SICOM3016 Industrial Ethernet Switch

Hardware Installation Manual

KYLAND

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Publication Date: Mar. 2013

Version: V3.0

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SICOM3016 Industrial Ethernet Switch

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.

Contents

1 Product Overview

SICOM3016 includes a series of high-performance industrial Ethernet switches developed by Kyland particularly for industrial applications. SICOM3016 is applicable to harsh and hazardous industrial environments due to its high-performance switching engine, solid closed housing, fanless but heat dissipation-capable single-rib shaped chassis, power overload, reverse polarity connection, and redundancy protection. The redundant network and power input support guarantees the reliable operation of the system.

The series switches support DIN-rail and panel mounting. They provide up to four 100Base-FX Ethernet ports and sixteen 10/100Base-T(X) Ethernet ports, as listed in the following table.

Table 1 Models

Model	**Port**		**Power Supply**
	100Base-FX Ethernet port	10/100Base-T(X) Ethernet port	
SICOM3016-4S/M-16T	4	16	24DC or 48DC (redundant power supply) 110DC or 220AC/DC (single power supply)
SICOM3016-4S/M-8T	4	8	
SICOM3016-3S/M-16T	3	16	
SICOM3016-2S/M-16T	2	16	
SICOM3016-2S/M-8T	2	8	
SICOM3016-1S/M-16T	1	16	
SICOM3016-16T	--	16	

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

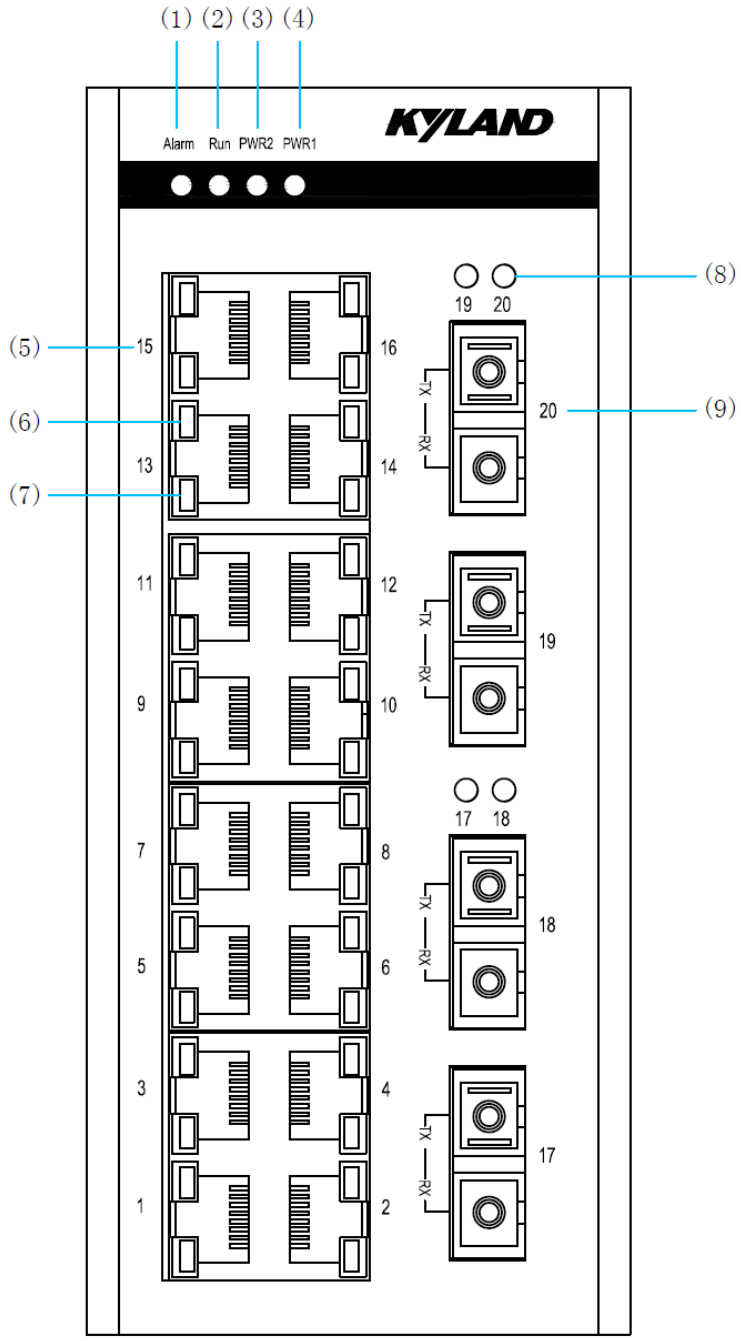


Figure 1 Front Panel of SICOM3016-4S/M-16T

Table 2 Description of Front Panel of SICOM3016-4S/M-16T

No.	Identifier	Description
(1)	Alarm	Alarm LED
(2)	Run	Running LED
(3)	PWR2	Power 2 LED
(4)	PWR1	Power 1 LED
(5)	1-16	Sixteen 10/100Base-T(X) Ethernet ports
(6)	--	10/100Base-T(X) Ethernet port speed LED (yellow)
(7)	--	10/100Base-T(X) Ethernet port connection status LED (green)
(8)	17-20	100Base-FX Ethernet port connection status LED
(9)	17-20	Four 100Base-FX Ethernet ports

