antaira

10/100TX to 100FX w/ 1 PoE Injector Industrial Media Converter

User Manual

v1.02

antaira

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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 this 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

The 1 10/100TX + 100FX w/ 1 PoE Injector Industrial Media Converter is a cost-effective solution and meets the high reliability requirements demanded by industrial applications. Use of the fiber port can extend the connection distance and increase the network elasticity and performance. The industrial media converter also provides the PoE function for various kinds of Powered Devices that can 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 1-port PoE Injection
  - ➢ Store-and-Forward Switching Architecture
  - ➢ Built-in Link Loss Forwarding Technology
  - ➢ Supports Wide Operating Temperature (-40°C ~ 80°C)
- ■ 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 content list below to verify with package.

- 1 10/100TX + 100FX w/ 1 PoE Injector Industrial Media Converter
- User manual
- Pluggable Terminal Block
- 2 wall mount plates with screws
- One DIN-Rail (attached on the unit)

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

Hardware Description

In this section, the Industrial Media Converter's hardware specifications, port, cabling, and wiring installation will be provided.

Physical Dimension

1 10/100TX + 100FX w/ 1 PoE Injector Industrial Media Converter dimension (W x D x H) is **30mm x 95mm x 140mm**

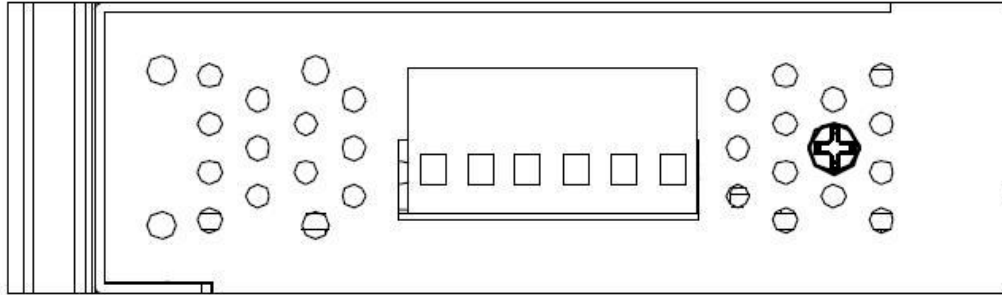## Front Panel

The Front Panel of the 1 10/100TX + 100FX w/ 1 PoE Injector Industrial Media Converter is shown as below:
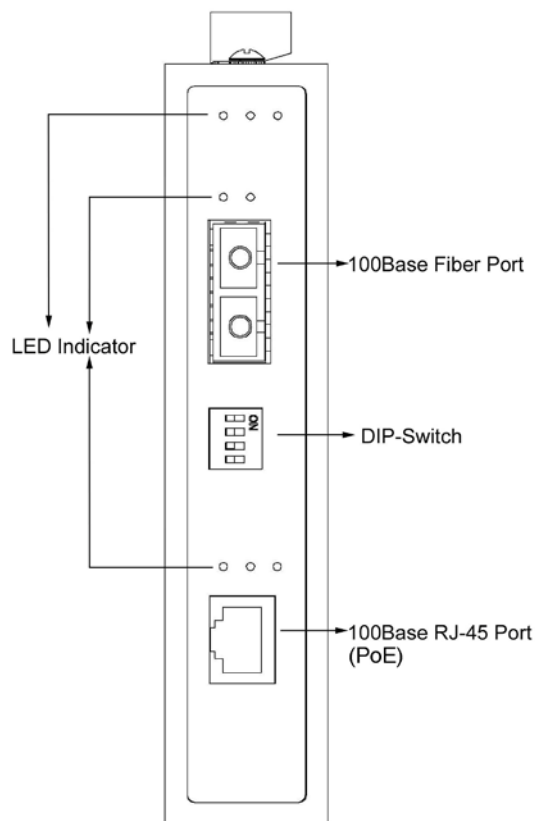
Front Panel of the PoE Injectors Industrial Media Converter

Top View

The top view of the 1 10/100TX + 100FX w/ 1 PoE Injector Industrial Media Converter has one terminal block connector of two DC power inputs.

Top View of the PoE Injectors Industrial Media Converter

LED Indicators

The diagnostic LEDs located on the front panel of the industrial media converter provide real-time system information and optional status. The table below describes the LED status and their meaning for the media converter.

