



**8-port 10/100TX + 2-Port 10/100/1000T/100/1000  
SFP Combo with 8 PoE Injectors  
Industrial Ethernet Switch**



**User Manual**

## **FCC Warning**

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.

## **CE Mark Warning**

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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# Introduction

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The 8 10/100TX + 2 10/100/1000T/100/1000 SFP Combo with 8 PoE Injectors Industrial Switch is a cost-effective solution and meets the high reliability requirements demanded by industrial applications. Using fiber port can extend the connection distance that increases the network elasticity and performance.

## Features

- System Interface/Performance
  - RJ-45 ports support Auto MDI/MDI-X Function
  - Embedded 8-port PoE Injection
  - SFP (Mini-GBIC) supports 100/1000 Dual Mode
  - Store-and-Forward Switching Architecture
  - Back-plane (Switching Fabric): 5.6Gbps
  - 1Mbits Packet Buffer
  - 8K MAC Address Table
  - Supports Wide Operating Temperature (-40°C ~ 75°C)
- Power Supply
  - Redundant Power Design
- Case/Installation
  - IP-30 Protection
  - DIN Rail and Wall Mount Design
- Relay Alarm
  - Relay output for port breakdown, power fail and alarm

# Package Content

Please refer to the package content list below to verify them against the checklist.

- 8 10/100TX + 2 10/100/1000T/100/1000 SFP Combo with 8 PoE Injectors Industrial Switch
- User manual
- Pluggable Terminal Block
- 2 wall mount plates and 6 screws
- One DIN-Rail (attached on the switch)



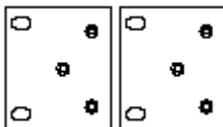
8 10/100TX + 2 10/100/1000T/100/1000 SFP Combo with 8 PoE Injectors Industrial Switch



User Manual



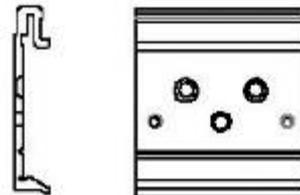
block connector



Wall Mount Plate



Screws



DIN-Rail

Compare the contents of the industrial switch with the standard checklist above. If any item is damaged or missing, please contact the local dealer for service.

# Hardware Description

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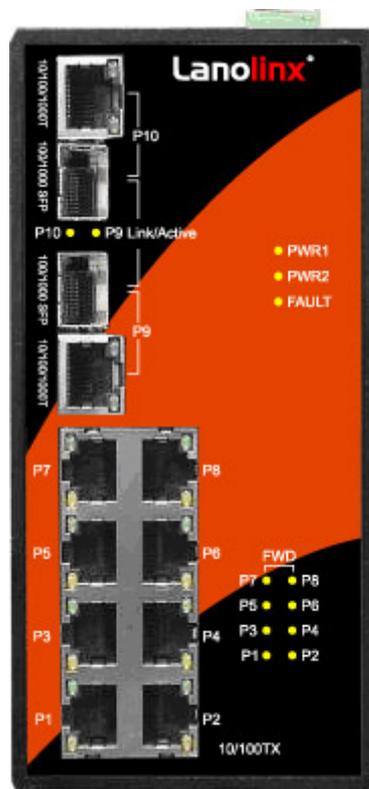
In this paragraph, the Industrial switch's hardware spec, port, cabling information, and wiring installation will be described.

## Physical Dimension

8 10/100TX + 2 10/100/1000T/100/1000 SFP Combo with 8 PoE Injectors Industrial Switch dimension (W x D x H) is **72mm x 105mm x 152mm**

## Front Panel

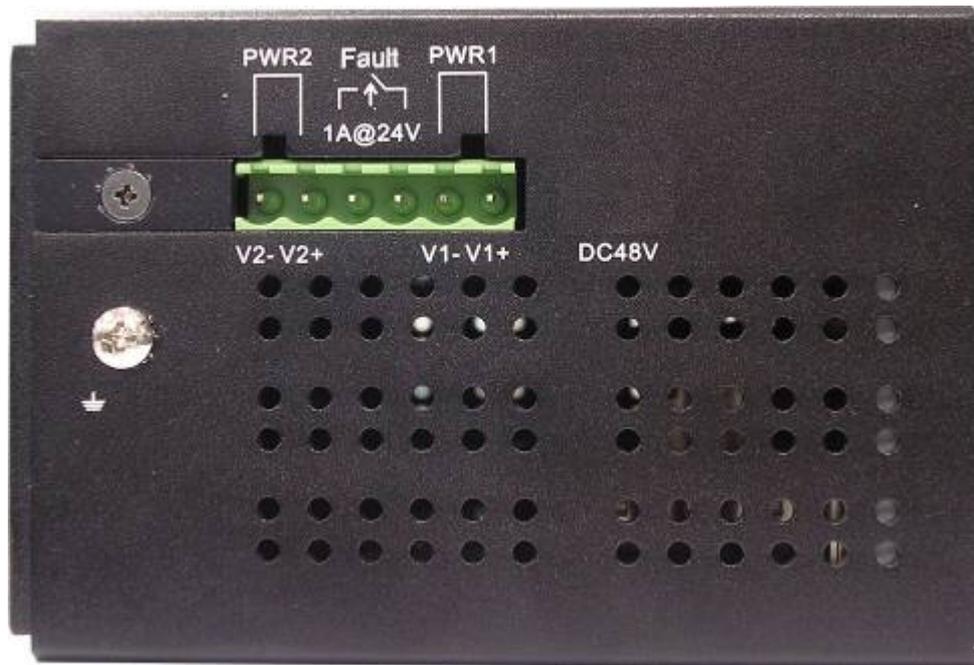
The Front Panel of the 8 10/100TX + 2 10/100/1000T/100/1000 SFP Combo with 8 PoE Injectors Industrial Switch is shown as below:



Front Panel of the PoE Injectors Industrial Switch

## Top View

The top view of the 8 10/100TX + 2 10/100/1000T/100/1000 SFP Combo with 8 PoE Injectors Industrial Switch has one terminal block connector of two DC power inputs.



Top View of the PoE Injectors Industrial Switch

## LED Indicators

The diagnostic LEDs located on the front panel of the industrial switch provide real-time information of system and optional status. The following table provides the description of the LED status and their meanings for the switch.

LED	Status	Meaning	
<b>PWR1</b>	Green	Power 1 is active	
	OFF	No power inputs	
<b>PWR2</b>	Green	Power 2 is active	
	OFF	No power inputs	
<b>Fault</b>	Red	Power input 1 or 2 is inactive	
	OFF	Power 1 & Power 2 are both active or no power inputs	
<b>P9, P10 (RJ-45)</b>	Upper LED	Green	Connected to network
		Blinking	Networking is active
		OFF	Not connected to network
	Lower LED	Green	The port is operating at speed of 1000M
OFF		The port is disconnected or not operating at speed of 1000M	
<b>Link/Active (P9, P10)</b>	Green	SFP port is linking	
	Blinks	Data is transmitting or receiving	
	OFF	Not connected to network	
<b>P1 ~ P8 (Green)</b>	Green	Connected to network	
	Blinking	Networking is active	

	OFF	Not connected to network
<b>P1 ~ P8 (Yellow)</b>	Yellow	Ethernet port full duplex
	Blinking	Collision of packet occurs
	OFF	Ethernet port half duplex or not connected to network
<b>FWD (P1 ~ P8)</b>	Green	A powered device is connected utilizing Power over Ethernet on the port
	OFF	No device is connected or power forwarding fails

## Ports

### ■ RJ-45 ports

The UTP (RJ-45) Fast Ethernet ports will auto-sense for 10Base-T or 100Base-TX connections. Auto MDI/MDIX means that the switch can connect to another switch or workstation without changing straight through or crossover cabling. See the below figures for straight through and crossover cable schematic.

### ■ RJ-45 Pin Assignments

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

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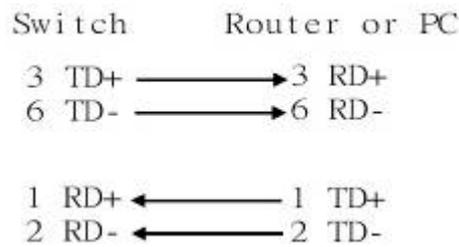
**[NOTE]** “+” and “-” signs represent the polarity of the wires that make up each wire pair.

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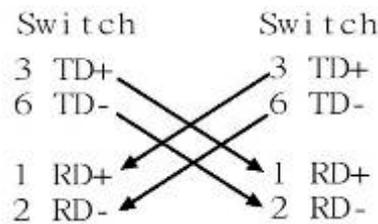
All ports on this industrial switch support automatic MDI/MDI-X operation, user can use straight-through cables (See figure below) for all network connections to PCs or servers, or to other switches or hubs. In straight-through cable, pins 1, 2, 3, and 6, at one end of the cable, are connected straight through to pins 1, 2, 3 and 6 at the other end of the

cable. The table below shows the 10BASE-T/100BASE-TX MDI and MDI-X port pin outs.