2.2 Top Panel

- Top Panel 1 (applicable to 24DC and 48DC)

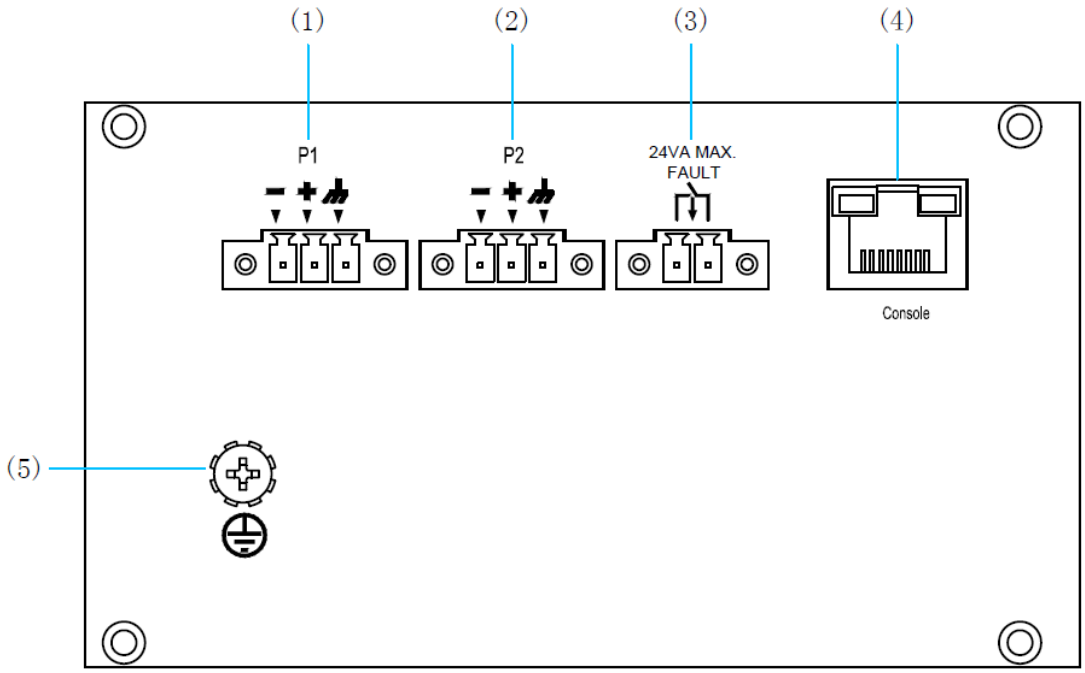
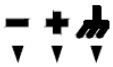
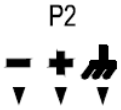


Figure 2 Top Panel 1

Table 3 Description of Top Panel 1

No.	Identifier	Description
(1)	P1 	Power terminal block 1
(2)	P2 	Power terminal block 2

(3)	24VA MAX. FAULT	Alarm terminal block
(4)	Console	Console port
(5)	--	Grounding screw

- Top Panel 2 (applicable to 110DC and 220AC/DC)

