Ruby3A Industrial Ethernet Switch

Hardware Installation Manual

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KYLAND

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Hardware Installation Manual

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

Notice for Safety Operation

The product performs reliably as long as it is used according to the guidance. Artificial damage or destruction of the device should be avoided. Before using the device, read this manual 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

The switch is mainly used in industrial environments where the reliability of communication networks is extremely high. It supports zero-packet loss redundancy protection technologies Parallel Redundancy Protocol (PRP) and High-availability Seamless Redundancy (HSR). With PRP and HSR, the data is replicated and transmitted for seamless recovery when a link failure occurs, so that no packet loss occurs, and network transmission reliability is improved.

Ruby3A supports DIN rail mounting and panel mounting. For details, see the following table.

Table 1 Models

Models	Ruby3A-3G-L2-L2 Ruby3A-3G-HV
Code definition	Code option
Ports	3G
	Note: *3G：two HSR/PRP ports(2G combo) 100FX or 1000LX/SX 10/100/1000 Base-T(X), one Access port(1G combo) 100FX or 1000LX/SX 10/100/1000 Base-T(X)*
Power input	L2-L2(24DCW，redundant power input) HV(220AC/DCW)

Note：

For the product information listed in these tables, 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:**
>
> It is recommended to purchase the port dustproof shield (optional) to keep ports clean and
> ensure device performance.

2.1 Front Panel
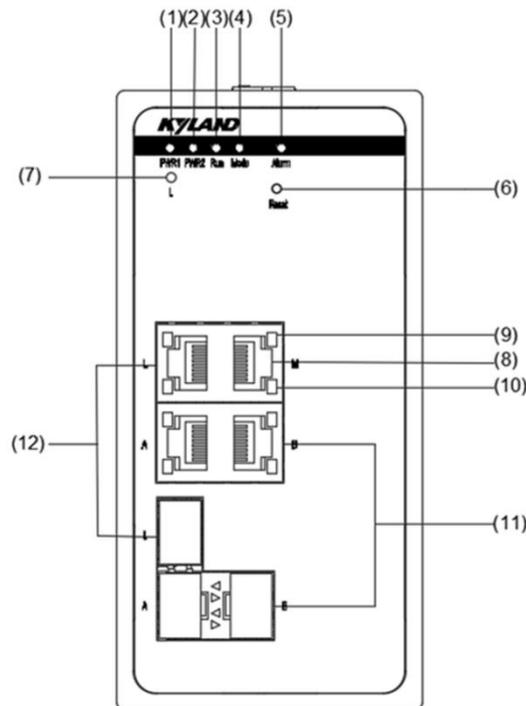

Figure 1 Front Panel

(1)   Power 1 LED   (2)   Power 2 LED   (3)   Running LED

(4) Operation mode LED   (5)   Alarm LED   (6)   Reset button

(7) Local port link status   (8)   Management port

(9)   10/100/1000Base-T(X) Ethernet Port connection status LED (green)

(10)   10/100/1000Base-T(X) Ethernet port speed LED (yellow)

(11)   HSR/PRP ports(2G combo) 100FX or 1000LX/SX   10/100/1000 Base-T(X)

(12)   Local port(1G combo) 100FX or 1000LX/SX   10/100/1000 Base-T(X)
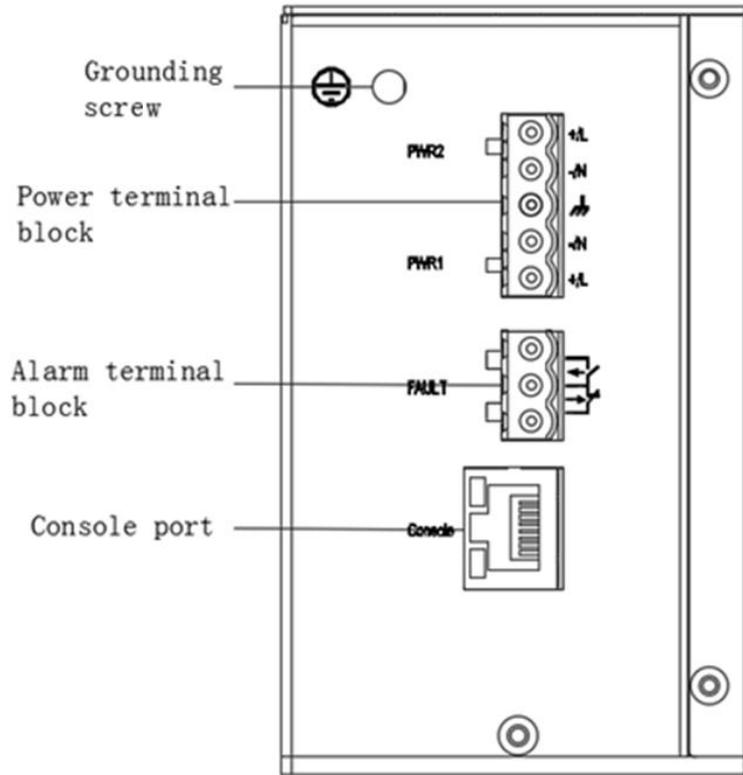
2.2 Top Panel

