KIEN1009 Industrial Ethernet Switch

Hardware Installation Manual

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KYLAND

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Hardware Installation Manual

Disclaimer: Kyland Technology Co., Ltd. tries to keep the content of this manual as accurate and as updated as possible. This document is not guaranteed to be error-free, and we reserve the right to amend it without notice to users.

Notice for Safety Operation

The product performs reliably as long as it is used according to the guidance. Artificial damage or destruction of the device should be avoided. Before using the device, read this notice carefully for personal and equipment safety. Please keep the manual for further reference. Kyland is not liable to any personal or equipment damage caused by violation of this notice.

- Do not place the device near water sources or damp areas. Keep the ambient relative humidity within the range from 5% to 95% (non-condensing).
- Do not place the device in an environment with high magnetic field, strong shock, or high temperature. Keep the working and storage temperatures within the allowed range.
- Install and place the device securely and firmly.
- Please keep the device clean; if necessary, wipe it with a soft cotton cloth.
- Do not place any irrelevant materials on the device or cables. Ensure adequate heat dissipation and tidy cable layout without knots.
- Wear antistatic gloves or take other protective measures when operating the device.
- Avoid any exposed metal wires because they may be oxidized or electrified.
- Install the device in accordance with related national and local regulations.
- Before power-on, make sure the power supply is within the allowed range of the device. High voltage may damage the device.
- Power connectors and other connectors should be firmly interconnected.
- Do not plug in or out the power supply with wet hands. When the device is powered on, do not touch the device or any parts with wet hands.
- Before operating a device connected to a power cable, remove all jewelry (such as rings, bracelets, watches, and necklaces) or any other metal objects, because they may cause electric shock or burns.
- Do not operate the device or connect or disconnect cables during an electrical storm.
- Use compatible connectors and cables. If you are not sure, contact our sales or technical support personnel for confirmation.

- Do not disassemble the device by yourself. When an anomaly occurs, contact our sales or technical support personnel.
- If any part is lost, contact our sales or technical support personnel to purchase the substitute. Do not purchase parts from other channels.
- Dispose of the device in accordance with relevant national provisions, preventing environmental pollution.

In the following cases, please immediately shut down your power supply and contact your Kyland representative:

- Water gets into the equipment.
- Equipment damage or shell damage.
- Equipment operation or performance has abnormally changed.
- The equipment emits odor, smoke or abnormal noise.

The following information applies when operating this device in hazardous locations:

Suitable for use in Class I, Division 2, Groups A, B, C and D Hazardous Locations, or nonhazardous locations only.

Cet appareillage est utilisable dans les emplacements de Classe I, Division 2, Groupes A, B, C et D, ou dans les emplacements non dangereux seulement.

WARNING: EXPLOSION HAZARD

- Do not disconnect equipment while the circuit is live or unless the area is known to be free of ignitable concentrations.
- Substitution of any component may impair suitability for Class I, Division 2.
- Exposure to some chemicals may degrade the sealing properties of materials used in the following devices: Identification of the sealed devices.

AVERTISSEMENT: RISQUE D'EXPLOSION

- Avant de deconnecter l'equipement, couper le courant ou s'assurer que l'emplacement est designe non dangereux.
- La substitution de composants peut rendre ce materiel inacceptable pour les emplacements de Classe I, Division 2.

Contents

1 Product Overview

KIEN1009 includes a series of green low-consumption industrial Ethernet switches applicable to wind power, distribution network automation, subway PIS, power SCADA, sewage treatment, metallurgy, intelligent transportation, rail transit, and many other industries. KIEN1009 supports redundant DC and AC power input of wide voltage range and provides normal-temperature-range and wide-temperature-range models.

The series switches support DIN-rail and panel mounting. KIEN1009 provides up to six 10/100Base-T(X) Ethernet ports, two 100Base-FX Ethernet ports, and one 1000Base-X, 10/100/1000Base-T(X) SFP slot (gigabit SFP slot).

Table 1 KIEN1009 Models

Models	**KIEN1009-Ports-Connector-PS1-PS2**
Code definition	Code option
Ports: GX, S/M, T	1S7T, 1M7T, 2S6T, 2M6T, 3S6T, 3M6T, 8T, 1GX8T, 1GX2S6T, 1GX2M6T
	Note: *1GX2S6T: one 1000Base-X, 10/100/1000Base-T(X) SFP slot; two 100Base-FX ports, single mode; six 10/100Base-T(X) ports.* *1GX2M6T: one 1000Base-X, 10/100/1000Base-T(X) SFP slot; two 100Base-FX ports, multiple mode; six 10/100Base-T(X) ports.*
Connector: parameters for S/M	**Ports with M:** ST05=ST connector, 1310nm, 5km SC05=SC connector, 1310nm, 5km FC05=FC connector, 1310nm, 5km **Ports with S:** ST40=ST connector, 1310nm, 40km SC40=SC connector, 1310nm, 40km FC40=FC connector, 1310nm, 40km SC60=SC connector, 1310nm, 60km

	SC80=SC connector, 1550nm, 80km **Ports without S or M:** N/A
PS1-PS2: power input	L2-L2 (24DCW, redundant power input, UL approved), L5-L5(12DCW, redundant power input)

Note:

We reserve the right to amend the product information listed in this table without notice. To obtain the latest information, contact our sales or technical support personnel.