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-)



Straight Through Cable Schematic



Cross Over Cable Schematic

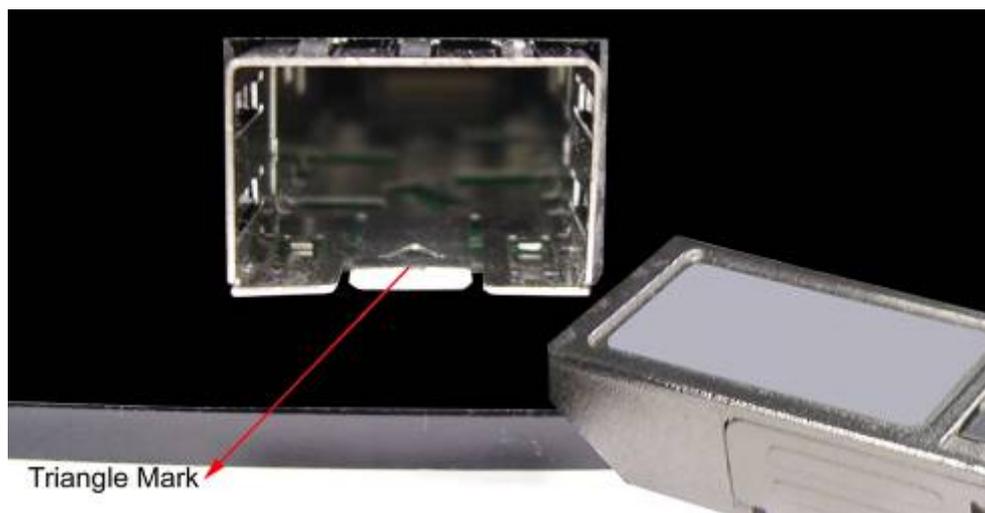
- 2 Mini-GBIC combo port:** 2 auto-detect Giga port—UTP or fiber. The gigabit Ethernet ports are shared with the mini-GBIC ports. UTP (Gigabit Ethernet) ports can operate in half/full-duplex modes and work at speeds of 10/100/1000Mbps that support auto-sensing technology to enable each port to detect the connecting speed. The mini-GBIC port is a joint for a mini-GBIC (SFP) transceiver, so the switch can be uplinked through fiber to another one.

## Cabling

- Use four twisted-pair, Category 5e or above cabling for RJ-45 port connection. The cable between the switch and the link partner (switch, hub, workstation, etc.) must be less than 100 meters (328 ft.) long.
- Use the mini-GBIC ports to uplink to another switch by inserting the mini-GBIC (SFP) transceiver.

To connect the transceiver and LC cable, please follow the steps shown below:

First, insert the transceiver into the SFP module. Notice that the triangle mark is the bottom of the module.

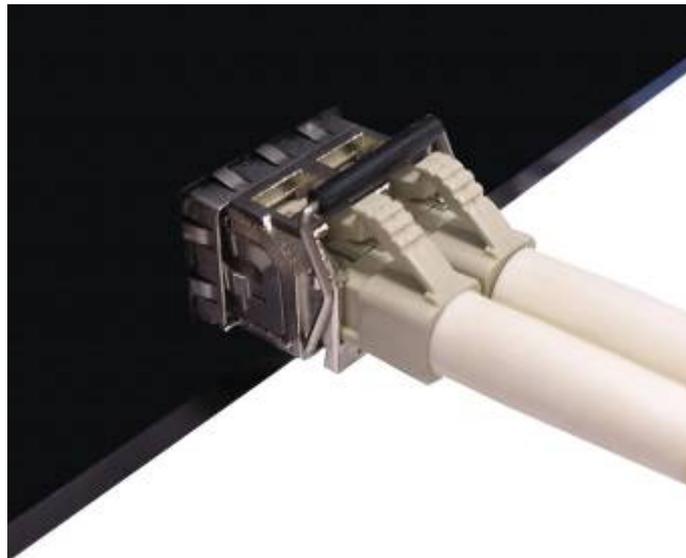


*Figure 2.8: Transceiver to the SFP module*



*Figure 2.9: Transceiver Inserted*

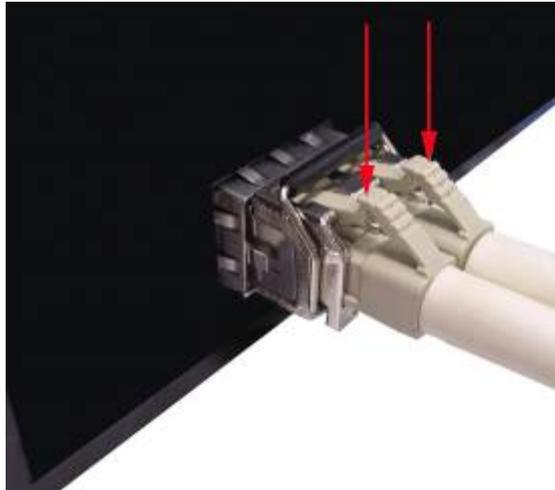
Second, insert the fiber cable of LC connector into the transceiver.