- **Ruby3A-3G-L2-L2 Top Panel**

Figure 2 Ruby3A-3G-L2-L2 Top Panel

- **Ruby3A-3G-HV Top Panel**
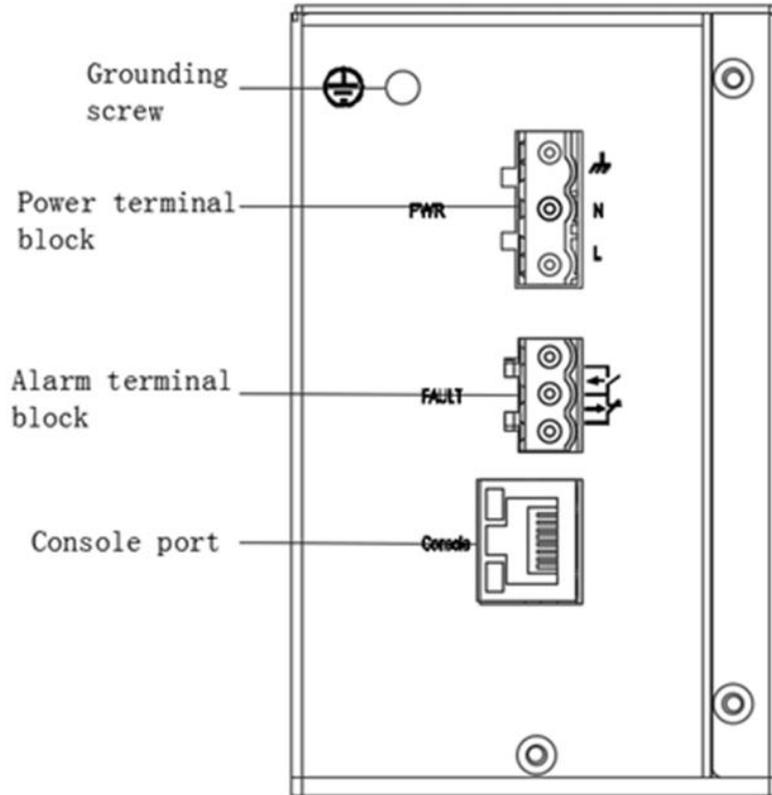
Figure 3 Ruby3A-3G-HV Top Panel