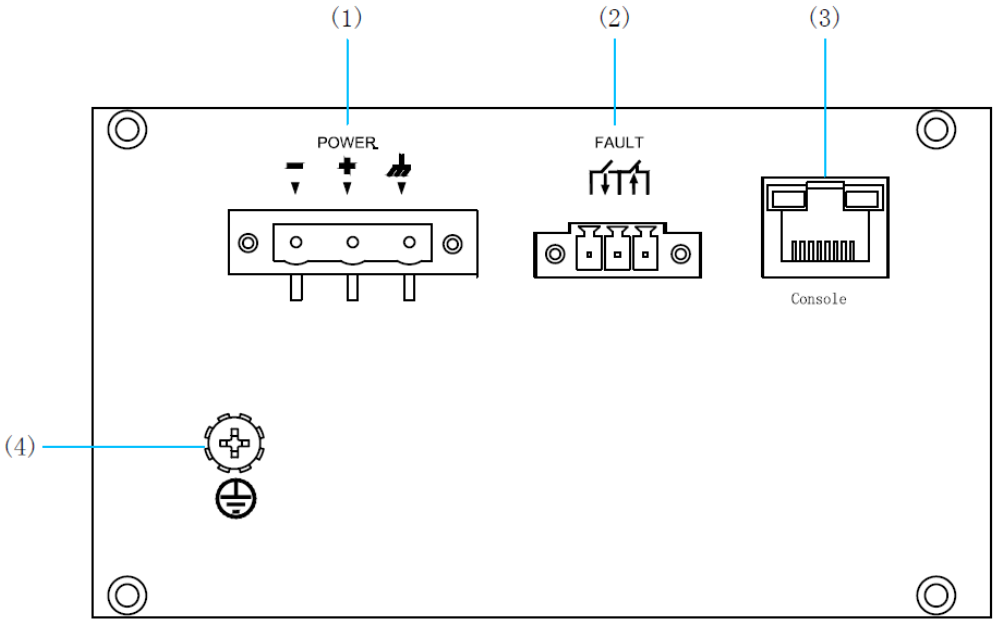


Figure 3 Top Panel 2

Table 4 Description of Top Panel 2

No.	**Identifier**	**Description**
(1)	POWER	Power terminal block
(2)	FAULT	Alarm terminal block
(3)	Console	Console port
(4)	--	Grounding screw

3 Mounting

3.1 Dimension Drawing

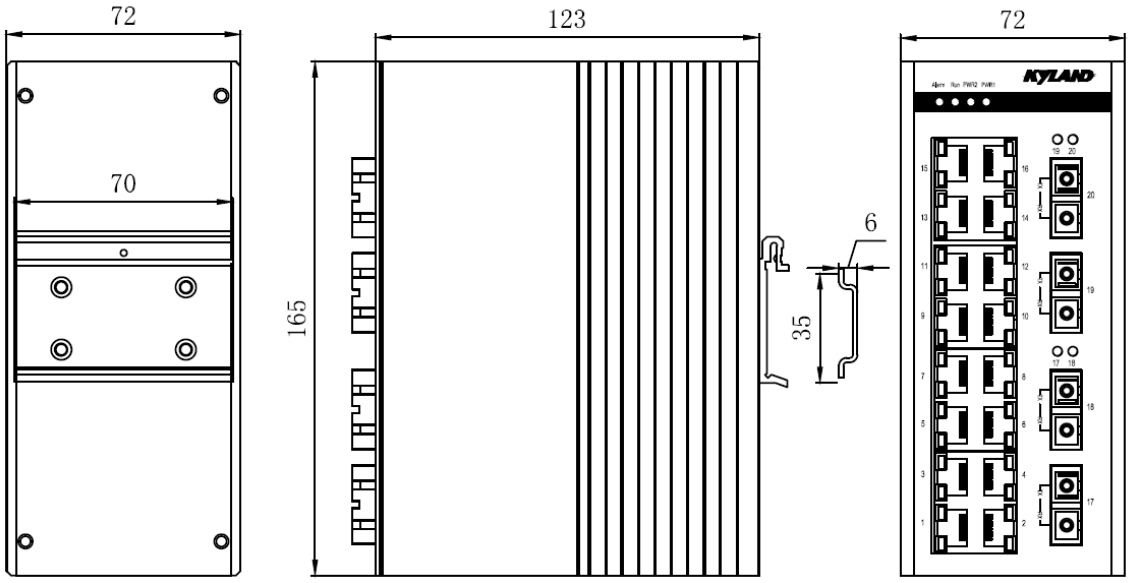


Figure 4 Dimensions for DIN-Rail Mounting (unit: mm)