*Figure 2.10: LC connector to the transceiver*

To remove the LC connector from the transceiver, please follow the steps shown below:

First, press the upper side of the LC connector to release from the transceiver and pull it out.



*Figure 2.11: Remove LC connector*

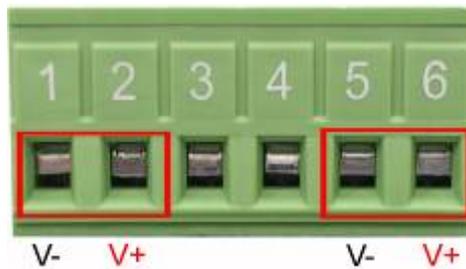
Second, push down the metal loop and pull the transceiver out by the plastic handle.



*Figure 2.12: Pull out from the transceiver*

## Wiring the Power Inputs

Please follow the steps below to insert the power wire.



Insert the positive and negative wires into the V+ and V- contacts on the terminal block connector.



Tighten the wire-clamp screws for preventing the wires from loosing.

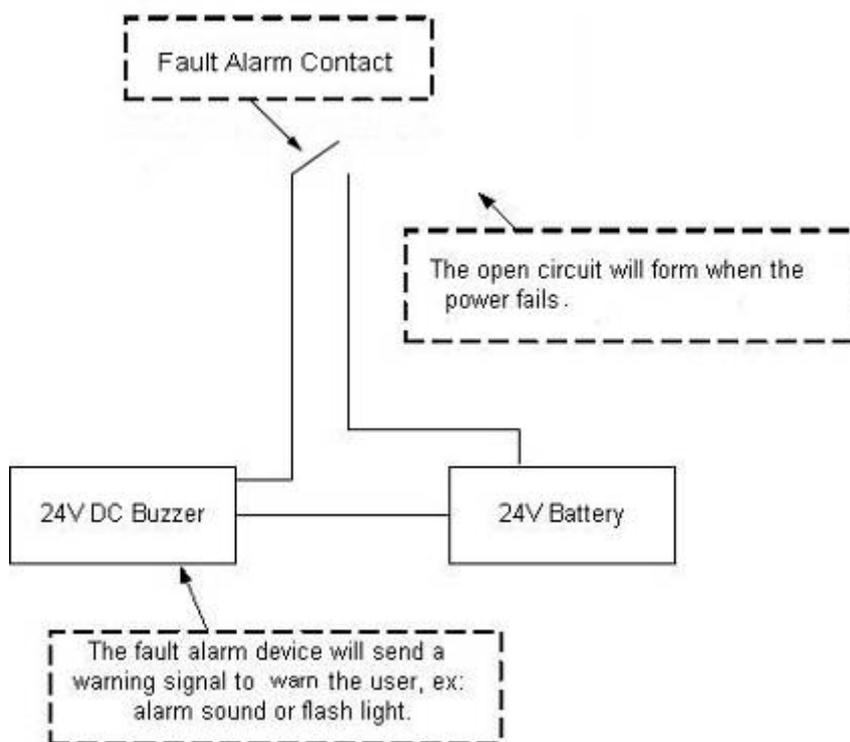
## Wiring the Fault Alarm Contact

The fault alarm contact is in the middle of terminal block connector as the picture shows below. Inserting the wires, it will detect the fault status including power failure or port link failure (managed industrial switch only) and form an open circuit. An application example for the fault alarm contact is shown as below:



Insert the wires into the fault alarm contact.