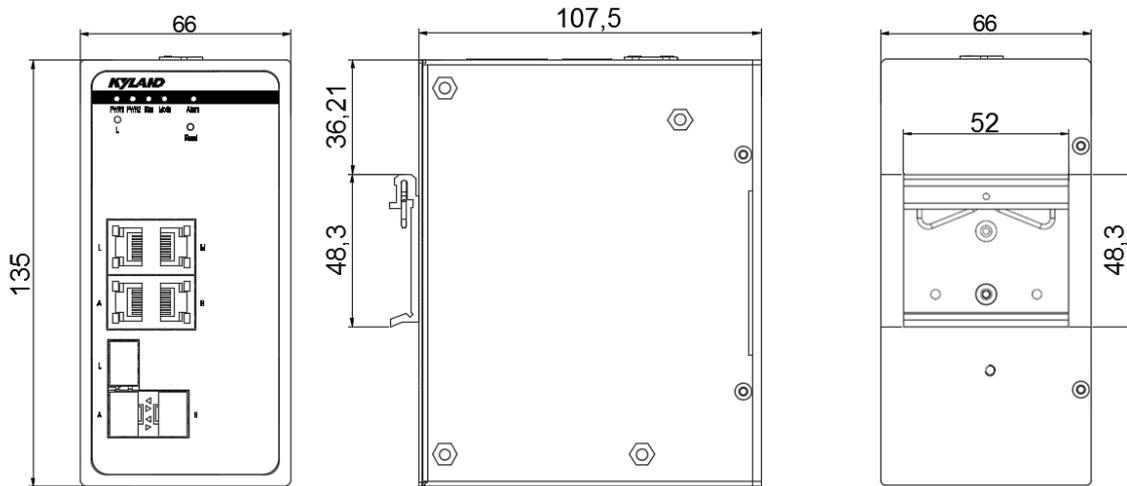# 3 Mounting

3.1 Dimension Drawing

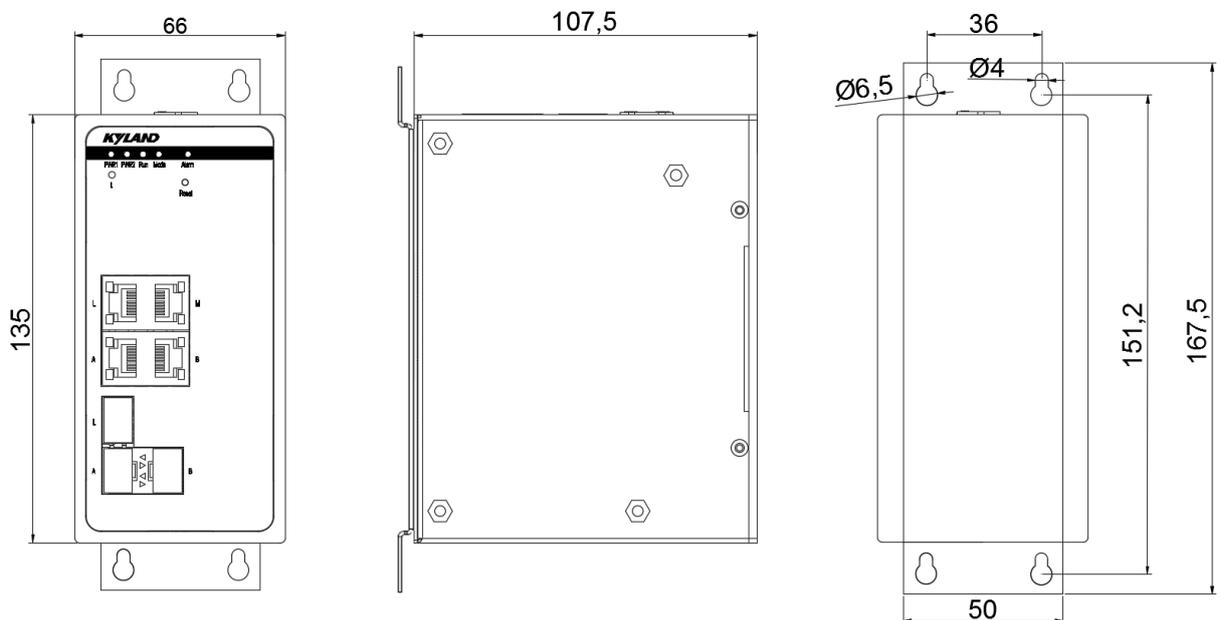Figure 4 Dimensions for DIN-Rail Mounting (unit: mm)

Figure 5 Dimensions for DIN-Rail 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 device supports both DIN-rail mounting 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.

5) Devices are to be installed in an authority certified enclosure and accessible only by the use of a tool.

6) Devices should be installed and accessed by service personnel or users who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken.

3.2.1 DIN-Rail Mounting

● DIN-Rail 1 Mounting

Step 1: Select the mounting position for the device and guarantee adequate space and heat dissipation.

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.
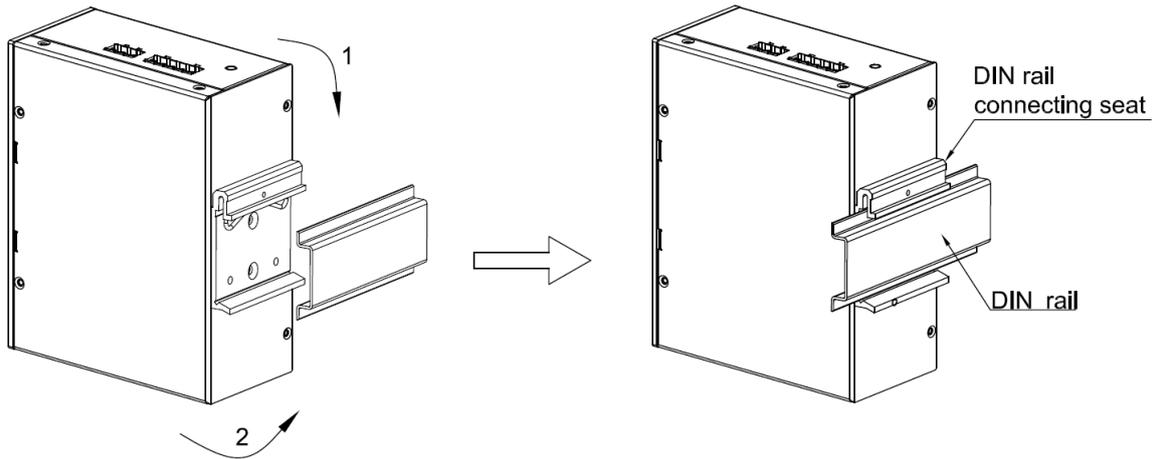
Figure 6 DIN-Rail 1 Mounting

● DIN-Rail 1 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 1 Dismounting
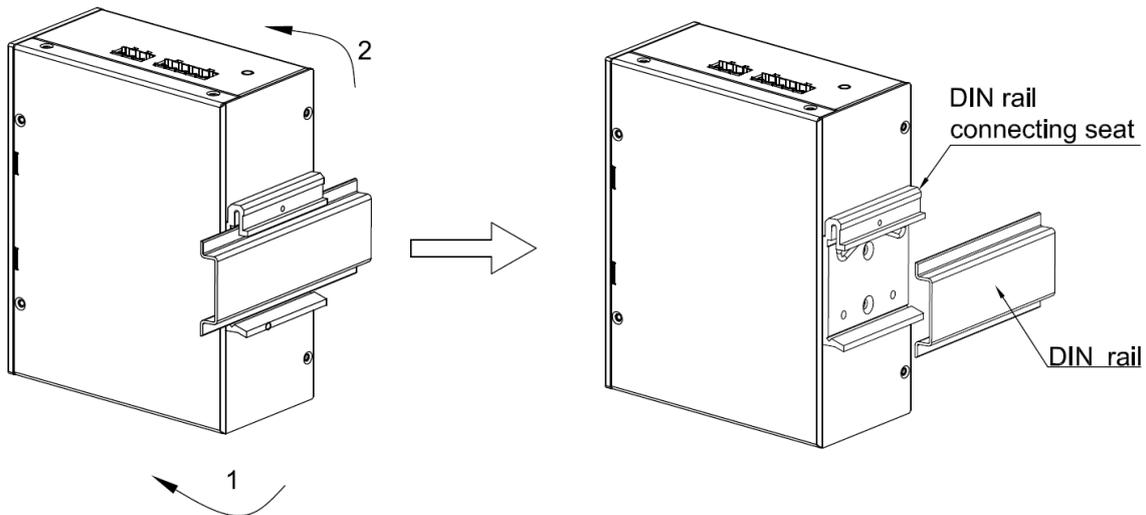
● DIN-Rail 2 Mounting

Step 1: Select the mounting position for the device and guarantee adequate space and heat dissipation.

