

# **SICOM8000 Industrial Ethernet Switch**

## **Hardware Installation Manual**

***KYLAND***

**Kyland Technology Co., Ltd.**

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## **SICOM8000 Industrial Ethernet Switch**

### **Hardware Installation Manual**

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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 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. Overhigh 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 jewelries (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 lightning.
- 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.

# Contents

1 Product Overview .....	1
2 Structure and Interface .....	3
3 Mounting.....	5
3.1 Dimension Drawing .....	5
3.2 Mounting Modes and Steps .....	5
3.2.1 Panel Mounting.....	6
3.2.2 Panel Dismounting (both vertical and horizontal) .....	8
4 Connection.....	9
4.1 10/100Base-T(X) Ethernet Port .....	9
4.2 1000Base-X Ethernet Port.....	11
4.3 Console Port.....	12
4.4 Grounding.....	13
4.5 Power Port.....	14
4.6 Alarm Port .....	15
5 Switch Access.....	16
5.1 Access through Console Port .....	16
5.2 Access through Telnet.....	18
5.3 Access through Web .....	18
6 Basic Features and Specifications.....	19

# 1 Product Overview

SICOM8000 includes a series of high-performance Ethernet switches developed by Kyland particularly for military applications. SICOM8000 is applicable to harsh and hazardous military environments due to the high-performance switching engine, solid closed housing, fanless but heat dissipation-capable single-rib shaped chassis, overcurrent, overvoltage, and EMC protection for power input, and sound EMC protection of M12 ports. Additionally, redundant power supply secures the reliable operation of the device. SICOM8000 provides powerful network management functions. The device can be managed through CLI, Telnet, Web, SNMP-based and OPC network management software.

The series switches support panel mounting and provide up to four 1000Base-X Ethernet ports and twenty-four 10/100Base-T(X) Ethernet ports.

Table 1 SICOM8000 Models

Model	Port		Power Supply
	1000Base-X Ethernet port	10/100Base-T(X) Ethernet port	
SICOM8000-4GX-24T	4	24	24DC, 48DC
SICOM8000-24T	--	24	(redundant)

Table 2 Optional Accessories

Model	Description
M12-4 Pin-99-3729-810-04	100M electrical port, console port, and alarm port connector
M16-5 Pin-99-5613-15-05	Power port connector
YMF15F02C1D40N-S	YMF adapter flange
DT-XL-TX-M12-RJ45-1m	M12 to RJ45 cable, 1m
DT-XL-PWR-M16-xxx-3m	M16 to bare end cable, 3m
YMF15T02B1P40N-2FC-C5*2-2S3/0.3	YMF fiber optic patch cord, single mode, 3m
YMF15T02B1P40N-YMF15T02B1P40N-C5*2-S5	YMF fiber optic patch cord, single mode, 5m
YMF15T02B1P40N-DLC-C5*2-2S5/0.15	YMF fiber optic patch cord, single mode, 5m
YMF15T02B1P11N-YMF15T02B1P11N-C5*2-S3	YMF fiber optic patch cord, single mode, 3m
YMF15T02B1P11N-DLC-C5*2-2S3/0.15	YMF fiber optic patch cord, single mode, 3m
YMF15F02A1D40N-2LC-S2-L0.5-2xLC	YMF fiber optic patch cord, single mode, 0.5m
YMF15T02B1P40N-SC-C5*2-2S5/0.15	YMF fiber optic patch cord, single mode, 5m
YMF15T02B1P40N-YMF15T02B1P40N-C5*2-S5	YMF fiber optic patch cord, single mode, 5m
YMF15T02B1P40N-C5*2-S2	YMF fiber optic patch cord, single mode, 2m