2 Structure and Interface

Caution:

It is recommended to purchase the port dustproof shield (optional) to keep ports clean and ensure switch performance.

2.1 Front Panel

- Front Panel of KIEN1009-8T

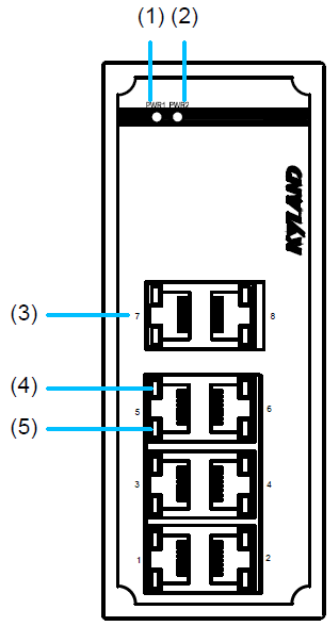


Figure 1 Front Panel of KIEN1009-8T

Table 2 Description of the Front Panel of KIEN1009-8T

No.	Identifier	Description
(1)	PWR1	Power 1 LED
(2)	PWR2	Power 2 LED
(3)	1-8	Eight 10/100Base-T(X) Ethernet ports
(4)	--	10/100Base-T(X) Ethernet port speed LED (yellow)
(5)	--	10/100Base-T(X) Ethernet port connection status LED (green)

- Front Panel of KIEN1009-1GX-2S/M-6T

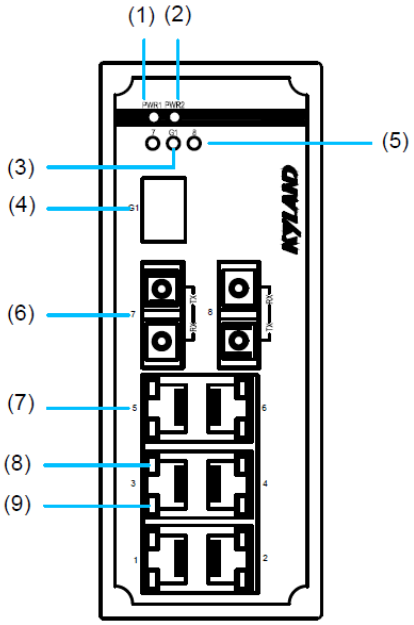


Figure 2 Front Panel of KIEN1009-1GX-2S/M-6T

Table 3 Description of the Front Panel of KIEN1009-1GX-2S/M-6T

No.	Identifier	Description
(1)	PWR1	Power 1 LED
(2)	PWR2	Power 2 LED
(3)	G1	Gigabit SFP slot connection status LED
(4)	G1	Gigabit SFP slot
(5)	7-8	100Base-FX Ethernet port connection status LEDs
(6)	7-8	Two 100Base-FX Ethernet ports
(7)	1-6	Six 10/100Base-T(X) Ethernet ports
(8)	--	10/100Base-T(X) Ethernet port speed LED (yellow)
(9)	--	10/100Base-T(X) Ethernet port connection status LED (green)

2.2 Top Panel

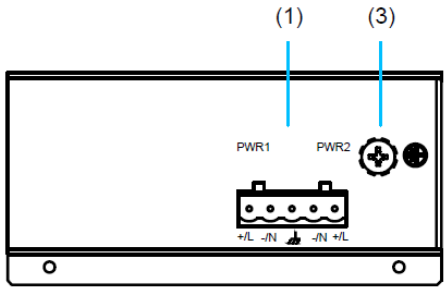


Figure 3 Top Panel

Table 4 Description of Top Panel

No.	Identifier	Description
(1)	PWR1 PWR2 +/L -/N -/N +/L	Power terminal block
(3)	--	Grounding screw