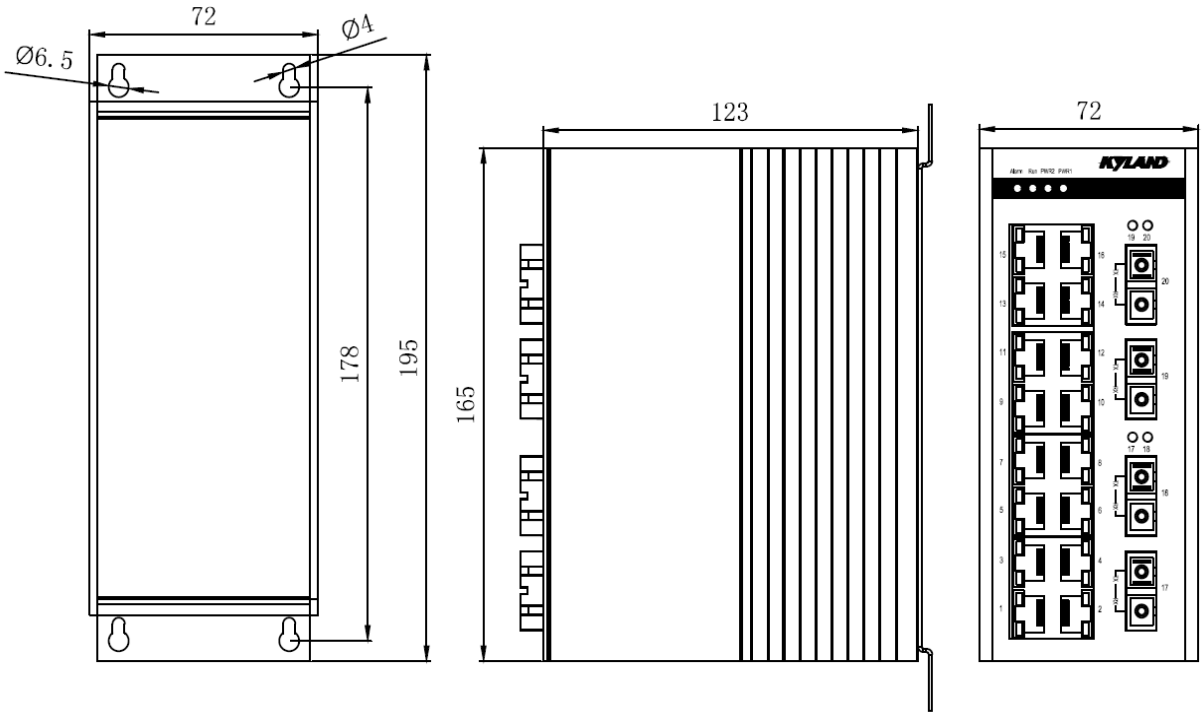


Figure 5 Dimensions for Panel Mounting (unit: mm)

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.
- 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: temperature (-40℃ to 85℃), 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: 72mm×165mm×123mm).

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.

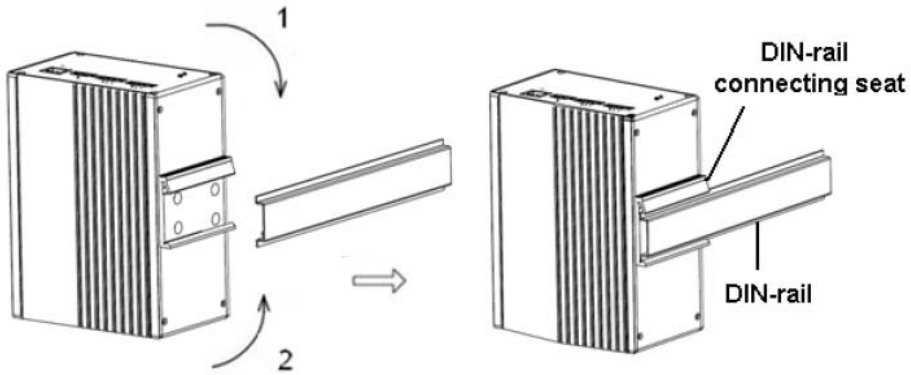


Figure 6 DIN-Rail Mounting

- Dismounting

Step 1: As shown in the following figure, press the device downward and move the device in direction 1 until the bottom of the device is detached from the DIN rail.

Step 2: Pull the device upward and move the device in direction 2 until the device is removed from the DIN rail completely.

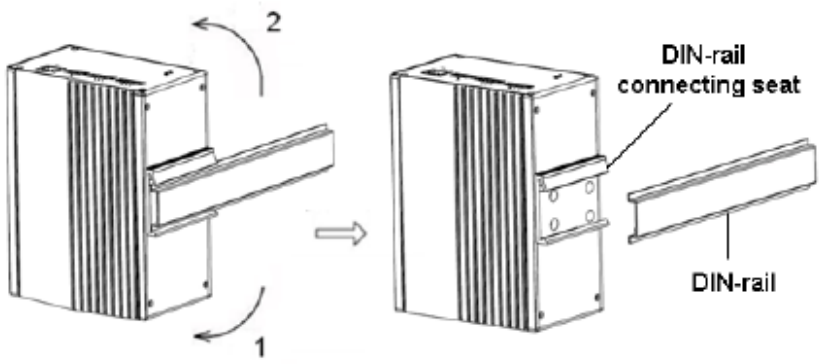


Figure 7 DIN-Rail Dismounting

3.2.2 Panel Mounting

Caution:

Purchase the plate (optional) for panel mounting.

- Panel 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: 72mm×165mm×123mm).

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.

