MICROSENS

5 10/100/1000T Industrial Switch

User Manual

MS655200

Content

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 Input

To reduce the risk of power failure, the Industrial switch provides +12 ~ 48 V_{DC} dual power inputs. If there is power failure, Industrial switch 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.

Advanced Protection

The power line of Industrial switch supports up to 3,000 VDC EFT protection, which secure equipment against unregulated voltage and make systems safer and more reliable. Meanwhile, 6,000 VDC ESD protections for Ethernet ports make Industrial switch more suitable for harsh environments.

Wide Operating Temperature

The operating temperature of the Industrial switch is between -40 ~ 75^{o}C (wide operating temperature model) or -10 ~ 60^{o}C (standard 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 LEDs that display the link status and transmission speed. Also the three power indicators P1, P2 and Fault help you diagnose immediately.

Features

- Provides 5 x 10/100/1000Base-T Mbps Ethernet ports.
- Supports full/half duplex flow control
- Supports auto-negotiation
- Supports MDI/MDI-X auto-crossover
- Supports Jumbo Frame of 9Kbytes
- Supports surge (EFT) protection 3,000 V_{DC} for power line
- Supports 6,000 V_{DC} Ethernet ESD protection
- Supports redundant +12 ~ 48 V_{DC} power input
- Provides flexible mounting: DIN-rail, Panel Mounting
- Supports operating temperatures from -40 ~ 75^{o}C (wide operating temperature model) or -10 ~ 60^{o}C (standard model)

Packing List

- 1 x 5-port 10/100/1000Base-T Industrial Ethernet Switch
- 1 x User Manual
- 2 x Wall Mounting Bracket and Screws

Safety Precaution

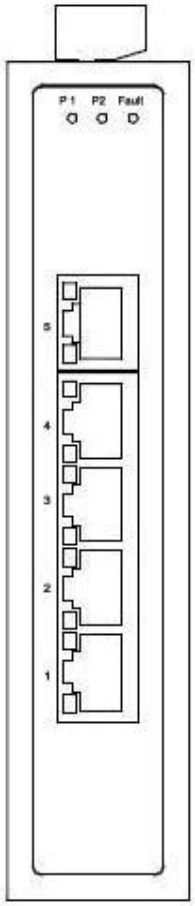
Attention *IF DC voltage is supplied by an external circuit, please use a protection device on the power supply input.*

Hardware Description

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

Front Panel

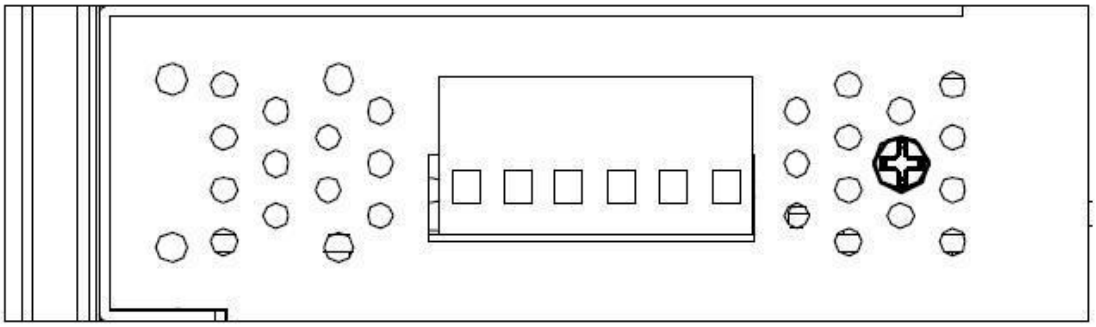
The Front Panel of the 5-port 10/100/1000Base-T Industrial Switch is shown as below.



Front Panel of the 5-port 10/100/1000Base-T Industrial Switch

Top View

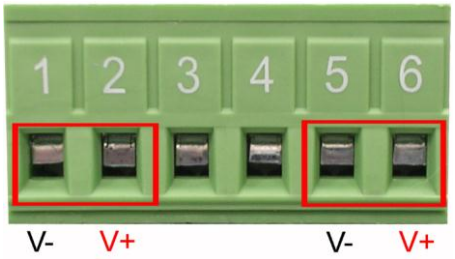
The top panel of the 5-port 10/100/1000Base-T Industrial Switch is equipped one terminal block connector of two DC power inputs.



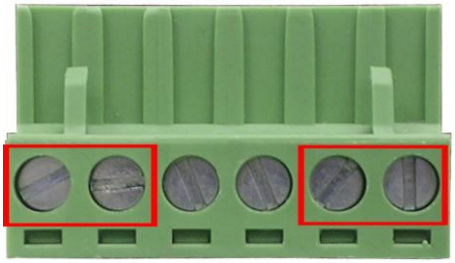
Top panel of the 5-port 10/100/1000BaseTX Industrial Switch

Wiring the Power Inputs

Please follow the steps below to insert the power wire.



