



Industrial 10/100BaseTX to 100BaseFX Media Converter

RUE-111 (multimode) **RUE-113** (singlemode)

User Manual



Rev. 2.00

15-September-2006

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 and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. 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.

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Introduction

The Industrial 10/100BaseTX to 100BaseFX Media Converter is a cost-effective solution for the converting 10/100Base-TX (Auto MDI/MDIX) to 100Base-FX cabling. It provides two power inputs that can be connected simultaneously to two DC power sources. If one power input fails, the other one acts as a backup.

The Industrial 10/100BaseTX to 100BaseFX Media Converter also provides relay alarm outputs to warn when the port link failure, so the technician can respond quickly with appropriate emergency operation procedures.

IP- switches are used to set the operation mode for relay alarm, Fiber ports, link loss forwarding function, and UTP operation mode.

Features

- UTP to Fiber Media converter
- Auto Negotiation Speed and Half/Full Duplex
- 12 to 48VDC power inputs
- TX port supports Auto MDI/MDI-X
- Relay alarm output for port link failure
- IEEE 802.3x flow control support
 - Flow control on full-duplex
 - Back pressure on half-duplex
- Built-in Link Loss Forwarding Technology
- DIN-Rail or wall mountable
- DIP-switches to set the operation mode and Link- Lost-Forwarding function.
- Redundant dual DC power Inputs

Package Contents

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

- Industrial 10/100BaseTX to 100BaseFX Media Converter
- One DIN-Rail (screwed on the converter)
- One wall mount plate and six screws
- User manual



Industrial 10/100BaseTX to 100BaseFX
Media Converter



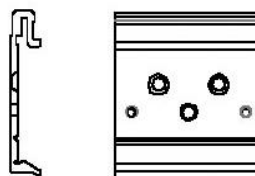
User Manual



Wall Mount Plate



Screws



DIN-Rail

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

Hardware Description

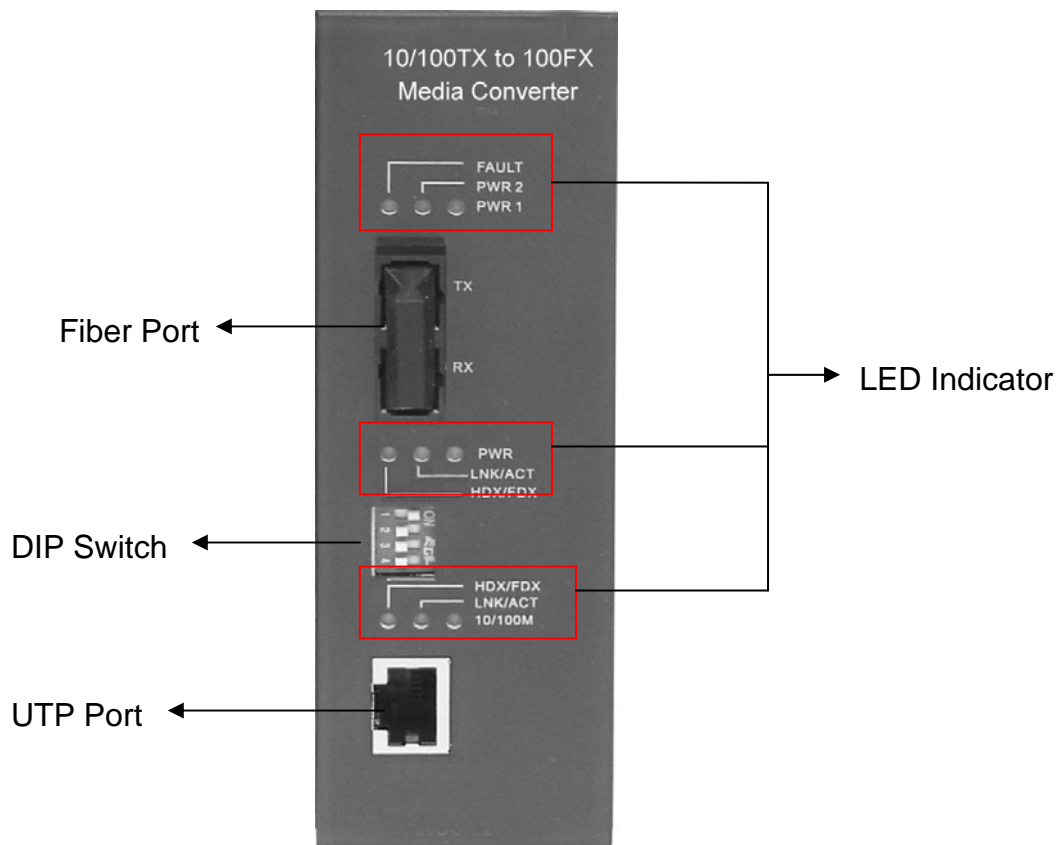
In this paragraph, we will introduce the Industrial media converter's hardware spec, port, cabling information, and wiring installation.