3 Mounting

3.1 Dimension Drawing

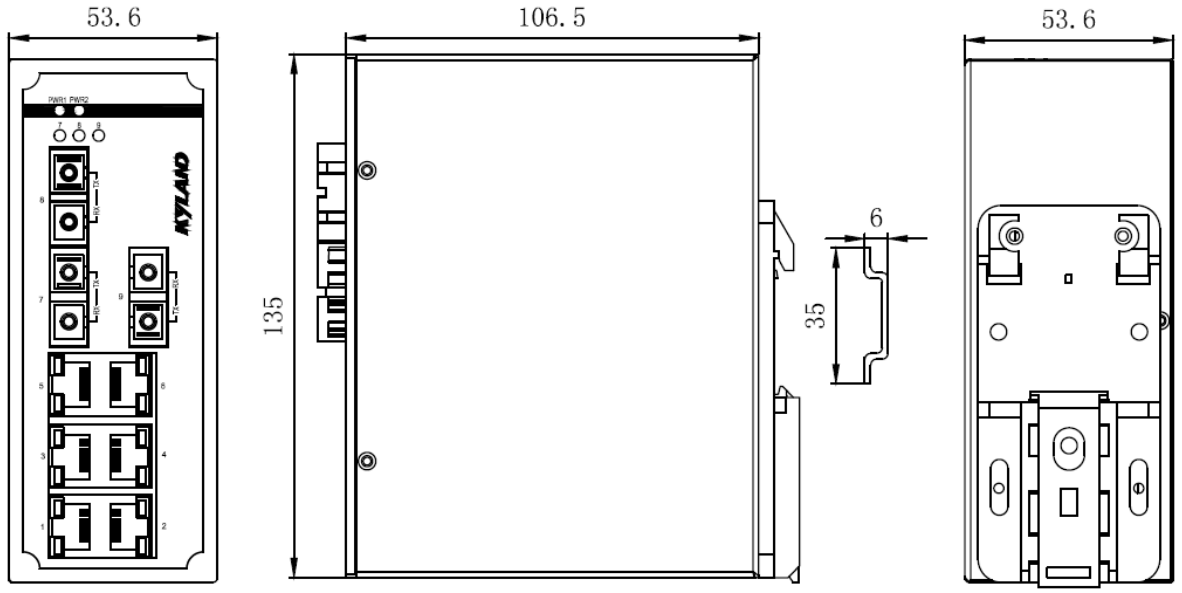


Figure 4 Dimensions for DIN-Rail Mounting (unit: mm)

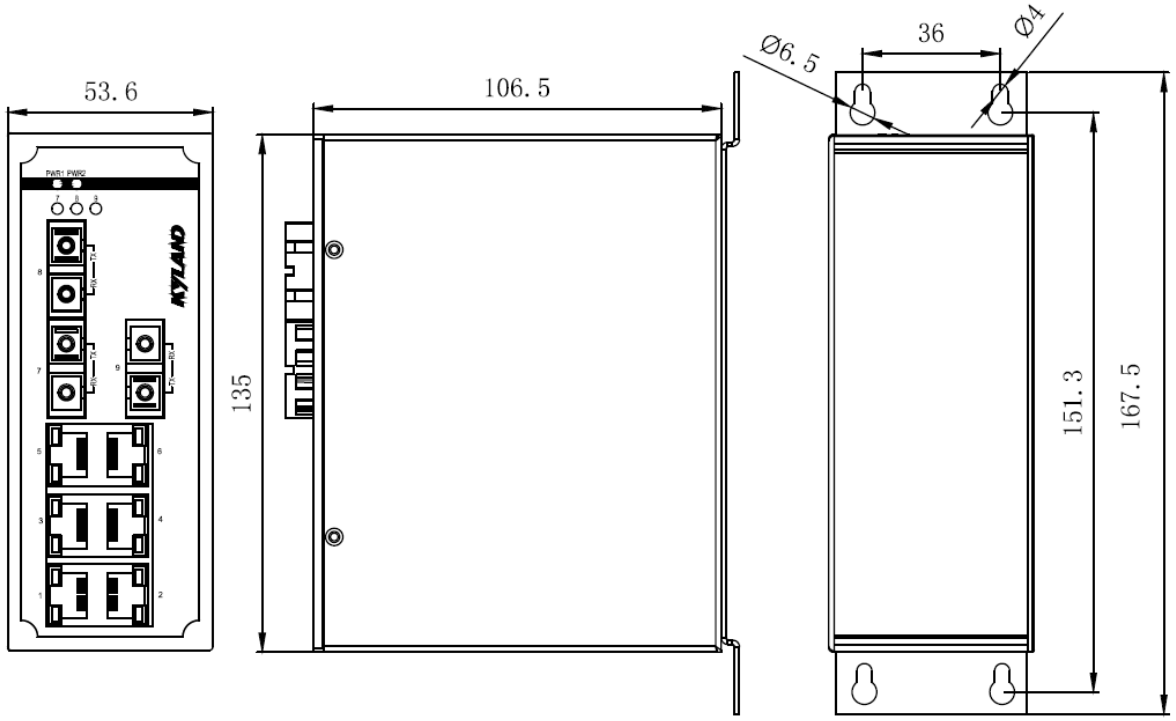


Figure 5 Dimensions for Panel Mounting (unit: mm)

Caution:

- As part of the heat dissipation system, the switch housing becomes hot during operation.

Please use caution when coming in contact and avoid covering the switch housing when the switch is running.

- KIEN1009-3S/M-6T is used as an example to show the dimensions and mounting modes. The dimensions and mounting modes of other models are similar.
- The figures in this manual are only for reference.

3.2 Mounting Modes and Steps

The series switches support DIN-rail and panel mounting. Before installation, make sure that the following requirements are met.

1) Environment: ambient temperature (see 6 Basic Features and Specifications), ambient relative humidity (5% to 95%, non-condensing)
2) Power requirement: The power input is within the voltage range of the switch.
3) Grounding resistance: <5Ω
4) No direct sunlight, distant from heat source and areas with strong electromagnetic interference.

3.2.1 DIN-Rail Mounting

- Mounting

Step 1: Select the mounting position for the device and guarantee adequate space and heat dissipation (dimensions: 53.6mm×135mm×106.5mm).

