

SICOM3024 Industrial Ethernet Switch

Hardware Installation Manual

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KYLAND

SICOM3024 Industrial Ethernet Switch

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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.

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1 Product Overview

SICOM3024 includes a series of managed industrial Ethernet switches developed by Kyland for applications in the power, rail transit, and many other industries. SICOM3024, equipped with a variety of ports, supports power failure alarm. The series switches can be managed through CLI, Telnet, Web, Kyvision, and SNMP-based network management software.

SICOM3024 supports 19 inch 1U rack mounting. It provides up to four 1000Base-X, 10/100/1000Base-T(X) SFP slots (gigabit SFP slots), eight fiber or copper (optional) 100M Ethernet ports, and sixteen 10/100Base-T(X) Ethernet ports, as listed in the following table.

Table 1 SICOM3024 Models

Model	Number of Ports			Power Supply
	Gigabit SFP slot	100Base-FX Ethernet port	10/100Base-T(X) Ethernet port	
SICOM3024-4GX-8S/M-16T	4	8	16	24DC, 48DC, 220AC/DCW (single and redundant power supply)
SICOM3024-4GX-6S/M-18T	4	6	18	
SICOM3024-4GX-4S/M-20T	4	4	20	
SICOM3024-4GX-2S/M-22T	4	2	22	
SICOM3024-4GX-24T	4	--	24	
SICOM3024-8S/M-16T	--	8	16	
SICOM3024-6S/M-18T	--	6	18	
SICOM3024-4S/M-20T	--	4	20	
SICOM3024-2S/M-22T	--	2	22	
SICOM3024-24T	--	--	24	



Note:

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

2 Structure and Interface


Caution:

To keep ports clean and ensure switch performance, you are advised to purchase the port dustproof shield (optional).

2.1 Front Panel

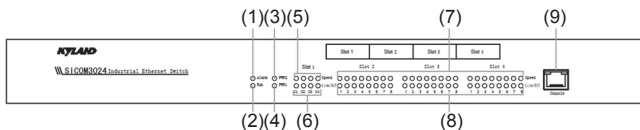


Figure 1 Front Panel of SICOM3024

Table 2 Description of the Front Panel of SICOM3024

No.	Identifier	Description
(1)	Alarm	Alarm LED
(2)	Run	Running LED
(3)	PWR2	Power 2 LED
(4)	PWR1	Power 1 LED
(5)	Slot 1 (G1-G4): Speed	Speed LEDs for four gigabit SFP slots
(6)	Slot 1 (G1-G4): Link/ACT	Connection status LEDs for four gigabit SFP slots
(7)	Slot 2-Slot 4 (1-8): Speed	Speed LEDs for twenty-four 100M Ethernet ports
(8)	Slot 2-Slot 4 (1-8): Link/ACT	Connection status LEDs for twenty-four 100M Ethernet ports
(9)	Console	Console port

2.2 Rear Panel

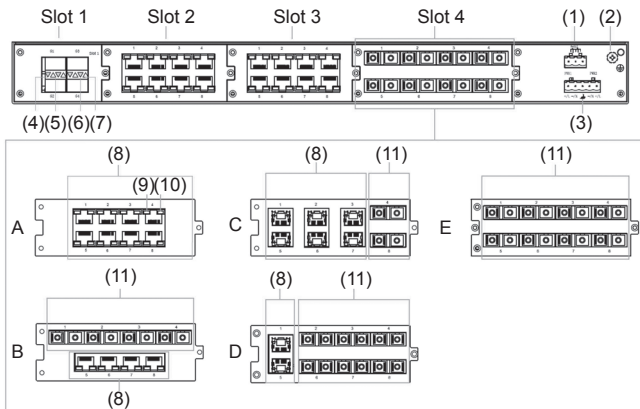


Figure 2 Rear Panel of SICOM3024

Table 3 Description of the Rear Panel of SICOM3024

No.	Description
(1)	Alarm terminal block
(2)	Grounding screw
(3)	Power terminal block
(4)	Lower gigabit SFP slot connection status LED (green)
(5)	Lower gigabit SFP slot speed LED (yellow)
(6)	Upper gigabit SFP slot connection status LED (green)
(7)	Upper gigabit SFP slot speed LED (yellow)
(8)	10/100Base-T(X) Ethernet port
(9)	10/100Base-T(X) Ethernet port speed LED (yellow)
(10)	10/100Base-T(X) Ethernet port connection status LED (green)
(11)	100Base-FX Ethernet port