Physical Dimension

Industrial 10/100BaseTX to 100BaseFX Media Converter dimensions (W x H x D) are **54mm x 135mm x 105mm**

Front Panel

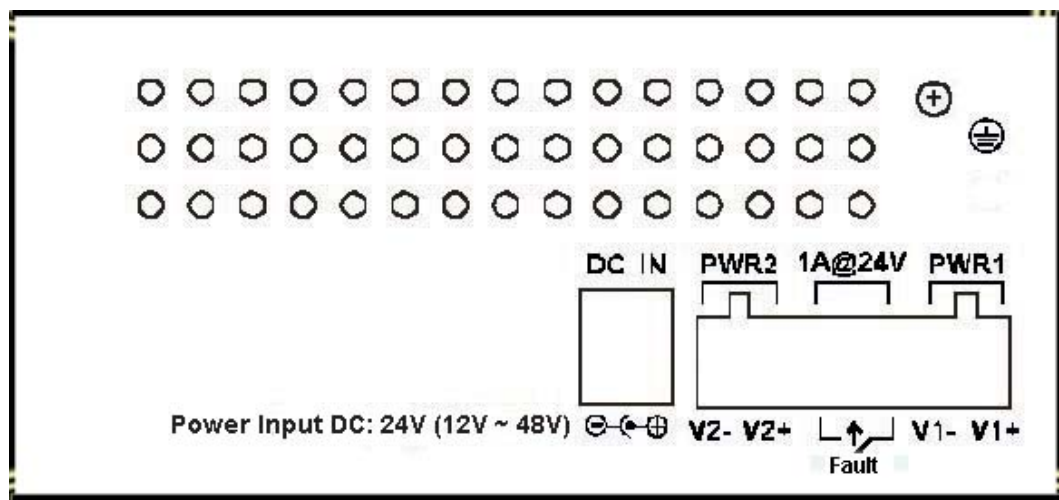
The Front Panel of the Industrial 10/100BaseTX to 100BaseFX Media Converter is showed below.



Front Panel of the Industrial 10/100BaseTX to 100BaseFX Media Converter

Bottom View

The bottom view of the Industrial 10/100BaseTX to 100BaseFX Media Converter consists one terminal block connector within two DC power inputs and one DC IN power jack.



Bottom Panel of Industrial 10/100BaseTX to 100BaseFX Media Converter

Ports

■ RJ-45 Port

The UTP ports will auto-sense for 10Base-T or 100Base-TX connections. Auto MDI/MDIX means that you can connect to another Switch or workstation without changing straight through or crossover cabling. See the Figure C and C-1 for straight through and crossover cabling schematic.

RJ-45 Pin Assignments

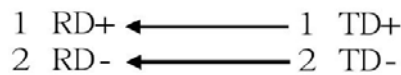
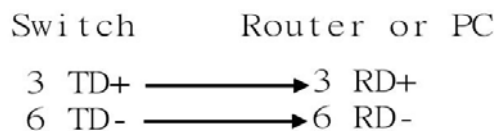
Pin Number	Assignment
1	Tx+
2	Tx-

3	Rx+
6	Rx-

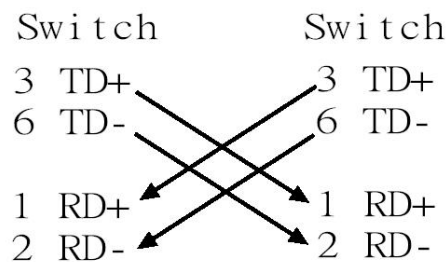
[NOTE] “+” and “-” signs represent the polarity of the wires that make up each wire pair.

