

SICOM3016BA Industrial Ethernet Switch

Hardware Installation Manual



KYLAND

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**SICOM3016BA Industrial Ethernet Switch
Hardware Installation Manual**

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Notice for Safety Operation

This product performs reliably as long as it is used according to the guidance. Artificial damage or destruction of the equipment should be avoided.

- Read this manual carefully and keep it for future reference;
- Do not place the equipment near water sources or damp areas;
- Do not place anything on power cable or put the cable in unreachable places;
- Do not tie or wrap the cable, which may cause a fire risk;
- Power connectors and other equipment connectors should be firmly interconnected and checked frequently;
- Do not repair the equipment by yourself, unless it is clearly specified in the manual;
- Please keep the equipment clean; if necessary, wipe the equipment with soft cotton cloth.

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	1
2.1	Front Panel	1
2.2	Top Panel	2
3	Mounting.....	3
3.1	Dimension Drawing	3
3.2	Mounting Modes and Steps.....	4
4	Cable Connection	6
4.1	10/100Base-T(X) Port.....	6
4.2	100Base-FX Port	8
4.3	1000Base-X SFP Port	8
4.4	Console Port.....	10
4.5	Debug Port	11
4.6	Power Terminal Block.....	13
4.7	Grounding.....	15
5	LEDs.....	15
6	Switch Access	16
6.1	Access through Console Port	16
6.2	Access through Telnet.....	18
6.3	Access through Web	19
7	Product Configuration Information	19
8	Basic Features and Specifications.....	21

1 Product Overview

SICOM3016BA is an intrinsically safe gigabit industrial Ethernet switch developed by Kyland. The switch is equipped with high-performance switching engine, overcurrent-, overvoltage-, and EMC-protection power supply, outstanding EMC protection on RJ45 ports, and redundant power input. All these features guarantee the reliably operation of the system.

SICOM3016BA provides powerful network management functions. The device can be managed through CLI, Telnet, Web, and SNMP-based network management software.

SICOM3016BA has two forms: integrated device and bare board. An integrated device supports panel mounting, while a bare board can be installed in another device. SICOM3016BA provides diversified ports, including 1000Base-X SFP, 100Base-FX, and 10/100Base-T(X) ports.

2 Structure and Interface

2.1 Front Panel

Table 9 and Table 10 list the products models of SICOM3016BA. This section uses SICOM3016BA-4GX-6S/M-6T as an example to describe the structure and ports of the front panel. The structure and ports of all the other models are similar to those of SICOM3016BA-4GX-6S/M-6T.

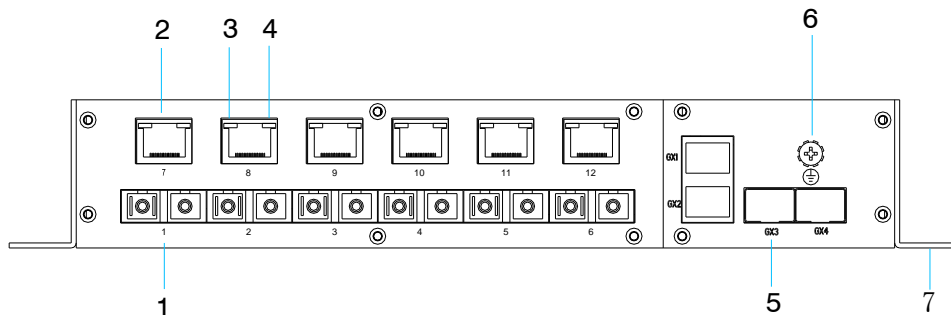


Figure 1 Front Panel

Table 1 Front Panel of SICOM3016BA-4GX-6S/M-6T

No.	Identifier	Description
1	1-6	100Base-FX port
2	7-12	10/100Base-T(X) port
3	--	10/100Base-T(X) RJ45 port speed LED
4	--	10/100Base-T(X) RJ45 port Link/ACT LED
5	GX1-GX4	1000Base-X SFP port
6	⊖	Grounding screw
7	--	Mounting ear