Step 2: Insert the connecting seat onto the top of the DIN rail, and push the bottom of the device inward and upward to ensure the DIN rail fits in the connecting seat. Make sure the device is firmly installed on the DIN rail, as shown in the following figure.

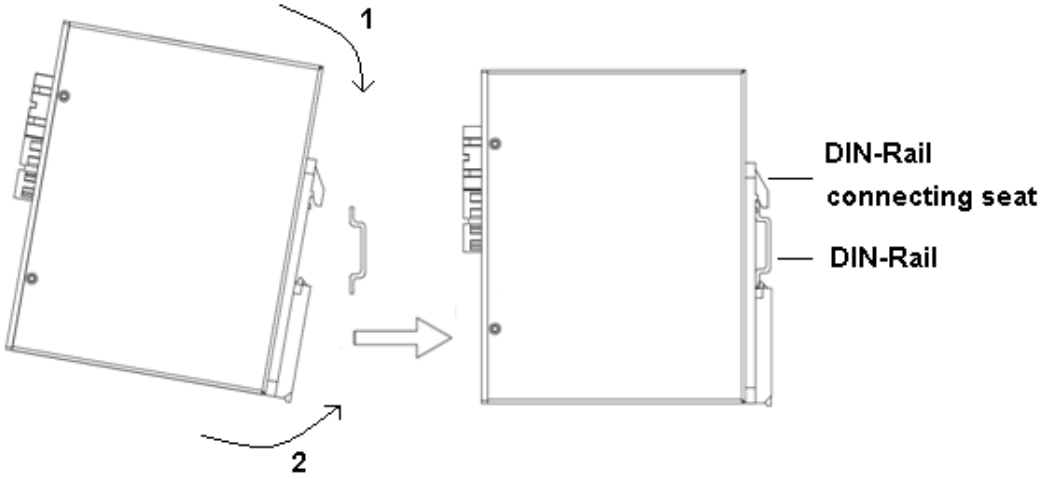


Figure 6 DIN-Rail Mounting

- Dismounting

Step 1: Insert the head of a screwdriver into the opening of the spring locking piece at the bottom from the left. Lift the handle of the screwdriver to open the spring locking piece of the connecting seat, as shown on the left of the following figure.

Step 2: Move the device in direction 2 until the bottom of the device is detached from the DIN rail. Then move the device in direction 3 and uplift the device until the top of the connecting seat is detached from the DIN rail.

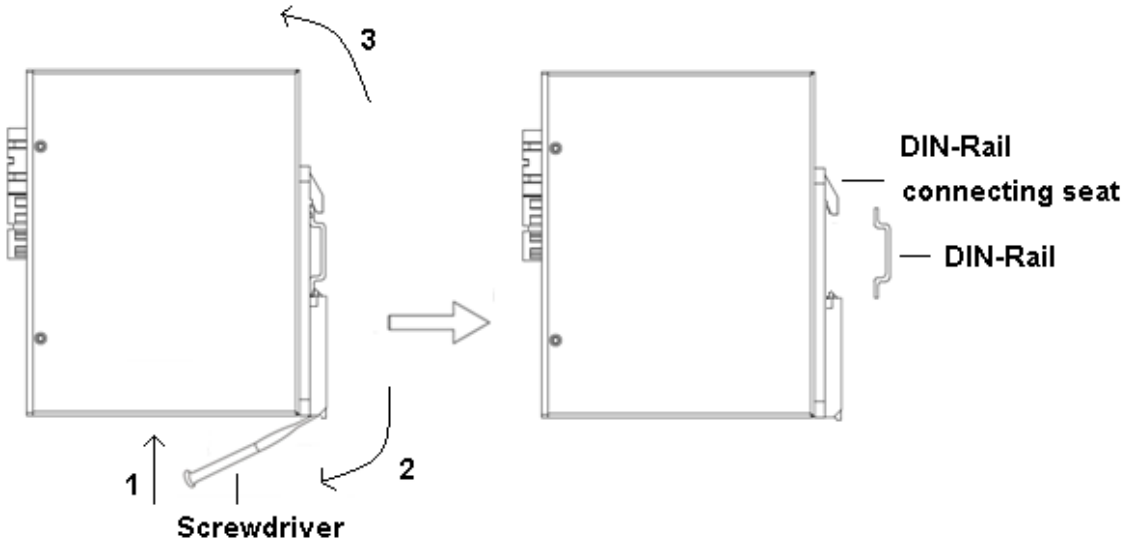


Figure 7 DIN-Rail Dismounting

3.2.2 Panel Mounting

Caution:

Purchase the plate (optional) for panel mounting.

- Mounting

Step 1: Use screws to secure the plate for panel mounting to the rear panel of the device.

Step 2: Select the mounting position (on a wall or inner wall of a cabinet) for the device and guarantee adequate space and heat dissipation (dimensions: 53.6mm×135mm×106.5mm).

Step 3: Punch four holes in the selected position according to the dimensions for panel mounting. Insert four screws into the four holes respectively, and turn the screws with a screwdriver until about a 5mm distance is left between each screw head and the wall.

