Ruijie RG-RSR830 Series Router

Hardware Installation and Reference Guide

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Preface

Intended Audience

This document is intended for:

- Network engineers
- Technical support and servicing engineers
- Network administrators

Technical Support

- Ruijie Networks website: https://www.ruijienetworks.com/
- Technical support website: https://ruijienetworks.com/support
- Case portal: https://caseportal.ruijienetworks.com
- Community: https://community.ruijienetworks.com
- Technical support mailbox: service_rj@ruijienetworks.com
- Live chat: https://www.ruijienetworks.com/rita

Conventions

1. Signs

The signs used in this document are described as follows:

Warning

An alert that calls attention to important rules and information that if not understood or followed can result in data loss or equipment damage.

Caution

An alert that calls attention to essential information that if not understood or followed can result in function failure or performance degradation.

Note

An alert that contains additional or supplementary information that if not understood or followed will not lead to serious consequences.

Specification

An alert that contains a description of product or version support.

2. Note

The manual offers configuration information (including model, port type and command line interface) for indicative purpose only. In case of any discrepancy or inconsistency between the manual and the actual version, the actual version prevails.

Contents

1 Product Overview

The RG-RSR830 series routers support link aggregation, load balancing, basic security features, and SD-WAN, which is suitable to serve as an access device in a micro branch. In addition, it supports application identification, application filtering, intrusion prevention system (IPS), and IP Security (IPsec).

- The RG-RSR830 provides eight wired ports, including ten gigabit electrical LAN ports, which can be switched to WAN ports. It also provides two gigabit electrical WAN ports, which are combo ports and can serve as gigabit optical WAN ports when the SIC-2SFP module is installed.
- The RG-RSR830-P provides ten wired ports, including eight gigabit electrical LAN ports that can be switched to WAN ports and two gigabit electrical WAN ports that are combo ports and can serve as gigabit optical WAN ports when the SIC-2SFP module is installed. The RSR830-P supports PoE/PoE+, with each port providing up to 30 W of power. The device provides a maximum of 110 W of power.

The RG-RSR830 series support various add-on expansion modules, and users can flexibly combine expansion modules to implement service functions based on service requirements.

Table 1-1 RG-RSR830 Series

Model	Port	Wi-Fi	PoE	Expansion Modules
RG-RSR830	LAN port: 8 x GE electrical ports WAN port: 2 x GE electrical ports	Not supported	Not supported	SIC-LTE-GS SIC-LTE-GD SIC-5G-G SIC-2SFP
RG-RSR830-P	LAN: 8 x GE electrical ports WAN: 2 x GE electrical ports	Not supported	Supported	SIC-LTE-GS SIC-LTE-GD SIC-5G-G SIC-2SFP

Warning

- In a domestic environment, the RG-RSR830 series may cause radio interference.
- The RG-RSR830 series routers are not suitable for use in locations where children are likely to be present.

Warning

- Replacement of a battery with an incorrect type that can defeat a safeguard.
- Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery, may result in an explosion.
- Leaving a battery in an extremely high temperature surrounding environment that can result in an explosion or the leakage of flammable liquid or gas.

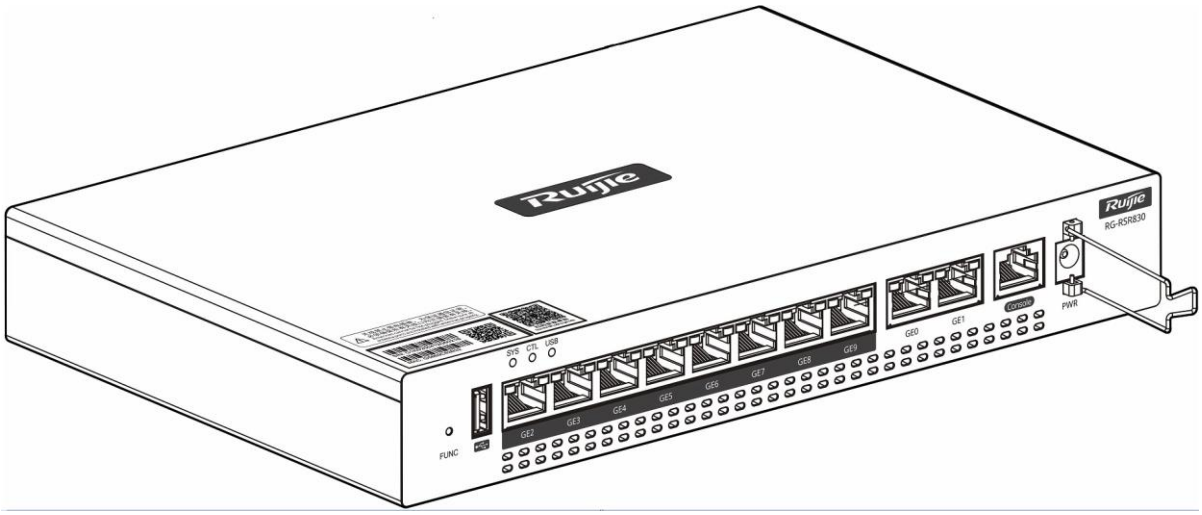
- A battery subjected to extremely low air pressure that may result in an explosion or the leakage of flammable.

1.2 RG-RSR830

1.2.1 Product Appearance

The RG-RSR830 provides eight GE LAN electrical ports (which can switch to WAN ports), two GE WAN electrical ports, one USB 2.0 port, and one FUNC button, as shown in Figure 1-1.