2.2 Top Panel

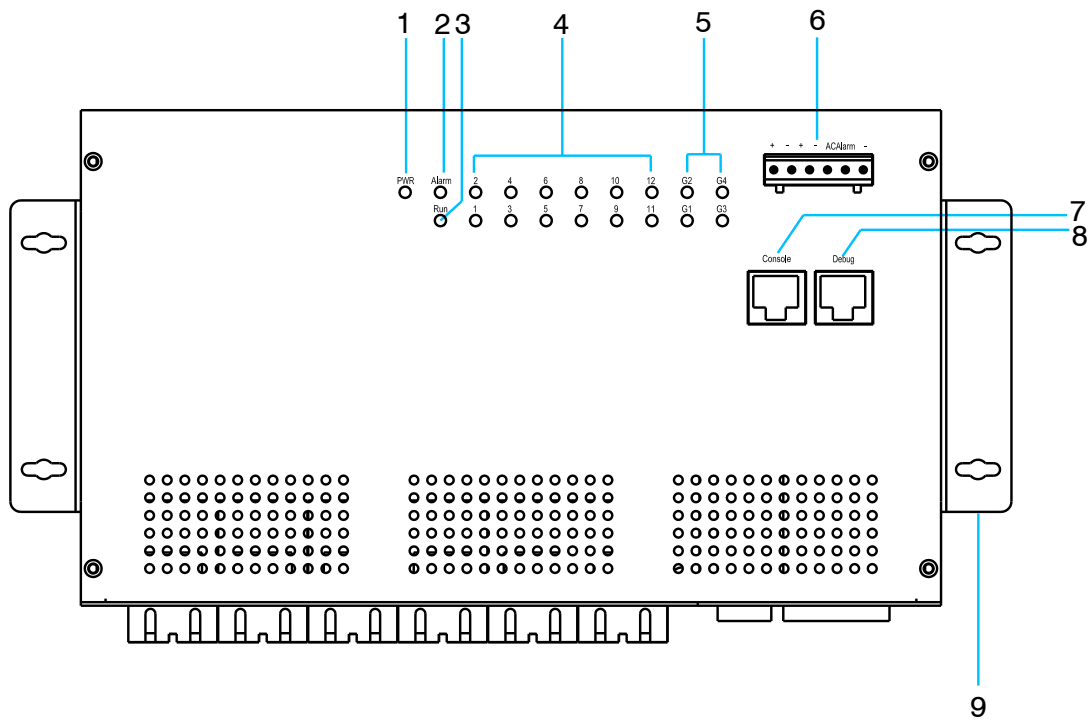


Figure 2 Top Panel

Table 2 Top Panel of SICOM3016BA

No.	Identifier	Description
1	PWR	Power LED
2	Alarm	Alarm LED
3	Run	Running LED

4	1-12	Fast Ethernet port LED
5	G1-G4	1000Base-X SFP port LED
6	+ - + - ACAAlarm -	Power terminal block
7	Console	Console port
8	Debug	Debug port
9	--	Mounting ear

3 Mounting

3.1 Dimension Drawing

- SICOM3016BA Integrated Device (unit: mm)

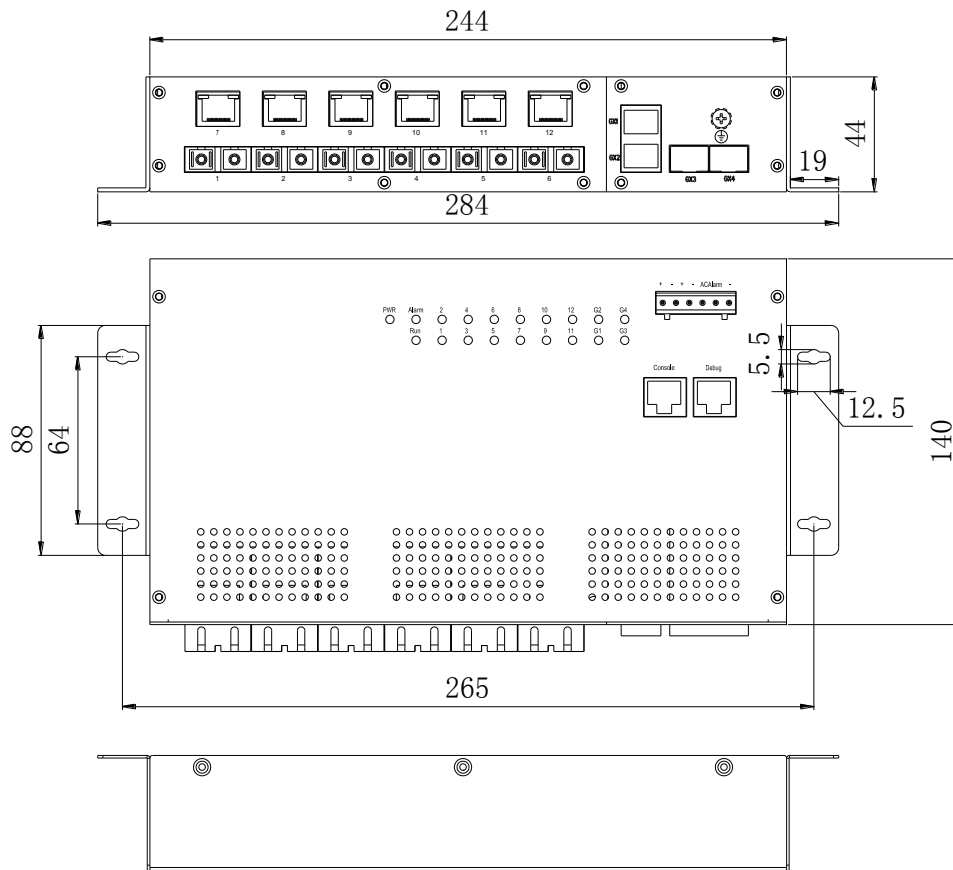


Figure 3 SICOM3016BA (Integrated Device)