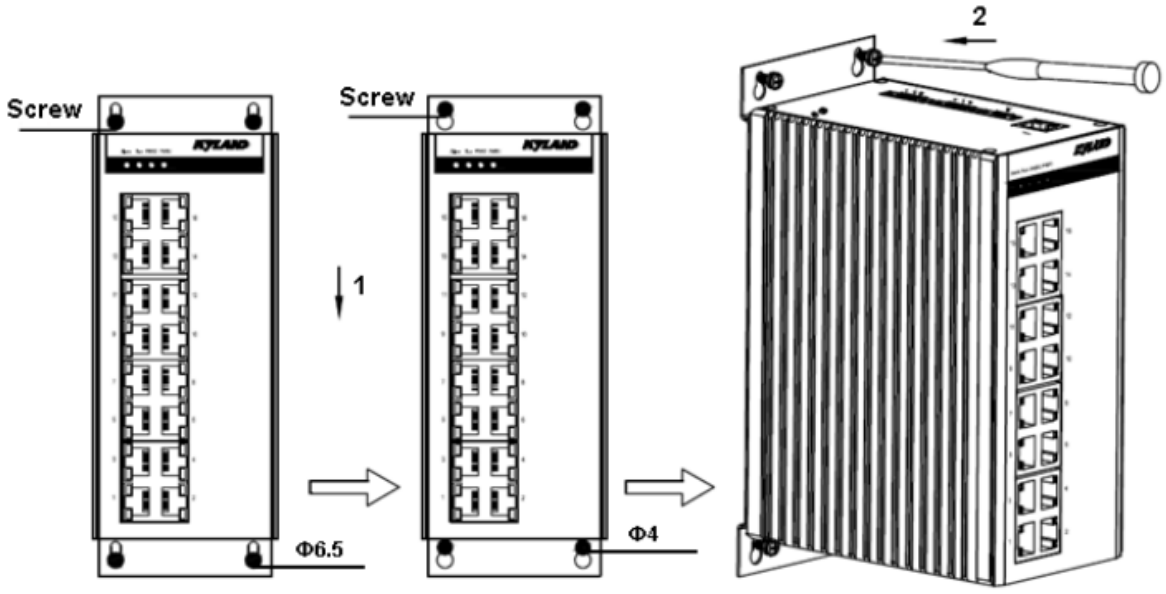


Figure 8 Panel Mounting

- **Panel 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.

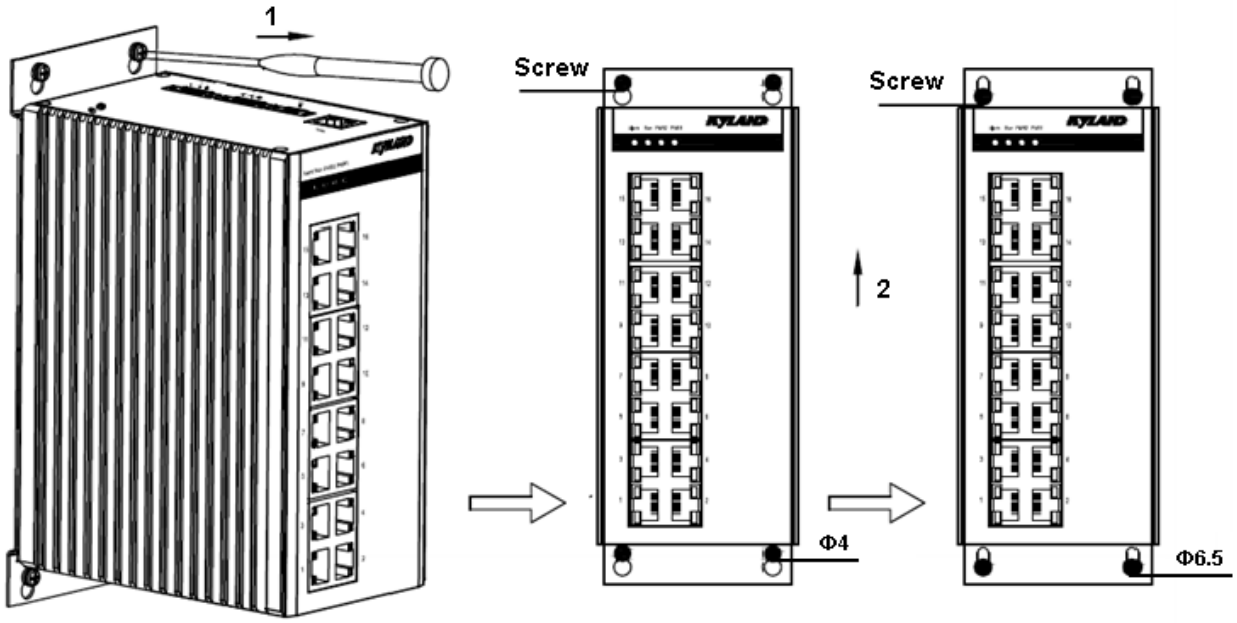


Figure 9 Panel Dismounting

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 RJ45 port.

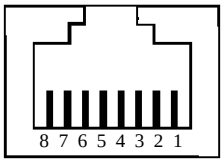


Figure 10 RJ45 Port

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

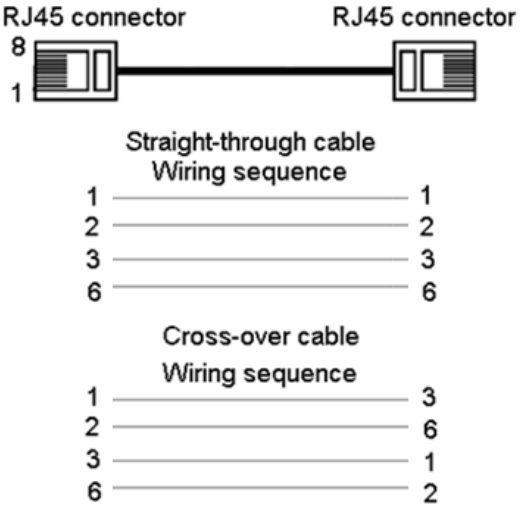


Figure 11 Connection Using Straight-through/Cross-over Cable

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.