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.
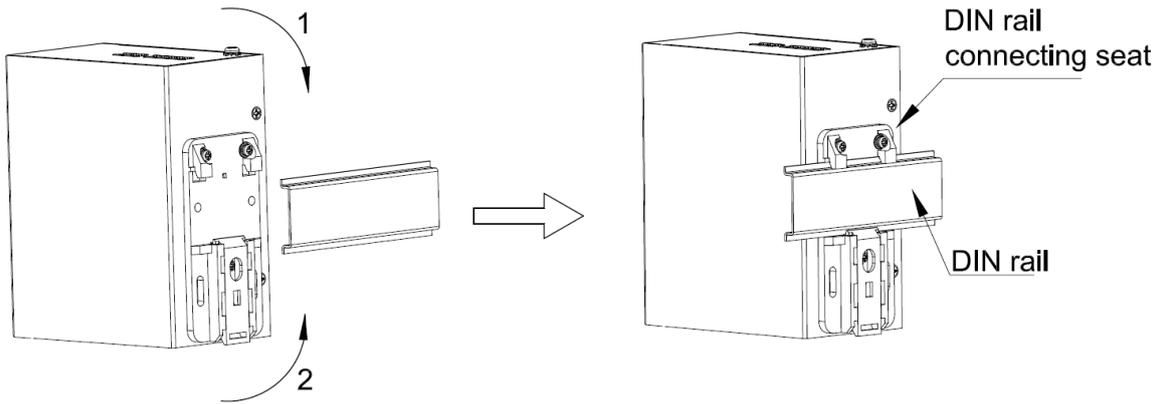
Figure 8 DIN-Rail 2 Mounting

● DIN-Rail 2 Dismounting

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

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

Figure 9 DIN-Rail 2 Dismounting

3.2.2 Panel Mounting

Note:

To adopt panel mounting, you need to purchase the plate for panel mounting (optional).

● Mounting

Step 1: Use screws to fix the plate for panel mounting to the rear panel of the device.
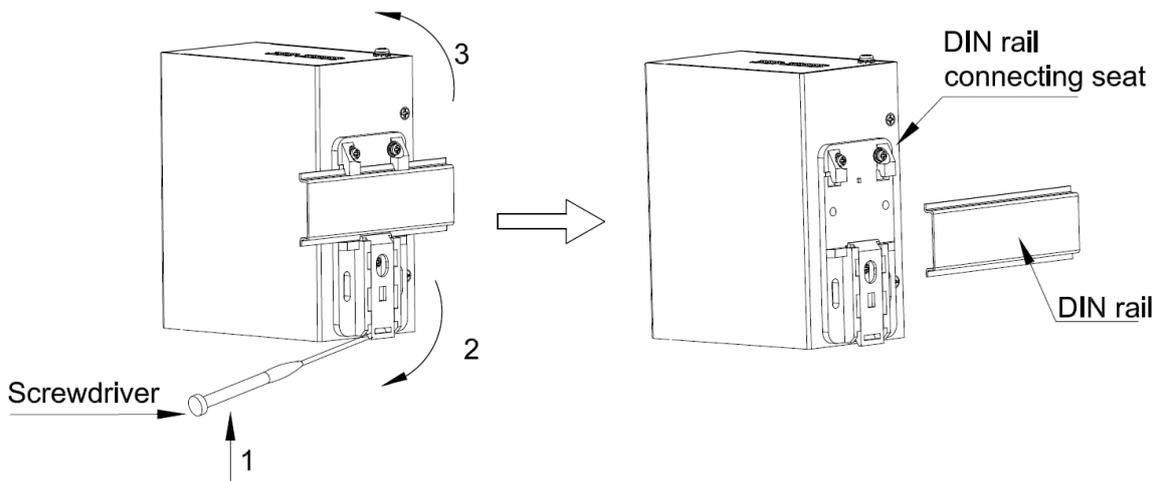
Step 2: Select the mounting position (on a wall or inner wall of a cabinet) for the device and guarantee adequate space and heat dissipation for it.