All UTP ports on this Industrial media converter support automatic MDI/MDI-X operation, you can use straight-through cables (See Figure) 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

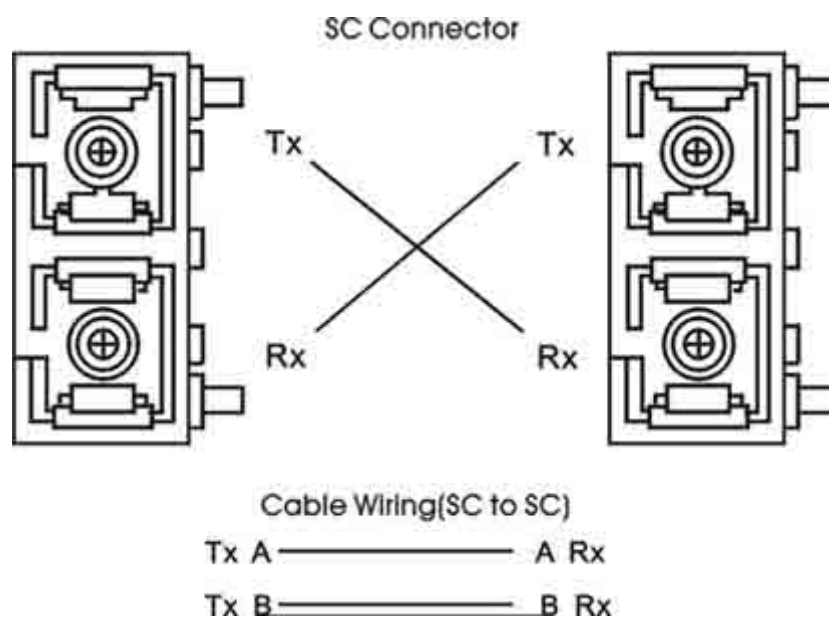


Cross over Cable Schematic

■ Fiber Port

This port is for 100Base-FX connections. We provide SC fiber connector in multi mode (2Km) or single mode (30Km) for different model number.

When you connect the fiber port to another fiber port, please follow the below Figure D to connect it. Wrong connection will cause the port cannot work normally.



ATTENTION



This is a Class 1 Laser/LED product. Don't stare into the Laser/LED Beam.

Cabling

- Use the four twisted-pair, Category 5 cables for RJ-45 port connections. The cable between the converter and the link partner (switch, hub, workstation, etc.) must be less than 100 meters (328 ft.)

long.

- The Fiber segment using the **single-mode** connector type must use a 8/125 or 9/125 um single-mode fiber cable. You can connect two devices up to **30 Kilometers (Available on single mode fiber model only)**.
- The Fiber segment using a **multi-mode** connector type must use 50 or 62.5/125 um multi-mode fiber cables. You can connect two devices up to **2Km distances (Available on multi mode fiber model only)**.

LED Indicators

There are 8 diagnostic LEDs located on the Front panel of industrial media converter. They provide real-time information of system and optional status. The following table provides description of the LED status and their meanings for the industrial media converter.

LED	Status	Meaning
Power	Green	When the industrial switch has power input s the LED will light on
	Off	No power
Power 1	Green	Power on
	Off	No power
Power 2	Green	Power on
	Off	No power
Fault	Orange	Power failure or UTP port failure or Fiber port failure
	Off	No Power failure or UTP port failure or Fiber port failure occurs or the port alarm is disabled

LNK/ACT (Fiber)	Green	The port is linking with its link partner.
	Blinks	The port is transmitting or receiving packets from the FX device.
	Off	No device attached
FDX (Fiber)	Orange	The port is operating in full-duplex mode.
	Off	Half-duplex mode or no device attached
10/100(UTP)	Green	In 100Mbps transmitting speed
	Off	In 10Mbps transmitting speed
LNK/ACT (UTP)	Green	The port is linking with its link partner.
	Blinks	The unit is transmitting or receiving packets from the devices.
	Off	No device attached
FDX (UTP)	Orange	The port is operating in full-duplex mode.
	Off	Half-duplex mode or no device attached

DIP-switch

The DIP-switch is used to configure operation mode for LLF (**Link Loss Forwarding**) operation mode for UTP/Fiber port and the relay alarm operation mode. The default value of the DIPswitch is **OFF**.