Figure 1-1 Appearance of the RG-RSR830



1. Front Panel

Figure 1-2 Front View of the RG-RSR830

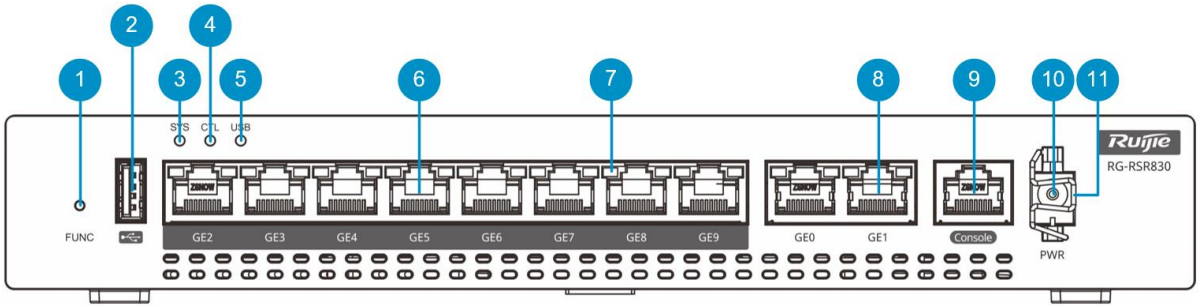


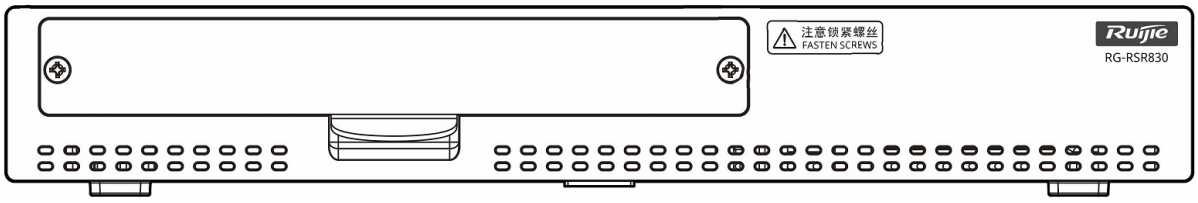
Table 1-2 Ports and Buttons on the Front Panel

No.	Port/Button	Description
1	FUNC button	Multi-function button (for details, see 1.2.4 LEDs and Buttons.)
2	USB port	USB 2.0 port, for connecting to the USB flash drive
3	SYS LED	System status LED

No.	Port/Button	Description
4	CTL LED	Controller status LED
5	USB LED	USB port status LED
6	Ports GE2–GE9	Electrical LAN ports for data transmission
7	Ethernet electrical port LED	Ethernet electrical port status LED
8	Ports GE0–GE1	Electrical WAN ports for data transmission
9	Console port	Management port
10	12 V power port	The port is used to connect the power adapter.
11	Power cord bail clasp	The clasp is used to secure the power cord.

2. Rear Panel

Figure 1-3 Rear View of the RG-RSR830



3. Product Nameplate

Figure 1-4 Nameplate of the RG-RSR830

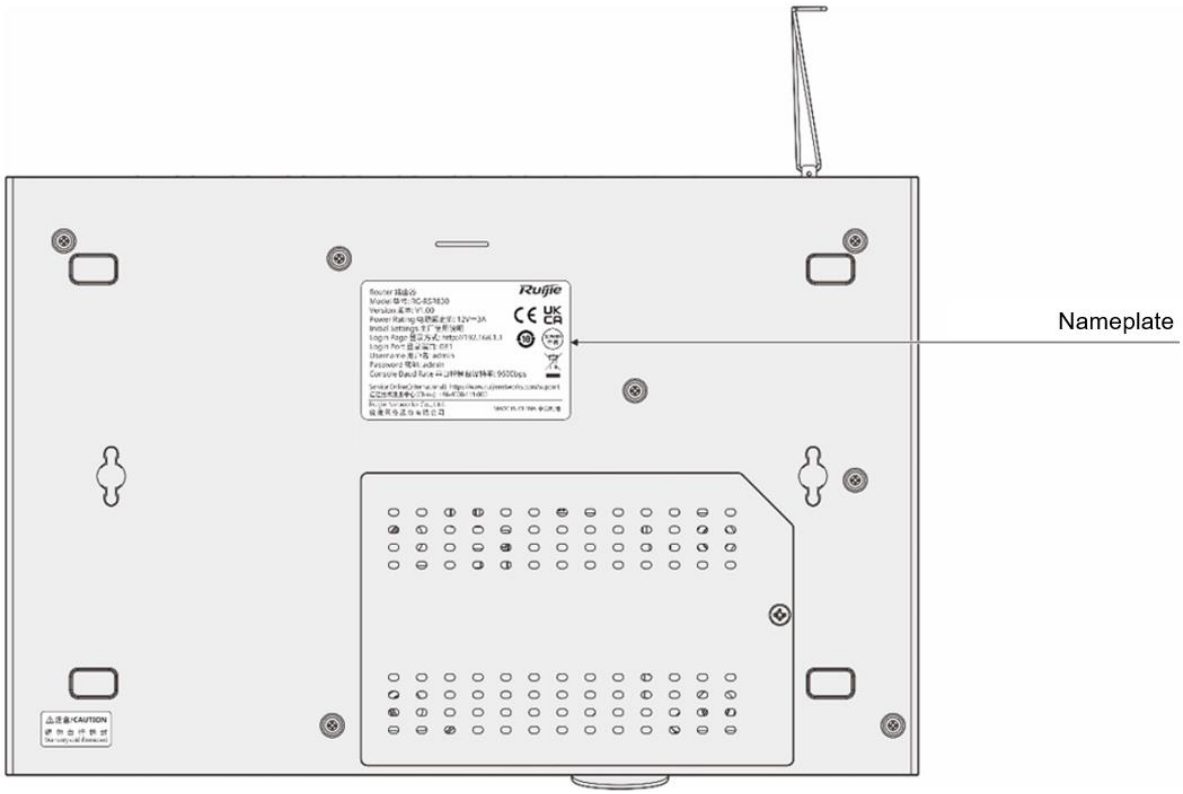


Figure 1-5 Nameplate Style

1.2.2 Package Contents

Table 1-3 Package Contents

Item	Quantity	Remarks
Chassis	1	
Power Adapter	1	
Power Cord	1	
Mounting Kit (Including Screws and Wall Anchors)	1	
Power Cord Retention Clip	1	
Warranty Card and List of Hazardous Substances	1	
Product Management Software of Ruijie Networks	1	Pre-installed on the device

Note

To obtain relevant product documentation, log in to the official website of Ruijie Networks (https://www.ruijienetworks.com). Choose **Support** > **Documentation and Download**. On the displayed page, select the corresponding product category to find the product and download relevant documentation.