**Note:**

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

## 2 Structure and Interface

- Front Panel

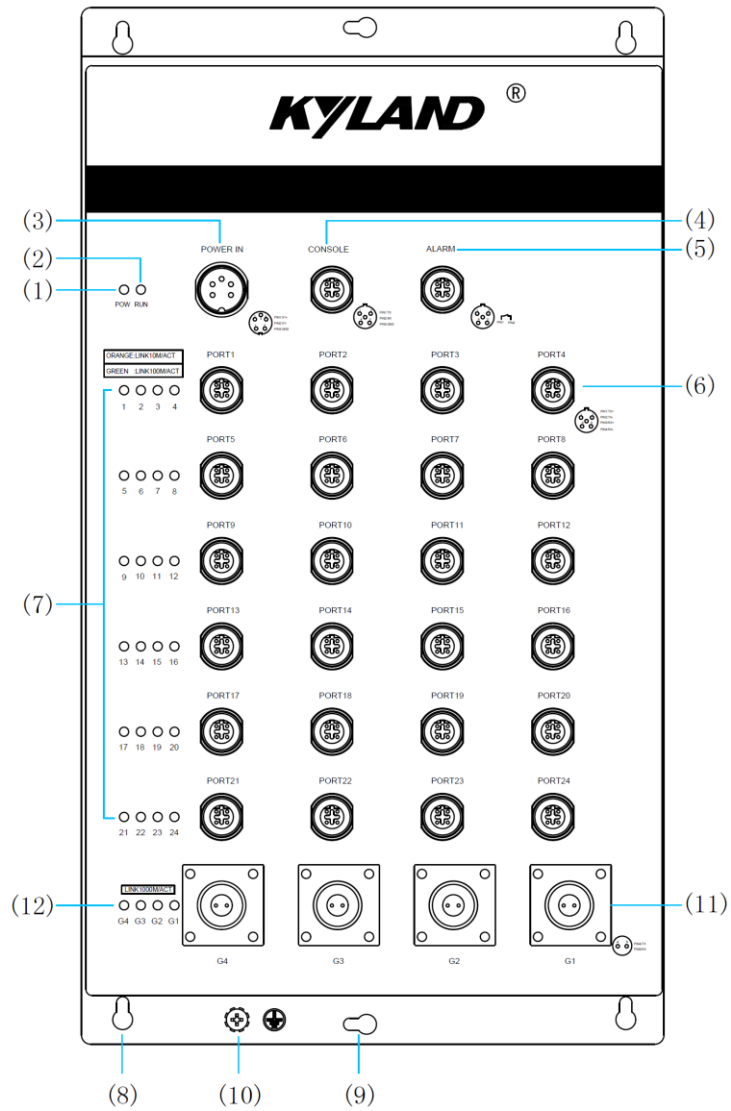


Figure 1 Front Panel



Table 3 Description of Front Panel

<b>No.</b>	<b>Identifier</b>	<b>Description</b>
(1)	POW	Power LED
(2)	RUN	Running LED
(3)	POWER IN	Power port
(4)	CONSOLE	Console port
(5)	ALARM	Alarm port
(6)	PORT1-PORT24	Twenty-four 10/100Base-T(X) Ethernet ports
(7)	1-24	LEDs for twenty-four 10/100Base-T(X) Ethernet ports
(8)	--	Screw hole for vertical mounting
(9)	--	Screw hole for horizontal mounting
(10)		Grounding screw
(11)	G1-G4	Four 1000Base-X Ethernet ports
(12)	G1-G4	1000Base-X Ethernet port LEDs

