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Overview

Introduction

The unmanaged industrial switch is a cost-effective solution and meets the high reliability requirements demanded by industrial applications.

High-Speed Transmissions

The Industrial switch includes a switch controller that can automatically sense transmission speeds (10/100/1000 Mbps). The RJ-45 interface can also be auto-detected, so MDI or MDI-X is automatically selected and a crossover cable is not required. All Ethernet ports have memory buffers that support the store-and-forward mechanism. This assures that data is properly transmitted.

Dual Power Inputs

To reduce the risk of power failure, the Industrial switch provides +9 ~ 56 V_{DC} dual power inputs. When power failure occurs, the device will automatically switch to the secondary power input.

Flexible Mounting

The industrial switch is extremely compact and can be mounted on a DIN-rail or a panel, so it is suitable for any space-constrained environment.

Wide Operating Temperature

The operating temperature of the Industrial switch is in the range between -20 ~ 60^{o}C (standard model) or -40 ~ 75^{o}C (wide operating temperature model). With such a wide range, you can use the Industrial switch in some of the harshest industrial environments that exist.

Easy Troubleshooting

LED indicators make troubleshooting quick and easy. Each 10/100/1000T port has 2 LED indicators that display the link status, transmission speed and collision status. Also other LED indicators help you diagnose the system immediately.

Features

- Provides 8 x 10/100/1000Base-T Mbps Ethernet ports.
- Store-and-Forward switching architecture
- Back-plane (switching fabric): 16Gbps
- Third-generation Broadcom switch with AV function
  - Guaranteed latency
  - Guaranteed BW
  - Synchronous timing
- Provides 192Kbits memory buffer
- 4K-entry MAC address table
- 9720 bytes jumbo frame
- Supports full/half duplex flow control
- Supports broadcast storm protection
- Supports MDI/MDI-X auto-crossover
- Supports redundant +9 ~ 56 V_{DC} power input
- Provides flexible mounting: DIN-rail, Panel Mounting
- Supports operating temperatures from -20 ~ 60^{o}C (standard model) or -40 ~ 75^{o}C (wide operating temperature model)

Packing List

- 1 x 8-port 10/100/1000Base-T Industrial Ethernet Switch
- 1 x User Manual
- 2 x Wall Mounting Brackets with screws

Safety Precaution

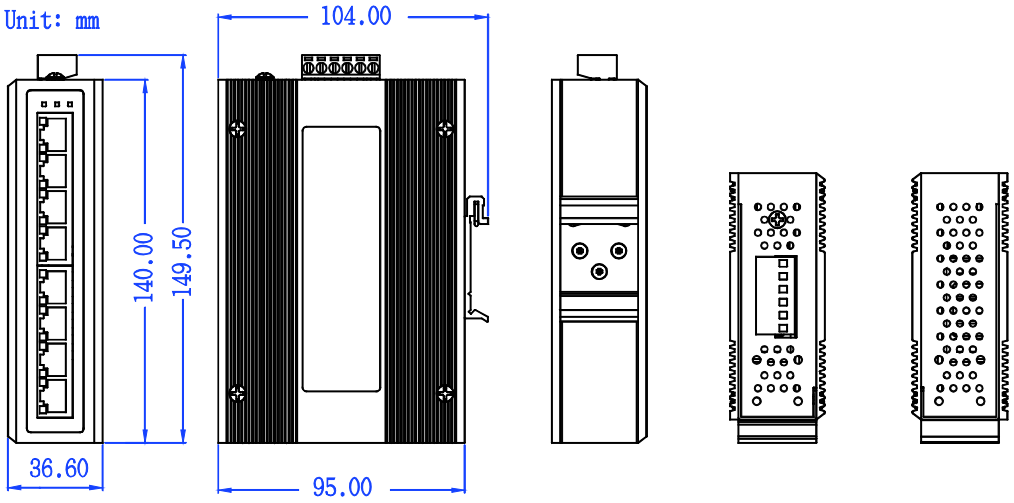
Attention *If DC voltage is supplied by an external circuit, please use a protection device on the power supply input.*

Hardware Description

In this paragraph, we will introduce the Industrial switch's dimensions, port, cabling information, and wiring installation.