1.2.3 Technical Specifications

1. Port Specifications

Table 1-4 Port Specifications

Port Specifications	RG-RSR830
Fixed service port	● Uplink WAN port: 2 x 10/100/1000BASE-T ports ● Downlink LAN port: 8 x 10/100/1000BASE-T ports, which can be switched to WAN ports
Fixed management port	1 x RJ45 console port
Status LED	1 x system status LED 1 x controller status LED 1 x USB port status LED 20 x Ethernet port LEDs
Button	1 x FUNC button
Expansion Module	SIC-LTE-GS: LTE card (Cat-6, 2 x SIM, active-standby) SIC-LTE-GD: LTE card (Cat-6, 2 x SIM, active-active)

Port Specifications	RG-RSR830
	SIC-5G-G: 5G NR in global bands single card, small plug-in card SIC-2SFP: expansion gigabit optical module plug-in card

2. Power Supply and Consumption

Table 1-5 Power Supply and Consumption

Power Supply and Consumption	RG-RSR830
Input power supply	36 W Power Adapter: ● Input: 100 V AC to 240 V AC, 50 Hz to 60 Hz, 0.9 A max. ● Output: 12 V DC, 3 A max, 36 W
Maximum Power Consumption	36 W (including module power)

3. Environment and Reliability

Table 1-6 Environment and Reliability

Environment and Reliability	RG-RSR830
Temperature	Operating temperature: 0°C to 45°C (32°F to 113°F) Storage temperature: –40°C to +70°C (–40°F to +158°F) Note: At a height between 1,800 m (5,905.51 ft.) and 5000 m (16404.2 ft.), every time the altitude increases by 220 m (721.78 ft.), the maximum temperature decreases by 1°C (1.8°F).
Humidity	Operating humidity: 10% RH to 90% RH (non-condensing) Storage humidity: 5% RH to 95% RH (non-condensing)
Altitude	Operating altitude: –500 m to +4000 m (–1640.42 ft. to +13123.36 ft.) Storage altitude: –500 m to +5000 m (–1640.42 ft. to +16404.20 ft.)
Fan	Fanless design, natural heat dissipation
IP rating	IP30
Mean Time Between Failure (MTBF)	100000 hours (11 year)

Caution

The RG-RSR830 adopts a fanless design. Therefore, maintain sufficient clearance around the router for air circulation.

4. Dimensions and Weight

Table 1-7 Dimensions and Weight of the RG-RSR830

Dimensions and Weight	RG-RSR830
Unit Dimensions (W x D x H)	260 mm x 171 mm x 38 mm (10.24 in. x 6.73 in. x 1.50 in.)
Shipping dimensions (W x D x H)	386 mm x 302 mm x 90 mm (15.20 in. x 11.89 in. x 3.54 in.)
Unit weight	0.95 kg (2.09 lbs.)
Shipping weight	1.65 kg (3.64 lbs.) (including the power supply and packaging)
Mounting	Mounting on a workbench /Wall mounting
Color	White
Lock option	Anti-theft lock

5. Certifications and Regulatory Compliance

Table 1-8 Certifications and Regulatory Compliance of the RG-RSR830

Certifications and Regulatory Compliance	RG-RSR830
Safety Regulation	EN 62368-1
EMC Regulation	EN 55035 EN IEC 61000-3-2 EN 55032 EN 61000-3-3 EN 300386

1.2.4 LEDs and Buttons

Table 1-9 LEDs and Buttons

LED/Button	Description
SYS LED	● Off: The device is not powered on. ● Blinking green: The motherboard is powered on, and the device is starting up. ● Solid red: The motherboard is powered on, but the device is faulty. ● Solid green: The motherboard is powered on, and the device successfully starts.
CTRL LED	● Solid green: The SD-WAN function is available.

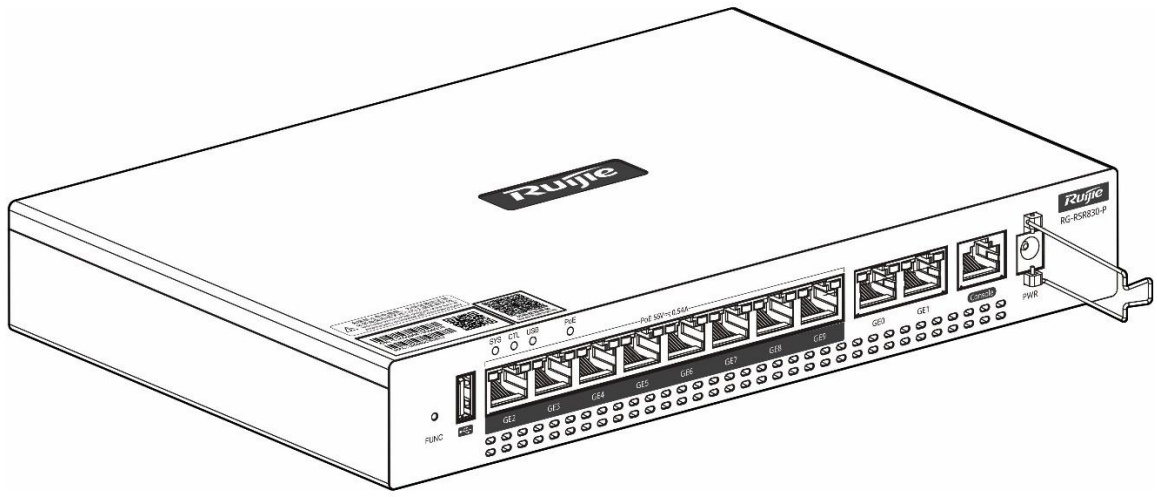
	● Off: The SD-WAN function is unavailable.
USB port status LED	● Off: No USB flash drive is inserted. ● Solid green: A USB flash drive is identified.
Ethernet electrical port LED	● Solid green: The port is Up at a rate of 1 Gbps. ● Blinking green: The port is receiving or sending data at a rate of 1 Gbps. ● Solid yellow: The port is Up at a rate of 100 Mbps/10 Mbps. ● Blinking yellow: The port is receiving or sending data at a rate of 100 Mbps or 10 Mbps. ● Off: The port is Down.
FUNC button	With no USB flash drive inserted: ● DHCP deployment: Press and hold the FUNC button until SYS LED blinks green. Release the button and press it twice within 6s to import DHCP deployment configuration. Then, reset the device. ● Factory settings restoration: Press and hold the FUNC button for more than 6s to restore the default configuration and reset the device. ● Device resetting: Press the FUNC button and perform no operation within 6s to reset the device. With a USB flash drive inserted: ● Deployment using a USB flash drive: Press the FUNC button. The system detects the configuration file whose name complies with the naming rule in the USB flash drive and executes the configuration file. Then, the system is reset. ● Upgrade using an installation package: Press the FUNC button. The system detects the installation package whose name complies with the naming rule in the USB flash drive and executes the installation package. Then, the system is reset.