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. Make the screws pass through the Φ6.5 positions in the following figure. Move the device in direction 1 until the four screws are in the Φ4 positions. Then tighten the screws to complete mounting.
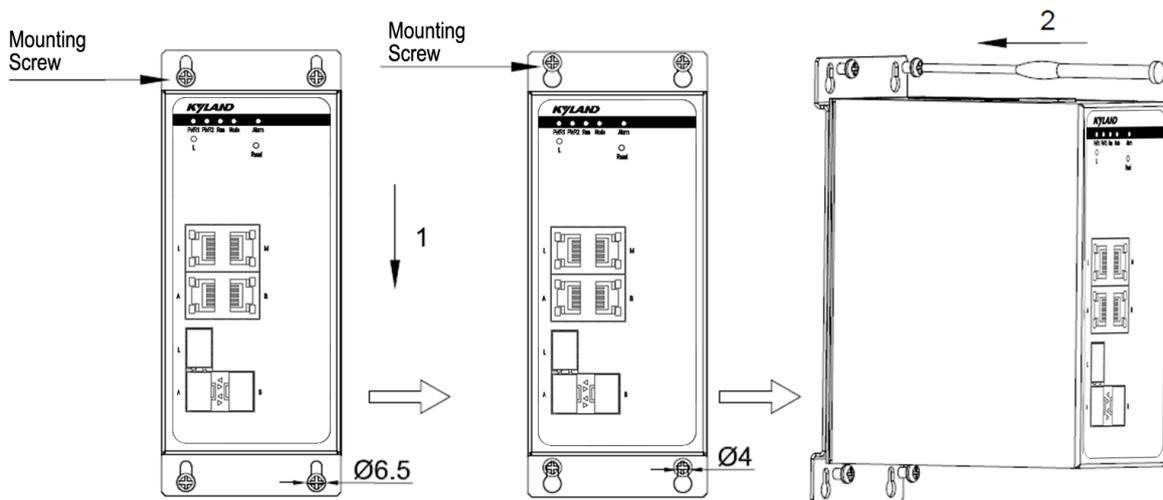
Figure 10 Panel Mounting

● Dismounting

Step 1: Loosen the four screws with a screwdriver. Move 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 11 Panel Dismounting

⚠️ CAUTION	**Caution:**
	Cut off the power and disconnect all cables before mounting, dismounting or moving the equipment.

4 Connection

4.1 10/100/1000Base-T(X) Ethernet Port

10/100/1000Base-T(X) Ethernet port is equipped with RJ45 connector. The port is self-adaptive. It can automatically configure itself to work in 10M, 100M, or 1000M s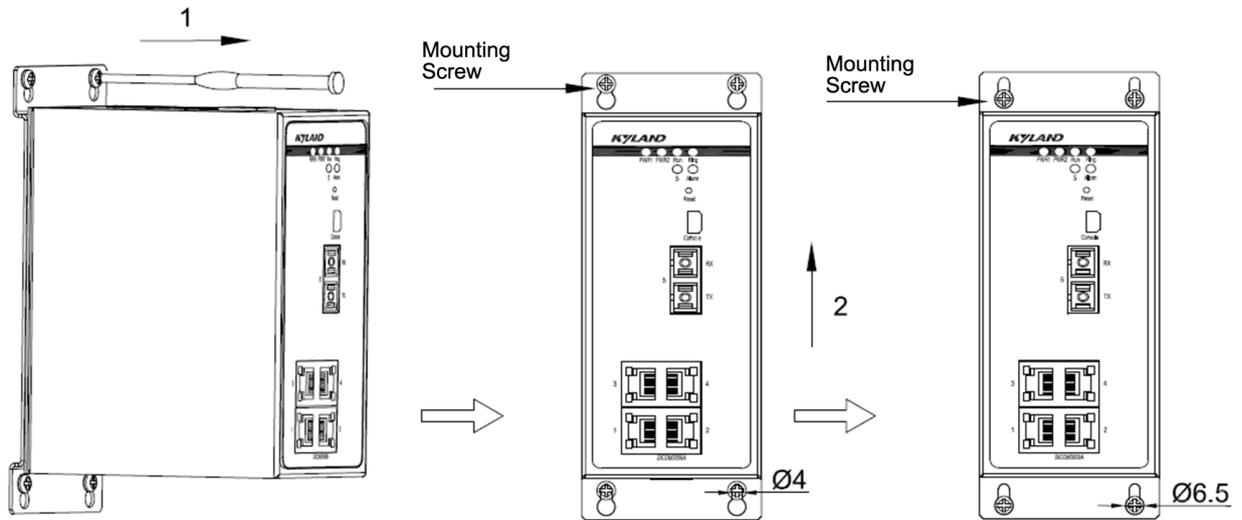tate, full or half duplex mode. The port can also adapt to MDI or MDI-X connection automatically. You can connect the port to a terminal or network device with a straight-through or cross-over cable.

● Pin Definition
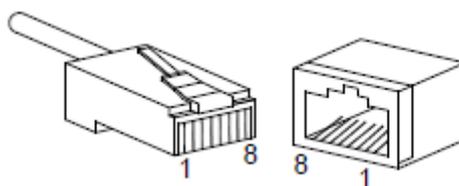
Figure 12 RJ45 Port

Table 2 Pin Definitions of 10/100/1000Base-T(X) RJ45 Port

Pin	MDI-X	MDI
1	Transmit/Receive Data (TRD1+)	Transmit/Receive Data (TRD0+)
2	Transmit/Receive Data (TRD1-)	Transmit/Receive Data (TRD0-)
3	Transmit/Receive Data (TRD0+)	Transmit/Receive Data (TRD1+)
4	Transmit/Receive Data (TRD3+)	Transmit/Receive Data (TRD2+)
5	Transmit/Receive Data (TRD3-)	Transmit/Receive Data (TRD2-)
6	Transmit/Receive Data (TRD0-)	Transmit/Receive Data (TRD1-)
7	Transmit/Receive Data (TRD2+)	Transmit/Receive Data (TRD3+)
8	Transmit/Receive Data (TRD2-)	Transmit/Receive Data (TRD3-)

	Note:
NOTE	"+" and "-" indicate level polarities.