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

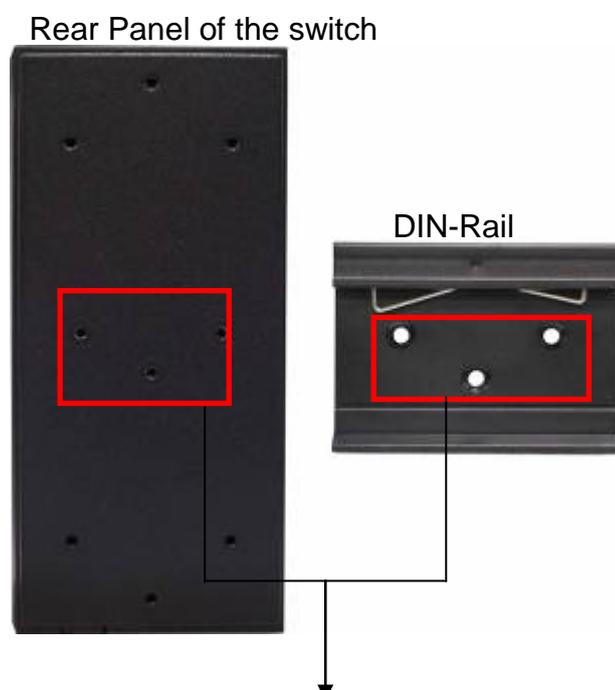


# Mounting Installation

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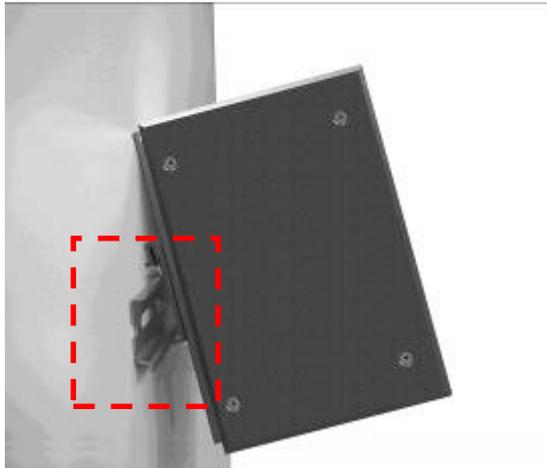
## DIN-Rail Mounting

The DIN-Rail is screwed on the industrial switch when out of factory. If the DIN-Rail is not screwed on the industrial switch, please see the following pictures to screw the DIN-Rail on the switch. Follow the steps below to hang the industrial switch.

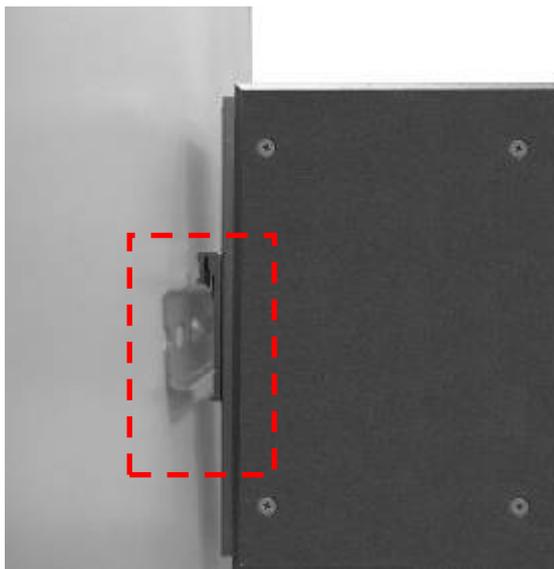


1. Use the screws to screw the DIN-Rail on the industrial switch
2. To remove the DIN-Rail, reverse the step 1.

1. First, insert the top of DIN-Rail into the track.



2. Then, lightly push the DIN-Rail into the track.

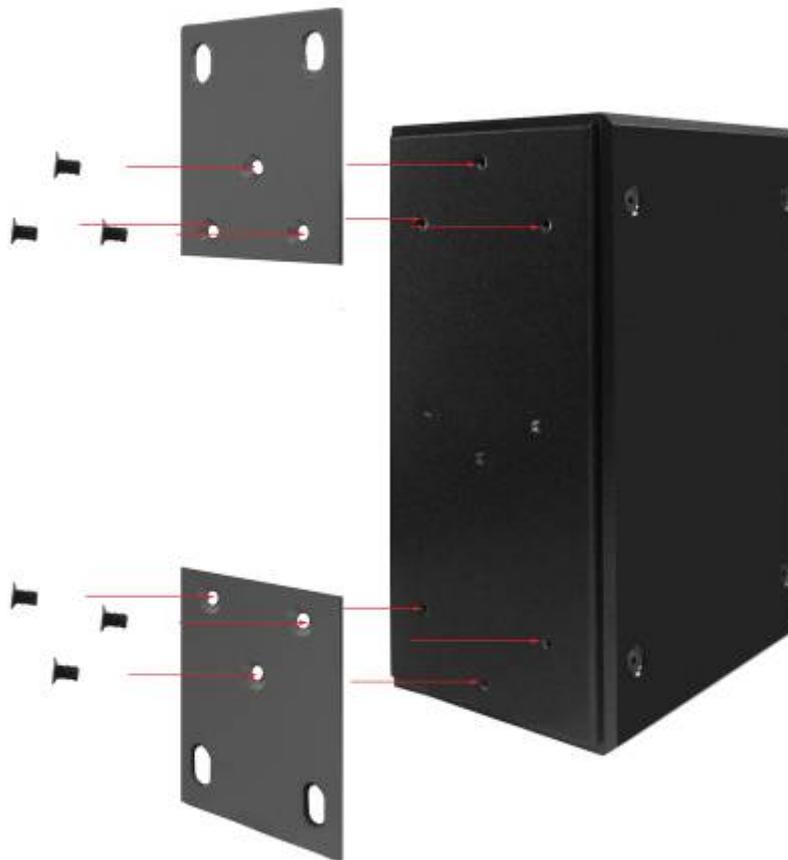


3. Check if the DIN-Rail is tightened on the track or not.
4. To remove the industrial switch from the track, reverse steps above.