### 3 Mounting

#### 3.1 Dimension Drawing

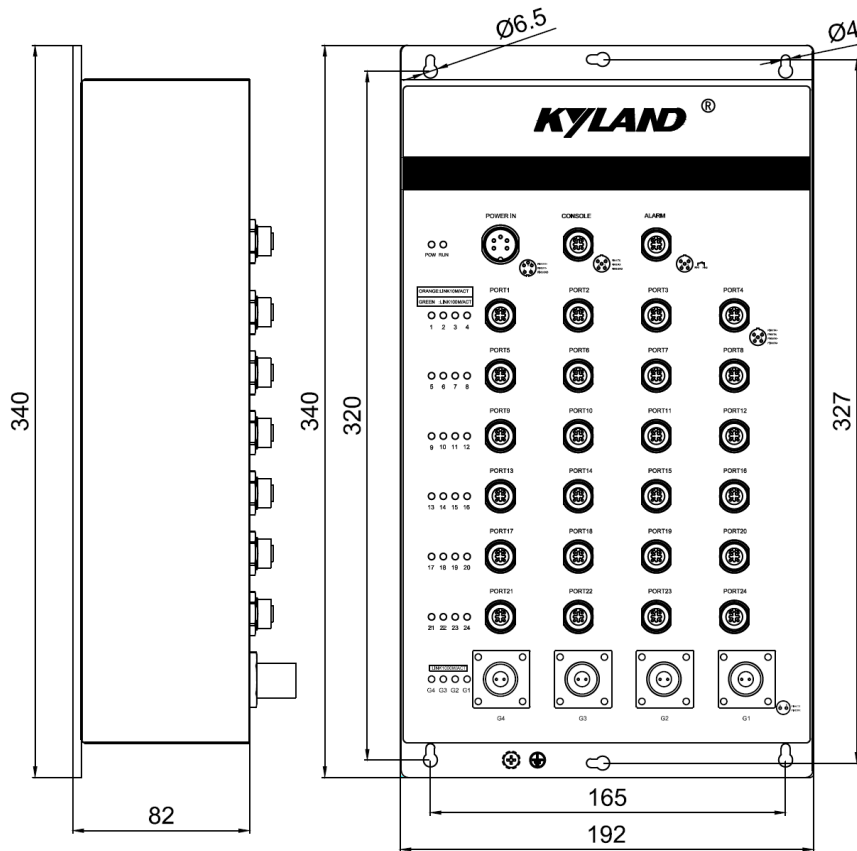


Figure 2 Dimensions (unit: mm)



**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 vertical and horizontal panel mounting. 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: <math><5\Omega</math>
- 4) No direct sunlight, distant from heat source and areas with strong electromagnetic interference.

**3.2.1 Panel Mounting**

- Vertical Mounting

Step 1: Select the mounting position for the device and guarantee adequate space and heat dissipation for it (dimensions: 192mm×340mm×82mm).

Step 2: Punch four holes in the selected position according to the dimensions of SICOM8000. Insert four screws into the holes with a screwdriver until about a 5mm distance is left between each screw head and the wall.

Step 3: Align the four mounting holes on the plate for panel mounting with the four screws. Make the screws pass through the  $\Phi 6.5$  positions in the following figure. Move the device in direction 1 until the screws are in the  $\Phi 4$  positions. Then tighten the screws.

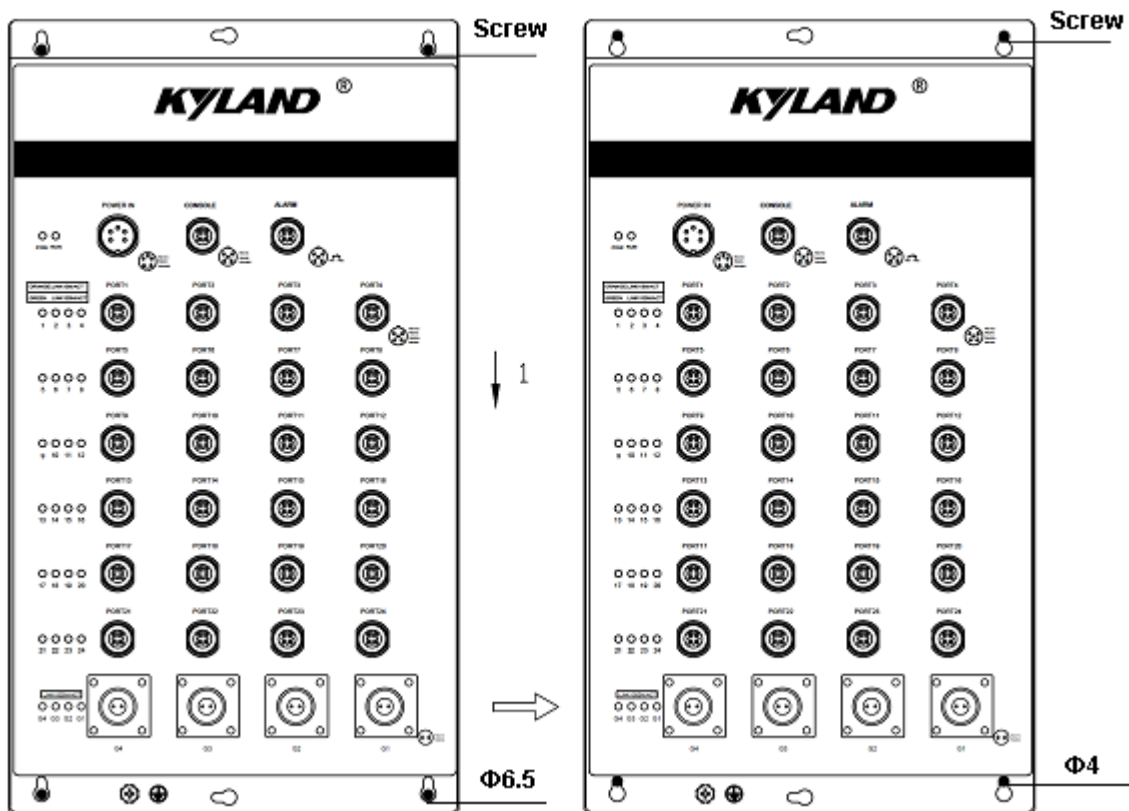


Figure 3 Panel Mounting (vertical)

● Horizontal Mounting

Step 1: Select the mounting position for the device and guarantee adequate space and heat dissipation for it (dimensions: 192mm×340mm×82mm).