- SICOM3016BA Bare Board (unit: mm)

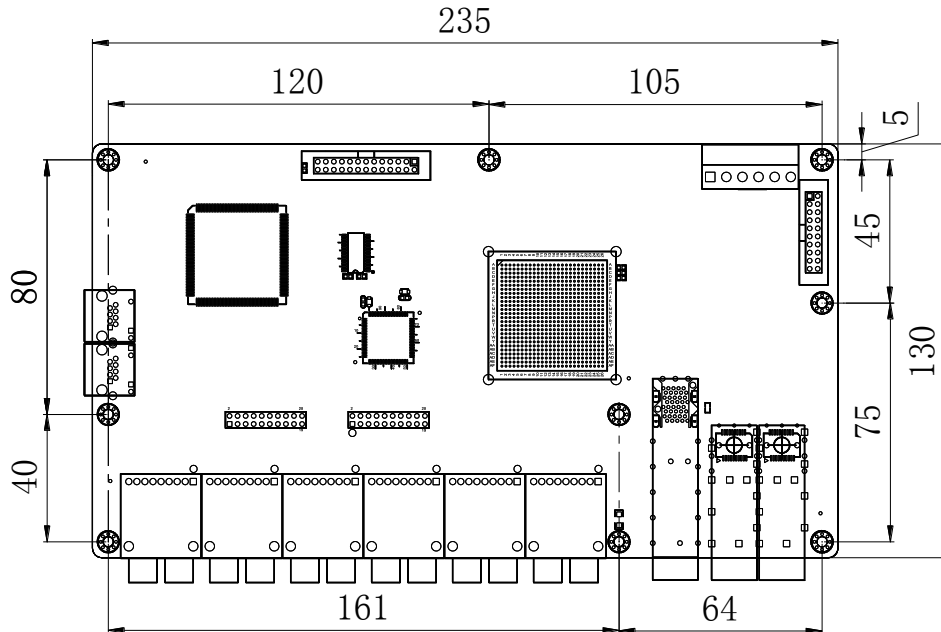


Figure 4 SICOM3016BA (Bare Board)

3.2 Mounting Modes and Steps

As mentioned in the first chapter, SICOM3016BA has two forms, that is, integrated device and bare board. A bare board can be directly installed in the target device, while the integrated device supports panel mounting. Detailed steps are as follows:

- Panel Mounting (Integrated Device)

Step 1: Select the mounting position on a wall or an inner wall of a cabinet for SICOM3016BA and guarantee adequate space for it.

Step 2: Punch four holes in the selected position according to the dimensions of SICOM3016BA. 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 3: Make the four screws pass through the middle (the part with

the largest radius) of the four holes on the mounting ears of SICOM3016BA. Move SICOM3016BA to the right (or left) until the screws are located at the left (or right) ends (the part with the smallest radius) of the mounting holes. Tighten the screws. In this way, you can secure the device to the wall or inner wall of a cabinet, as shown in Figure 5.

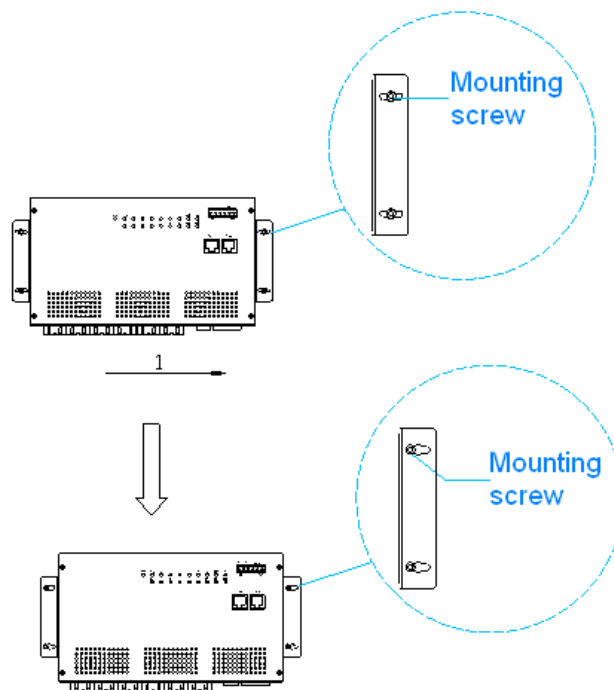


Figure 5 Panel Mounting

- Panel Dismounting (Integrated Device)

Step 1: Loosen the four screws with a screwdriver. Move the device to the left (or right) until the screws are located in the middle of the four mounting holes on the mounting ears. Then make the screws pass through the mounting holes. In this way, you can remove 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. In so doing, you have completed dismounting the device.