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 1/2 or port connections failed
		Off	Power input 1/2 and port connections are functional, or no power inputs
FDX/COL (fiber port)	Yellow	On	Full-duplex mode
		Flashing	Collision occurs
LNK/ACT (fiber port)	Green	On	Connected to network
		Flashing	Networking is active
		Off	Not connected to network
100M (RJ-45)	Yellow	On	Linking to 100Mbps network
		Off	Linking to 10Mbps network or disconnected
LNK/ACT (RJ-45)	Green	On	Connected to network
		Flashing	Networking is active
		Off	Not connected to network
FWD	Green	On	The port is supplying power to the powered-device
		Off	No powered-device attached or power supplying failed

DIP-Switch

The DIP-Switch is used to configure operation mode for **LLF** (**L**ink **L**oss **F**orwarding)/**LFP** (**L**ink **F**ault **P**ass-Through), and operation mode for UTP/Fiber port. The default value of the DIP-switch is **OFF**.

S/W No	Status	Description
1	ON	Enables Port/Power Alarm
1	OFF	Disable Port/Power Alarm
2	ON	Enables LLF/LFP
2	OFF	Disables LLF/LFP
3	ON	100Base-FX Half-mode
3	OFF	100Base-FX Full-mode
4	ON	Media mode (100TX to 100FX)
4	OFF	Switching mode

LLF/LFP (DIP-Switch 2): Enabling LLF/LFP allows UTP/STP link failures to be reported to the fiber side and also allow Fiber link failures to be reported to the UTP/STP side. Therefore, the LLF/LFP feature is available in both UTP/STP and Fiber side.

Media mode (DIP-Switch 4): When media mode is enabled (ON), it operates with minimum latency. The transmission flow does not wait until the entire frame is ready, but instead forwards the received data immediately while data is being received. The TP port should be forced at 100M in this application. When the DIP-Switch is set at switching mode (OFF), the function is the same as a Switch/Hub.

Note   *Please don't change the DIP-switch setting when UTP/STP or fiber port is transmitting or receiving data. It may cause data errors. If you change the DIP-switch setting, please power off the media converter and power on again to make the setting effective.*

Ports

■ **RJ-45 ports**

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

■ **RJ-45 Pin Assignments**

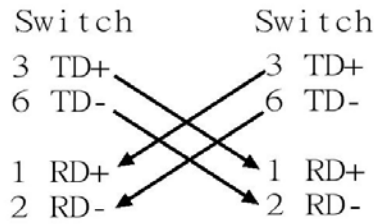| Pin Number	Assignment
1	Tx+
2	Tx-
3	Rx+
6	Rx-

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

All ports on this industrial media converter supports automatic MDI/MDI-X operation, user can use straight-through cables (See figure below) for all network connections to PCs/servers, or to switches/hubs. For 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-)

Switch   Router or PC

3 TD+ ─────────►3 RD+
6 TD- ─────────►6 RD-

1 RD+ ◄─────────1 TD+
2 RD- ◄─────────2 TD-
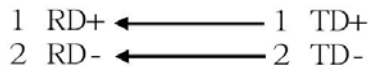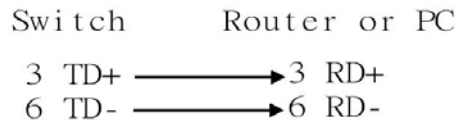
Straight Through Cable Schematic

Switch   Switch

3 TD+   3 TD+
6 TD-   6 TD-
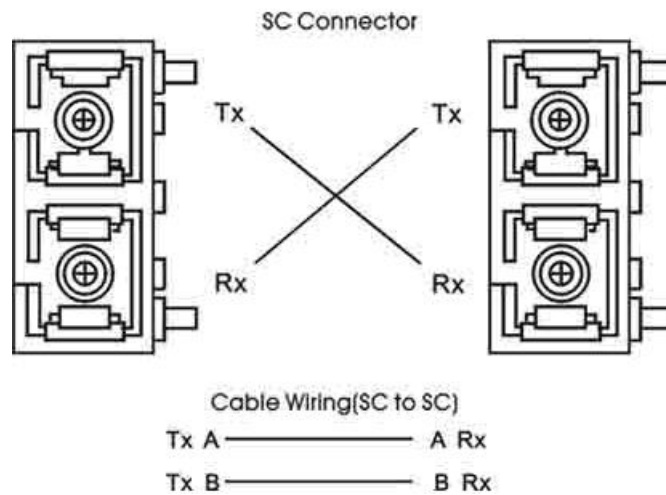
1 RD+   1 RD+
2 RD-   2 RD-

Cross Over Cable Schematic

■ **Fiber Port**

The fiber port is an SC type connector that is either multi mode (2Km) or single mode (30Km).