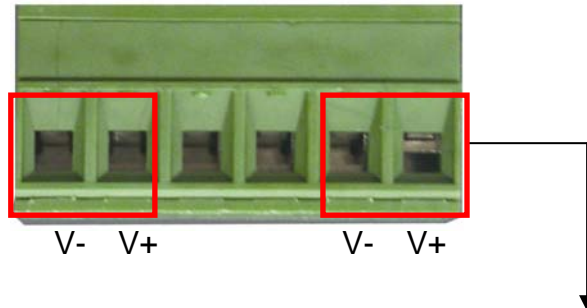
DIP Switch No	Status	Description
1	ON	Enable Port Alarm. If the port's link fails, the fault LED will light up.
	OFF	Disable Port Alarm
2	ON	LLF Enable
	OFF	LLF Disable
3	ON	100Base-FX Half Duplex mode
	OFF	100Base-FX Full Duplex mode
4	ON	100Base-TX Full Duplex mode
	OFF	UTP Auto-Negotiation

Link Loss Forwarding: When LLF is enabling, allow UTP link failures to be reported to the fiber side and also allow Fiber link failure to be reported to the UTP side. Therefore, A link lost forward feature is provided in both UTP and Fiber side.

[NOTE] Please don't change the DIP-switch setting when UTP or fiber port is transmitting or receiving data. It may cause some data error. **After changing the DIP-switch setting, a Power OFF/ON must be executed to enable new configuration.**

Wiring the Power Inputs

Please follow below steps to insert the power wire.



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

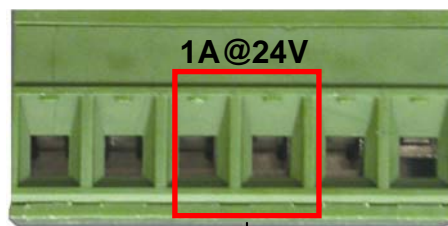


2. Tighten the wire-clamp screws for preventing the DC wires from loosening.

[NOTE] The wire range of terminal block is from 12~ 24 AWG.