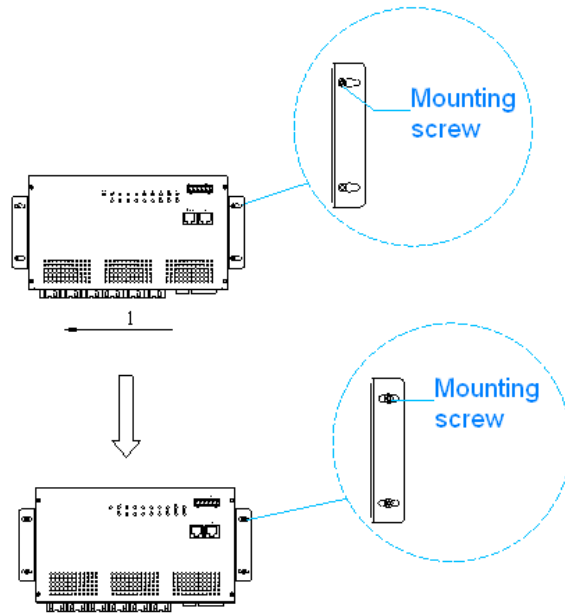


Figure 6 Panel Dismounting

4 Cable Connection

4.1 10/100Base-T(X) Port

10/100Base-T(X) 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.

Figure 7 shows the pin numbers of the 10/100Base-T(X) RJ45 port.

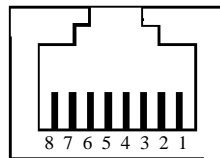


Figure 7 RJ45 Port

Table 3 lists the pin definitions of the 10/100Base-T(X) RJ45 port.

Table 3 Pin Definition 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

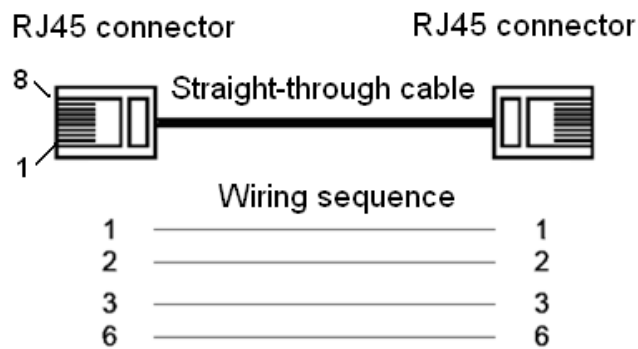


Figure 8 Connection Using Straight-through Cable

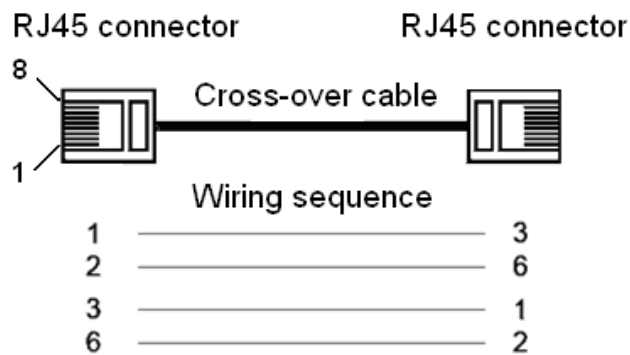


Figure 9 Connection Using Cross-over Cable

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 Port

100Base-FX port is equipped with FC/ST/SC connector, and each port consists of TX (transmit) port and RX (receive) port, as shown in Figure 10. Figure 10 shows 100Base-FX port wiring. (The following uses the SC port as example; ST/FC wiring method is the same with SC.) To enable data transmission between Switch A and Switch B, connect the TX (transmit) port of Switch A to the RX (receive) port of Switch B, and the RX (receive) port of Switch A to the TX (transmit) port of Switch B.