1.3 RG-RSR830-P

1.3.1 Product Appearance

The RG-RSR830-P provides eight wired ports, two gigabit electrical WAN port, one USB 2.0 port, and one FUNC button, as shown in Figure 1-6.

Figure 1-6 Appearance of the RG-RSR830-P



1. Front Panel

Figure 1-7 Front View of the RG-RSR830-P

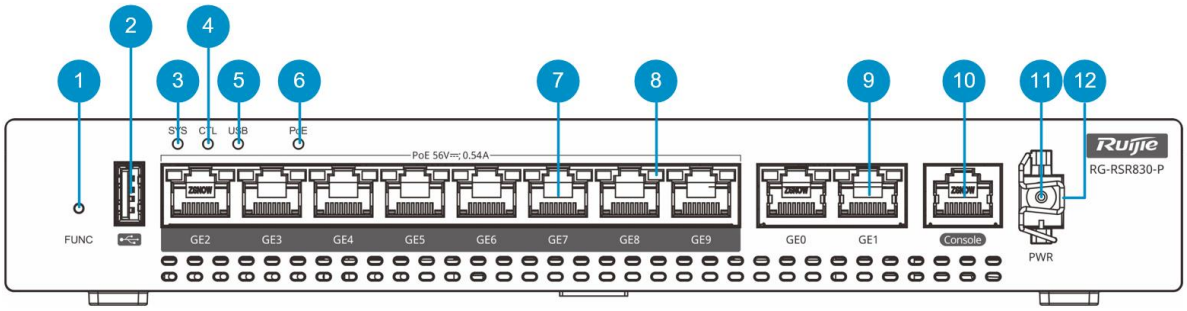
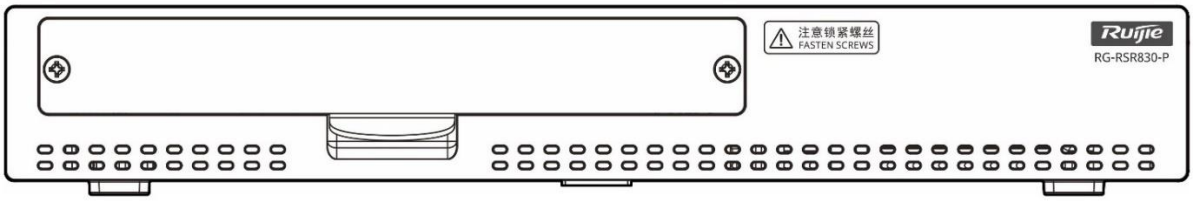


Table 1-10 Ports and Buttons on the Front Panel

No.	Port/Button	Description
1	FUNC button	Multi-function button
2	USB port	USB 2.0 port, for connecting to the USB flash drive
3	SYS LED	System status LED
4	CTL LED	Controller status LED
5	USB LED	USB port status LED
6	PoE status LED	PoE status LED (If the LED is on, it indicates that PoE is enabled on the port.)
7	Ports GE2–GE9	Electrical LAN ports for data transmission
8	Ethernet electrical port LED	Ethernet electrical port status LED
9	Ports GE0–GE1	Electrical WAN ports for data transmission
10	Console port	Management port
11	56 V power port	The port is used to connect the power adapter.
12	Power cord bail clasp	The clasp is used to secure the power cord.

2. Rear Panel

Figure 1-8 Rear View of the RG-RSR830-P



3. Product Nameplate

Figure 1-9 Nameplate of the RG-RSR830-P

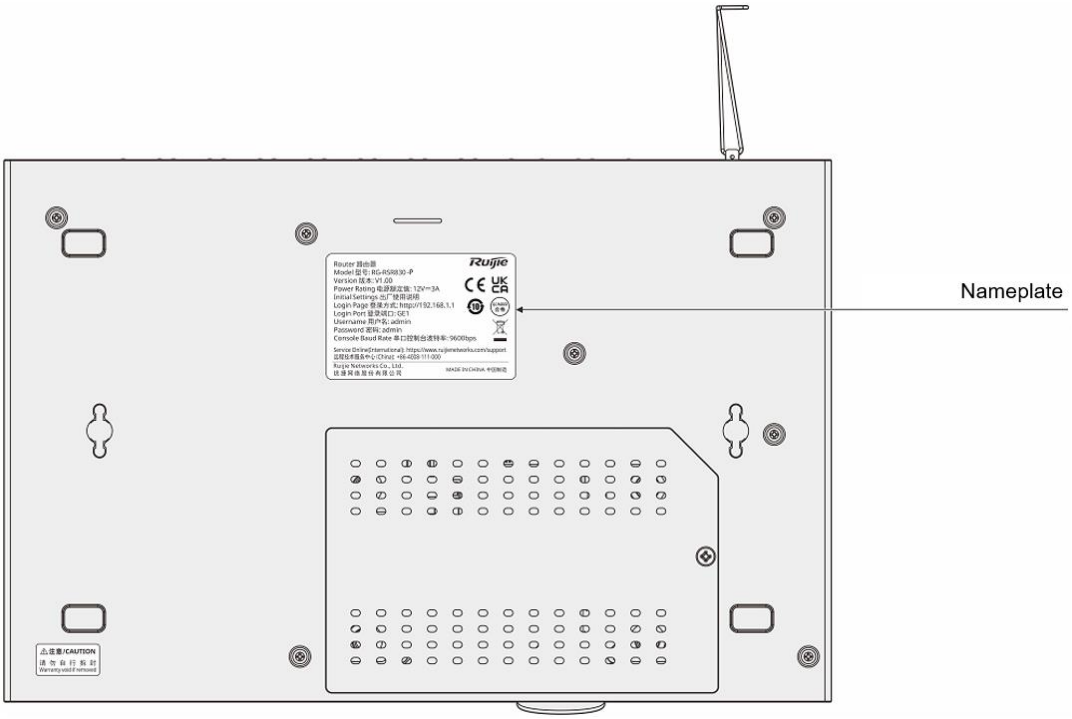


Figure 1-10 Nameplate Style

1.3.2 Package Contents

Table 1-11 Package Contents

Item	Quantity	Remarks
Chassis	1	
Power Adapter	1	
Power Cord	1	
Mounting Kit (Including Screws and Wall Anchors)	1	
Power Cord Retention Clip	1	
Warranty Card and List of Hazardous Substances	1	
Product Management Software of Ruijie Networks	1	Pre-installed on the device

Note

To obtain relevant product documentation, log in to the official website of Ruijie Networks (https://www.ruijienetworks.com). Choose **Support** > **Documentation and Download**. On the displayed page, select the corresponding product category to find the product and download relevant documentation.