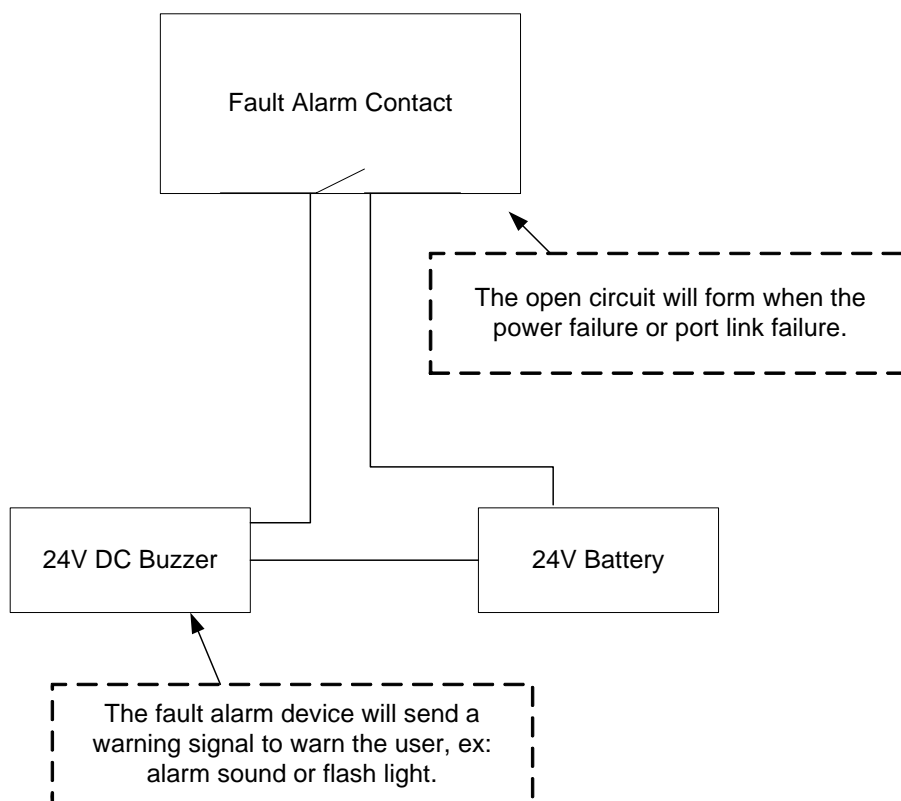
Wiring the Fault Alarm Contact

The fault alarm contact is in the middle of terminal block connector as below figure shows. By inserting the wires and set the DIPswitch at “ON” status, it will detect when power is failure or port link failure and form an open circuit. And, the following figure shows an application example for the fault alarm contact.



Insert the wires into the fault alarm contact

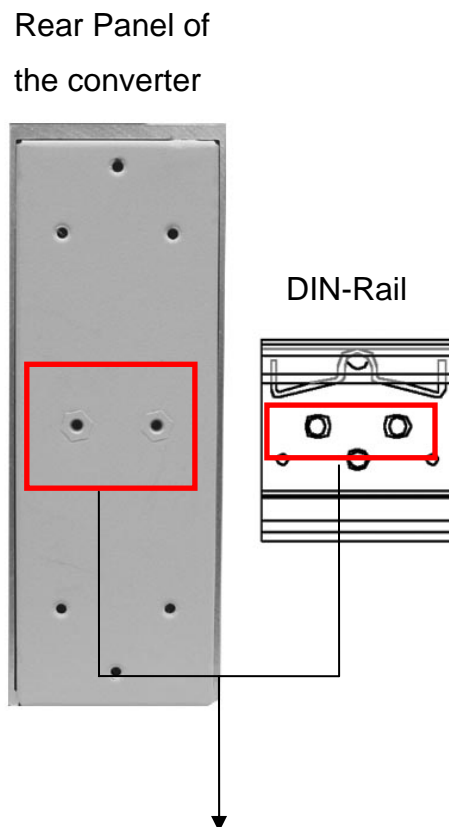
[NOTE] The wire range of terminal block is from 12~ 24 AWG.



Mounting Installation

DIN-Rail Mounting

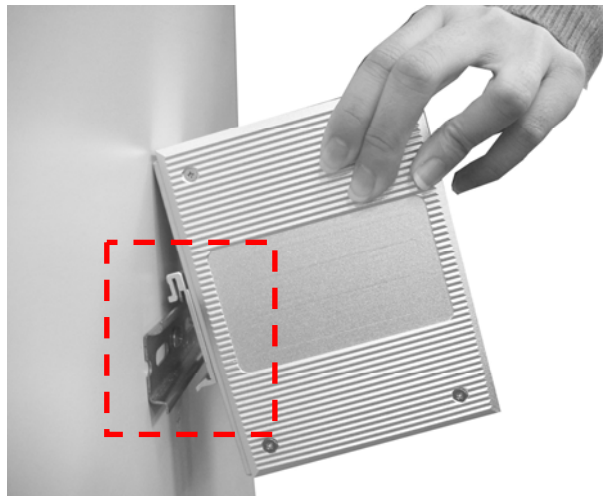
The DIN-Rail is screwed on converter when out of factory. If the DIN-Rail is not screwed on the converter, please see the following Figure F to screw the DIN-Rail on the converter. Follow the below steps to hang the converter.