Step 2: Punch two holes in the selected position according to the dimensions of SICOM8000. Insert two screws into the holes with a screwdriver until about a 5mm distance is left between each screw head and the wall.

Step 3: Align the two mounting holes on the plate for panel mounting with the two screws. Make the screws pass through the  $\Phi 6.5$  positions in the following figure. Move the device in direction 1 until the screws are in the  $\Phi 4$  positions. Then tighten the screws.

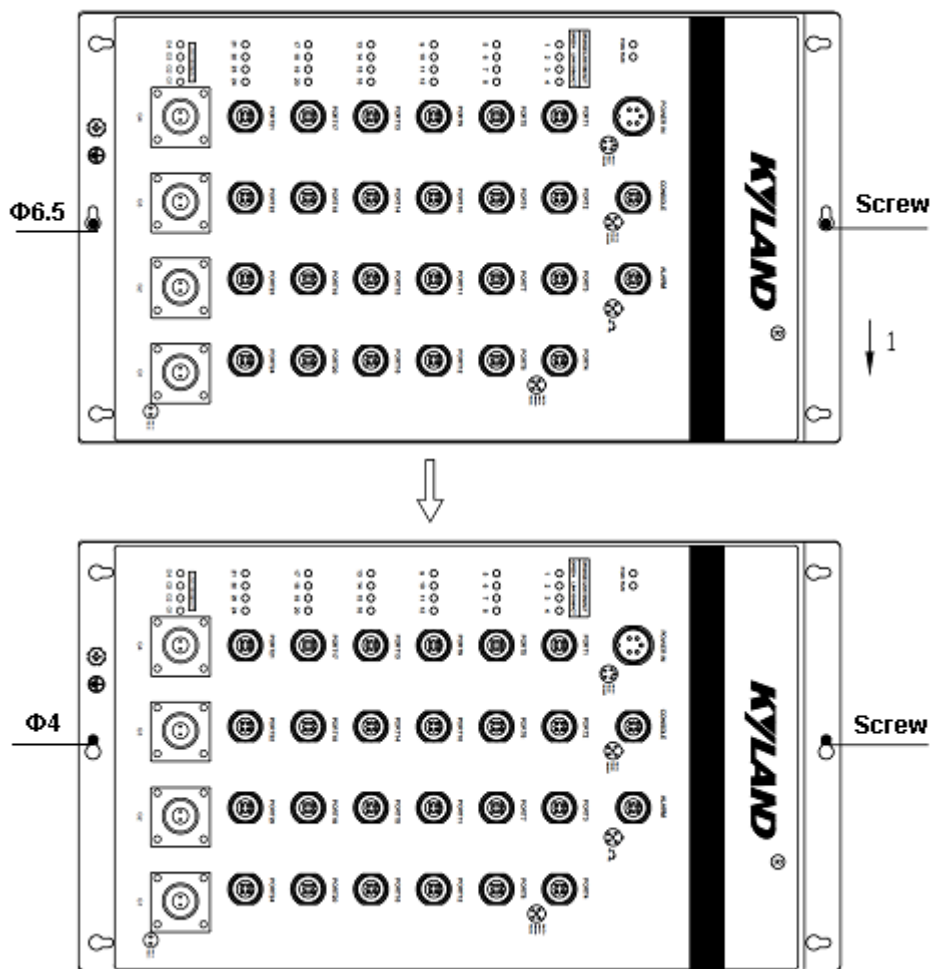


Figure 4 Panel Mounting (horizontal)

**3.2.2 Panel Dismounting (both vertical and horizontal)**

Step 1: Loosen the screws with a screwdriver. Pull the device upward until the screws are in the  $\Phi 6.5$  positions in the following figure. Then remove the plate for panel mounting from the 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.