Step 4: Align the four mounting holes on the plate for panel mounting with the four screws. Insert the screws through the Φ6.5 positions in the following figure. Move the device in direction 1 until the screws are in the Φ4 positions. Then tighten the screws.

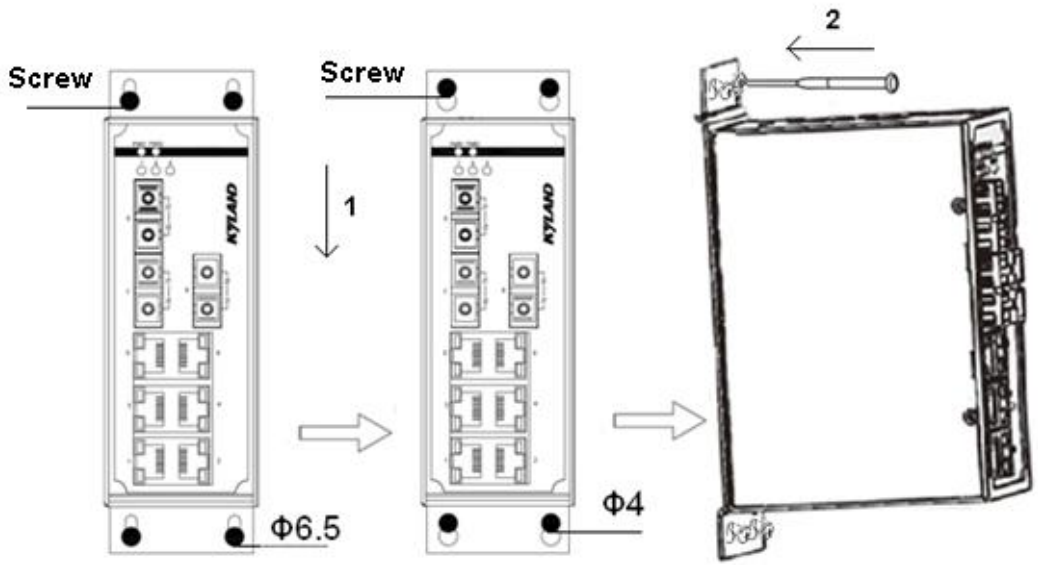


Figure 8 Panel Mounting

- Dismounting

Step 1: Loosen the four screws with a screwdriver. Pull the device upward until the four screws are in the Φ6.5 positions in the following figure. Then remove the plate for panel mounting from the four screws to detach the device from the wall or inner wall of the cabinet.

Step 2: Loosen the screws completely with a screwdriver. Remove them from the wall or inner wall of the cabinet. Then remove the plate for panel mounting from the rear panel to complete dismounting the device.

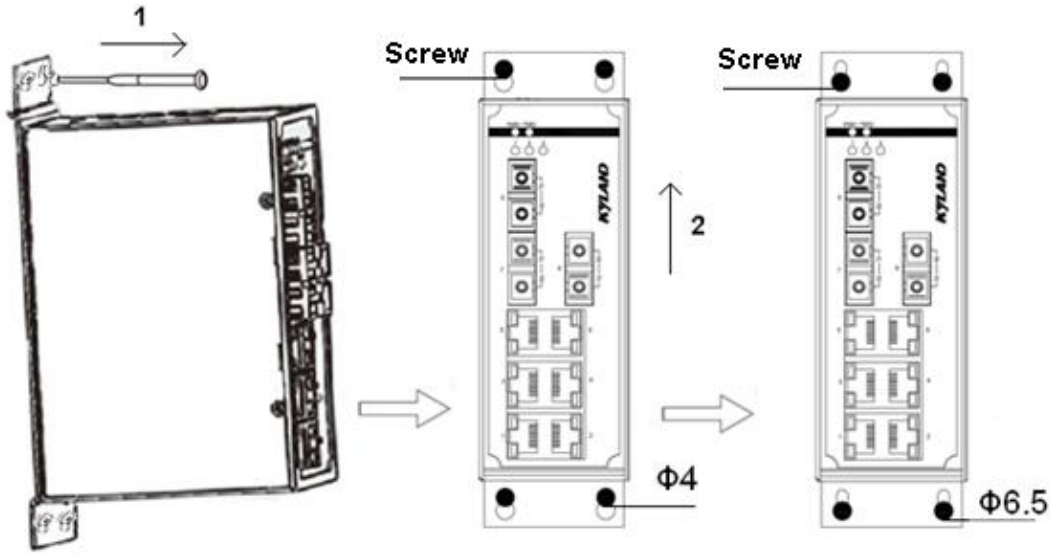


Figure 9 Panel Dismounting

4 Connection

4.1 10/100Base-T(X) Ethernet Port

10/100Base-T(X) Ethernet port is equipped with RJ45 connector. The port is self-adaptive. It can automatically configure itself to work in 10M or 100M state, full or half duplex mode. The port can also adapt to MDI or MDI-X connection automatically. You can connect the port to a terminal or network device with a straight-through or cross-over cable.

- Pin Definition

The following figure shows the pin numbers of the 10/100Base-T(X) RJ45 port.