## Wall Mount Plate Mounting

Follow the steps below to mount the industrial switch with wall mount plate.

1. Remove the DIN-Rail from the industrial switch; loose the screws to remove the DIN-Rail.
2. Place the wall mount plate on the rear panel of the industrial switch.
3. Use the screws to screw the wall mount plate on the industrial switch.
4. Use the hook holes at the corners of the wall mount plate to hang the industrial switch on the wall.
5. To remove the wall mount plate, reverse steps above.



Screw the wall mount plate on the Industrial Switch

# Hardware Installation

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In this paragraph, we are going to mention how to install the 8 10/100TX + 2 10/100/1000T/100/1000 SFP Combo with 8 PoE Injectors Industrial Switch and the installation points to be attended to it.

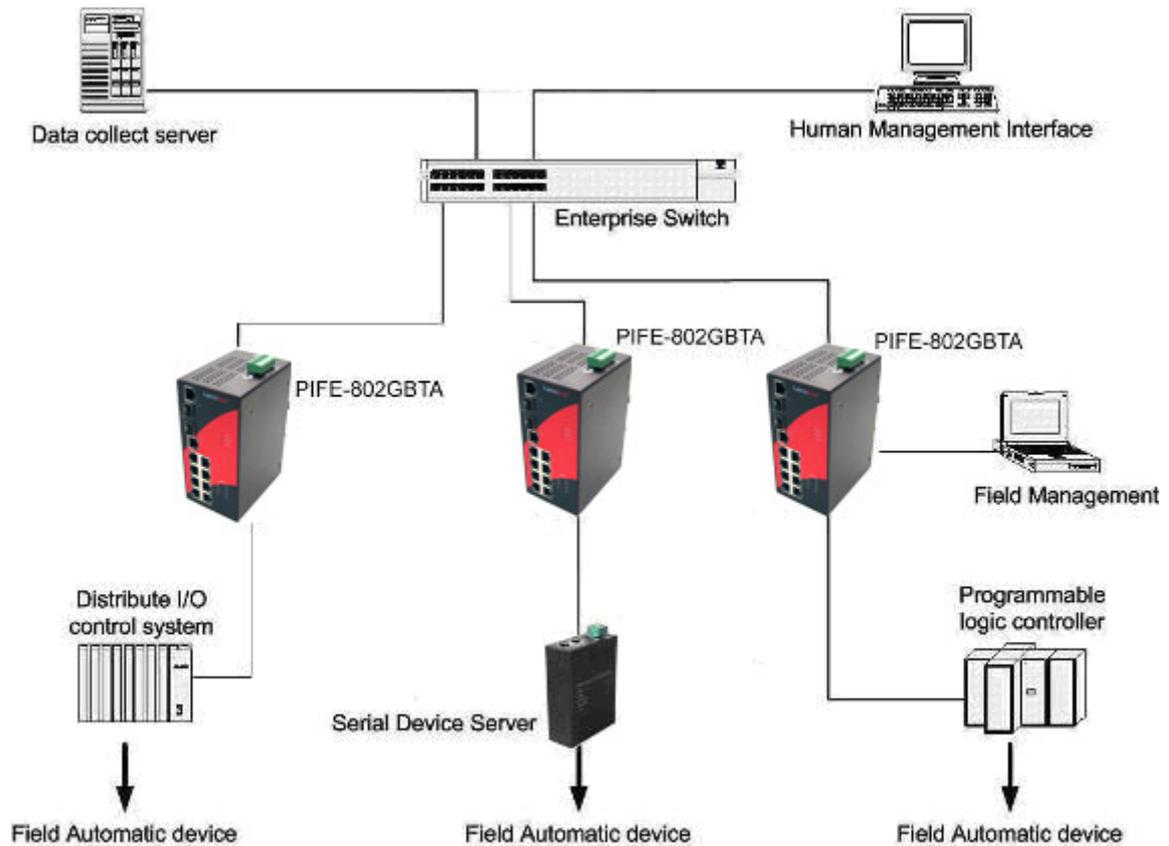
## Installation Steps

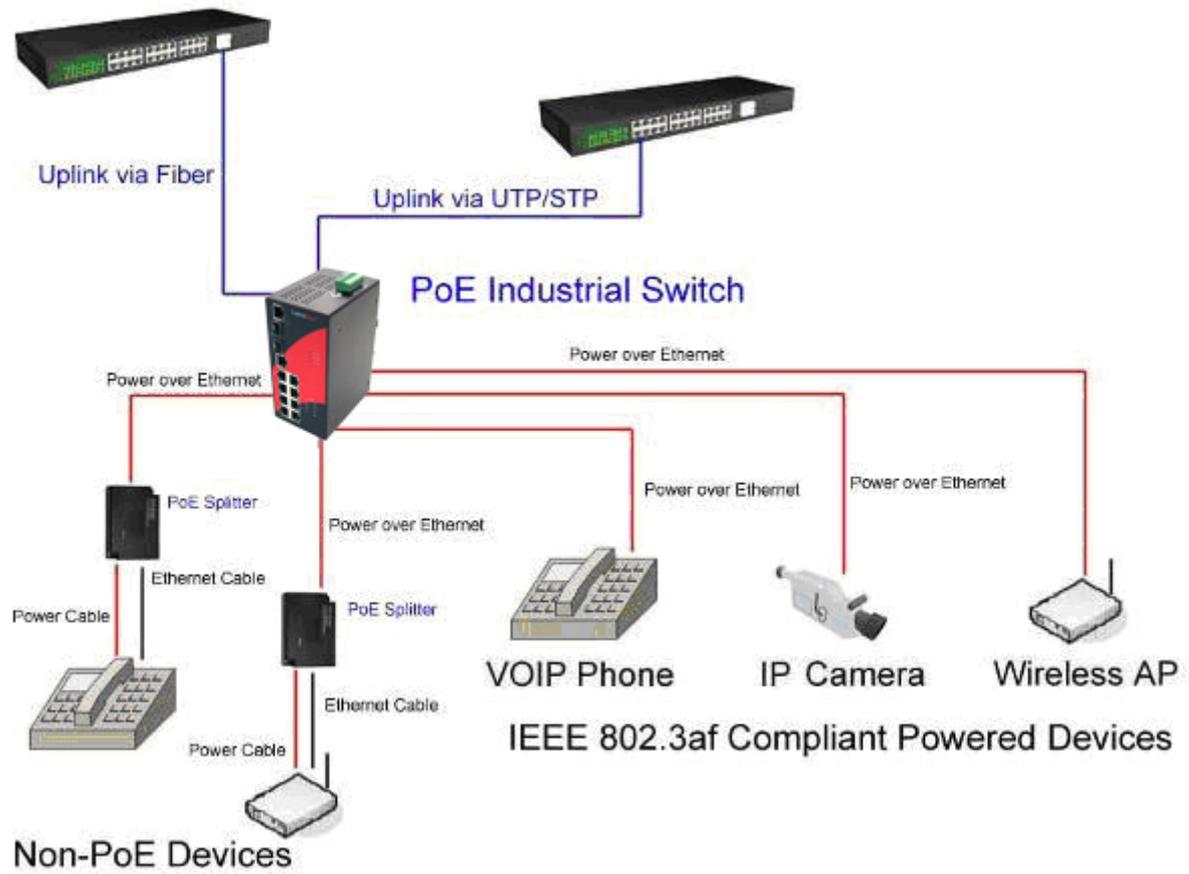
1. Unpack the Industrial switch packing.
2. Check if the DIN-Rail is screwed on the Industrial switch or not. If the DIN-Rail is not screwed on the Industrial switch, please refer to **DIN-Rail Mounting** section for DIN-Rail installation. If user want to wall mount the Industrial switch, then please refer to **Wall Mount Plate Mounting** section for wall mount plate installation.
3. To hang the Industrial switch on the DIN-Rail track or wall, please refer to the **Mounting Installation** section.
4. Power on the Industrial switch. Please refer to the **Wiring the Power Inputs** section for knowing the information about how to wire the power. The power LED on the Industrial switch will light up. Please refer to the **LED Indicators** section for indication of LED lights.
5. Prepare the twisted-pair, straight through Category 5e/above cable for Ethernet connection.
6. Insert one side of the RJ-45 cable into the Industrial switch Ethernet port and another side to the network device's Ethernet port, e.g. Switch, PC or Server. The UTP port (RJ-45) LED on the Industrial switch will light up when the cable is connected with the network device. Please refer to the **LED Indicators** section for LED light indication.
7. When all connections are set and LED lights all show in normal, the installation is complete.

# Network Application

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This segment provides the samples to help user have more actual idea of industrial switch application. For a sample application of the industrial switch, see the figures below.