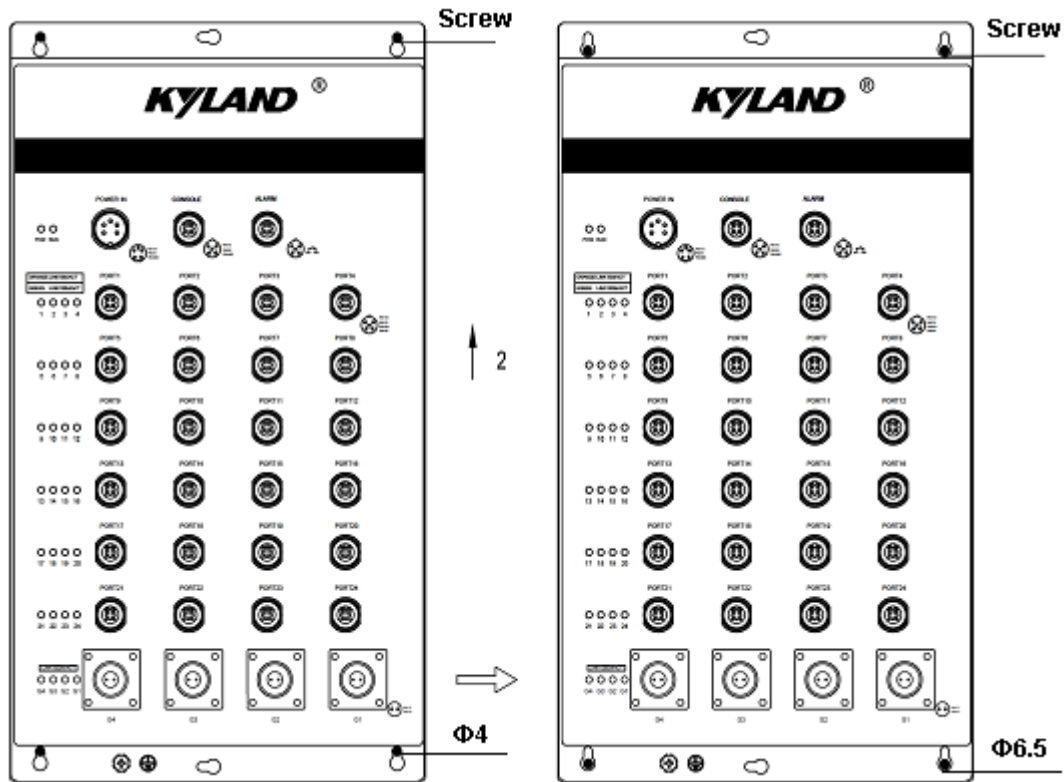


Figure 5 Panel Dismounting

## 4 Connection

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

10/100Base-T(X) Ethernet port is equipped with M12 connector, which is dustproof, waterproof, and anti-vibration. 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

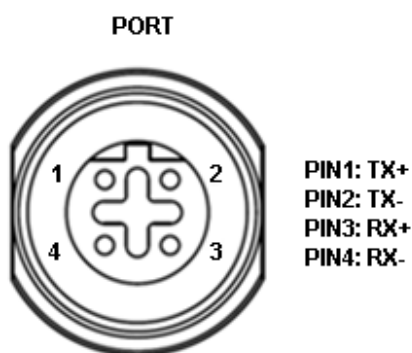


Figure 6 M12 Port (female)

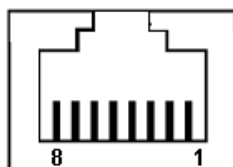


Figure 7 RJ45 Port (female)

You can use an M12-M12 or M12-RJ45 cable (optional, as shown in

Table 2) to connect the port for communication. The preceding figures show the pin numbers of an M12 port and an RJ45 port. For pin definitions, see the following table.

Table 4 Pin Definitions of M12 Port

Pin	MDI-X Signal	MDI Signal
1	Receive Data+ (RX+)	Transmit Data+ (TX+)
2	Receive Data- (RX-)	Transmit Data- (TX-)
3	Transmit Data+ (TX+)	Receive Data+ (RX+)
4	Transmit Data- (TX-)	Receive Data- (RX-)



**Note:**

"+" and "-" indicate level polarities.