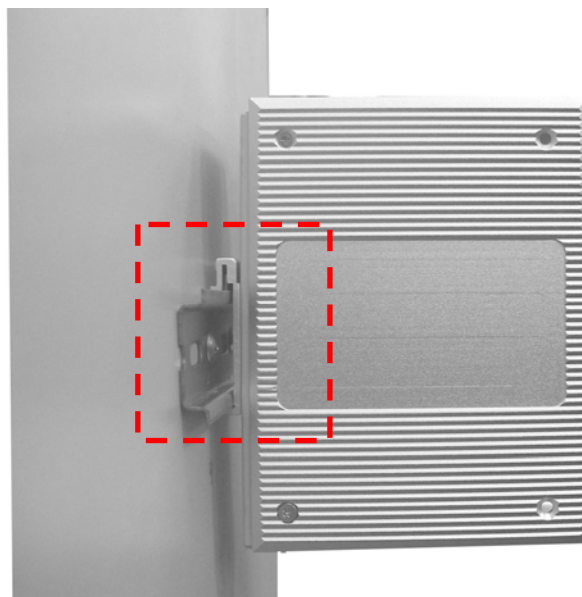
1. Use the screws to screw on the DIN-Rail on the converter.
2. To remove the DIN-Rail, reverse the step 1.

Figure F

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



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

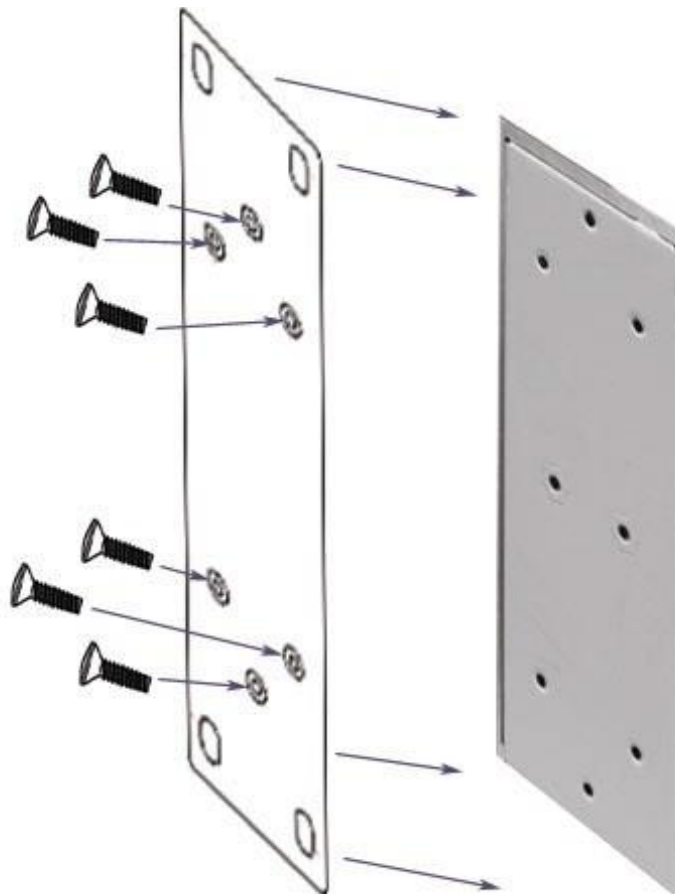


3. Check the DIN-Rail is tightly on the track.
4. To remove the converter from the track, reverse step 2 and step1 above.

Wall Mount Plate Mounting

Follow the below steps to mount the Industrial media converter with wall mount plate.