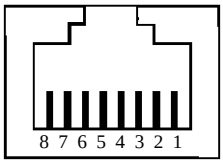


Figure 10 RJ45 Port

The following table lists the pin definitions of the 10/100Base-T(X) RJ45 port.

Table 5 Pin Definitions of 10/100Base-T(X) RJ45 Port

Pin	MDI-X Signal	MDI Signal
1	Receive Data+ (RD+)	Transmit Data+ (TD+)
2	Receive Data- (RD-)	Transmit Data- (TD-)
3	Transmit Data+ (TD+)	Receive Data+ (RD+)
6	Transmit Data- (TD-)	Receive Data- (RD-)
4, 5, 7, 8	Unused	Unused
Note: "+" and "-" indicate level polarities.		

- Wiring Sequence

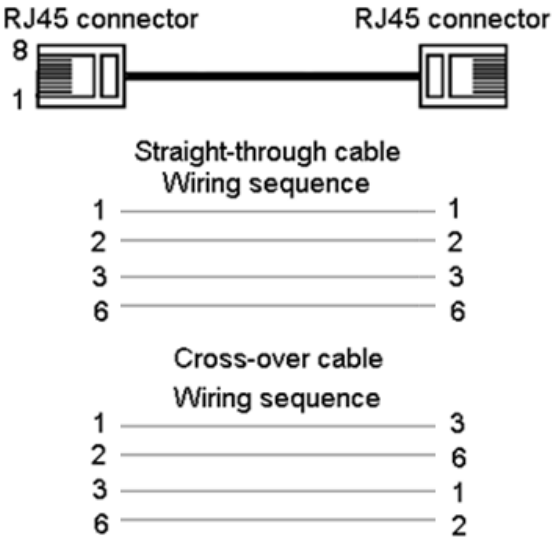


Figure 11 Connection Using Straight-through/Cross-over Cable

Note:

The color of the cable for RJ45 connector meets the 568B standard: 1-orange and white, 2-orange, 3-green and white, 4-blue, 5-blue and white, 6-green, 7-brown and white, and 8-brown.

4.2 100Base-FX Ethernet Port

100Base-FX Ethernet port is equipped with FC/ST/SC connector, and each port consists of TX (transmit) port and RX (receive) port. To enable data transmission between Device A and Device B, connect the TX port of Device A to the RX port of Device B, and the RX port of Device A to the TX port of Device B. The following uses an SC port as an example. The wiring sequence of an ST/FC port is the same with that of the SC port.

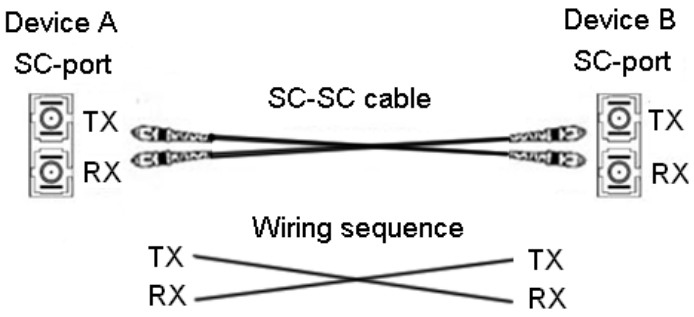


Figure 12 Connection of 100Base-FX Ethernet Port

Caution:

The device uses laser to transmit signals in fibers. The laser meets the requirements of level 1 laser products. Routine operation is not harmful to your eyes, but do not look directly at the fiber port when the device is powered on.

4.3 1000Base-X, 10/100/1000Base-T(X) SFP Slot

1000Base-X, 10/100/1000Base-T(X) SFP slot (gigabit SFP slot) requires an SFP optical/electrical module to enable data transmission. The following table lists the gigabit SFP optical/electrical modules (optional) supported by the series switches.

Table 6 Gigabit SFP Optical/Electrical Modules

Model	Port	MM/SM	Connector	Central Wavelength	Transmission Distance
IGSFP-M-SX-LC-850-0.55	1000Base-X port	MM	LC	850nm	0.55km
IGSFP-S-LX-LC-1310-10	1000Base-X port	SM	LC	1310nm	10km
IGSFP-S-LH-LC-1310-40	1000Base-X port	SM	LC	1310nm	40km
IGSFP-S-ZX-LC-1550-80	1000Base-X port	SM	LC	1550nm	80km
IGSFP-10/100/1000BASE-T-RJ45	10/100/1000Base-T(X) port	--	RJ45	--	--

4.3.1 Gigabit SFP Optical Module

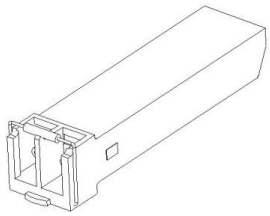


Figure 13 Gigabit SFP Optical Module

An SFP optical module is equipped with LC connector, and each port consists of a TX (transmit) port and an RX (receive) port. To enable communication between Device A and Device B, connect the TX port of Device A to the RX port of Device B, and the RX port of Device A to the TX port of Device B, as shown in the following figure.