When you connect the fiber port to another device, please follow the figure below to connect accordingly. Wrong connection will cause the port to not work correctly.

SC Connector

Tx   Tx

Rx   Rx

Cable Wiring(SC to SC)

Tx A ───────────── A Rx
Tx B ───────────── B Rx

ATTENTION

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

Cabling

- Twisted-pair segments 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.
- Fiber segments using **single-mode** connector type must use 9/125µm single-mode fiber cable. Users can connect two devices at a distance up to **30 Kilometers**.
- Fiber segments using **multi-mode** connector type must use 50 or 62.5/125 µm multi-mode fiber cable. Users can connect two devices up to **2 Kilometers**.

Wiring the Power Inputs

Please follow the steps below to insert the power wires.
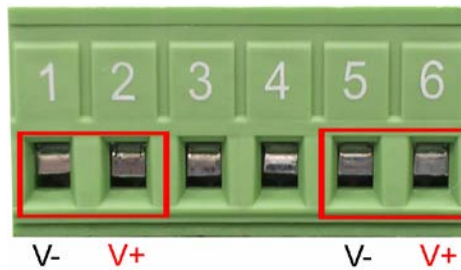
Insert the positive and negative wires into the V+ and V- contacts on the terminal block connector.

Tighten the wire-clamp screws to prevent wires from loosening.

Wiring the Fault Alarm Contact

The fault alarm contacts are 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 below:


Insert the wires into the fault alarm contacts.

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 pre-screwed on the industrial media converter from the factory. If the DIN-Rail is not screwed on the unit, please follow the instructions below on how to install the DIN-Rail on the unit. Follow the steps below to mount the industrial media converter.
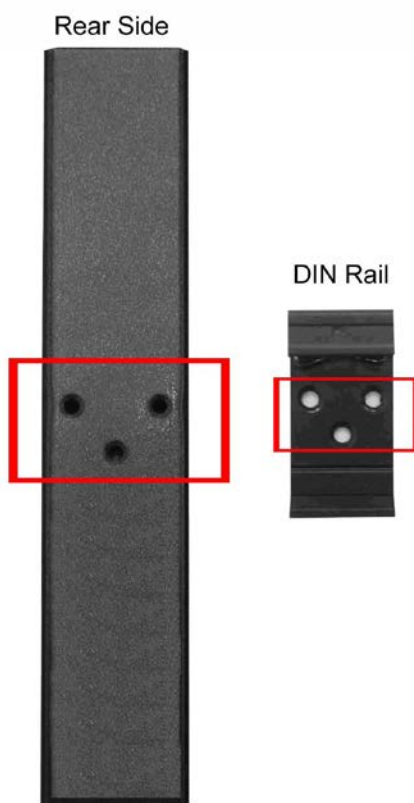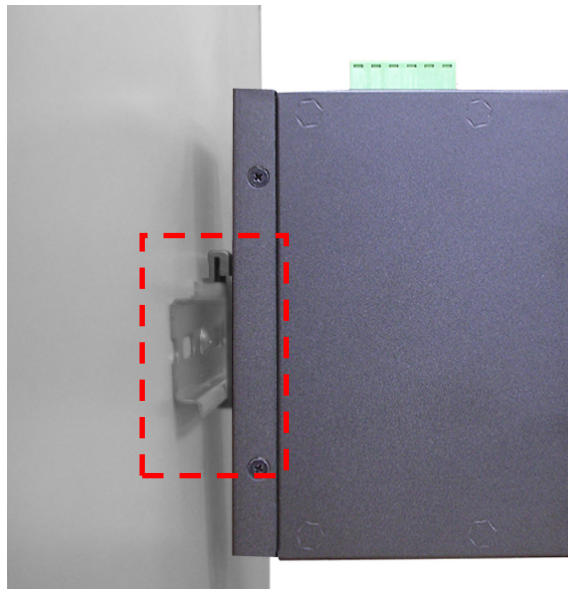

1. Use the screws to install the DIN-Rail on the rear side of the unit.
2. To remove the DIN-Rail, reverse the step 1.

3. After the DIN-Rail is screwed on the rear side of the unit, 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 securely mounted on the track.
6. To remove the industrial media converter from the track, reverse steps above.