● Wiring Sequence

Figure 13 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
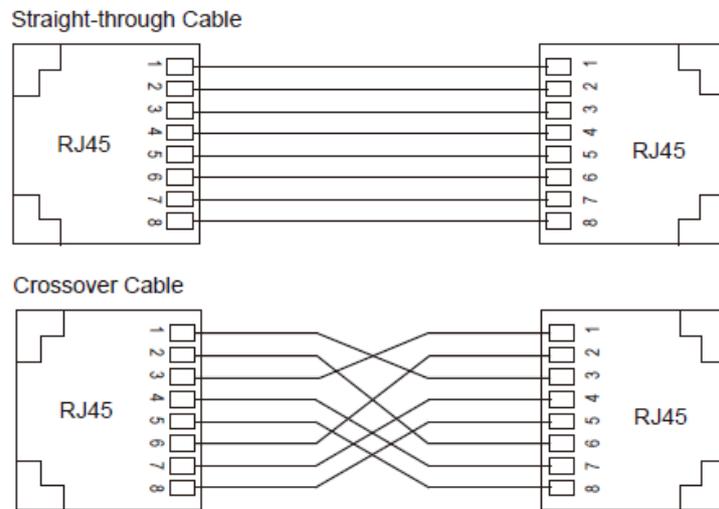> 8-brown.

4.2 1000LX/SX 10/100/1000Base-T(X) SFP slot

1000LX/SX   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 SFP
optical/electrical modules (optional) supported by the series switches.

Table 3 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
IFSFP-M-LX-LC-1310-2	100Base-X port	MM	LC	1310nm	2km

IFSFP-S-LH-LC-1310-40	100Base-X port	SM	LC	1310nm	40km
IGSFP-10/100/1000BASE-T-RJ45	10/100/1000Base-T(X) port	--	RJ45	--	--

Note:

The device uses the SFP module that supports digital diagnosis to support the optical power detection function of the SFP slot. For details about the SFP module, consult our sales or technical support personnel.

4.2.1 SFP Optical Module
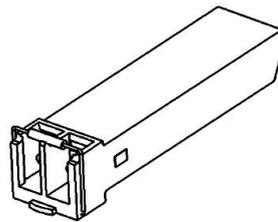
Figure 14 SFP Optical Module

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 15 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 16 Connecting the SFP Optical Module

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

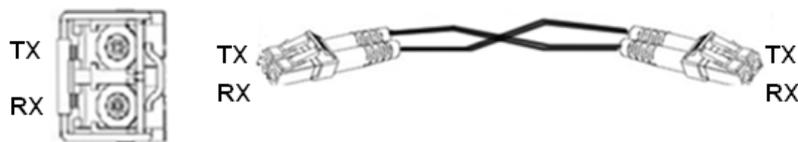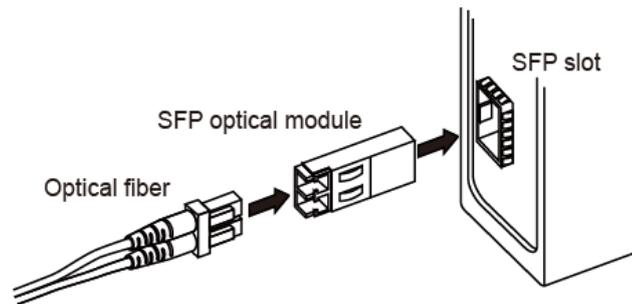1. Insert the two connectors in one end of two fibers into the SFP module, and those in the other end into the peer module.

2. View the corresponding connection status LED:

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

Caution:

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

● If the defined transmission distance of an SFP module is longer than 60km, do not use a short fiber (<20km) for connection. If such a short fiber is used, the module will be burned.

4.2.2 SFP Electrical Module
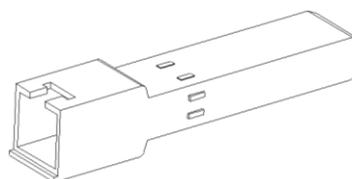

Figure 17 SFP Electrical Module

● 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.
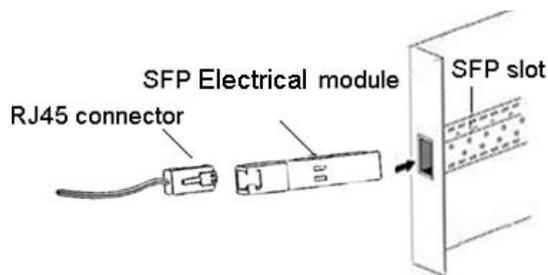
Figure 18 Connecting the SFP Electrical Module

4.3 1000LX/SX 10/100/1000Base-T(X) Combo Port

As shown in following table, the 1000LX/SX, 10/100/1000Base-T(X)Combo port consists of one 1000Base-X port(GX) and one 10/100/1000Base-T(X) Ethernet port, and only one of the two ports can be used at one time, and the 1000Base-X port has priority over 10/100/1000Base-T(X) port. Plug the optical fiber and the twisted pair into GX and GE respectively; GX can communicate normally and the GE will be disabled automatically.

The following table lists the relation of Gigabit SFP ports of Combo port and the corresponding 10/100/1000 Base-T(X) Ethernet port.

Table 4 Combo port corresponding relation

Combo port	1000Base-X SFP port	10/100/1000Base-T(X) Ethernet port
(1)	GX1	GE1
(2)	GX2	GE2
......	......	......