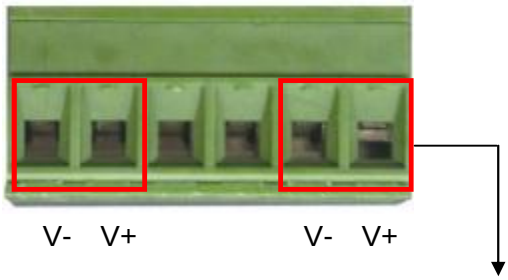
Dimensions

The dimensions of the industrial switch are 36.6 x 140 x 95 mm (W x H x D) for wide temperature model. The dimensions of the standard model that is not equipped with side heatsinks are 30.0 x 140 x 95 mm (W x H x D). The figure below gives the dimensions and views of each side of the 8-port 10/100/1000Base-T Industrial Switch.



Wiring the Power Inputs

Please follow the steps below to insert the power wires.



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

2. Tighten the wire-clamp screws to prevent the DC wires from loosing.

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

LED Indicators

The LED indicators located on the front panel display the power status and network status of the Industrial switch; each has their own specific meaning as the table shown below.

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 is inactive
		Off	Power input 1 and 2 are both functional, or no power inputs
1 ~ 8 (Upper LED)	Green	On	Connected to network
		Flashing	Networking is active
		Off	Not connected to network
1 ~ 8 (Lower LED)	Green	On	Connected to network at speed of 1000Mbps
		Off	Not connected to network or not working at speed of 1000Mbps

RJ-45 Pin Assignments

The UTP/STP ports will automatically sense for Fast Ethernet (10Base-T/100Base-TX) or Gigabit Ethernet (10Base-T/100Base-TX/1000Base-T) connection. Auto MDI/MDIX means that the switch can connect to another switch or workstation without changing straight through or crossover cabling. See the figures below for straight through and crossover cable schema.

- **10/100Base-TX Pinouts**

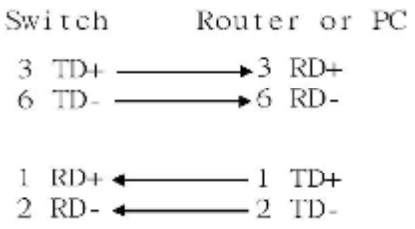
Pin Number	Assignment
1	Tx+
2	Tx-
3	Rx+
6	Rx-

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

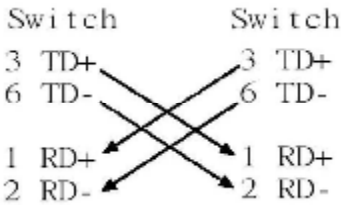
The table below shows the 10Base-T/100Base-TX MDI and MDI-X port pinouts.

Pin Number	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-)

■ 10/100Base-TX Cable Schema



Straight Through Cable Schema



Crossover Cable Schema

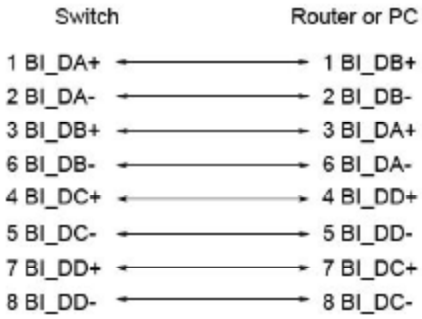
■ 10/100/1000Base-T Pinouts

The table below describes the gigabit Ethernet RJ-45 pinouts.