**Caution:**

- The figure above shows the rear panel of SICOM3024. The layout of slot1, slot2, and slot3 is fixed and that of slot4 can be A, B, C, D, or E. The actual layout depends on the models you select. Kyland will provide integrated devices for you according to your selection.
- A blind plate is inserted in slot 1 of the following models:
SICOM3024-8S/M-16T, SICOM3024-6S/M-18T,
SICOM3024-4S/M-20T, SICOM3024-2S/M-2T,
SICOM3024-24T.

3 Mounting

3.1 Dimension Drawing

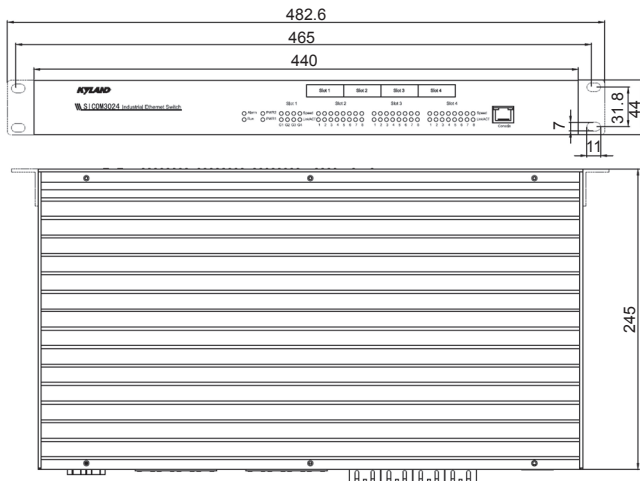


Figure 3 Dimension Drawing (unit: mm)



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.
- The figures in this manual are only for reference.

3.2 Mounting Modes and Steps

The series switches support rack mounting by the front/rear panel. The following uses mounting by front panel as an example to describe mounting steps. The steps for mounting by rear panel are similar to those for mounting by front panel. Before installation, make sure that the following requirements are met.

- 1) Environment: temperature (-40°C to 85°C), 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: $<5\Omega$
- 4) No direct sunlight, distant from heat source and areas with strong electromagnetic interference.

● Installing Mounting Brackets

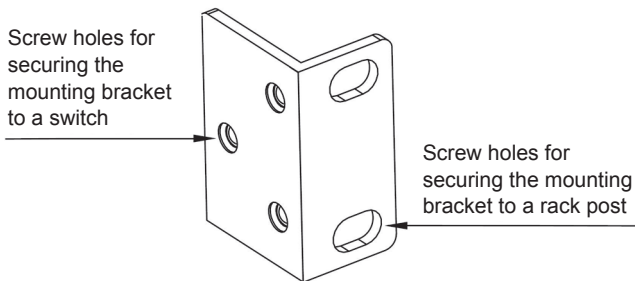


Figure 4 Mounting Bracket

You can select the screw holes for front or rear panel mounting to install the mounting brackets. If there are screws inserted in the screw holes, remove the screws and keep them for future use.

As shown in the following figure, use three screws to secure two mounting brackets to the switch respectively.

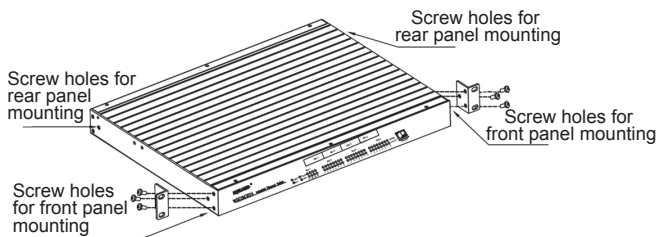


Figure 5 Installing Mounting Brackets

- Mounting

Step 1: Select the mounting position for the switch and guarantee adequate space and heat dissipation (dimensions: 440mm×44mm×245mm).