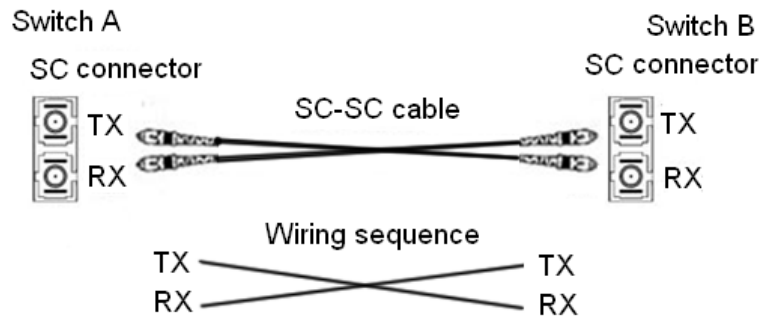


Figure 10 100Base-FX Cable Connection

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 SFP Port

To use 1000Base-X SFP port, you need to purchase a gigabit SFP module (For details, see Table 11). After the SFP module is inserted into the 1000Base-X SFP port, you can connect the device to other devices with optical fibers for communication.

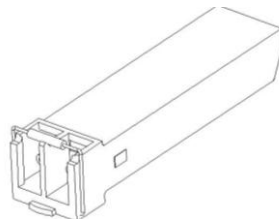


Figure 11 SFP Module

Gigabit SFP module is equipped with LC connector, and each port consists of a TX (transmit) port and an RX (receive) port, as shown in Figure 12.

To enable data transmission between Switch A and Switch B, connect the TX (transmit) port of Switch A to the RX (receive) port of Switch B, and the RX (receive) port of Switch A to the TX (transmit) port of Switch B, as shown in Figure 12.

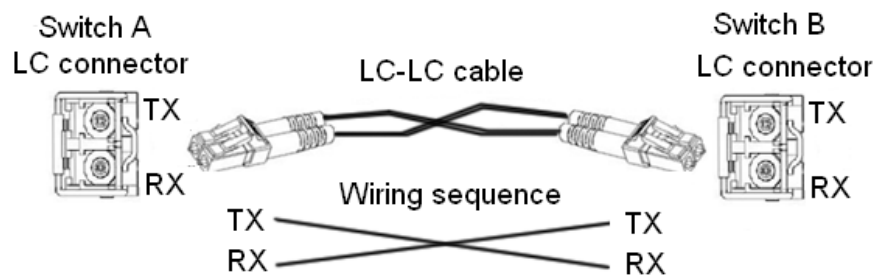


Figure 12 Cable Connection of Gigabit SFP Module

- How to Determine the RX Port and TX Port of Gigabit SFP Module
 1. Insert the two connectors in one end of optical fiber into gigabit SFP module, and those in the other end of the optical fiber into the SFP module of another switch.
 2. Check the corresponding port Link/ACT indicator in the front panel:
 - If the indicator blinks, the link is connected.
 - If the indicator 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 in the one end of the optical fiber.
- How to Connect the Gigabit SFP Optical Module

Insert the gigabit SFP module into the 1000Base-X SFP slot in the switch, and then plug the optical fiber into the TX port and RX port of the SFP module, as shown in Figure 13.

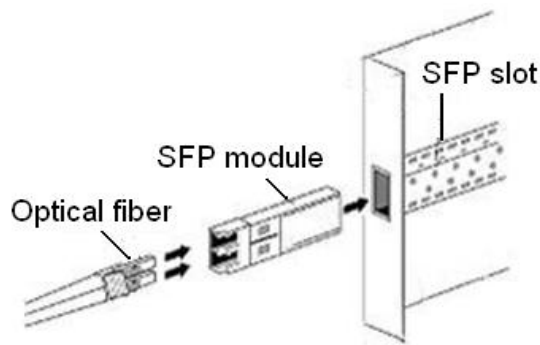


Figure 13 Connecting the Gigabit SFP Optical Module

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.

4.4 Console Port

There is a console port on the top panel of the switch, as shown in Figure 14. Connect the 9-pin serial port of a PC to the console port of the switch with an RJ45-DB9 console cable. You can configure, maintain, and manage the switch by running the Hyper Terminal in the Windows OS of the computer.

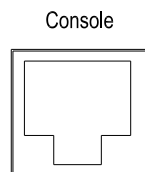


Figure 14 Console Port

- **RJ45-DB9 Console Cable**

Figure 16 shows the RJ45-DB9 console cable. One end of the 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 15 shows the pin numbers of the DB9 connector.

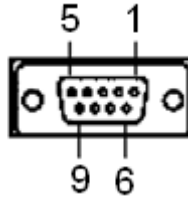


Figure 15 DB9 Connector

Table 4 lists the pin definitions of the DB9 connector.

Table 4 Pin Definition of DB9 Connector

Pin	Definition
2	Receive Data (RXD)
3	Transmit Data (TXD)
5	GND
1, 4, 6, 7, 8, 9	Unused

Figure 16 shows the wiring sequence of the RJ45-DB9 console cable.