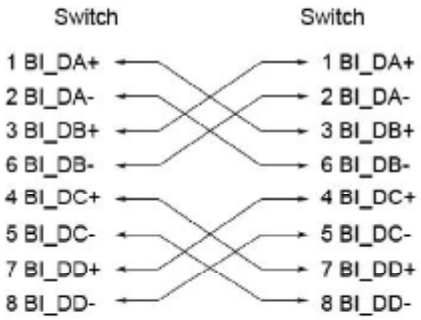
Pin	Signal name	Description
1	BI_DA+	Bi-directional pair A+
2	BI_DA-	Bi-directional pair A-
3	BI_DB+	Bi-directional pair B+
4	BI_DC+	Bi-directional pair C+
5	BI_DC-	Bi-directional pair C-
6	BI_DB-	Bi-directional pair B-
7	BI_DD+	Bi-directional pair D+
8	BI_DD-	Bi-directional pair D-

■ **10/100/1000Base-T Cable Schema**

The following two figures illustrate the 10/100/1000Base-T cable schema.



Straight Through Cable Schema



Crossover Cable Schema

Cabling

Use unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable for RJ-45 connections: 100Ω Category 3, 4 or 5 cable for 10Mbps connections, 100Ω Category 5 cable for 100Mbps, or 100Ω Category 5e/above cable for 1000Mbps connections.

The cable between the switch and the link partner (switch, hub, workstation, etc.) must be less than 100 meters (328 ft.) long.

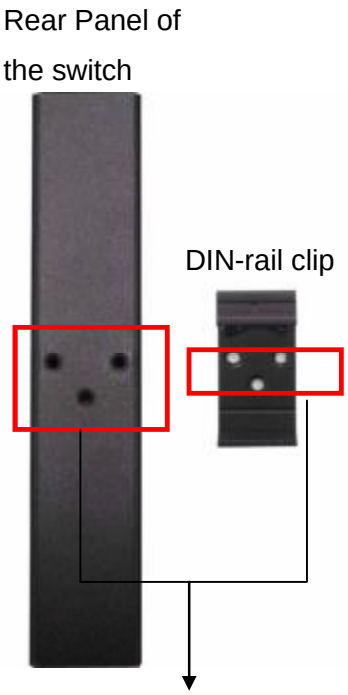
Mounting Installation

DIN-Rail Mounting

Assembling the DIN-Rail Clip

The DIN-rail clip is screwed on the industrial switch when out of factory. If not, please refer to the following steps and figure to secure the DIN-rail clip on the switch.

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

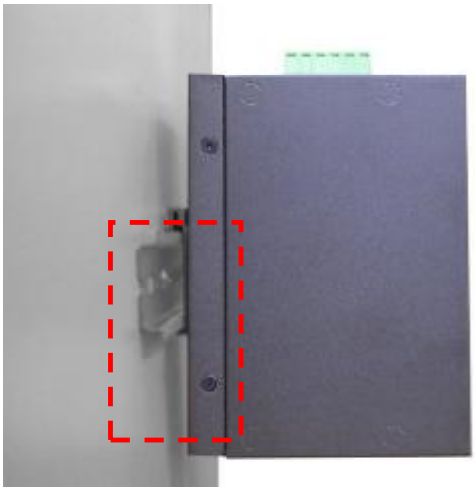


Hanging the Industrial Switch

Follow the steps below to hang the industrial switch on the DIN rail.

1, First, position the rear side of the switch directly in front of the DIN rail. Make sure the top of the clip hooks over the top of the DIN rail.

2, Push the unit downward.