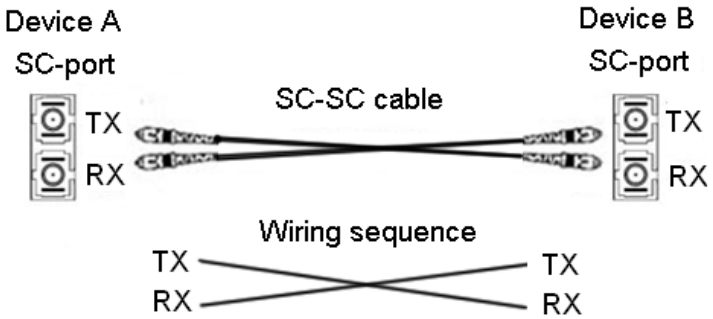


Figure 12 Connection of 100Base-FX Ethernet Port

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 Console Port

SICOM3016 provides a console port on the top panel. Connect the 9-pin serial port of a PC to the console port of the switch with an RJ45-DB9 console cable. Then you can configure, maintain, and manage the switch by running Hyper Terminal in Windows OS of a computer.

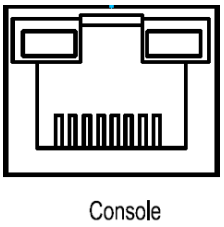


Figure 13 Console Port

- RJ45-DB9 Console Cable

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

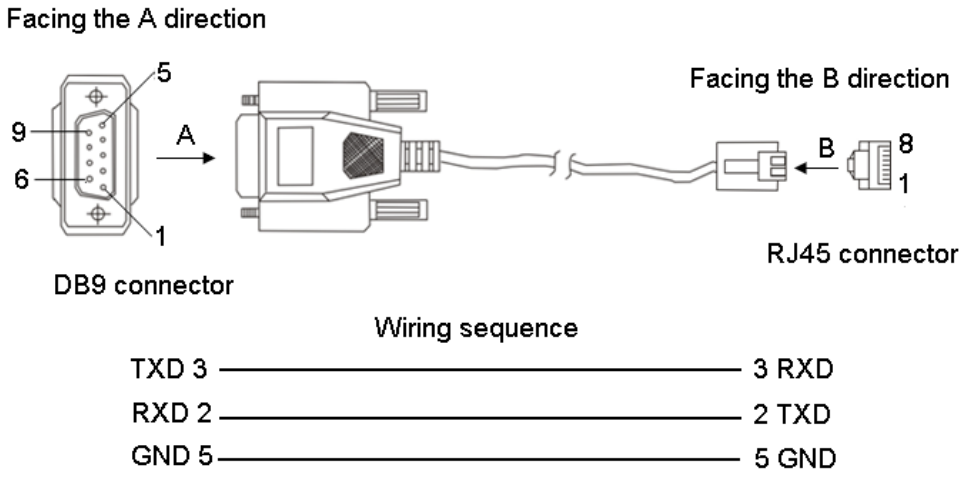


Figure 14 Wiring Sequence of DB9-RJ45 Console Cable

Table 6 Pin Definitions of DB9-RJ45 Console Cable

DB9 Pin	RJ45 Pin	Signal	Description
2	3	RXD	Receive data
3	2	TXD	Transmit data
5	5	GND	Grounding

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.

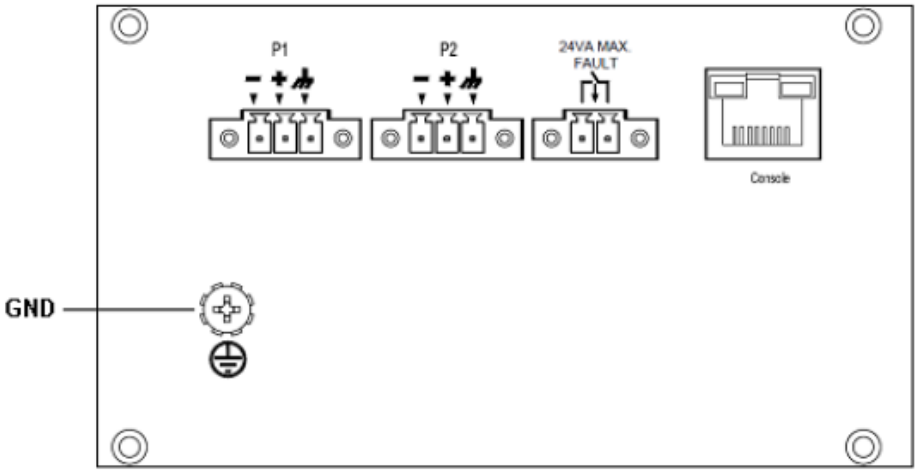


Figure 15 Grounding

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 to the device.