# Troubleshooting

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- Verify that is using the right power cord/adapter (DC 48V), please don't use the power adapter with DC output voltage higher than 48V, or it will burn this converter down.
- Select the proper UTP cable to construct user network. Please check that is using the right cable. Use unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable for RJ-45 connections: 100  $\Omega$  Category 3, 4 or 5 cable for 10Mbps connections, 100 $\Omega$  Category 5 cable for 100Mbps connections or 100 $\Omega$  Category 5e/above cable for 1000Mbps. Also be sure that the length of any twisted-pair connection does not exceed 100 meters (328 feet).
- **Diagnosing LED Indicators:** the Switch can be easily monitored through panel indicators, which describes common problems user may encounter and where user can find possible solutions, to assist in identifying problems.
- If the power indicator does not light on when the power cord is plugged in, user may have a problem with power cord. Then check for loose power connections, power losses or surges at power outlet. If you still cannot resolve the problem, contact the local dealer for assistance.
- If the Industrial switch LED indicators are normal and the connected cables are correct but the packets still cannot transmit. Please check your system's Ethernet devices' configuration or status.

# Technical Specification

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8 10/100TX + 2 10/100/1000T/100/1000 SFP Combo with 8 PoE Injectors Industrial Switch technical specifications is shown as below.

<b>Standard</b>	IEEE 802.3 10Base-T Ethernet IEEE 802.3u 100Base-TX/FX IEEE802.3ab 1000Base-T IEEE802.3z Gigabit fiber IEEE802.3x Flow Control and Back Pressure IEEE802.3af Power over Ethernet
<b>Protocol</b>	CSMA/CD
<b>Transfer Rate</b>	14,880 pps for 10Base-T Ethernet port 148,800 pps for 100Base-TX/FX Fast Ethernet port 1,488,000 pps for Gigabit Fiber Ethernet port
<b>Packet Buffer</b>	1Mbits
<b>MAC address</b>	8K MAC address table
<b>LED</b>	<b>8 ports 10/100TX</b> : Link/Activity (Green), Full duplex/Collision (Yellow), Power Feeding (Green) <b>Giga port</b> : Link/Activity (Green) <b>Per unit</b> : Power 1 (Green), Power 2 (Green), Fault (Red)
<b>Network Cable</b>	10Base-T: 2-pair UTP/STP Cat. 3, 4, 5, 5e cable EIA/TIA-568 100-ohm (100m) 100Base-TX: 2-pair UTP/STP Cat. 5/5E cable EIA/TIA-568 100-ohm (100m) 1000Base-TX: 2-pair UTP/STP Cat. 5E cable EIA/TIA-568 100-ohm (100m)

<p><b>Optical cable</b></p>	<p><b>Distance:</b>  Multi mode:  0 to 5 km, 1300 nm (50/125 μm, 800 MHz*km)  0 to 4 km, 1300 nm (62.5/125 μm, 500 MHz*km)  Single mode:  0 to 40 km, 1310 nm (9/125 μm, 3.5 PS/(nm*km))  0 to 80 km, 1550 nm (9/125 μm, 19 PS/(nm*km))</p> <p><b>Min. TX Output:</b>  Multi mode: -20 dBm  Single mode: 0 to 40 km, -5 dBm; 0 to 80 km, -5 dBm</p> <p><b>Max. TX Output:</b>  Multi mode: -14 dBm  Single mode: 0 to 40 km, 0 dBm; 0 to 80 km, 0 dBm</p> <p><b>Sensitivity:</b>  -36 to -32 dBm (Single mode); -34 to -30 dBm (Multi mode)</p>
<p><b>Back-plane (Switching Fabric)</b></p>	<p>5.6Gbps</p>
<p><b>Packet throughput ability</b></p>	<p>8.3Mpps at 64bytes</p>
<p><b>Power Supply</b></p>	<p>External Power Supply: DC 48V  Redundant power DC 48V with connective removable terminal block</p>
<p><b>Power Consumption</b></p>	<p>140 Watts (maximum)</p>
<p><b>Install</b></p>	<p>DIN rail kit and wall-mount ear for DIN-type cabinet install and wall mounting</p>
<p><b>Operating Temperature</b></p>	<p>-40°C ~ 75°C (Wide Operating Temperature model)  -10°C ~ 60°C (standard model)</p>

<b>Operating Humidity</b>	5% to 95% (Non-condensing)
<b>Storage Temperature</b>	-40°C to 85°C
<b>Case Dimension</b>	IP-30, 72 mm (W) x 105 mm (D) x 152mm (H)
<b>EMI</b>	FCC Class A CE EN61000-4-2/3/4/5/6/8/11/12 CE EN61000-6-2 CE EN61000-6-4
<b>Safety</b>	UL cUL CE/EN60950-1
<b>Stability testing</b>	IEC60068-2-32 (Free fall) IEC60068-2-27 (Shock) IEC60068-2-6 (Vibration)