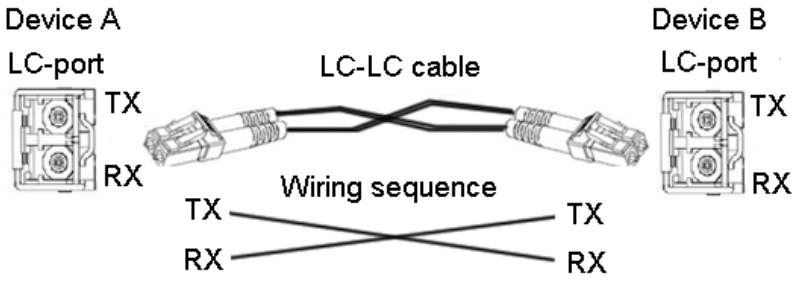


Figure 14 Fiber Connection of the SFP Optical Module

- How to Connect the SFP Optical Module

Insert the SFP optical module into the SFP slot in the switch, and then insert the fibers into the TX port and RX port of the SFP module.

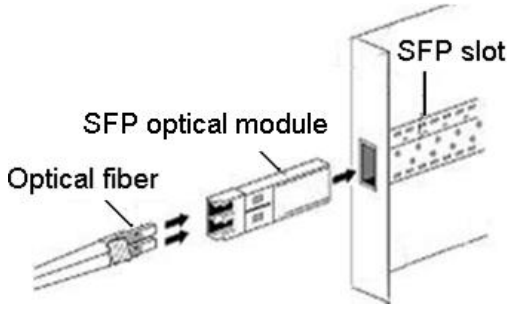


Figure 15 Connecting the SFP Optical Module

Identify the RX port and TX port of an SFP optical module:

1. Insert the two connectors in one end of two fibers into the SFP module, and those in the other end into the peer module.
2. View the corresponding connection status LED:

   If the LED is on, the connection is correct. If the LED is off, the link is not connected. This may be caused by incorrect connection of the TX and RX ports. In this case, swop the two connectors at one end of the fibers.

Caution:

- The device uses laser to transmit signals in fibers. The laser meets the requirements of level 1 laser products. Routine operation is not harmful to your eyes, but do not look directly at the fiber port when the device is powered on.
- If the defined transmission distance of an SFP module is longer than 60km, do not use a short fiber (<20km) for connection. If such a short fiber is used, the module will be burned.

4.3.2 Gigabit SFP Electrical Module

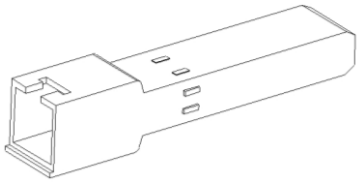


Figure 16 Gigabit SFP Electrical Module

- How to Connect the SFP Electrical Module

Insert the SFP electrical module into the SFP slot in the switch, and then insert the RJ45 connector of the twisted pair into the SFP module.

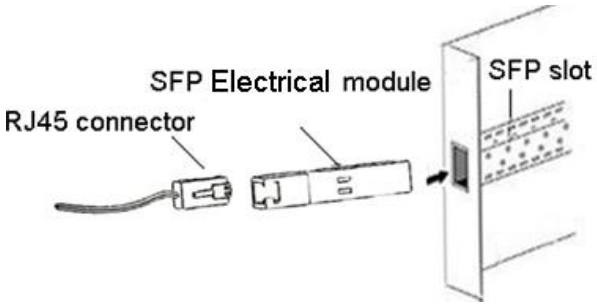


Figure 17 Connecting the SFP Electrical Module

4.4 Grounding

Grounding protects the switch from lightning and interference. Therefore, you must ground the switch properly. You need to ground the switch before it is powered on and disconnect the grounding cable after the switch is powered off.

The switch provides a grounding screw on the top panel for chassis grounding. After crimping one end of the grounding cable to a cold pressed terminal, secure the end to the grounding screw and connect the other end to the earth firmly.

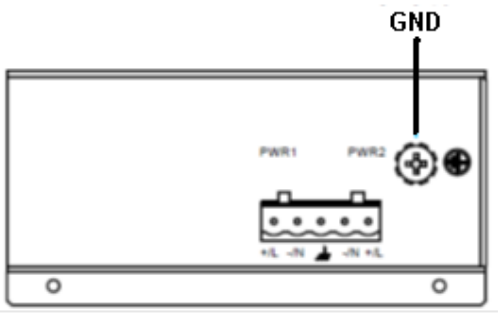


Figure 18 Grounding

Note:

Cross-sectional area of the chassis grounding cable>2.5mm^2; grounding resistance<5Ω

4.5 Power Terminal Block

There is a power terminal block on the top panel of the device. You need to connect the power wires to the terminal block to provide power for the device. The device supports redundant power supply with 5-pin 5.08mm-spacing plug-in terminal block. When the redundant power supply is used and one power input is faulty, the device can continue operating properly, thereby improving network reliability.

Note:

- Grounding resistance<5Ω.
- Use copper conductors only, temperature rating 75℃ only.

The following figure shows the 5-pin 5.08mm-spacing plug-in terminal block.