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

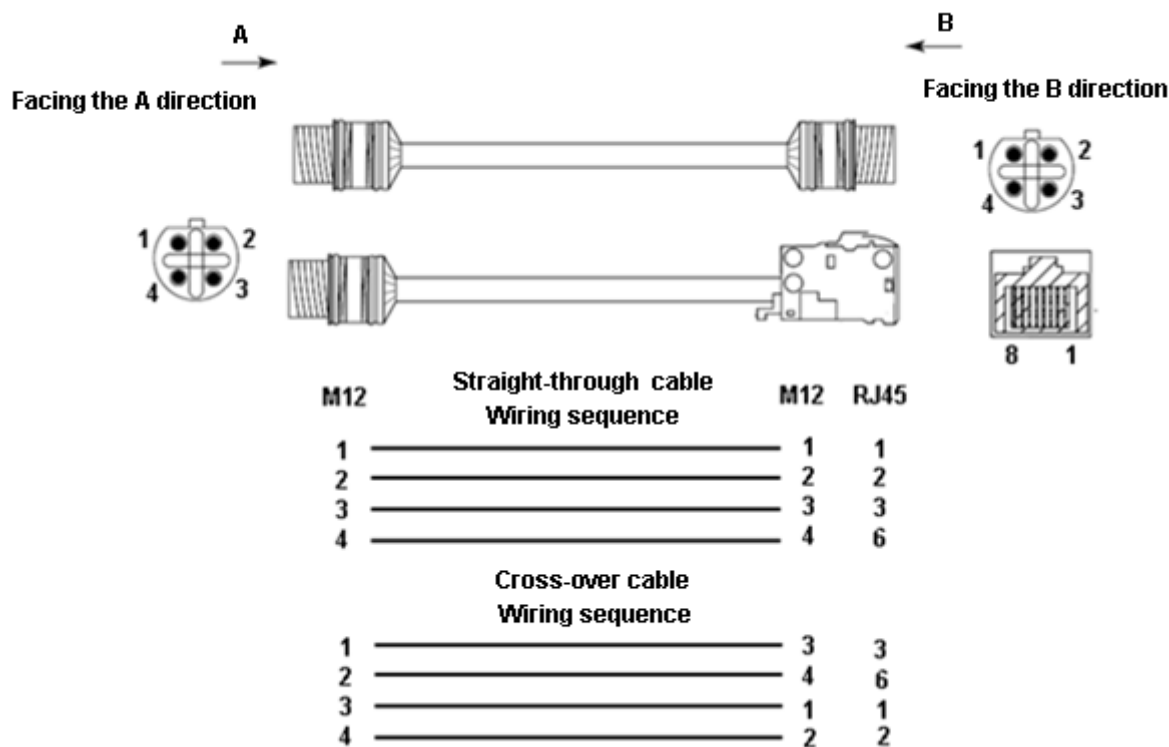


Figure 8 Connection Using Straight-through/Cross-over Cable



**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 1000Base-X Ethernet Port

SICOM8000 provides four 1000Base-X Ethernet ports: G1, G2, G3, and G4. These ports use YMF15 connector. Each port consists of TX (transmit) port and RX (receive) port. To enable communication between Device 1 and Device 2, connect the TX port of Device 1 to the RX port of Device 2, and the RX port of Device 1 to the TX port of Device 2.

- Pin Definition

The following figure shows the pin numbers of the YMF15 port.

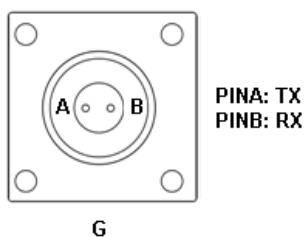


Figure 9 YMF15 Port

- Wiring



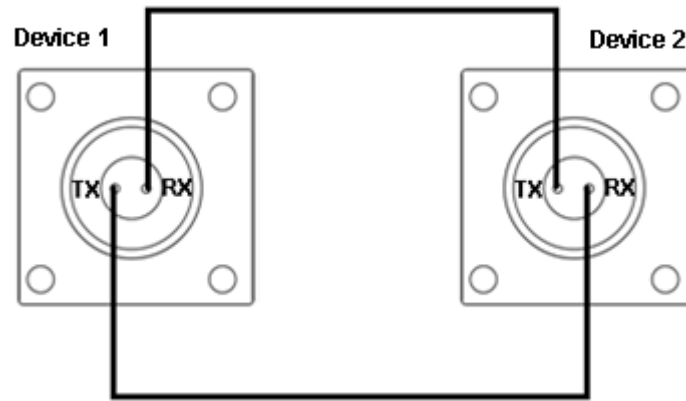


Figure 10 Connection of 1000Base-X Ethernet Port

### 4.3 Console Port

The device 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 an M12-DB9 console cable. You can configure, maintain, and manage the switch by running the Hyper Terminal in the Windows OS of the computer.