1.3.3 Technical Specifications

1. Port Specifications

Table 1-12 Port Specifications

Port Specifications	RG-RSR830-P
Fixed service port	Uplink WAN port: 2 x 10/100/1000Base-T ports Downlink LAN port: 8 x 10/100/1000Base-T ports, which can be switched to WAN ports LAN ports 2 to 9 support PoE/PoE+.
Fixed management port	1 x RJ45 console port
Status LED	1 x system status LED 1 x controller status LED 1 x USB port status LED 20 x Ethernet port LEDs 1 x PoE status LED
Button	1 x FUNC button

Port Specifications	RG-RSR830-P
Expansion Module	SIC-LTE-GS: LTE card (Cat-6, 2 x SIM, active-standby) SIC-LTE-GD: LTE card (Cat-6, 2 x SIM, active-active) SIC-5G-G: 5G NR in global bands single card, small plug-in card SIC-2SFP: expansion gigabit optical module plug-in card

2. Power Supply and Consumption

Table 1-13 Power Supply and Consumption

Power Supply and Consumption	RG-RSR830-P
Input power supply	150 W Power Adapter: ● Input: 100 V AC to 240 V AC, 50 Hz to 60 Hz, 2 A max. ● Output: 56 V DC, 2.68 A, 150 W
Maximum Power Consumption	150 W (including PoE power and module power)
External Power Supply	Each port provides up to 30 W of power. The device provides up to 110 W of power.

Caution

The IEEE 802.3at- and IEEE 802.3bt-compliant access points, such as RG-AP840-L, RG-AP4820, RG-ADP-M, need to be powered through alternate ports when powered by the RG-RSR830-P.

3. Environment and Reliability

Table 1-14 Environment and Reliability

Environment and Reliability	RG-RSR830-P
Temperature	Operating temperature: 0°C to 45°C (32°F to 113°F) Storage temperature: –40°C to +70°C (–40°F to +158°F) Note: At a height between 1800 m (5905.51 ft.) and 5000 m (16404.20 ft.), every time the altitude increases by 220 m (721.79 ft.), the maximum temperature decreases by 1°C (1.8°F).
Humidity	Operating humidity: 10% RH to 90% RH (non-condensing) Storage humidity: 5% RH to 95% RH (non-condensing)
Altitude	Operating altitude: –500 m to +4000 m (–1640.42 ft. to +13123.36 ft.) Storage altitude: –500 m to +5000 m (–1640.42 ft. to +16404.20 ft.)
Fan	Fanless design, natural heat dissipation

Environment and Reliability	RG-RSR830-P
IP rating	IP30
Mean Time Between Failure (MTBF)	100000 hours (11 year)

Caution

The RG-RSR830 adopts a fanless design. Therefore, maintain sufficient clearance around the router for air circulation.

4. Dimensions and Weight

Table 1-15 Dimensions and Weight of the RG-RSR830-P

Dimensions and Weight	RG-RSR830-P
Unit Dimensions (W x D x H)	260 mm x 171 mm x 38 mm (10.24 in. x 6.73 in. x 1.50 in.)
Shipping dimensions (W x D x H)	386 mm x 302 mm x 90 mm (15.20 in. x 11.89 in. x 3.54 in.)
Unit weight	1.05 kg (2.31 lbs.)
Shipping weight	2.25 kg (4.96 lbs.) (including the power supply and packaging)
Mounting	Mounting on a workbench /Wall mounting
Color	White
Lock option	Anti-theft lock

5. Certifications and Regulatory Compliance

Table 1-16 Certifications and Regulatory Compliance of the RG-RSR830

Certifications and Regulatory Compliance	RG-RSR830-P
Safety Regulation	EN 62368-1
EMC Regulation	EN 55035 EN IEC 61000-3-2 EN 55032 EN 61000-3-3 EN 300386

1.3.4 LEDs and Buttons

Table 1-17 LEDs and Buttons

LED/Button	Description
SYS LED	● Off: The device is not powered on. ● Blinking green: The motherboard is powered on, and the device is starting up. ● Solid red: The motherboard is powered on, but the device is faulty. ● Solid green: The motherboard is powered on, and the device successfully starts.
CTRL LED	● Solid green: The SD-WAN function is available. ● Off: The SD-WAN function is unavailable.
USB port status LED	● Off: No USB flash drive is inserted. ● Solid green: A USB flash drive is identified.
Ethernet electrical port LED	● Solid green: The port is Up at a rate of 1 Gbps. ● Blinking green: The port is receiving or sending data at a rate of 1 Gbps. ● Solid yellow: The port is Up at a rate of 100 Mbps/10 Mbps. ● Blinking yellow: The port is receiving or sending data at a rate of 100 Mbps or 10 Mbps. ● Off: The port is Down.
FUNC button	With no USB flash drive inserted: ● DHCP deployment: Press and hold the FUNC button until SYS LED blinks green. Release the button and press it twice within 6s to import DHCP deployment configuration. Then, reset the device. ● Factory settings restoration: Press and hold the FUNC button for more than 6s to restore the default configuration and reset the device. ● PoE port status indicator: Press the button to enable the PoE port LED to indicate the PoE status. With a USB flash drive inserted: ● Deployment using a USB flash drive: Press the FUNC button. The system detects the configuration file whose name complies with the naming rule in the USB flash drive and executes the configuration file. Then, the system is reset. ● Upgrade using an installation package: Press the FUNC button. The system detects the installation package whose name complies with the naming rule in the USB flash drive and executes the installation package. Then, the system is reset.
PoE port LED	● Solid green: indicates the switching status. ● Solid yellow: indicates the PoE status.

1.4 EU and UK declaration of conformity

Ruijie Networks Co., Ltd. hereby declares that the device is in compliance with the essential requirements and other relevant provisions of directives 2014/53/EU, 2009/125/EC, 2011/65/EU and (EU)2015/863, and UK Radio Equipment Regulations 2017.

The original EU and UK declaration of conformity may be found at https://www.ruijienetworks.com/

Restrictions in the 5 GHz band:

The 5150 to 5350 MHz frequency range is restricted to indoor use only in: AT, BE, BG, CH, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IS, IT, LI, LT, LU, LV, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, UK.