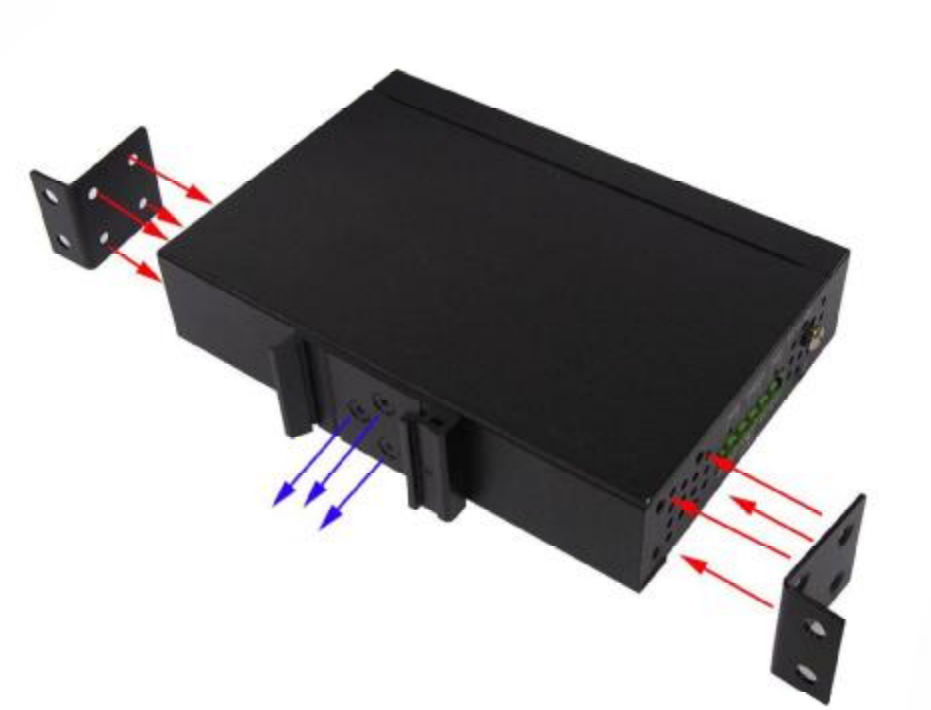
3, Check the DIN-Rail clip is tightly fixed on the DIN rail.

4, To remove the industrial switch from the track, reverse the steps above.

Wall-Mount Plate Mounting

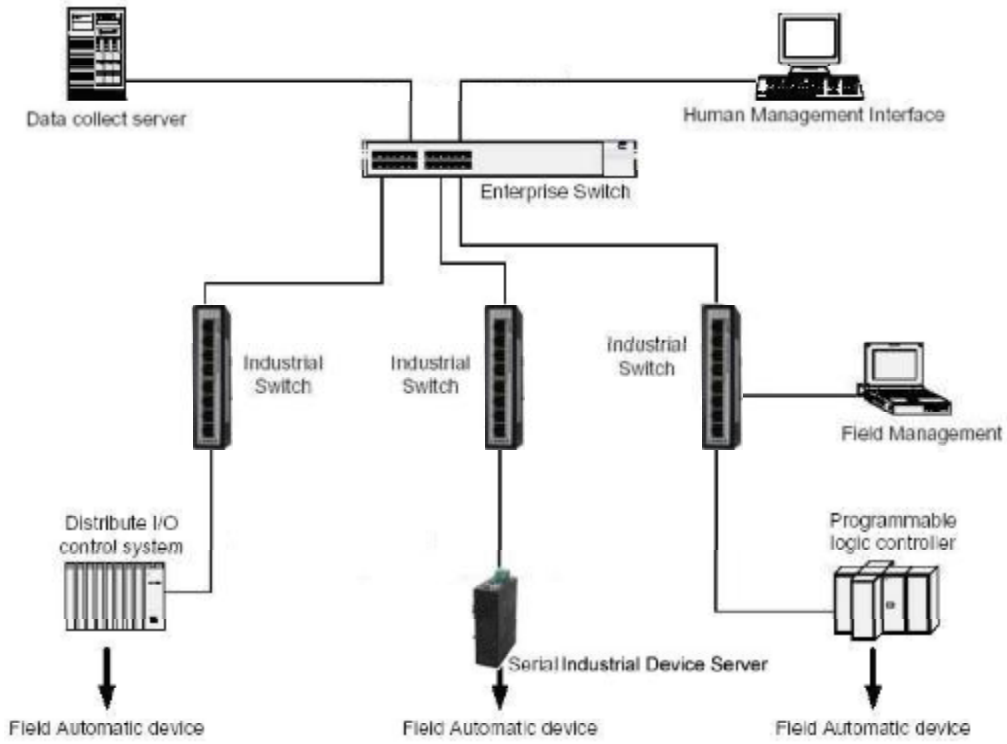
Follow the steps below to mount the industrial switch with the wall mount plates included.