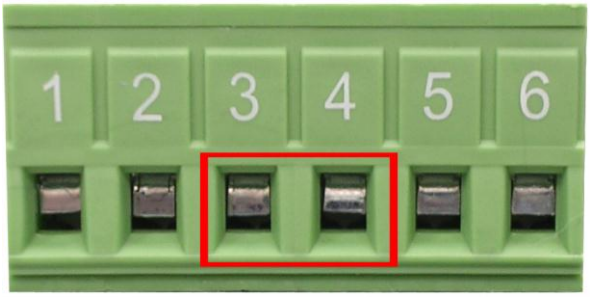
1. Insert the positive and negative wires into the V+ and V- contacts on the terminal block connector.



2. To tighten the wire-clamp screws for preventing the DC wires to loose.

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 which the power is failure or port link failure (for managed model) and form an open circuit.



Insert the wires into the fault alarm contact (No. 3 & 4)

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

LED Indicators

There are few LEDs display the power status and network status located on the front panel of the Industrial switch, each of them has its own specific meaning as below table.

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 ~ 5 (Upper LED)	Green	On	Connected to network
		Flashing	Networking is active at speed of 100Mbps
		Off	Not connected to network
1 ~ 5 (Lower LED)	Green	On	Connected to network at speed of 1000Mbps
		Off	Not connected to network

Ports

RJ-45 ports (Auto MDI/MDIX): The RJ-45 ports are auto-sensing for 10Base-T, 100Base-TX or 100Base-T devices connections. Auto MDI/MDIX means that you can connect to another switch or workstation without changing straight through or crossover cabling. See figures as below for straight through and crossover cable schematic.

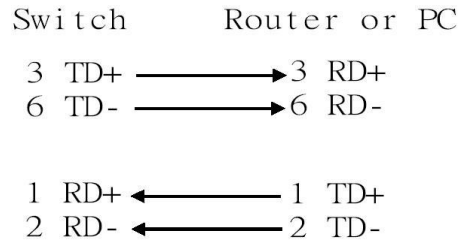
- **RJ-45 Pin Assignments**

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

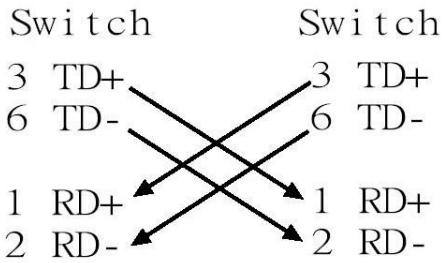
Note *"+" and "-" signs represent the polarity of the wires that make up each wire pair.*

All ports on this industrial switch support automatic MDI/MDI-X operation, you 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

Cabling

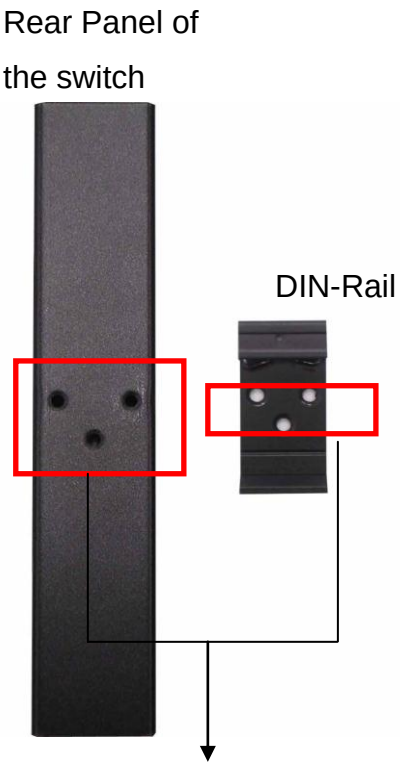
Use unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable for RJ-45 connections: 100Ω Category 3, 4 or 5 cable for 10Mbps connections, 100Ω Category 5 cable for 100Mbps, or 100Ω Category 5e/above cable for 1000Mbps connections.