Step 2: Move the switch in direction 1 until the screw holes for securing the mounting brackets to rack posts are in alignment with the corresponding holes in the rack posts. Then use four screws and supporting captive nuts to secure the mounting brackets to the rack posts.

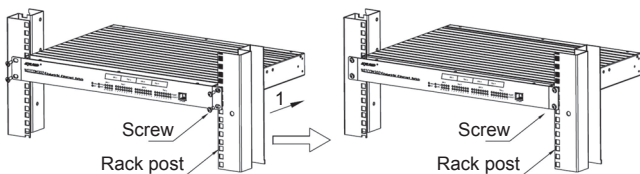


Figure 6 Mounting

- Dismounting

Step 1: Remove the four screws and supporting captive nuts securing the mounting brackets to the rack posts.

Step 2: Remove the switch from the rack posts. Then unscrew the mounting brackets to complete 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 RJ45 port.

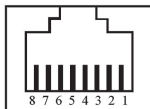



Figure 7 RJ45 Port

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

Table 4 Pin Definitions of 10/100Base-T(X) Ethernet 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
<div>  Note: "+" and "-" indicate level polarities. </div>		

- Wiring Sequence

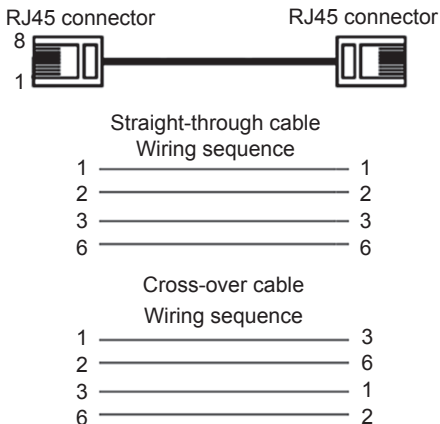


Figure 8 Connection Using Straight-through/Cross-over Cable



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.

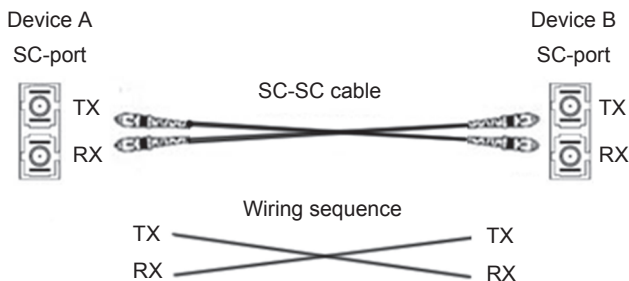


Figure 9 Connection of 100Base-FX Ethernet Port



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 5 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
IG-FSFP-M-LX-LC-1310-2	100Base-FX port	MM	LC	1310nm	2km
IG-FSFP-S-LX-LC-1310-10	100Base-FX port	SM	LC	1310nm	10km
IGSFP-10/100/1000BASE-T-RJ45	10/100/1000Base-T(X) port	--	RJ45	--	--

4.3.1 Gigabit SFP Optical Module

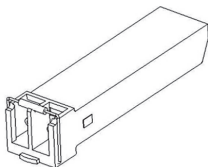


Figure 10 Gigabit SFP Optical Module

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.

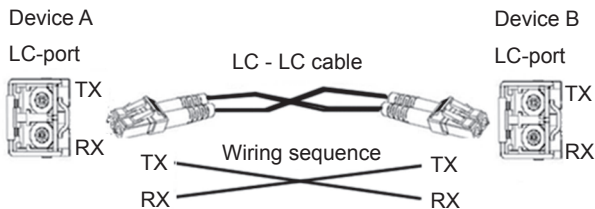


Figure 11 Fiber Connection of an SFP Optical Module

● 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.