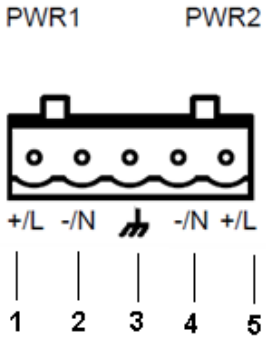


Figure 19 5-Pin 5.08mm-Spacing Plug-in Terminal Block (socket)

The following table lists the pin definitions of the 5-pin 5.08mm-spacing plug-in terminal block.

Table 7 Pin Definitions of 5-Pin 5.08mm-Spacing Plug-in Terminal Block

No.	DC Definition	AC Definition
1	PWR1: +	PWR1: L
2	PWR1: -	PWR1: N
3	PGND	PGND

4	PWR2: -	PWR2: N
5	PWR2: +	PWR2: L

- Wiring and Mounting

Step 1: Ground the device properly according to section 4.4.

Step 2: Remove the power terminal block from the device.

Step 3: Insert the power wires into the power terminal block according to Table 7, and secure the wires.

Step 4: Insert the terminal block with the connected wires into the terminal block socket on the device.

Step 5: Connect the other end of the power wires to the external power supply system according to the power supply requirements of the device. View the status of the power LEDs on the front panel. If the LEDs are on, the power is connected properly.

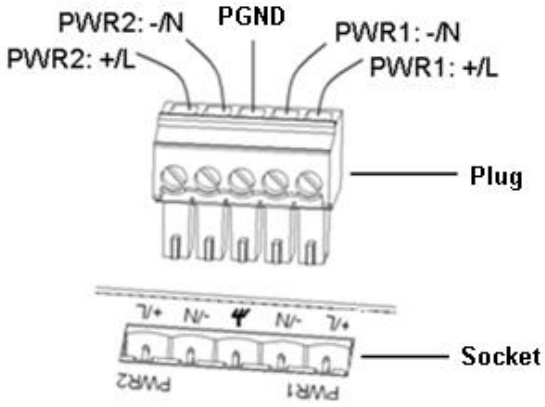


Figure 20 Connection of 5-Pin 5.08mm-Spacing Plug-in Terminal Block

Wiring and Mounting should meet following specifications.

Table 8 Wiring and Mounting Specifications

Terminal Type	**Required Torque**	**Wire Range (AWG)**
Terminal Block Plug	4.5-5.0 lb-in for WEIDMUELLER terminal block	12-24
	5-7 lb-in for PHOENIX terminal block	

Caution:

- The switch supports 12DCW and 24DCW(UL approved) power input. Before connecting the

device to power supply, make sure that the power input meets the power requirement. If connected to an incorrect power input, the device may be damaged.

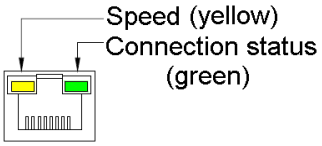
- To comply with UL restrictions, this equipment must be powered from a source compliant with Class 2.

Warning:

- Do not touch any exposed conducting wire, terminal, or component with a voltage warning sign, because it may cause damage to humans.
- Do not remove any part or plug in or out any connector when the device is powered on.

5 LEDs

Table 9 LEDs

LED	State	Description
Power LED (applicable to single power supply)	On	The power is connected and operates properly.
	Off	The power is not connected or operates abnormally.
Power 1 LED (applicable to redundant power supply)	On	Power 1 is connected and operates properly.
	Off	Power 1 is not connected or operates abnormally.
Power 2 LED (applicable to redundant power supply)	On	Power 2 is connected and operates properly.
	Off	Power 2 is not connected or operates abnormally.
100Base-FX Ethernet port connection status LED	On	Effective port connection
	Blinking	Ongoing network activities
	Off	No effective port connection
Gigabit SFP slot connection status LED	On	Effective port connection
	Blinking	Ongoing network activities
	Off	No effective port connection
		
10/100Base-T(X) Ethernet port speed LED (yellow)	On	100M working state (100Base-TX)
	Off	10M working state (10Base-T) or no connection
10/100Base-T(X) Ethernet port connection status LED (green)	On	Effective port connection
	Blinking	Ongoing network activities
	Off	No effective port connection

6 Basic Features and Specifications

Power Requirements		
Power Identifier	Rated Voltage Range	Maximum Voltage Range
L5(12DCW)	12-24VDC	9-36VDC
L2(24DCW, UL approved)	24-48VDC	18-72VDC 18-60VDC(UL approved)
Terminal block	5-pin 5.08mm-spacing plug-in terminal block	
Rated Power Consumption		
Rated power consumption	6.5W (MAX)	
Physical Characteristics		
Housing	Aluminum, fanless	
Installation	DIN-rail mounting and panel mounting	
Dimensions (W×H×D)	53.6mm×135mm×106.5mm (excluding connectors, DIN rail, and plate for panel mounting)	
Weight	0.76Kg	
Environmental Limits		
Ambient temperature	-40℃~+85℃ Only L2 model gets UL certification with the max ambient temperature of 75℃.	
Storage temperature	-40℃~+85℃	
Ambient relative humidity	5%~95% (non-condensing)	
MTBF		
MTBF	397,000 hours	
Warranty		
Warranty	5 years	

Note:

Signal output rated voltage is less than 30 volts.

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