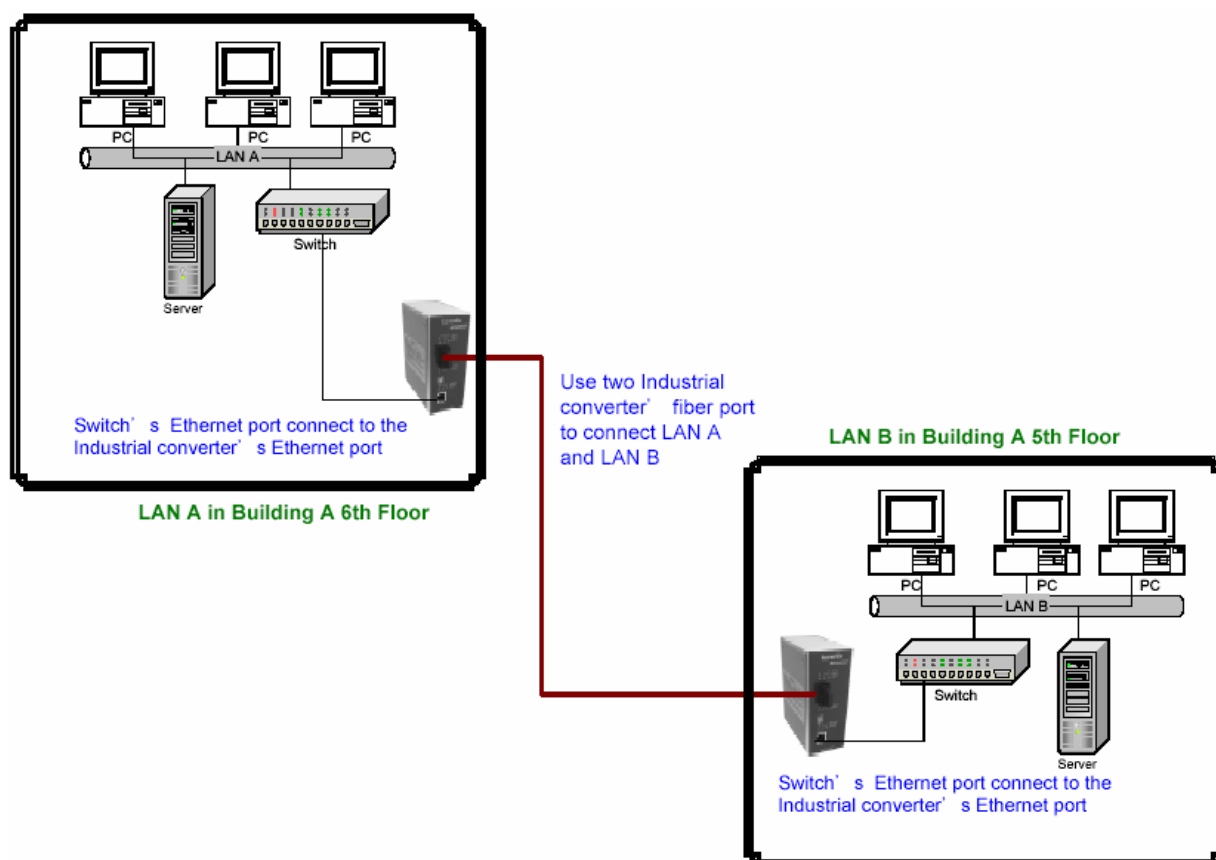
1. Remove the DIN-Rail from the Industrial media converter; loose the screws to remove the DIN-Rail.
2. Place the wall mount plate on the bottom side of the Industrial media converter.
3. Use the screws to screw the wall mount plate on the Industrial media converter.
4. Use the hook holes at the corners of the wall mount plate to hang the Industrial media converter on the wall.
5. To remove the wall mount plate, reverse steps above.



Screws to screw the wall mount plate on the Industrial media converter

Hardware Installation

In this section, we will describe how to install the 10/100BaseTX to 100BaseFX Media Converter and the installation points for the attention. In Figure, it is an example application for the Industrial converter.



Installation Steps

1. Unpacked the Industrial media converter.
2. Check the DIN-Rail is screwed on the Industrial media converter. If the DIN-Rail is not screwed on the Industrial media converter. Please refer to **DIN-Rail Mounting** section for DIN-Rail installation. If you want to wall mount the Industrial media converter, then please refer to **Wall**

Mount Plate Mounting section for wall mount plate installation.

3. To insert the Industrial media converter into the track or hang on the wall, please refer to the **Mounting Installation** section.
4. Power on the Industrial media converter. How to wire the power; please refer to the **Wiring the Power Inputs** section. The power LED on the Industrial media converter 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 and optic fiber cable for fiber connection.

[NOTE] The Fiber port has single-mode and multi-mode. To check your Industrial media converter fiber connector type, look for the sticker on the Industrial media converter.