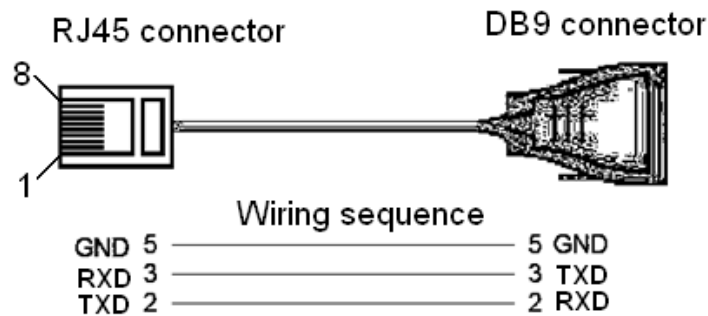


Figure 16 Wiring Sequence of Console Cable

4.5 Debug Port

The debug port (as shown in Figure 17) is on the top panel. The port is equipped with RJ45 connector. You can connect the port to the network port of a PC with an RJ45-RJ45 twisted pair, as shown in Figure 18. Then you can manage and configure the switch through Web or Telnet. For

details, see sections 6.2 and 6.3.

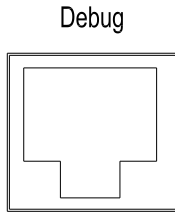


Figure 17 Debug Port

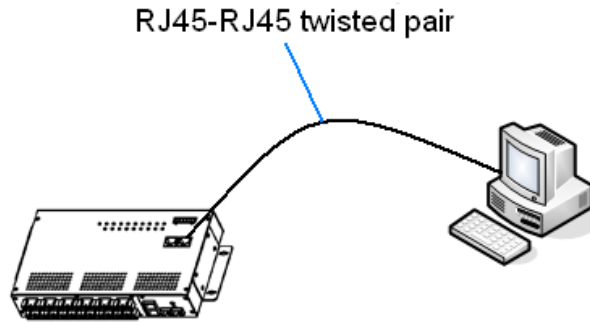


Figure 18 Cable Connection of Debug Port

The debug 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.

Figure 19 shows the pin numbers of the debug port.

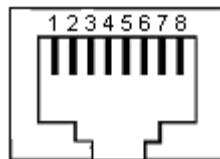


Figure 19 Pin Numbers

Table 5 lists the pin definitions of the debug port.

Table 5 Pin Definitions of Debug 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**

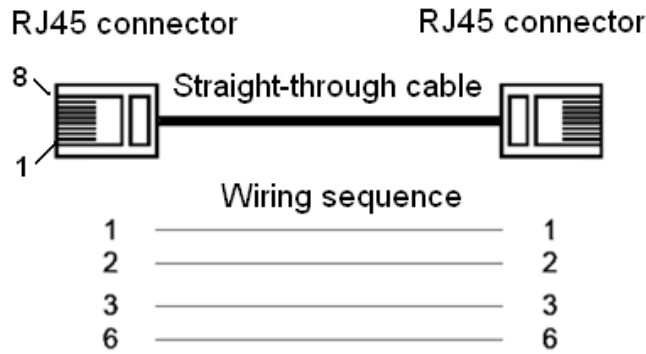


Figure 20 Connection Using Straight-through Cable

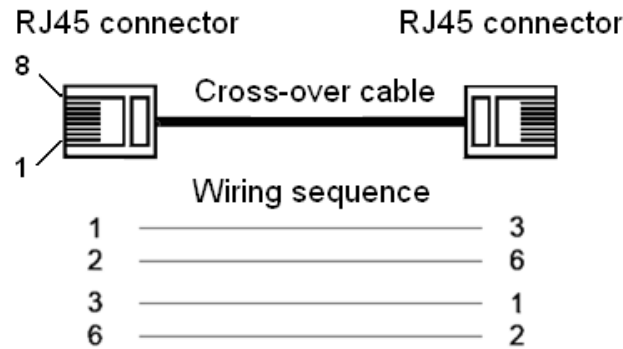


Figure 21 Connection Using Cross-over Cable

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.

4.6 Power Terminal Block

SICOM3016BA adopts 6-pin 5.08mm-spacing plug-in terminal block. You need to connect the power cable to the terminal block to provide power and AC power alarm signals for the device.

Note: $0.75\text{mm}^2 < \text{Cross-sectional area of the power cable} < 2.5\text{mm}^2$;

Grounding resistance: $< 5\Omega$.

- 6-Pin 5.08mm-Spacing Plug-in Terminal Block

Figure 22 shows the pin numbers of the 6-pin 5.08mm-spacing plug-in terminal block.

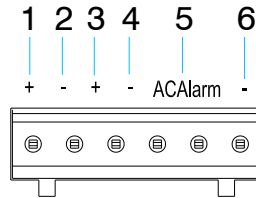


Figure 22 6-Pin 5.08mm-Spacing Plug-in Terminal Block (socket)

Table 6 lists the pin definitions of the 6-pin 5.08mm-spacing plug-in terminal block.