Wall Mount Plate Mounting

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

1. Remove the DIN-Rail from the industrial media converter; loosen the screws to remove the DIN-Rail.
2. Place the wall mount plate on the top & bottom side of the industrial media converter.
3. Use the screws to install the wall mount plate on the unit.
4. Use the hook holes at the corners of the wall mount plate to mount the industrial media converter on the wall.
5. To remove the wall mount plate, reverse steps above.
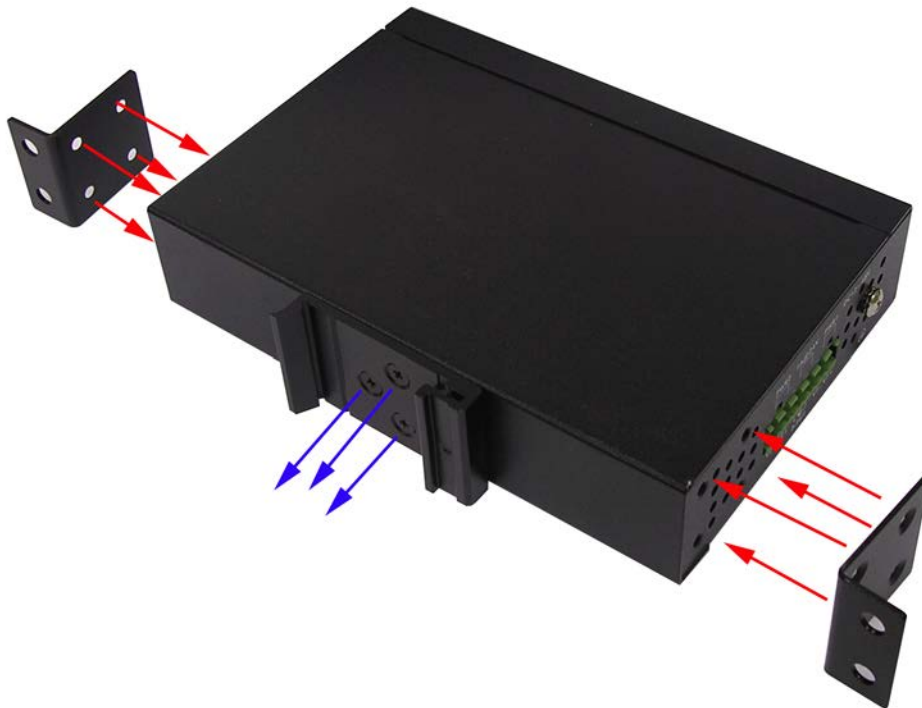
Hardware Installation

In this section, instructions on how to install the 1 10/100TX + 100FX w/ 1 PoE Injector Industrial Media Converter will be provided.

Installation Steps

1. Unpack the Industrial Media Converter.
2. Check if the DIN-Rail is installed on the Industrial Media Converter. If the DIN-Rail is not attached on the Industrial Media Converter, please refer to the **DIN-Rail Mounting** section for DIN-Rail installation. If wall mounting is desired, please refer to **Wall Mount Plate Mounting** section for wall mount plate installation.
3. To mount the Industrial Media Converter on a DIN-Rail track or wall, please refer to the **Mounting Installation** section.
4. Power on the Industrial Media Converter. Please refer to the **Wiring the Power Inputs** section for information on how to wire for power. The power LED on the Industrial Media Converter will light. Please refer to the **LED Indicators** section for LED light indication.
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 Media Converter Ethernet port and the other side to a network device Ethernet port, e.g. Switch, PC or Server. The UTP/STP port (RJ-45) LED on the Industrial Media Converter will light when the cable is connected to the network device. Please refer to the **LED Indicators** section for LED light indication.
7. When all connections are set and all LED lights are normal, the installation is complete.