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

Mounting Installation

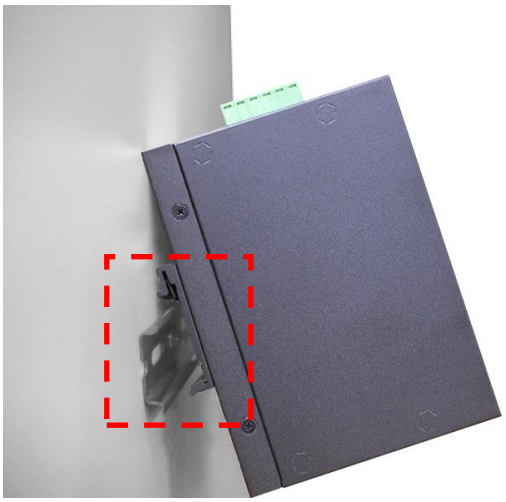
DIN-Rail Mounting

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 figure to screw the DIN-Rail on the switch. Follow the steps below to hang the industrial switch.

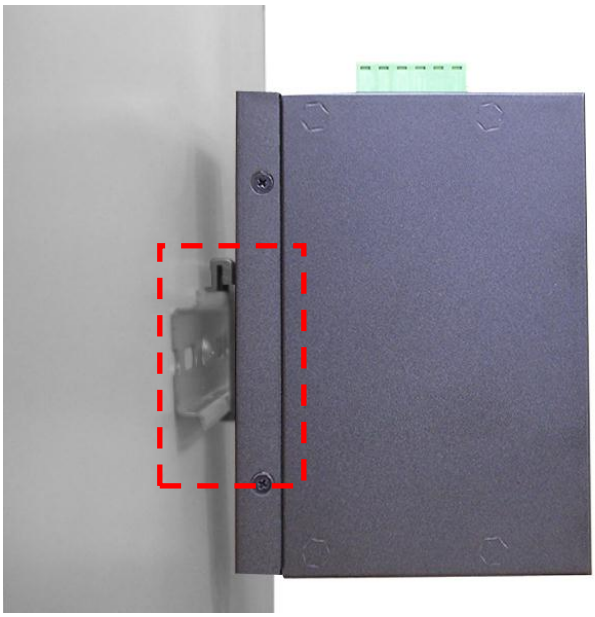


1. Use the screws to screw on the DIN-Rail on the industrial switch
2. To remove the DIN-Rail, reverse step 1.

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



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

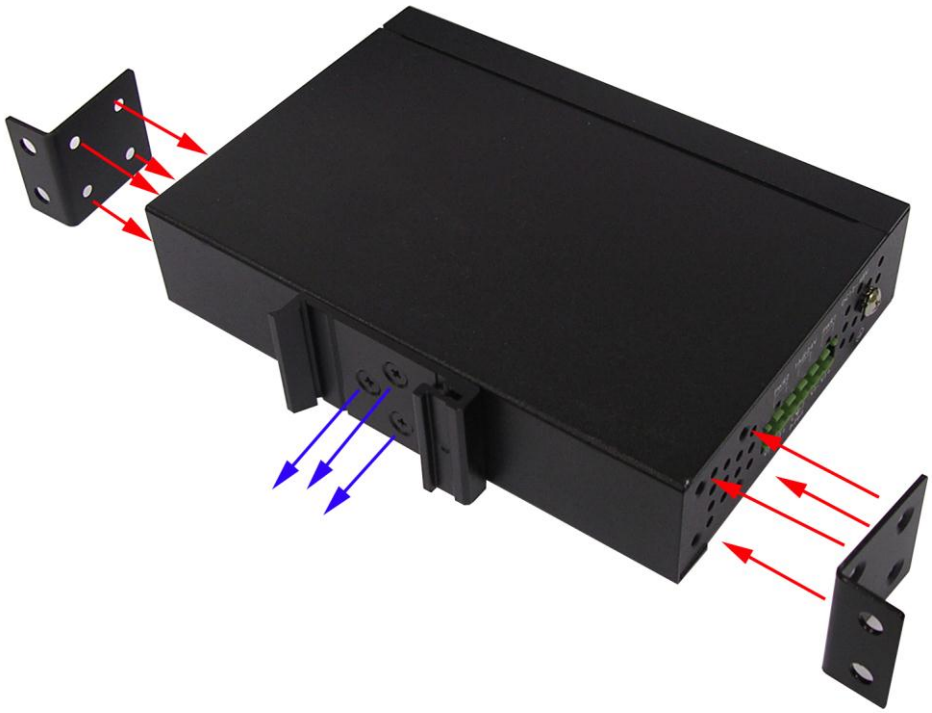


5. Check the DIN-Rail is tightly on the track.
6. To remove the industrial switch from the track, reverse the steps above.

