Lantech

IPES-0005T-4B

5-Port 10/100TX with 4 PoE Mode B
Passive Injector Industrial Switch

User Manual



V1.01

Nov-2007

Recommendation for Shielded network cables

STP cables have additional shielding material that is used to reduce external interference. The shield also reduces the emission at any point in the path of the cable. Our recommendation is to deploy an STP network cable in demanding electrical environments. Examples of demanding indoor environments are where the network cable is located in parallel with electrical mains supply cables or where large inductive loads such as motors or contactors are in close vicinity to the camera or its cable. It is also mandatory to use an STP cable where the power device (like IP camera) is used outdoors or where the network cable is routed outdoors.



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.

Content

Introduction 1
Features 1
Package Contents..... 2

Hardware Description ……..... 3
Physical Dimension..... 3
Front Panel 3
Top View 4
LED Indicators 5
Ports 6
Cabling 7
Wiring the Power Inputs 8
Wiring the Fault Alarm Contact 9

Mounting Installation 10
DIN-Rail Mounting..... 10
Wall Mount Plate Mounting 12

Hardware Installation 13
Installation Steps..... 13

Network Application 14
Troubleshooting 15
Technical Specification..... 16

Introduction

The 5-Port 10/100TX with 4 PoE Mode B Passive Injector Industrial Switch is a cost-effective solution and meets the high reliability requirements demanded by industrial applications. Besides, the industrial switch provides the PoE function for kinds of Powered Devices to receive power as well as data over the RJ-45 cable.

Features

System Interface/Performance

- RJ-45 ports support Auto MDI/MDI-X Function
- Embedded 4-port PoE Injection
- Store-and-Forward Switching Architecture
- Back-plane (Switching Fabric): 1.0Gbps
- 2K MAC Address Table

Power Supply

- DC 48V Redundant Power

Case/Installation

- IP-30 Protection
- DIN Rail and Wall Mount Design

Provides EFT protection 3,000 VDC for power line

Supports 6,000 VDC Ethernet ESD protection

Package Contents

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

5-Port 10/100TX with 4 PoE Mode B Passive Injector Industrial SwitchUser manual

Pluggable Terminal Block

2 wall mount plates with screws

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

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

Physical Dimension

5-Port 10/100TX with 4 PoE Mode B Passive Injector Industrial Switch

Dimension (W x D x H) is 30mm x 95mm x 140mm

Front Panel

The Front Panel of the 5-Port 10/100TX with 4 PoE Mode B Passive Injector Industrial Switch is shown as below:



Front Panel of the PoE Injectors Industrial Switch

Top View

The top view of the 5-Port 10/100TX with 4 PoE Mode B Passive Injector 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	Color	Description	
P1	Green	On	Power input 1 is active
		Off	Power input 1 is inactive
P2	Green	On	Power input 2 is active
		Off	Power input 2 is inactive
Fault	Red	On	Power input 1 or 2 has failed
		Off	Power input 1 and 2 are both functional, or no power inputs
FWD (1 ~ 4)	Green	On	The port is supplying power to the powered-device
		Off	No powered-device attached or power supplying fails
1 ~ 5 (RJ-45)	Green (Upper LED)	On	Connected to network
		Flashing	Networking is active
		Off	Not connected to network
	Yellow (Lower LED)	On	Full-duplex link
		Flashing	Collision occurs
		Off	Half-duplex link or link down

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.

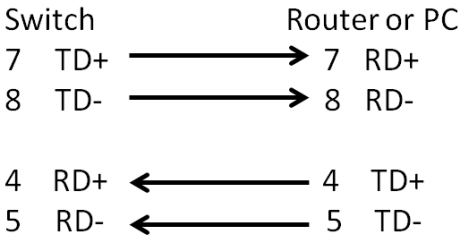
RJ-45 Pin Assignments

Pin Number	Assignment
4	Tx+
5	Tx-
7	Rx+
8	Rx-

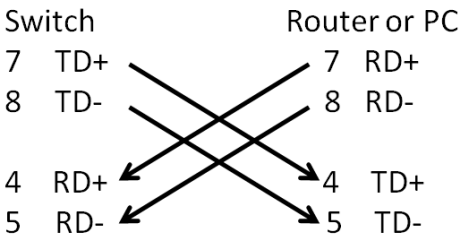
Note "+" and "-" signs represent the polarity of the wires that make up each wire pair.