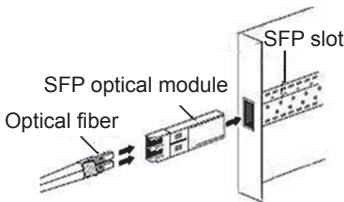


Figure 12 Connecting the SFP Optical Module

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, swap 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

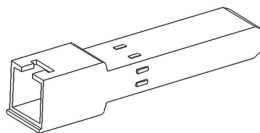


Figure 13 Gigabit SFP Electrical Module

- 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.

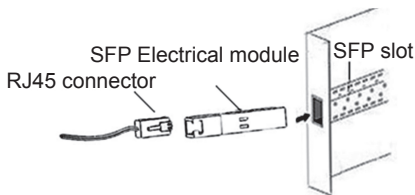
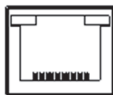


Figure 14 Connecting the SFP Electrical Module

4.4 Console Port

SICOM3024 provides a console port on the front panel. Connect the 9-pin serial port of a PC to the console port of the switch with a DB9-RJ45 console cable. Then you can configure, maintain, and manage the switch by running Hyper Terminal in Windows OS of a computer.



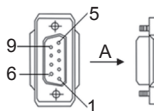
Console

Figure 15 Console Port

● DB9-RJ45 Console Cable

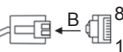
One end of a DB9-RJ45 console cable is the DB9 connector to be inserted into the 9-pin serial port of a PC, and the other end is crimped RJ45 connector to be inserted into the console port of the switch.

Facing the A direction



DB9 connector

Facing the B direction



RJ45 connector

Wiring sequence

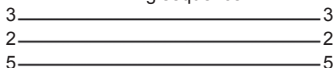


Figure 16 Wiring Sequence of DB9-RJ45 Console Cable

Table 6 Pin Definitions of DB9 Port (9-Pin Serial Port) and RJ45 Port (Console Port)

DB9 Port (9-Pin Serial Port)		RJ45 Port (Console Port)	
Pin	Signal	Pin	Signal
2	RXD (Receive data)	2	TXD (Transmit data)
3	TXD (Transmit data)	3	RXD (Receive data)
5	GND (Grounding)	5	GND (Grounding)

4.5 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 rear 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.

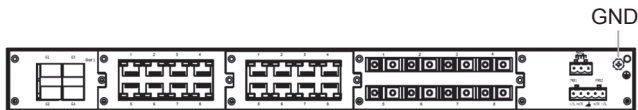


Figure 17 Grounding



Note:

Cross-sectional area of the chassis grounding cable $> 2.5\text{mm}^2$; grounding resistance $< 5\Omega$.

4.6 Power Terminal Block

There is a power terminal block on the rear panel of the device. You need to connect the power wires to the terminal block to provide power to the device. The device supports single (PWR1) and redundant (PWR1 and PWR2) power supply with a 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:**

$0.75\text{mm}^2 < \text{Cross-sectional area of the power wire} < 2.5\text{mm}^2$;
grounding resistance $< 5\Omega$.

● 5-Pin 5.08mm-Spacing Plug-in Terminal Block

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

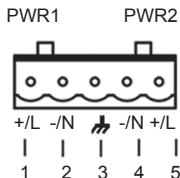




Figure 18 5-Pin 5.08mm-Spacing Plug-in Terminal Block (socket)

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.	Signal	DC Definition	AC Definition
1	+/L	PWR1: +	PWR1: L
2	-/N	PWR1: -	PWR1: N
3		PGND	PGND
4	-/N	PWR2: -	PWR2: N
5	+/L	PWR2: +	PWR2: L
<div>  Caution: For single power supply, only pins 1, 2, and 3 (PWR1) of the terminal block can be connected. Do not use pins 4 and 5. </div>			

● Wiring and Mounting

Step 1: Ground the device properly according to section 4.5.

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.