1. To remove the DIN-Rail clip from the industrial switch, unscrew the screws to remove the DIN-Rail clip.
2. Place the wall-mount plates on the rear panel of the industrial switch.
3. Use the screws to secure the wall-mount plates on the industrial switch.
4. Use the hook holes at the corners of the wall-mount plates to hang the industrial switch on the wall.
5. To remove the wall-mount plates, reverse the steps above.



Hardware Installation

In this paragraph, we will describe how to install the 8-port 10/100/1000Base-TX Industrial Switch and the installation points for the attention.



Installation Steps

1. Unpacked the Industrial switch.
2. Check the DIN-Rail is screwed on the Industrial switch. If the DIN-Rail is not screwed on the Industrial switch. Please refer to **DIN-Rail Mounting** section for DIN-Rail installation. If you 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. How to wire the power; please refer to the **Wiring the Power Inputs** section. The power LED on the Industrial switch will light up. Please refer to the **LED Indicators** section for meaning of LED lights.
5. Prepare the twisted-pair, straight through Category 5e cable for Ethernet connection.
6. Insert one side of Category 5e or above cable into the Industrial switch RJ-45 port and another side of category 5e or above cable to the network devices' RJ-45 port, ex: switch, PC or Server. The RJ-45 LED indicator 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 meaning.
7. When all connections are all set and LED lights all show in normal, the installation is complete.

Troubleshooting

- Verify that you are using the included or appropriate power cord/adapter. Don't use the power adapter with DC output higher than the power rating of the device. Otherwise, the device will burn down.
- Select the proper UTP/STP cable to construct your network. Please check that you are using the right cable. Use unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable for RJ-45 connections: 100Ω Category 3, 4 or 5 cable for 10Mbps connections, 100Ω Category 5 cable for 100Mbps, or 100Ω Category 5e/above cable for 1000Mbps connections. 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 you may encounter and where you can find possible solutions, to assist in identifying problems.
- IF the power indicator does not light on when the power cord is plugged in, you 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 your local dealer for assistance.
- If the Industrial switch LED indicators function normal and the connected cables are correct but the packets still cannot transmit, please check your system's Ethernet devices' configuration or status.

Technical Specifications

The technical specifications of the Industrial Switch are listed as follows.

Communications

Compatibility	IEEE 802.3, 802.3u, 802.3ab IEEE 802.3x
LAN	10/100/1000Base-T
Back-plane (Switching Fabric)	16 Gbps
Packet Throughput (Full-duplex)	23.8Mpps @ 64bytes
Transmission Distance	Up to 100 m
Transmission Speed	Up to 1000 Mbps
Broadcast Storm Rate Limit	250,000pps (default)

Interface

Connectors	8 x RJ-45 (8-port 10/100/1000TX) 6-pin removable screw terminal (power & relay)
LED Indicators	Unit: P1, P2, Fault Ethernet port: Link/Active (100Mbps) Speed (1000Mbps)

Power

Power Consumption	5.28 watts @ 12VDC 5.28 watts @ 48VDC
Power Input	2 x Unregulated +9 ~ 56 VDC
Relay Output	1 Relay Output

Mechanism

Dimensions (WxHxD)	30.0 x 140 x 95 mm (standard model) 36.6 x 140 x 95 mm (-E model)
Enclosure	IP-30, Metal shell with solid mounting kits

Environment

Operating Temperature	-20 ~ 60°C (standard model) -40 ~ 75°C (-E model)
Operating Humidity	5% ~ 95% (non-condensing)
Storage Temperature	-40 ~ 85°C
MTBF	589, 289 hrs

Certifications

Safety	CE EN60950-1
EMC	FCC Class A, CE EN61000-4-2 (ESD) CE EN61000-4-3 (RS) CE EN61000-4-4 (EFT) CE EN61000-4-5 (Surge) CE EN61000-4-6 (CS) CE EN61000-4-8 CE EN61000-4-11 CE EN61000-4-12 CE EN61000-6-2 CE EN61000-6-4
Free Fall	IEC60068-2-32
Shock	IEC60068-2-27
Vibration	IEC60068-2-6