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 4, 5, 7, and 8, at one end of the cable, are connected straight through to pins 4, 5, 7 and 8 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
4	Receive Data plus (RD+)	Transmit Data plus (TD+)
5	Receive Data minus (RD-)	Transmit Data minus (TD-)
7	Transmit Data plus (TD+)	Receive Data plus (RD+)
8	Transmit Data minus (TD-)	Receive Data minus (RD-)



Straight Through Cable Schematic



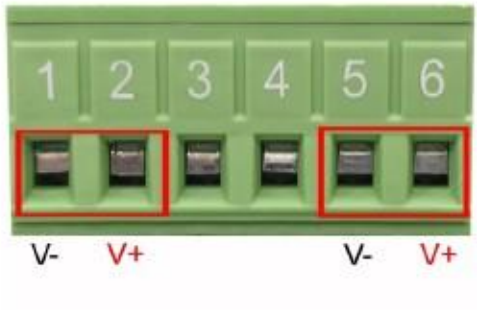
Cross Over Cable Schematic

Cabling

Twisted-pair segment can be connected with unshielded twisted pair (UTP) or shielded twisted pair (STP) cable. The cable must comply with the IEEE 802.3u 100Base TX standard for Category 5. The cable between the converter and the link partner (switch, hub, workstation, etc.) must be less than 100 meters (328 ft.) long.

Wiring the Power Inputs

Please follow the steps below to insert the power wire.



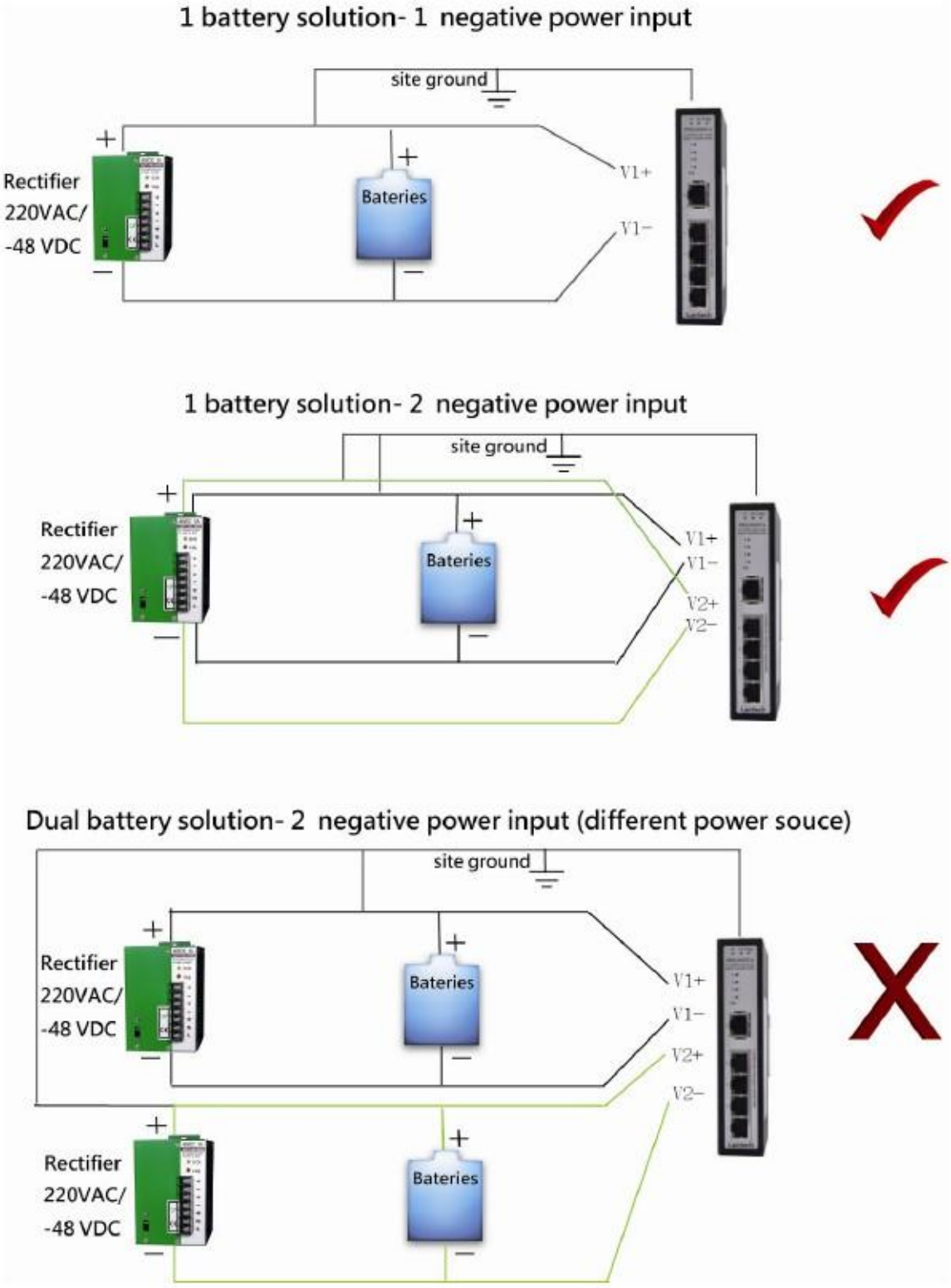
Insert the positive and negative wires into the V+ and V- contacts on the terminal block connector.