Frequency Bands and Power

The frequency bands and transmitting power (radiated and/or conducted) nominal limits applicable to this radio equipment are as follows:

- Wi-Fi:

2400–2483.5MHz: **20 dBm**, Wi-Fi 5G: 5150–5350 MHz: **23 dBm**, 5470–5725 MHz: **30 dBm**.

	AT	BE	BG	CH	CY	CZ	DE	DK	EE	EL	ES
	FI	FR	HR	HU	IE	IS	IT	LI	LT	LU	LV
	MT	NL	NO	PL	PT	RO	SE	SI	SK	TR	UK(NI)

	UK

The device should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

1.5 Expansion Modules

1.5.1 SIC-LTE-GD

1. Product Appearance

The SIC-LTE-GD is a 4G Dual SIM Dual Standby (DSDS) data module that supports the Wideband Code Division Multiple Access (WCDMA), Time Division Long Term Evolution (TD-LTE), Frequency Division Duplexing-Long Term Evolution (LTE FDD) standards. It can be inserted into the RG-RSR830 series router with service interface card (SIC) slots to enable wired routing and wireless data transmission on 3G/4G public network. The SIC-LTE-GD has four LTE antenna interfaces, as shown in Figure 1-11.

Figure 1-11 Appearance of the SIC-LTE-GD

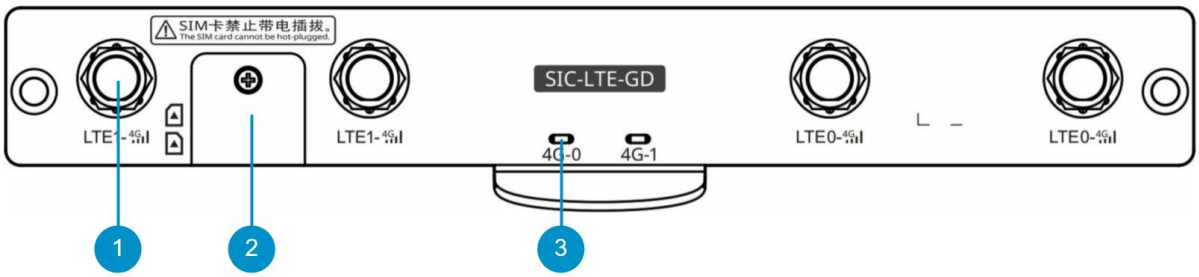


Table 1-18 Panel Button and LED

No.	Button and LED	Description
1	LTE antenna connector	LTE antenna connector
2	Button of the SIM card slot	Button of the SIM card slot, with SIM card slots inside
3	LTE status LED	LTE status LED

Note

The two antenna connectors on the right of the device correspond to module 0 and SIM 0, and the two on the left correspond to module 1 and SIM 1.

Table 1-19 Panel LED

Name	Description	LED Status
4G0/4G1	SIM card status	● Off: System services are not available. ● Solid green: 4G services are available, with strong signal strength. ● Blinking green: 4G services are available, with weak signal strength. ● Solid orange: 3G services are available, with strong signal strength. ● Blinking orange: 3G services are available, with weak signal strength.

2. Technical Specifications

Table 1-20 Technical Specifications of the SIC-LTE-GD

Model	SIC-LTE-GD
Module service port	2 x 4G ports (DSDS)
Transmit power	LTE-FDD: Class 3 (23 dBm±2 dB) LTE-TDD: Class 3 (23 dBm±2 dB) WCDMA: Class 3 (23 dBm±2 dB)
Unit dimensions (W x D x H)	Excluding antennas: 155 mm x 93 mm x 21 mm (6.10 in. x 3.66 in. x 0.83 in.) Including external antennas: 155 mm x 138.3 mm x 176.5 mm (6.10 in. x 5.44 in. x 6.95 in.)
Shipping dimensions (W x D x H)	207 mm x 125 mm x 50 mm (8.15 in. x 4.92 in. x 1.97 in.)
Unit weight	0.31 kg (0.68 lbs.)
Shipping weight	0.47 kg (1.04 lbs.)

Communication Standard	3GPP E-UTRA Release 12
Safety Regulation	EN 62368-1
EMC Regulation	EN 301 489-1 EN 301 489-52
Radio Standard	EN301 908-1 EN301 908-2 EN301 908-13 EN IEC 62311

3. Product Nameplate

Figure 1-12 Nameplate of the SIC-LTE-GD

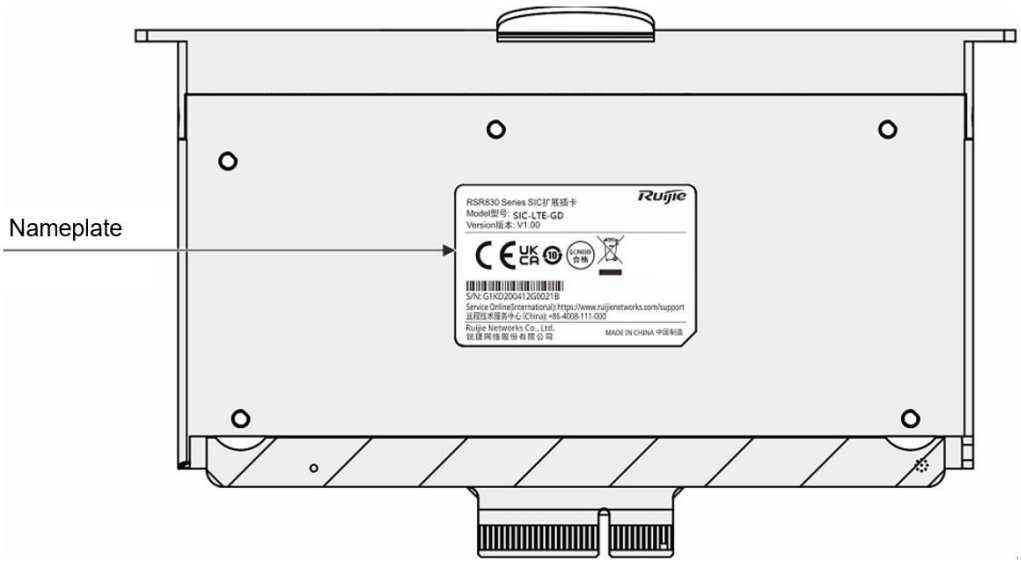


Figure 1-13 Nameplate Style

1.5.2 SIC-LTE-GS

1. Product Appearance

The SIC-LTE-GS is a 4G Dual SIM Single Standby module that supports the WCDMA, TD-LTE, LTE FDD standards. It can be inserted into an RG-RSR830 series router with SIC slots to enable wired routing and wireless data transmission on 3G/4G public network. The SIC-LTE-GS has two LTE antenna interfaces, as shown in Figure 1-14.