The single-**mode** connector type must use 8/125 or 9/125 um single-mode fiber cable. The connect distance between two devices is up to **30 Km**.

The **multi-mode** connector type must use 50 or 62.5/125 um multi-mode fiber cable. The connect distance between two devices is up to **2Km**.

6. Insert one side of Category 5 cables into the Industrial media converter Ethernet port (RJ-45 port) and another side of category 5 cables to the network switch's Ethernet port (RJ-45 port). The UTP port (RJ-45) LED on the Industrial media converter will light up when the cable connected with the switch. Please refer to the **LED Indicators** section for LED light meaning.

[NOTE] Be sure the connected local switch's Ethernet port support MDI/MDI-X. If it does not support then use the crossover category-5 cable.

7. Insert one side of fiber cable into the Industrial media converter fiber port and another side to the convert in the opposite side connection. The fiber port LED on the converter will light up when the cable

connected. Please refer to the **LED Indicators** section for LED light meaning.

8. When all connections are all set and LED lights all show in normal, the installation is complete.

Troubleshooting

- Verify that you are using the right power cord/adapter (DC 12-48V). Do not use a power adapter with DC output larger than 48V, or it will damage the device.
- Check the configuration of the DIP-switch. It must be sett in the same operation mode with the link partner.
- Select the proper UTP/Fiber cable to construct your network. The single-mode converter must use single-mode fiber cable. Please check that you are using the right cable.
- Don't both use multi-mode and single mode cables.
- If the Industrial media converter 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 Specifications

Industrial 10/100BaseTX to 100BaseFX Media Converter technical specification are following.

Standard	IEEE802.3 10BASE-T IEEE802.3u 100BASE-TX/100BASE-FX IEEE802.3x Flow Control and Back pressure
Connector	Fiber: SC (Multi-Mode model), SC (Single-mode model, 30Km) RJ-45 Socket: CAT-3/5 (10/100Mbps) Twisted Pair cable Auto MDI/MDI-X and Auto-Negotiation Function Support
Switch architecture	Store and Forward
Fiber parameters	Fiber Core: Multi-Mode (62.5/125um, 50/125um) Single-Mode (8/125um, 10/125um) Wavelength: 1310nm Fiber Distance: Multi-Mode Fiber 2Km (Available on Multi mode model) Single-Mode Fiber 30Km (Available on Single mode model)

Link Lost Forward	<p>TX →Fiber: If TX port link down, the media converter will force Fiber port to link down</p> <p>Fiber →TX: If Fiber port link down, the media converter will force TX port to link down.</p>
DIP Switch	<ul style="list-style-type: none"> ■ DIP Switch 1: ON: Enables Port Alarm OFF: Disables Port Alarm ■ DIP Switch 2: ON: Enables LLF (Link Lose Forwarding) OFF: Disables LLF (Link Lose Forwarding) ■ DIP Switch 3: ON: 100Base-FX Half-mode OFF: 100Base-FX Full-mode ■ DIP Switch 4: ON: 100Base-TX Full-duplex mode OFF: Auto-Negotiation
LED	<ul style="list-style-type: none"> ■ Power (Green), Power1 (Green), Power2 (Green), Fault (Orange) ■ Fiber: Link/Activity (Green) Half/Full Duplex (Orange) ■ TX: 10/100(Green) Link (Green) Half/Full Duplex (Orange)
Power	Input Voltage: 12 to 48VDC; Redundant inputs
Power consumption	4.6 Watts
Reserve polarity protection	Present

Overload current protection	Present
Operation Temperature	0 to 60°C (32 to 140°F)
Storage Temperature	-40 to 85°C
Ambient Relative Humidity	5 to 90%(non-condensing)
Dimension	54 mm (W) x 135 mm (H) x 105mm (D)
EMI	FCC Class A, CE EN6100-4-2, CE EN6100-4-3, CE EN-6100-4-4, CE EN6100-4-5, CE EN6100-4-6
Safety	UL, cUL, CE/EN60950
Shock	IEC 60068-2-27
Free fall	IEC 60068-2-32
Vibration	IEC 60068-2-6