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

Power Restriction (under - 48VDC power)

IPES-0005T-4B only can support one -48VDC power source.
If using two -48VDC power source, IPES-0005T-4B may cause damage.



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:



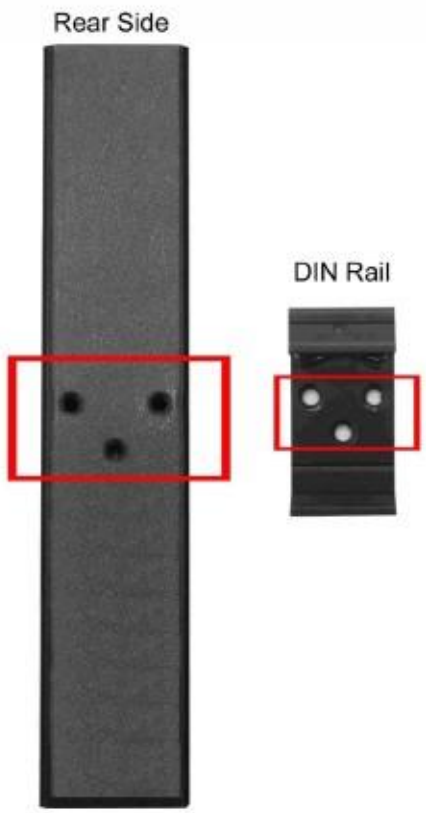
Insert the wires into the fault alarm contact.

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

Mounting Installation

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 rear side of the industrial switch.
2. To remove the DIN-Rail, reverse the step 1.