Figure 1-14 Appearance of the SIC-LTE-GS

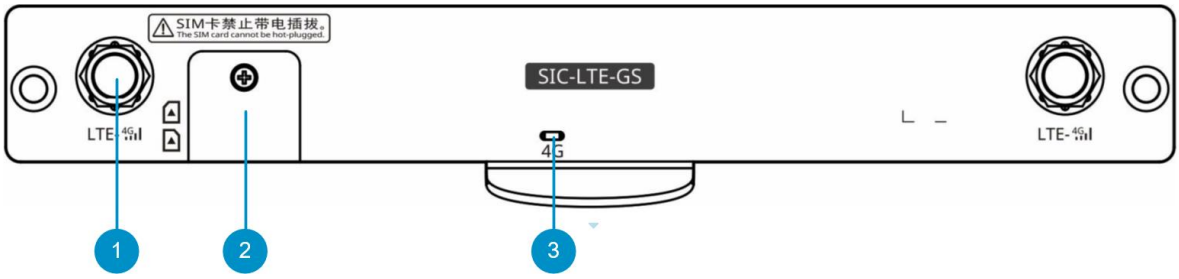


Table 1-21 Panel Button and LED

No.	Button and LED	Description
1	LTE antenna connector	LTE antenna connector
2	Button of the SIM card slot	Button of the SIM card slot, with SIM card slots inside
3	LTE status LED	LTE status LED

Table 1-22 Panel LED

Name	Description	LED Status
4G	SIM card status	● Off: System services are not available. ● Solid green: 4G services are available, with strong signal strength. ● Blinking green: 4G services are available, with weak signal strength. ● Solid orange: 3G services are available, with strong signal strength. ● Blinking orange: 3G services are available, with weak signal strength.

2. Technical Specifications

Table 1-23 Technical Specifications of the SIC-LTE-GS expansion module

Model	SIC-LTE-GS
Module service port	1 x 4G port (Dual SIM Single Standby)

Transmit power	LTE-FDD: Class 3 (23 dBm±2 dB) LTE-TDD: Class 3 (23 dBm±2 dB) WCDMA: Class 3 (23 dBm±2 dB)
Unit dimensions (W x D x H)	Excluding antennas: 155 mm x 93 mm x 21 mm (6.10 in. x 3.66 in. x 0.83 in.) Including external antennas: 155 mm x 138.3 mm x 176.5 mm (6.10 in. x 5.44 in. x 6.95 in.)
Shipping dimensions (W x D x H)	207 mm x 125 mm x 50 mm (8.15 in. x 4.92 in. x 1.97 in.)
Unit weight	0.25 kg (0.66 lbs.)
Shipping weight	0.41 kg (0.90 lbs.)
Communication Standard	3GPP E-UTRA Release 12
Safety Regulation	EN 62368-1
EMC Regulation	EN 301 489-1 EN 301 489-52
Radio Standard	EN301 908-1 EN301 908-2 EN301 908-13 EN IEC 62311

3. Product Nameplate

Figure 1-15 Nameplate of the SIC-LTE-GS

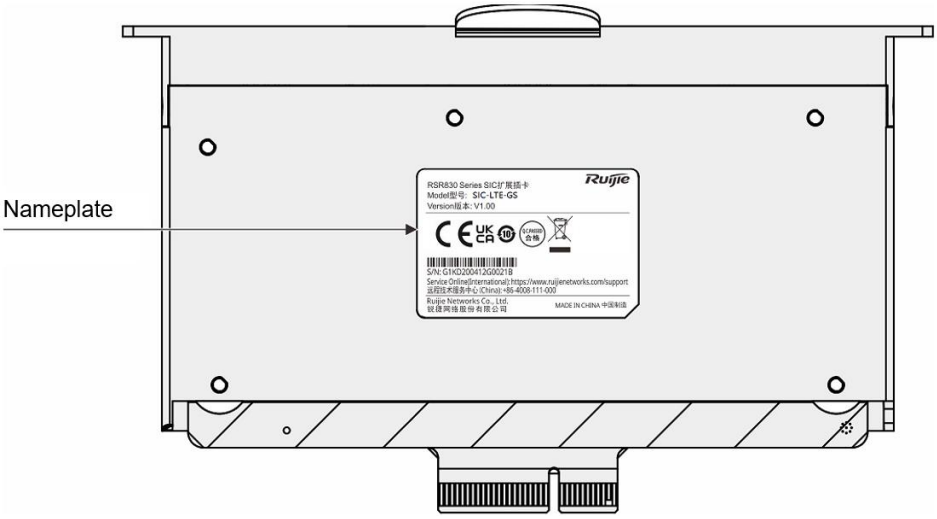


Figure 1-16 Nameplate Style

1.5.3 SIC-5G-G

1. Product Appearance

The SIC-5G-G is a Dual SIM Single Standby 5G data module that supports the WCDMA, TD-LTE, LTE FDD, and 5G standards. It can be inserted into the RG-RSR830 series device with SIC slots to enable wired routing and wireless data transmission on 3G/4G/5G public network. The SIC-5G-G has four LTE antenna interfaces, as shown in Figure 1-17.

Figure 1-17 Appearance of the SIC-5G-G Expansion Module

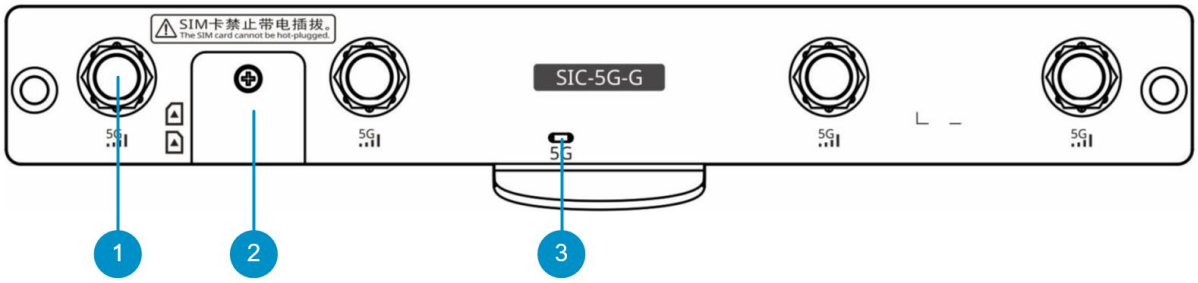


Table 1-24 Panel Button and LED

No.	Button and LED	Description
1	LTE antenna connector	LTE antenna connector
2	Button of the SIM card slot	Button of the SIM card slot, with SIM card slots inside
3	5G/LTE status LED	LTE status LED

Table 1-25 Panel LED

Name	Description	LED Status
5G	SIM card status	● Off: System services are not available. ● Solid green: 5G services are available, with strong signal strength. ● Blinking green: 5G services are available, with weak signal strength. ● Solid orange: 4G services are available, with strong signal strength. ● Blinking orange: 4G services are available, with weak signal strength.