Wall Mount Plate Mounting

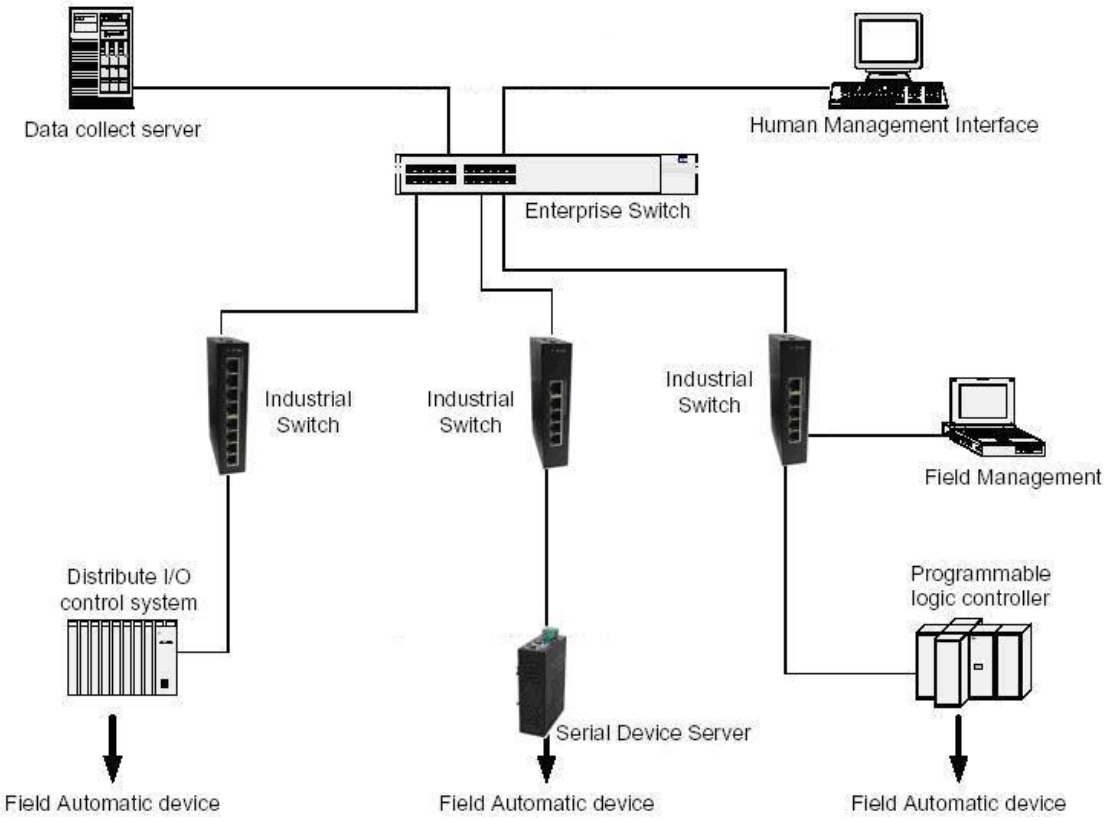
Follow the steps below to mount the industrial switch with wall mount plate.

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.



Hardware Installation

In this paragraph, we will describe how to install the 5-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 5 cable for Ethernet connection.
6. Insert one side of Category 5e or above cables into the Industrial switch Ethernet port (RJ-45 port) and another side of category 5e or above cables to the network devices' Ethernet port (RJ-45 port), ex: switch, Pc or Server. The UTP port (RJ-45) LED on the Industrial switch will light up when the cable 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.

Troubles shooting

- Verify that you are using the right power cord/adapter (DC 12-48V), please don't use the power adapter with DC output higher than 48V, or it will burn this switch down.
- Select the proper UTP cable to construct your network. Please check that you are using the right cable. Use unshielded twisted-pair (UTP) or shield 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 are normal and the connected cables are correct and the packets still cannot transmit. Please check your system's Ethernet devices' configuration or status.

Technical Specification

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
Transmission Distance	Up to 100 m
Transmission Speed	Up to 1000 Mbps

Interface

Connectors	5 x RJ-45 (5-port 10/100/1000TX) 6-pin removable screw terminal (power & relay)
LED Indicators	Unit: P1, P2, Fault Ethernet port: Link/Active (100Mbps) Link (1000Mbps)

Power

Power Consumption	4.6 W
Power Input	2 x Unregulated +12 ~ 48 V_{DC}
Fault Output	1 Relay Output

Mechanism

Dimensions (WxDxH)	30 x 95 x 140 mm
Enclosure	IP-30, Metal shell with solid mounting kits

Protection

ESD (Ethernet)	6,000 V_{DC}
Surge (EFT for power)	3,000 V_{DC}
Power Reverse	Yes

Environment

Operating Temperature	-40 ~ 75°C (wide operating temp. model) -10 ~ 60°C (standard model)
Operating Humidity	5% ~ 95% (non-condensing)
Storage Temperature	-40 ~ 85°C

Certifications

Safety	CE EN60950-1
EMC	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