3. After the DIN-Rail is screwed on the rear side of the switch, insert the top of DIN-Rail into the track.



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

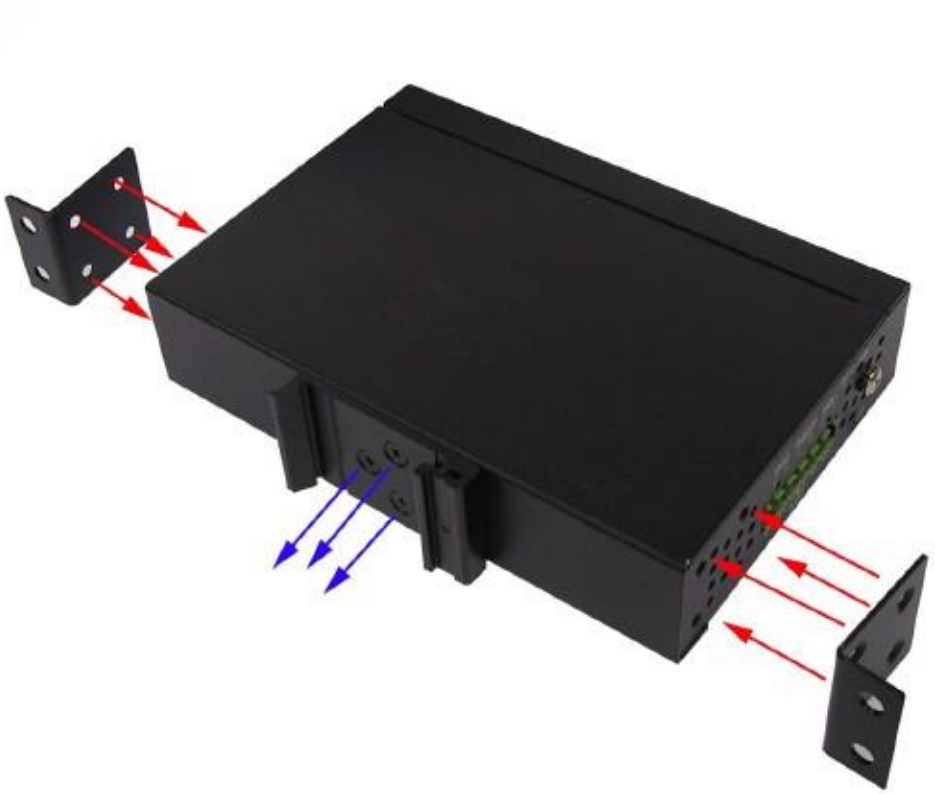


5. Check if the DIN-Rail is tightened on the track or not.
6. To remove the industrial switch from the track, reverse steps above.

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 plates on the Industrial Switch

Hardware Installation

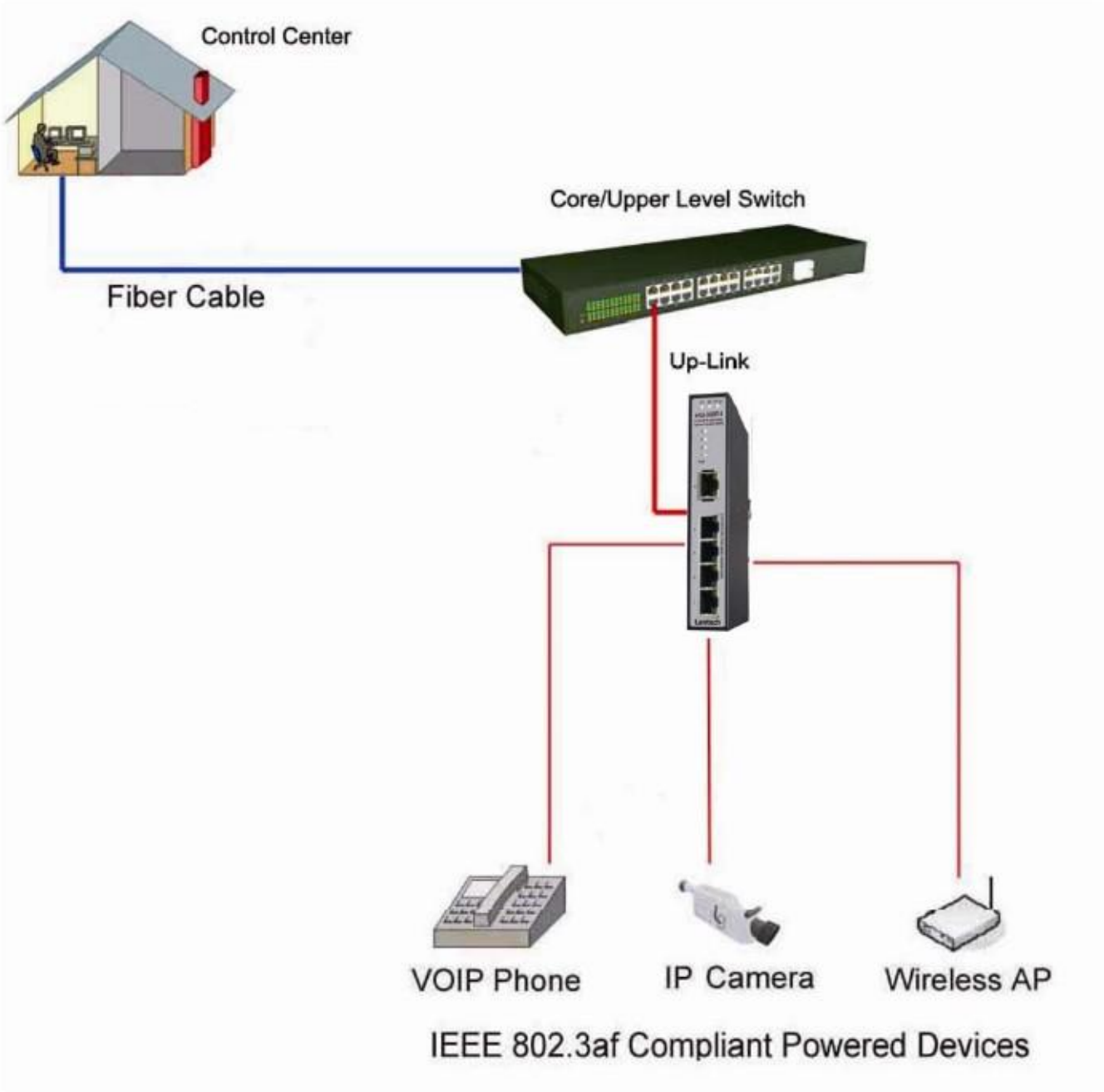
In this paragraph, we are going to mention how to install the 5-Port 10/100TX with 4 PoE Mode B Passive Injector Industrial Switch and the installation points to be attended to it.