Table 6 Pin Definition of 6-Pin 5.08mm-Spacing Plug-in Terminal Block

No.	Identifier	Definition
1/3	+	Positive power input
2/4/6	-	GND
5	AC Alarm	AC power alarm input: TTL level input. High level input indicates AC power supply, while low level input indicates alarm battery power supply. The AC/DC power supply status is displayed on the Web network management interface.

- Wiring and Mounting

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

Step 2: Insert the power cable into the power terminal block according to Table 6 to fix the power cable.

Step 3: Insert the terminal with the connected cable into the terminal block on the switch.

Caution: The device supports 5DC and 12DC 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.

4.7 Grounding

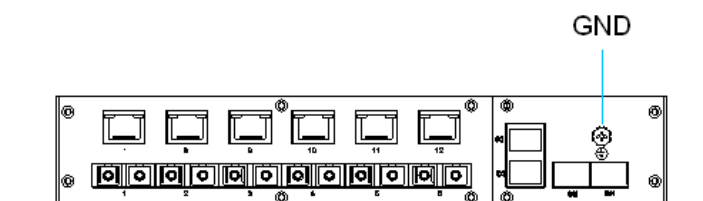


Figure 23 GND

There is a grounding screw on the front panel of SICOM3016BA. The screw is for chassis grounding. Connect one end of the grounding cable to the grounding screw and the other end to the earth firmly (cross-sectional area of the chassis grounding cable $>2.5\text{mm}^2$; grounding resistance $<5\Omega$).

5 LEDs

Table 7 lists the descriptions of SICOM3016BA LEDs.

Table 7 LEDs

LED	State	Description
Running LED		
Run	On	The CPU operates abnormally or the device is starting up.
	Blinking (1Hz)	The CPU operates properly.
	Off	The CPU does not start up.
Alarm LED		
Alarm	On	An alarm occurs.
	Off	No alarm occurs.
Power LED		
PWR	On	The power is connected and operates properly.
	Off	The power is not connected or operates abnormally.
Fast Ethernet Port LED		
Link/ACT	On	Effective port connection
	Blinking	Ongoing network activities

	Off	No effective port connection
10/100Base-T(X) RJ45 Port LED		
Each RJ45 port has two LEDs. The yellow one indicates port rate while the green one indicates port connection state.		
Speed (yellow)	On	100M working state
	Off	10M working state or no connection
Link/ACT (green)	On	Effective port connection
	Blinking	Ongoing network activities
	Off	No effective port connection
1000Base-X SFP Port LED		
Link/ACT	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 9-pin serial port of a PC to the console port of the switch with an RJ45-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 new connection "aa", as shown in Figure 24.



Figure 24 Creating a Connection

Step 4: Select the COM port in use (You can view the port in use in Device Manager), as shown in Figure 25.



Figure 25 Selecting a Serial 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 Figure 26.

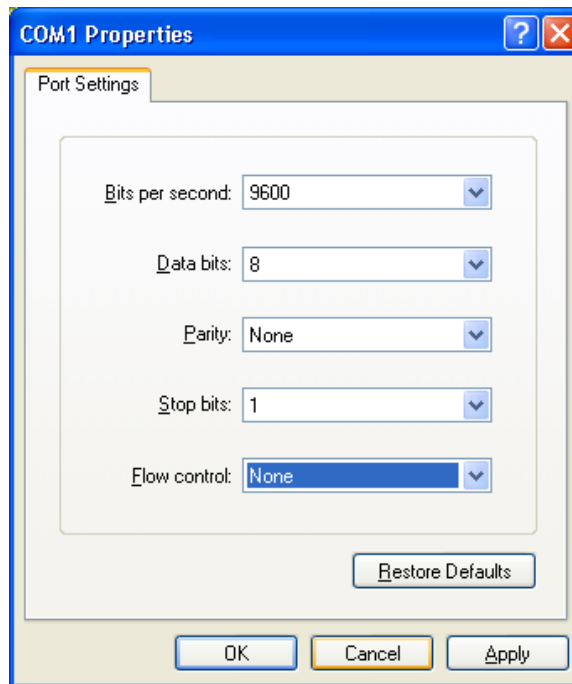


Figure 26 Setting Port Parameters

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

Table 8 CLI Commands

View	Command	Description
User view	SWITCH>enable	Enter the management view.
Management view	SWITCH#show interface	Query the 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 10/100Base-T(X) port or debug port of the switch with an RJ45-RJ45 network cable.

Step 2: Enter "telnet *IP-address*" in the Run dialog box, as shown in Figure 27. The default IP address of a Kyland switch is 192.168.0.2.