4.4 Console Port

The RJ45 connector use a DB9-RJ45 console cable to connect the 9-pin serial port of a PC to the console port of the switch.

Then you can configure, maintain, and manage the switch by running Hyper Terminal in Windows OS of the PC.
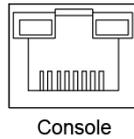
Figure 19 Console Port

● 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.
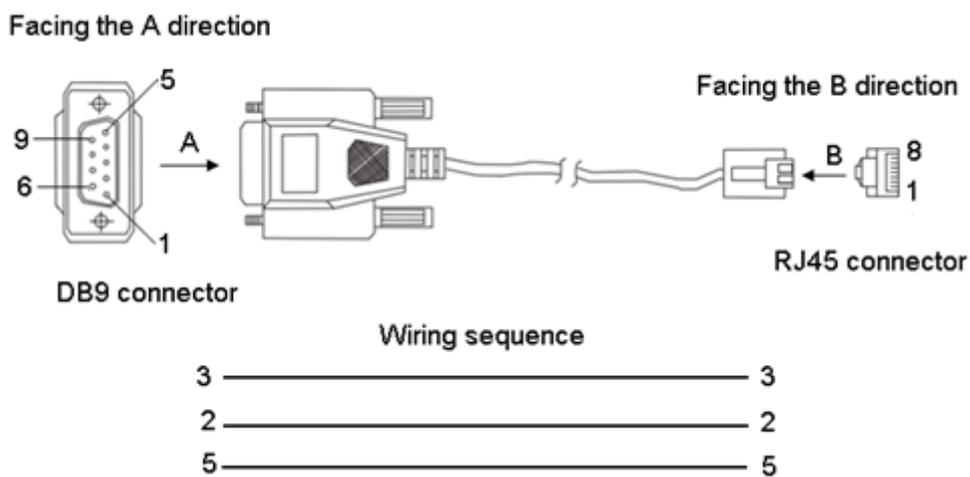
Figure 20 Wiring Sequence of DB9-RJ45 Console Cable

Table 5 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(see Figure 2) 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.

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

4.6 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. The Ruby3A-3G-L2-L2 device supports redundant power input with a 5-pin 5.08mm-spacing plug-in terminal block. When one power input is faulty, the device can continue operating properly, thereby improving network reliability. The Ruby3A-3G-HV device supports power input with a 3-pin 7.62mm-spacing plug-in terminal block.

> **Note：**
>
> ● 0.75mm^2<Cross-sectional area of the power wire<2.5mm^2; grounding resistance<5Ω.
>
> ● Use copper conductors only, temperature rating 85℃ only.

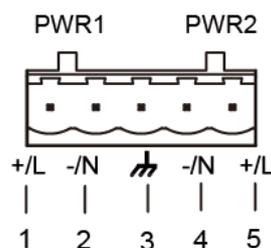● 5-Pin 5.08mm-Spacing Plug-in Terminal Block

Figure 21 5-Pin 5.08mm-Spacing Plug-in Terminal Block (socket)

Table 6 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

● 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 6 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.

Wiring and Mounting should meet following specifications.

Table 7 Wiring and Mounting Specifications

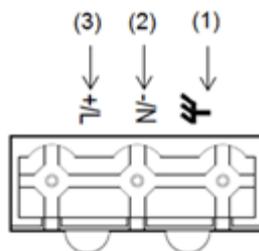| Terminal Type	Required Torque	Wire Range (AWG)
Terminal Block Plug	4.5-5.0 lb-in	12-24

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

Figure 22 5-Pin 5.08mm-Spacing Plug-in Terminal Block (socket)

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

No.	Signal	DC Definition	AC Definition
1	⏚	PGND	PGND

| 2 | -/N | PWR：- | PWR：N |
| 3 | +/L | PWR：+ | PWR：L |

● 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 8 and secure the wires.

Step 4: 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.

Wiring and Mounting should meet following specifications.

Table 9 Wiring and Mounting Specifications

Terminal Type	Required Torque	Wire Range (AWG)
Terminal Block Plug	4.5-5.0 lb-in	12-24

Caution:

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 top 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
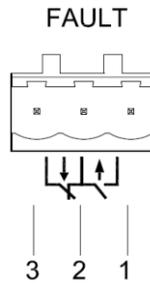
5.08mm-spacing plug-in terminal block.

Figure 23 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.

● Use copper conductors only, temperature rating 85℃ only.

● 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.

Wiring and Mounting should meet following specifications.

Table 10 Wiring and Mounting Specifications

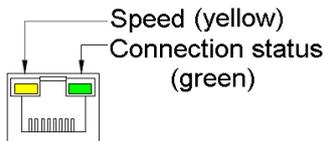| Terminal Type	Required Torque	Wire Range (AWG)
Terminal Block Plug	4.5-5.0 lb-in	12-24

5 Reset

The device provides a Reset button on the front panel. The button can be used to restart the device or restore factory default settings.

You can restart the device by pressing and holding the button for 0.5 to 3 second.