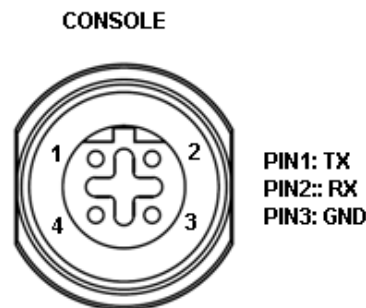


Figure 11 Console Port (female)

- M12-DB9 Console Cable

One end of the M12-DB9 cable is an M12 connector (optional, as shown in

Table 2) to be inserted into the console port of the device, and the other end is the DB9 connector to be inserted into the 9-pin serial port of a PC.

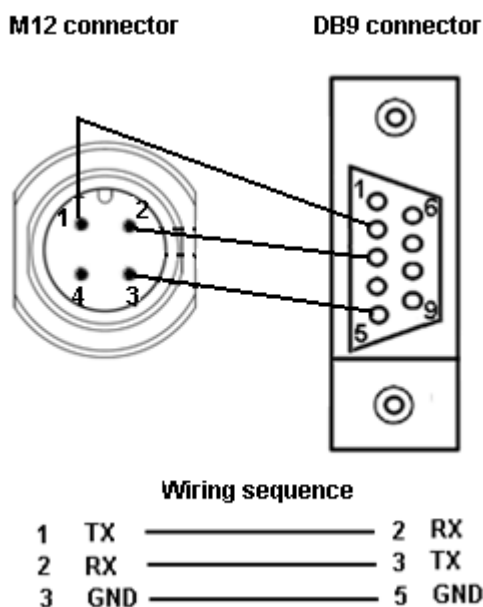


Figure 12 Wiring Sequence of M12-DB9 Console Cable

Table 6 Pin Definitions of M12-DB9 Console Cable

M12 Pin	DB9 Pin	Signal	Description
1	3	TX	Transmit data
2	2	RX	Receive data
3	5	GND	Grounding
4	--	--	Unused

### 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 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.

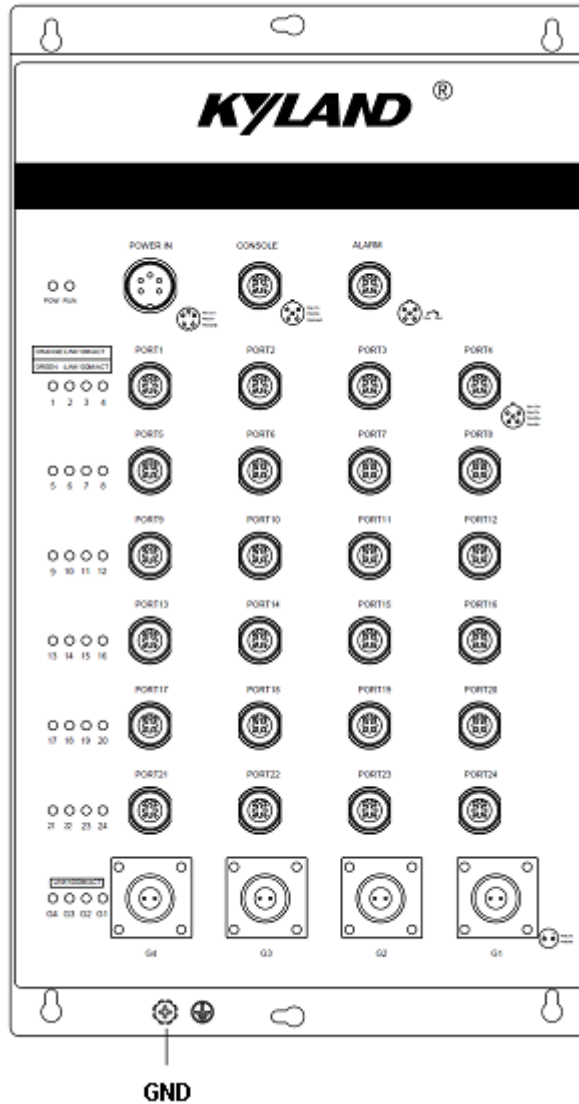


Figure 13 Grounding



**Note:**

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

**4.5 Power Port**

There is a power port on the front panel of the device. You need to connect the power cable to the power port to provide power for the device. The power port uses M16 connector, which is dustproof, waterproof, and anti-vibration.



**Note:**

0.75mm<sup>2</sup><Cross-sectional area of the power cable<2.5mm<sup>2</sup>; grounding resistance<5Ω.