Note:

0.75mm^2<Cross-sectional area of the power wire<2.5mm^2; grounding resistance<5Ω.

- 3-Pin 3.81mm-Spacing Plug-in Terminal Block

The device uses two 3-pin 3.81mm-spacing plug-in terminal blocks to connect to 24DC or 48DC power input. In this case, the device supports redundant power supply. When the redundant power supply is used and one power input is faulty, the device can continue operating properly, thereby improving network reliability.

The following figure shows the 3-pin 3.81mm-spacing plug-in terminal block.

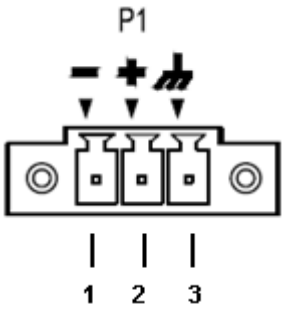


Figure 16 3-Pin 3.81mm-Spacing Plug-in Terminal Block (socket)

The following table lists the pin definitions of the 3-pin 3.81mm-spacing plug-in terminal block.

Table 7 Pin Definitions of 3-Pin 3.81mm-Spacing Plug-in Terminal Block

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

- 3-Pin 7.62mm-Spacing Plug-in Terminal Block

The device uses a 3-pin 7.62mm-spacing plug-in terminal block to connect to 110DC or 220AC/DC power input. In this case, the device supports single power supply.

The following figure shows the 3-pin 7.62mm-spacing plug-in terminal block.

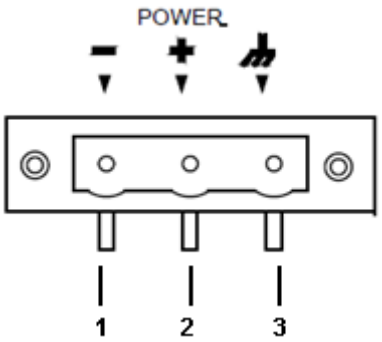


Figure 17 3-Pin 7.62mm-Spacing Plug-in Terminal Block (socket)

The following table lists the pin definitions of the 3-pin 7.62mm-spacing plug-in terminal block.

Table 8 Pin Definitions of 3-Pin 7.62mm-Spacing Plug-in Terminal Block

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

- 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 or Table 8 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.

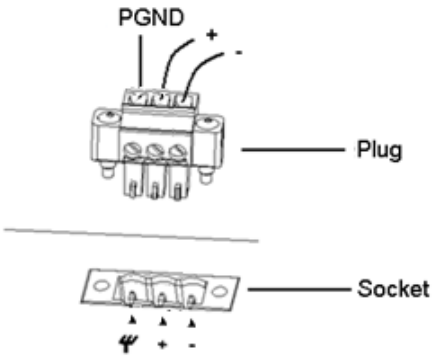


Figure 18 Connection of 3-Pin 3.81mm-Spacing Plug-in Terminal Block

Caution:

- The switch supports 24DC, 48DC, 110DC, and 220AC/DC 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.
- The connection of 3-pin 7.62mm-spacing plug-in terminal block is similar to that of the 3-pin 3.81mm-spacing plug-in terminal block in Figure 18.

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 Terminal Block

The device provides an alarm terminal block on the top panel for alarm output.

- 2-Pin 3.81mm-Spacing Plug-in Terminal Block

When connected to 24DC or 48DC power input, the device uses a 2-pin 3.81mm-spacing plug-in terminal block for alarm. When the device works properly, the alarm relay contacts are closed; when an alarm occurs, the alarm relay contacts are open.

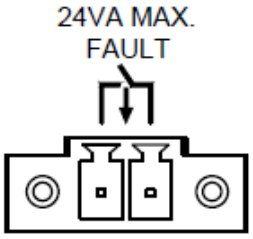


Figure 19 2-Pin 3.81mm-Spacing Plug-in Terminal Block (socket)

Electrical parameters of the relay:

Max Switch Voltage: 250VAC/350VDC

Max Switch Current: 120mA

- 3-Pin 3.81mm-Spacing Plug-in Terminal Block

When connected to 110DC or 220AC/DC power input, the device uses a 3-pin 3.81mm-spacing plug-in terminal block for alarm. 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.

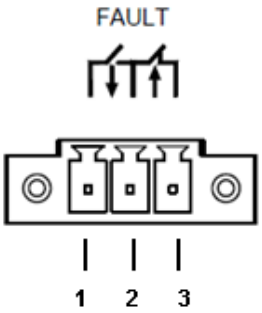


Figure 20 3-Pin 3.81mm-Spacing Plug-in Terminal Block (socket)

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.