6 LEDs

Table 11 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	Blinking	The CPU operates properly.
	On	The CPU is starting up.
	Off	The CPU does not start up.
Alarm LED	On	An alarm occurs.
	Off	No alarm occurs.
1000Base-FX Ethernet port/Gigabit SFP slot connection status LED	On	Effective port connection
	Blinking	Ongoing network activities
	Off	No effective port connection
10/100/1000Base-T(X) Ethernet port speed LED (yellow)	On	1000M working state (1000Base-TX)
	Off	10/100M working state or no connection
10/100/1000Base-T(X) Ethernet port connection status LED (green)	On	Effective port connection
	Blinking	Ongoing network activities
	Off	No effective port connection
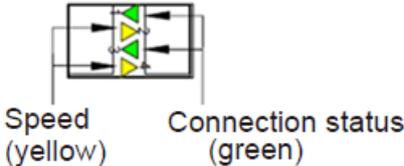
LED 1 and LED 2 indicate the status of the left gigabit SFP slot, while LED 3 and LED 4 indicate the status of the right gigabit SFP slot.			
1000LX/SX 10/100/1000Base-T (X) SFP slot speed LED	SFP Optical Module	On	1000M working state (1000Base-TX)
		Off	10/100M working state or no connection
	SFP Electrical Module	On	1000M working state (1000Base-TX)
		Off	10/100M working state or no connection
1000LX/SX 10/100/1000Base-T(X) SFP slot port connection status LED		On	Effective port connection
		Blinking	Ongoing network activities
		Off	No effective port connection

7 Switch Access

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

7.1 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.

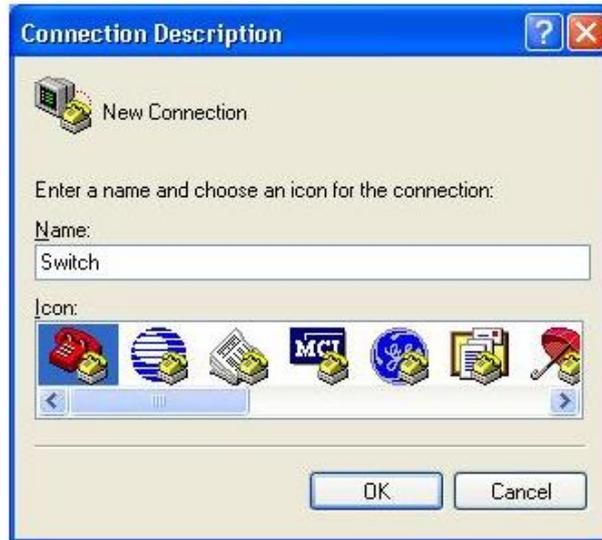Step 3: Create a connection "Switch", as shown in the following figure.

Figure 24 Creating a Connection

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

Figure 25 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: 115200, Data bits: 8, Parity: None, Stop bits: 1,

and Flow control: None), as shown in the following figure.

Figure 26 Setting Port Parameters

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

Table 12 CLI Commands

View	Command	Description
General mode	SWITCH>enable	Enter the privileged mode.
Privileged mode	SWITCH#show interface vlan 1	Query the default IP address of the switch.
Privileged mode	SWITCH#show version	Query the version of the switch.
Privileged mode	SWITCH#reboot	Restart the switch.
Privileged mode	SWITCH#set default SWITCH#save	Restore the factory default settings (including the IP address).
Privileged mode	SWITCH#config terminal	Enter the configuration mode.

7.2 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.
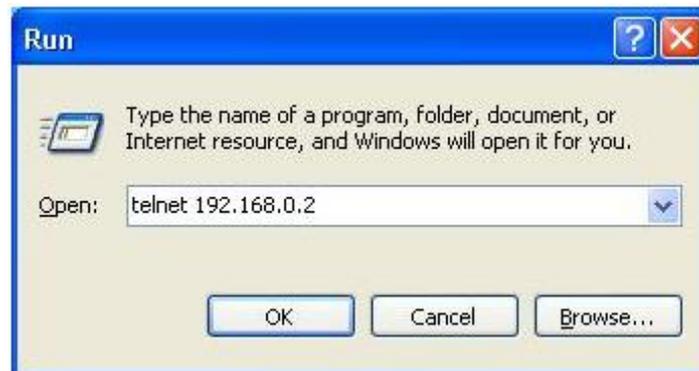

Figure 27 Access through Telnet

Step 3: Click OK. The Telnet CLI is displayed. Then you can run the commands in Table 12 to perform operations.

7.3 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 "kyland".

Note：

● Firefox browser is recommended.

● For details about how to access the device and other operations, refer to the Web operation manual in the delivered CD.

8 Basic Features and Specifications

Power Requirements

Power Identifier	Rated Voltage Range	Maximum Voltage Range
HV(220AC/DCW)	100-240VAC,50/60Hz;110-220VDC	85-264VAC/77-300VDC
L2(24DCW)	24-48VDC	18-72VDC
Terminal block	Ruby3A-3G-L2-L2：5-pin 5.08mm-spacing plug-in terminal block Ruby3A-3G-HV：3-pin 7.62mm-spacing plug-in terminal block	

Rated Power Consumption

Rated power consumption	6.5W (MAX)

Physical Characteristics

Housing	Metal, fanless
Protection class	IP40
Installation	DIN-rail mounting or panel mounting
Dimensions (W×H×D)	66.0mm×135mm×107.5mm (excluding the connector, DIN rail, and component for panel mounting)
Weight	0.95Kg

Environmental Limits

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

MTBF

MTBF	351889h

Warranty

Warranty	five years

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