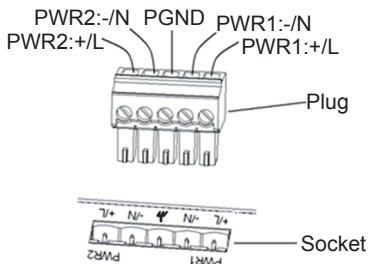


Figure 19 Connection of 5-Pin 5.08mm-Spacing Plug-in Terminal Block

**Caution:**

The switch supports 24DC, 48DC, and 220AC/DCW 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.

**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.

4.7 Alarm Terminal Block

The device provides an alarm terminal block on the rear panel for alarm output. When the switch works properly, the normally-open contacts of the alarm relay are closed and the normally-closed contacts are open; when an alarm occurs, the normally-open contacts are open and the normally-closed contacts are closed. The alarm is outputted through a 3-pin 5.08mm-spacing plug-in terminal block.



Figure 20 Alarm Terminal Block (socket)

Electrical parameters of the relay:

Max Switch Voltage: 250VAC/220VDC;

Max Switch Current: 2A

Max Switching Power: 60W

Dielectric Strength: 2KV


Note:

Pin 1 and pin 2 are normally-open contacts; pin 2 and pin 3 are normally-closed contacts. When the switch works properly, pin 1 and pin 2 are closed, pin 2 and pin 3 are open; when an alarm occurs, pin 1 and pin 2 are open; pin 2 and pin 3 are closed.

● Wiring and Mounting

Step 1: Remove the alarm terminal block from the switch.

Step 2: Secure the three wires for alarm into the alarm terminal block in the required sequence.


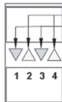
Step 3: Insert the alarm terminal block into its socket.

5 LEDs

Table 8 Front Panel LEDs

LED		State	Description
Power 1 LED		On	Power 1 is connected and operates properly.
		Off	Power 1 is not connected or operates abnormally.
Power 2 LED		On	Power 2 is connected and operates properly.
		Off	Power 2 is not connected or operates abnormally.
Running LED		On	The device is starting up.
		Blinking	The CPU operates properly.
		Off	The device does not start up.
Alarm LED		On	An alarm occurs.
		Off	No alarm occurs.
100M port speed LED	10/100Base-T(X) Ethernet port	On	100M working state (100Base-TX)
		Off	10M working state (10Base-T) or no connection
	100Base-FX Ethernet port	On	100M working state (100Base-FX)
		Off	No connection
100M port connection status LED		On	Effective port connection
		Blinking	Ongoing network activities
		Off	No effective port connection
Gigabit SFP slot speed LED	Gigabit SFP optical module	On	1000M working state (1000Base-X)
		Off	100M working state (100Base-FX) or no connection
	Gigabit SFP electrical module	On	1000M working state (1000Base-TX)
		Off	10/100M working state (10/100Base-T(X)) or no connection
Gigabit SFP slot connection status LED		On	Effective port connection
		Blinking	Ongoing network activities
		Off	No effective port connection

Table 9 Rear Panel LEDs

LED	State	Description	
<div></div>			
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	
<div></div>			
LED 1 and LED 2 indicate the status of the lower gigabit SFP slot, while LED 3 and LED 4 indicate the status of the upper gigabit SFP slot.			
Gigabit SFP slot speed LED (yellow)	Gigabit SFP optical module	On	1000M working state (1000Base-X)
		Off	100M working state (100Base-FX) or no connection
	Gigabit SFP electrical module	On	1000M working state (1000Base-TX)
		Off	10/100M working state (10/100Base-T(X)) or no connection
Gigabit SFP slot connection status LED (green)	On	Effective port connection	
	Blinking	Ongoing network activities	
	Off	No effective port connection	

6 Switch Access

You can access the switch in any of the following ways:

6.1 Access through Console Port

Step 1: Connect the console port of the switch to the 9-pin serial port of a PC with the delivered DB9-RJ45 console cable.

Step 2: Open Hyper Terminal in Windows OS. On the computer's desktop, click Start → All Programs → Accessories → Communications → Hyper Terminal.