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/STP 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

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



Troubleshooting

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 equipment down.

Select the proper UTP/STP cable to construct your network. Please check that is using the right cable. Use unshielded twisted-pair (UTP) or shield twisted-pair (STP) cable for RJ-45 connections: 100 Ω Category 3, 4 or 5 cable for 10Mbps connections, 100Ω Category 5 cable for 100Mbps connections, or 100Ω 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: To assist in identifying problems, the Switch can be easily monitored through panel indicators, which describe common problems the user may encounter and where the user can find possible solutions.

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

The 5 10/100TX with 4 PoE Mode B Passive Injector Industrial Switch technical specifications is shown as below.

Standard	IEEE 802.3 10Base-T Ethernet IEEE 802.3u 100Base-TX Fast Ethernet IEEE802.3x Flow Control and Back Pressure IEEE802.3af Power over Ethernet
Protocol	CSMA/CD
Transfer Rate	14,880 pps for 10Base-T Ethernet port 148,800 pps for 100Base-TX Fast Ethernet port
MAC Address	2K MAC address table
Connector	10/100TX: 5 x RJ-45 with auto MDI/MDI-X function; Supports 4 PoE injector function
PoE Pin Assignment	RJ-45 port #1 - #4 support PoE non-standard; B mode Positive (VCC+): RJ-45 pin 4, 5. Negative (VCC-): RJ-45 pin 7, 8. Data (1,2,3,6)
LED	Per unit: Power 1 (Green), Power 2 (Green), Fault(Red) Per port: Link/Activity (Green), Full duplex/Collision (Yellow) PoE: Feeding Power (Green)

Network Cable	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)
Power Supply	Redundant power DC 48V with connective removable terminal block
Power Consumption	3.4Watts (without PoE); 57 Watts (Full load with PoE)
Installation	DIN rail kit for DIN-type cabinet install and wall-mount ear for wall mounting
Operating Temp.	-40°C to 75°C (wide operating temperature model) -20°C to 60°C (standard model)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40°C to 85°C
Case Dimension	IP-30, 30mm (W) x 95mm (D) x 140mm (H)
EMI	FCC Class A CE EN61000-4-2/3/4/5/6/8/11/12 CE EN61000-6-2 CE EN61000-6-4
Safety	CE/EN60950-1
Stability testing	IEC60068-2-32 (Free fall) IEC60068-2-27 (Shock) IEC60068-2-6 (Vibration)