Electrical parameters of the relay:

Max Switch Voltage: 250VAC/220VDC

Max Switch Current: 2A

Max Switching Power: 60W

Dielectric Strength: 2KV

- Wiring and Mounting

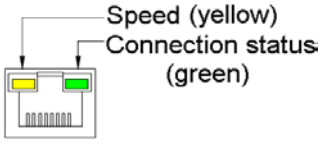
Step 1: Remove the alarm terminal block from the switch.

Step 2: Secure the 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 9 LEDs

LED		State	Description
Power 1 LED	3-pin 3.81mm-spacing plug-in terminal block	On	Power 1 is connected and operates properly.
		Off	Power 1 is not connected or operates abnormally.
	3-pin 7.62mm-spacing plug-in terminal block	On	The power is connected and operates properly.
		Off	The power is not connected or operates abnormally.
Power 2 LED (only applicable to 3-pin 3.81mm-spacing plug-in terminal block)		On	Power 2 is connected and operates properly.
		Off	Power 2 is not connected or operates abnormally.
Running LED		Blinking	The CPU operates properly.
		Off	The CPU does not start up.
Alarm LED		On	An alarm occurs.
		Off	No alarm occurs.
100Base-FX Ethernet port 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 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 RJ45-DB9 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.

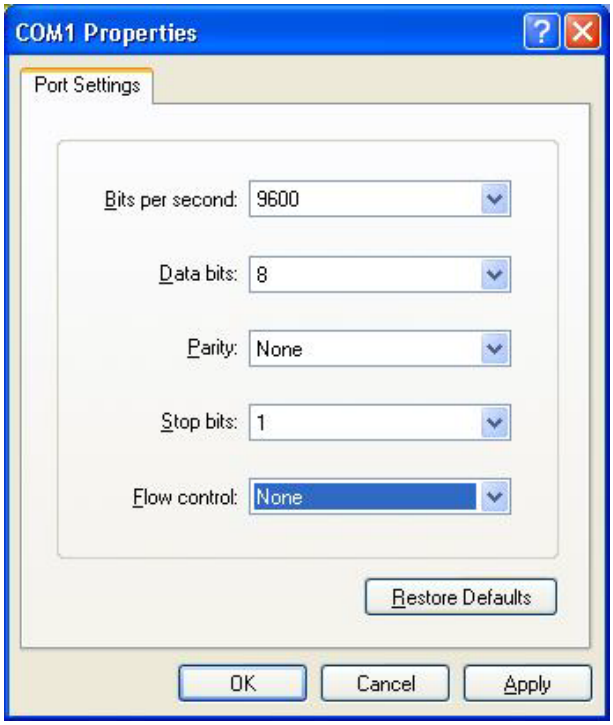


Figure 23 Setting Port Parameters

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 the PC to the RJ45 port of the switch with an RJ45-RJ45 cable.

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.

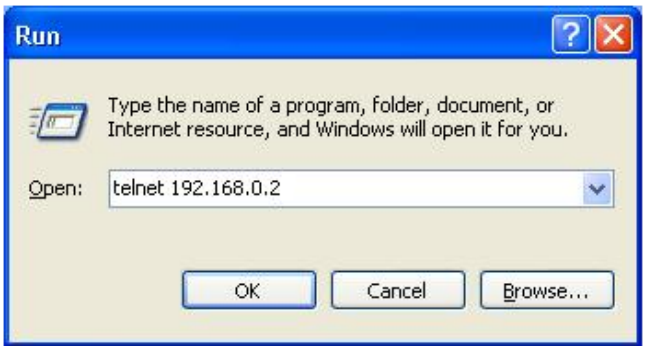


Figure 24 Access through Telnet

Step 3: Click OK. The Telnet CLI is displayed. Then you can enter commands (as listed in Table 10) to perform operations.

6.3 Access through Web

Step 1: Connect the network port of the PC to the RJ45 port of the switch with an RJ45-RJ45 cable.

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 using 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.

7 Basic Features and Specifications

Power Requirements		
Power Identifier	Rated Voltage Range	Maximum Voltage Range
24DC	24VDC	18-36VDC
48DC	48VDC	36-72VDC
110DC	110VDC	77-154VDC
220AC/DC	100-240VAC, 50/60Hz; 220VDC	85-264VAC/120-300VDC
Terminal block	3-pin 3.81mm-spacing plug-in terminal block (redundant power supply) 3-pin 7.62mm-spacing plug-in terminal block (single power supply)	
Rated Power Consumption		
Rated power consumption	9.7W (MAX)	
Physical Characteristics		
Housing	Aluminum, fanless	
Installation	DIN-rail and panel mounting	
Dimensions (W×H×D)	72mm×165mm×123mm (excluding connectors, DIN rail, and plate for panel mounting)	
Weight	1.2Kg	
Environmental Limits		
Operating temperature	-40℃~+85℃	
Storage temperature	-40℃~+85℃	
Ambient relative humidity	5%~95% (non-condensing)	
MTBF		
MTBF	333,775 hours	
Warranty		
Warranty	5 years	

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