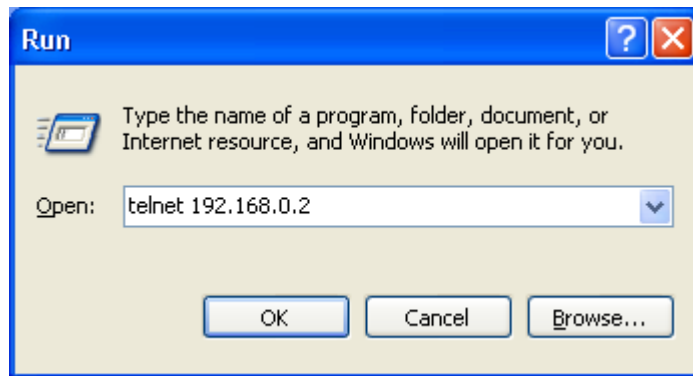


Figure 27 Access Through Telnet

Step 3: Click OK to enter the Telnet CLI. Run the commands in Table 8 for further operations.

6.3 Access through Web

Step 1: Connect the network port of a PC to the 10/100Base-T(X) port or debug port of the switch with an RJ45-RJ45 network 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.

7 Product Configuration Information

Table 9 and Table 10 list the models supported by SICOM3016BA.

Table 9 SICOM3016BA Configuration (Integrated Device)

Model	Interface	Power
SICOM3016BA-4GX-12S/M	Four 1000Base-X SFP ports, twelve 100Base-FX ports, SM (MM), FC/ST/SC connector	5DC, 12DC (redundant)
SICOM3016BA-4GX-8S/M-4T	Four 1000Base-X SFP ports, eight 100Base-FX ports, SM (MM), FC/ST/SC connector, four 10/100Base-T(X) adaptive RJ45 ports	

SICOM3016BA-4GX-6S/M-6T	Four 1000Base-X SFP ports, six 100Base-FX ports, SM (MM), FC/ST/SC connector, six 10/100Base-T(X) adaptive RJ45 ports	
SICOM3016BA-4GX-6S/M	Four 1000Base-X SFP ports, six 100Base-FX ports, SM (MM), FC/ST/SC connector	

Note: SICOM3016BA (integrated device) also provides 3GX and 2GX models as well as models without gigabit ports. The identifiers (for example, 6S/M) for 100M ports in the names of the other models are identical with those of models listed in Table 9. For models with conformal coating on the PCB, "-C" is added to the names before the identifiers for ports.

Table 10 SICOM3016BA Configuration (Bare Board)

Model	Interface	Power
SICOM3016BA-EM-C-4GX-12S/M	Bare board with conformal coating, four 1000Base-X SFP ports, twelve 100Base-FX ports, SM (MM), FC/ST/SC connector	5DC, 12DC (redundant)
SICOM3016BA-EM-C-4GX-8S/M-4T	Bare board with conformal coating, four 1000Base-X SFP ports, eight 100Base-FX ports, SM (MM), FC/ST/SC connector, four 10/100Base-T(X) adaptive RJ45 ports	
SICOM3016BA-EM-C-4GX-6S/M-6T	Bare board with conformal coating, four 1000Base-X SFP ports, six 100Base-FX ports, SM (MM), FC/ST/SC connector, six 10/100Base-T(X) adaptive RJ45 ports	
SICOM3016BA-EM-C-4GX	Bare board with conformal coating, four	

-6S/M	1000Base-X SFP ports, six 100Base-FX ports, SM (MM), FC/ST/SC connector	
-------	---	--

Note: SICOM3016BA (bare board) also provides 3GX and 2GX models as well as models without gigabit ports. The identifiers (for example, 6S/M) for 100M ports in the names of the other models are identical with those of models listed in Table 10.

Table 11 SICOM3016BA Optional Accessories

Model	Description
DT-FCZ-RJ45-01	RJ45 dustproof shield
Industrial Gigabit SFP Module	
IGSFP-M-SX-LC-850-0.55	1000Base-X port; multi mode, LC connector; 850nm center wavelength (CWL), 550m transmission distance
IGSFP-S-LX-LC-1310-10	1000Base-X port; single mode, LC connector; 1310nm center wavelength (CWL), 10km transmission distance
IGSFP-S-LH-LC-1310-40	1000Base-X port; single mode, LC connector; 1310nm center wavelength (CWL), 40km transmission distance
IGSFP-S-ZX-LC-1550-80	1000Base-X port; single mode, LC connector; 1550nm center wavelength (CWL), 80km transmission distance

8 Basic Features and Specifications

- Power Requirements

Rated Voltage Range : 5DC: 5VDC

12DC: 12VDC

Maximum Voltage Range : 5DC: 4.5-5.5VDC

12DC: 9-18VDC

Power terminal: 6-pin 5.08mm-spacing plug-in terminal block