Step 3: Create a connection "Switch", as shown in the following figure.

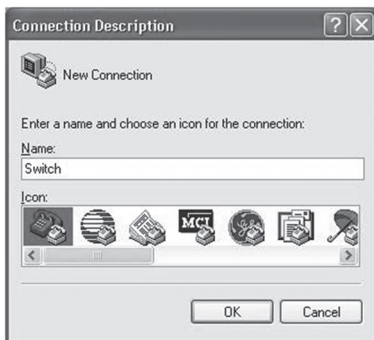


Figure 21 Creating a Connection

Step 4: Connect the communication port in use, as shown in the following figure.



Figure 22 Selecting a Serial Port

**Note:**

To confirm the communication port in use, right-click [My Computer] and select [Property]. Click [Hardware] → [Device Manager] → [Port] to view the communication port.

Step 5: Set port parameters (Bits per second: 9600, Data bits: 8, Parity: None, Stop bits: 1, and Flow control: None), as shown in the following figure.

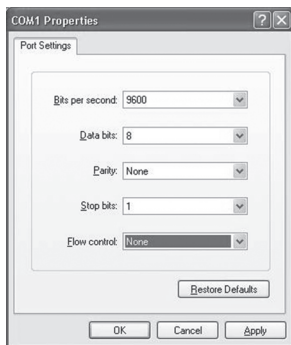


Figure 23 Setting Port Parameters

Step 6: Click OK to enter the switch CLI. Then the following commands can be used to perform operations.

Table 10 CLI Commands

View	Command	Description
User view	SWITCH>enable	Enter the management view.
Management view	SWITCH#show interface	Query the current IP address of the switch.
Management view	SWITCH#show version	Query the version of the switch.
Management view	SWITCH#reboot	Restart the switch.
Management view	SWITCH#load default	Restore the factory default settings (excluding the IP address).
Management view	SWITCH#config terminal	Enter the configuration view.

6.2 Access through Telnet

Step 1: Connect the network port of a PC to the Ethernet port of the switch with a network cable.

Step 2: On the Windows desktop, click Start and Run. The Run dialog box is displayed. Enter "telnet *IP address*". For example, if the IP address of the device is 192.168.0.2 (default IP address of the device), enter "telnet 192.168.0.2" in the dialog box.

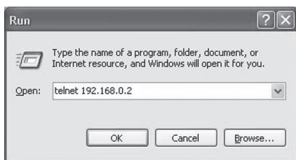


Figure 24 Access through Telnet

Step 3: Click OK. The Telnet CLI is displayed. Then you can run the commands in Table 10 to perform operations.

6.3 Access through Web

Step 1: Connect the network port of a PC to the Ethernet port of the switch with a network cable.

Step 2: Enter the IP address of the device in the address box of the browser. The user login interface is displayed. You can log in to the Web UI by default user name "admin" and password "123".



Note:

- IE8.0 or a later version is recommended.
- For details about how to access the device and other operations, refer to the Web operation manual in the delivered CD.

7 Basic Features and Specifications

Power Requirements

Power Identifier	Rated Voltage Range	Maximum Voltage Range
24DC	24VDC	18-36VDC
48DC	48VDC	36-72VDC
220AC/DCW	100-240VAC, 50/60Hz; 110-220VDC	85-264VAC/77-300VDC
Terminal block	5-pin 5.08mm-spacing plug-in terminal block	

Rated Power Consumption

Rated power consumption	24W (MAX)
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Physical Characteristics

Housing	Aluminum, fanless
Installation	19 inch 1U rack mounting
Dimensions (W×H×D)	440mm×44mm×245mm (excluding connectors and mounting brackets)
Weight	4.1Kg

Environmental Limits

Operating temperature	-40℃~+85℃
Storage temperature	-40℃~+85℃
Ambient relative humidity	5%~95% (non-condensing)

MTBF

MTBF	318,296 hours
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Warranty

Warranty	5 years
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