Network Application

This segment provides an example to help users understand an industrial media converter application. For a sample application using the industrial media converter, see figure below.
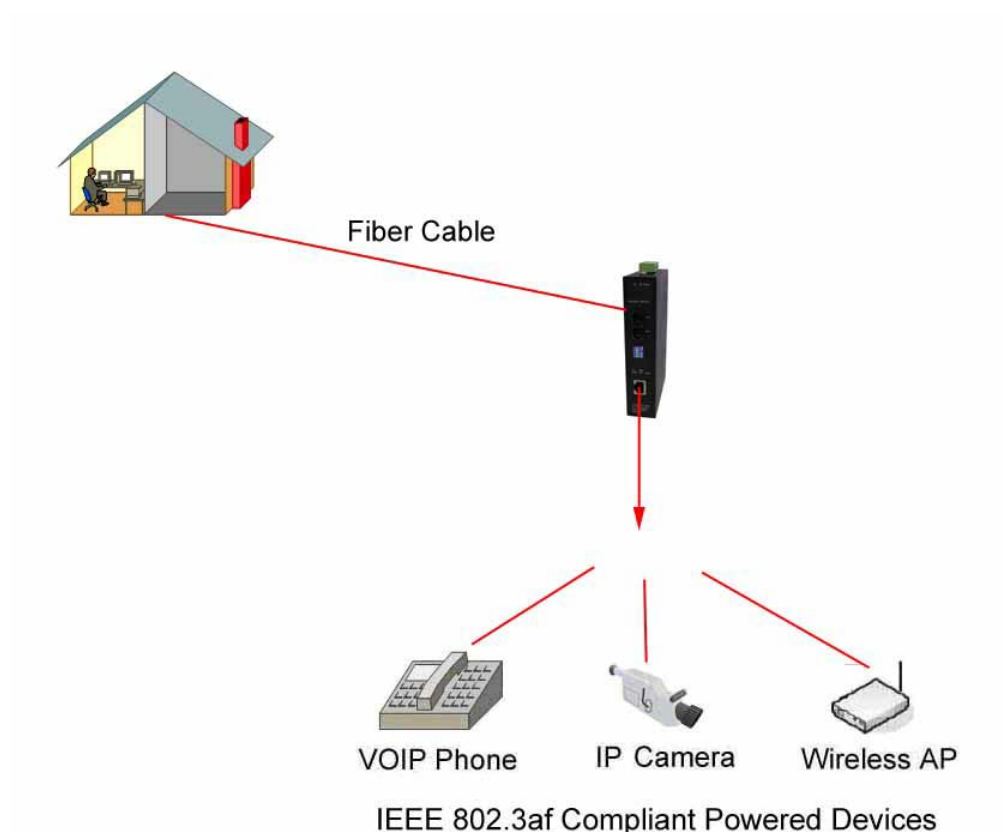
Troubles shooting

- Verify that the right power cord/adapter (DC 48V) is being used, please do not use a power adapter with DC output voltage higher than 48V, or it will burn the converter.
- Select the proper UTP/STP cable to construct your network. Please check that the right cable is being used. 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 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 Media Converter can be easily monitored through panel indicators, which describe common problems users may encounter and where users can find possible solutions.
- If the power indicator does not light up when the power cord is plugged in, users may have a problem with the power cord. 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 Media Converter LED indicators are normal and the connected cables are correct but the packets still do not transmit. Please check your system's Ethernet devices' configuration or status.

Technical Specification

The 1 10/100TX + 100FX w/ 1 PoE Injector Industrial Media Converter technical specifications are shown below.

Standard	IEEE 802.3 10Base-T Ethernet IEEE 802.3u 100Base-TX/FX 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/FX Fast Ethernet port
Connector	10/100TX: 1 x RJ-45 with auto MDI/MDI-X function; Supporst PoE injector function 100M fiber: 1 x SC type connector for Single-mode or Multi-mode type fiber cable
PoE Pin Assignment	RJ-45 port # 1~# 4 support IEEE 802.3af End-point, Alternative A mode. Positive (VCC+): RJ-45 pin 1, 2. Negative (VCC-): RJ-45 pin 3, 6. Data (1,2,3,6)
LED	**RJ-45**: Link/Activity (Green), 100M (Yellow), Power Feeding (Green) **Fiber**: FDX/COL (Yellow), Link/Activity (Green) **Per unit:** Power 1 (Green), Power 2 (Green), Fault (Red)

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)
Optical cable	Multi mode: 50/125µm ~ 62.5/125µm Single mode: 9/125µm Available distance: 2km (multi-mode)/30km (single-mode) Wavelength: 1310nm (Multi-mode/Single-mode)
Power Supply	Redundant power DC 48V with connective removable terminal block
Power Consumption	3.3Watts (without PoE); 16.4Watts (Full load with PoE)
Installation	DIN rail kit for DIN-type cabinet install and wall-mount ear for wall mounting
Operating Temp.	$-40^{o}C$ to $80^{o}C$ (wide operating temperature model) $-10^{o}C$ to $70^{o}C$ (standard model)
Operation Humidity	5% to 95% (Non-condensing)
Storage Temperature	$-40^{o}C$ to $85^{o}C$
Case Dimension	IP-30, 30 mm (W) x 95 mm (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	UL cUL CE/EN60950-1

Stability testing	IEC60068-2-32 (Free fall)
	IEC60068-2-27 (Shock)
	IEC60068-2-6 (Vibration)