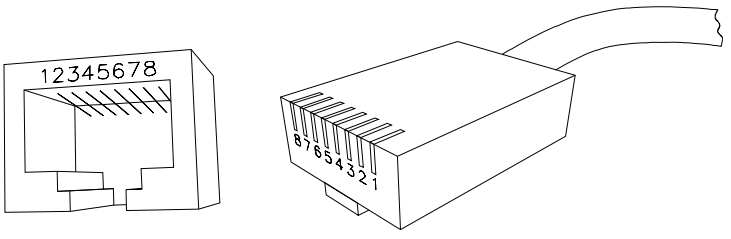
Specifications

Industrial Ethernet Switch	10/100Base-TX auto-negotiating ports with RJ-45 connectors, 100Base-FX/BX fiber ports
Applicable Standards	IEEE 802.3u 100Base-TX/FX IEEE802.3x Full-duplex Flow Control IEEE802.3az Energy Efficient Ethernet IEEE802.1p Quality of Series (QoS)
Forwarding Rate **10Base-Te:** **100Base-TX:** **100Base-FX/BX:**	 10 / 20Mbps half / full-duplex 100 / 200Mbps half / full-duplex 200Mbps full-duplex
Performance	148,80pps for 10Mbps 148,810pps for 100Mbps
Cable **10Base-Te:** **100Base-TX:** **100Base-FX/BX:**	 2-pair UTP/STP Cat. 5 2-pair UTP/STP Cat. 5 Up to 100m (328ft) MMF (50 or 62.5μm), SMF (9 or10μm)
LED Indicators	Per unit – Power status (PWR) Per port – 10/100TX or 100FX/BX - LNK/ACT (Green), 100 (Yellow)
Dimensions	26mm (W) × 70mm (D) × 110mm (H) (1.02” (W) × 2.76” (D) × 4.33” (H))
Net Weight	0.2Kg (0.44lb.)
Power	Terminal Block: 12-48VDC
Power Consumption	2.12W Max.
Operating Temperature	-10°C to 60°C (14°F to 140°F)
Storage Temperature	-25°C to 85°C (-13°F to 185°F)
Humidity	5%-95% non-condensing
EMI	FCC Part 15, Class A EN61000-6-4: 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)
Environmental Test Compliance	Vibration Resistance: IEC60068-2-6 Fc Shock: IEC60068-2-27 Ea Free Fall: IEC60068-2-32 Ed Free Fall: FED STD 101C Method 5007.1 (by CARTON)

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