● M16 Power Port

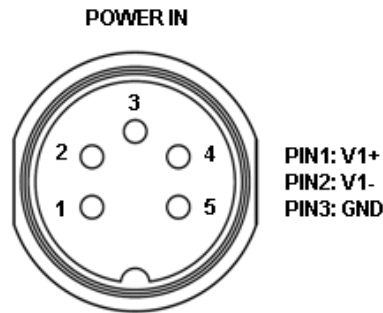


Figure 14 M16 Power Port (socket)

● Wiring and Mounting

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

Step 2: Insert one end of the power cable into the M16 connector (optional, as shown in

Table 2) firmly.

Step 3: Insert the M16 connector with the connected cable into the power port on the device.

Step 4: Connect the other end of the power cable to an external power supply system according to the power supply requirements of the device. View the status of the power LED. If the LED is on, the power is connected properly.



**Caution:**

The switch supports 24DC and 48DC. 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.

**4.6 Alarm Port**

The device provides an alarm port on the front panel for alarm output. When the device works properly, pin 1 and pin 2 are open. When an alarm occurs, pin 1 and pin 2 are closed.

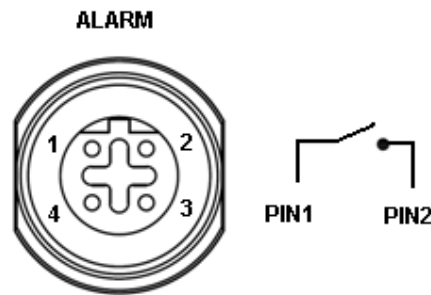


Figure 15 Pin Numbers of M12 Alarm Port (socket)

Electrical parameters of the relay:

Maximum voltage: 250VAC/350VDC

Maximum current: 120mA

- Wiring and Mounting

Step 1: Insert the alarm cable into the alarm port connector (optional, as shown in

Table 2) firmly.

Step 2: Insert the alarm port connector with connected cable into the alarm port on the device.

## 5 Switch Access

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

### 5.1 Access through Console Port

Step 1: Connect the console port of the switch to the 9-pin serial port of a PC with an M12-DB9 console cable.

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

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



Figure 16 Creating a Connection

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



Figure 17 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 18 Setting Port Parameters

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

Table 7 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.



## 5.2 Access through Telnet

Step 1: Connect the network port of the PC to the M12 port of the switch with an M12-RJ45 cable (optional, as shown in

Table 2).

Step 2: Enter "telnet *IP address*" in the Run dialog box. For example, if the IP address of the switch is 192.168.0.2 (default IP address of a Kyland switch), enter "telnet 192.168.0.2" in the dialog box.

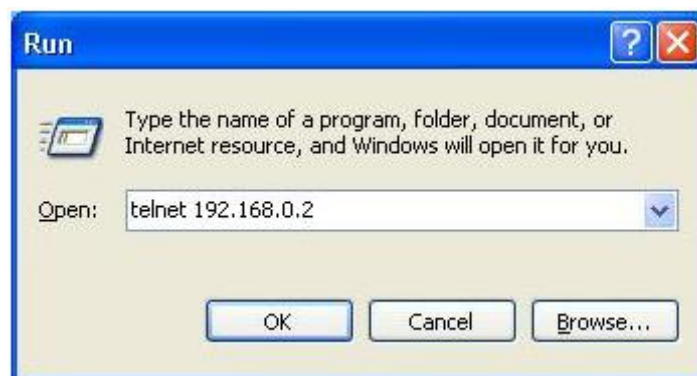


Figure 19 Access through Telnet

Step 3: Click OK. The Telnet CLI is displayed. Then you can enter commands (as listed in Table 7) to perform operations.

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## 5.3 Access through Web

Step 1: Connect the network port of the PC to the M12 port of the switch with an M12-RJ45 cable (optional, as shown in

Table 2).

Step 2: Enter the IP address of the switch 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 switch and other operations, refer to the Web operation manual in the delivered CD.
-

## 6 Basic Features and Specifications

### Power Requirements

Power Identifier	Rated Voltage Range	Maximum Voltage Range
24DC	24VDC	18-36VDC
48DC	48VDC	36-72VDC
Power port	M16 connector	

### Rated Power Consumption

Rated power consumption	20W (MAX)
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### Physical Characteristics

Housing	Aluminum, fanless
Installation	Vertical and horizontal panel mounting
Dimensions (W×H×D)	192mm×340mm×82mm (excluding connectors)
Weight	4Kg (MAX)

### Environmental Limits

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

### Warranty

Warranty	5 years
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For more information about KYLAND products, please visit our website: <http://www.kyland.com>