2. Technical Specifications

Table 1-26 Dimensions and Weight of the SIC-5G-G expansion module

Model	SIC-5G-G
Module service port	1 x 5G port
Transmit power	5G NR bands: Class 3 (23 dBm ±2 dB) 5G NR HPUE bands (N38/N40/N41/N77/N78/N79): Class 2 (26 dBm +2/–3 dB) LTE bands: Class 3 (23 dBm ±2 dB) LTE HPUE1bands (B38/B41/B42/B43): Class 2 (26 dBm ±2 dB) WCDMA bands: Class 3 (23 dBm ±2 dB)
Unit dimensions (W x D x H)	Excluding antennas: 155 mm x 93 mm x 21 mm (6.10 in. x 3.66 in. x 0.83 in.) Including external antennas: 155 mm x 138.3 mm x 176.5 mm (6.10 in. x 5.44 in. x 6.95 in.)
Shipping dimensions (W x D x H)	207 mm x 125 mm x 50 mm (8.15 in. x 4.92 in. x 1.97 in.)
Unit weight	0.27 kg (0.66 lbs.)
Shipping weight	0.46 kg (1.01 lbs.)
Communication Standard	3GPP Release 16
Safety Regulation	GB 4943.1
EMC Regulation	GB/T9254.1

3. Product Nameplate

Figure 1-18 Nameplate of the SIC-5G-G

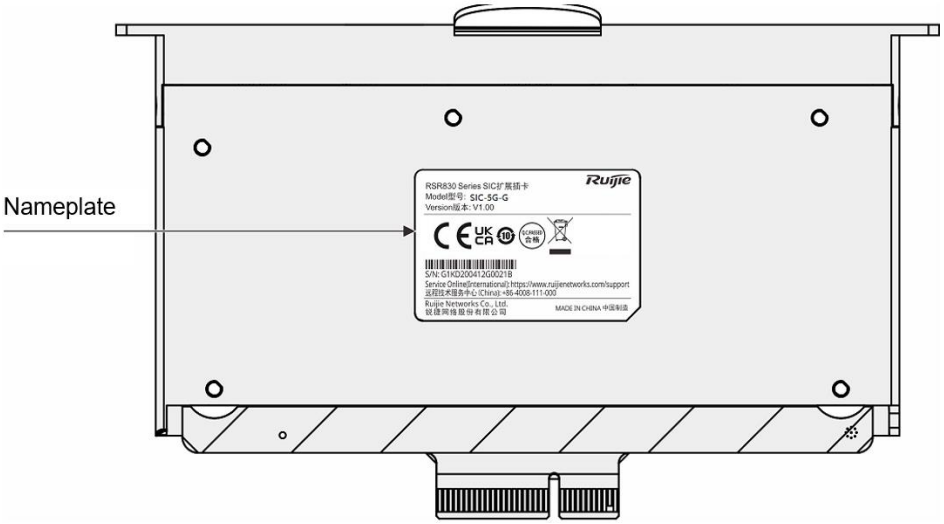


Figure 1-19 Nameplate Style

1.5.4 SIC-2SFP

1. Product Appearance

The SIC-2SFP is a 1000M expansion module for optical transceiver expansion. It can be inserted into the RG-RSR830 series device with SIC slots and provides two 1000M SFP ports, as shown in Figure 1-20.

Figure 1-20 Appearance of the SIC-2SFP Expansion Module

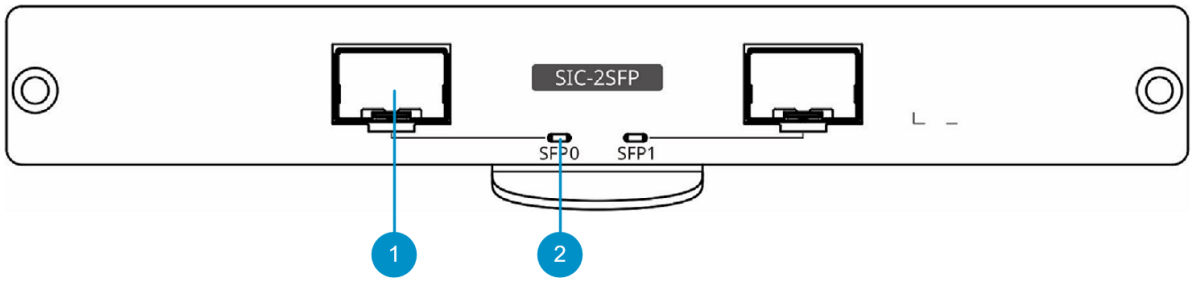


Table 1-27 Panel Button and LED

No.	Button and LED	Description
1	SFP port	SFP port
2	Port status LED	SFP port status LED

Table 1-28 Panel LED

Name	Description	LED Status
SFP0/SFP1	Port status	● Off: The port is Down. ● Solid green: The optical port is Up at the rate of 1G. ● Blinking green: The optical port is sending or receiving data at the rate of 1G.

2. Technical Specifications

Table 1-29 Technical Specifications of the SIC-2SFP

Model	SIC-2SFP
Module service port	2 x 1GE SFP ports
Unit dimensions (W x D x H)	155 mm x 93 mm x 21 mm (6.10 in. x 3.66 in. x 0.83 in.)
Shipping dimensions (W x D x H)	207 mm x 125 mm x 50 mm (8.15 in. x 4.92 in. x 1.97 in.)
Unit weight	0.2 kg (0.66 lbs.)
Shipping weight	0.32 kg (0.71 lbs.)
Safety Regulation	GB 4943.1
EMC Regulation	GB/T9254.1

3. Product Nameplate

Figure 1-21 Nameplate of the SIC-2SFP

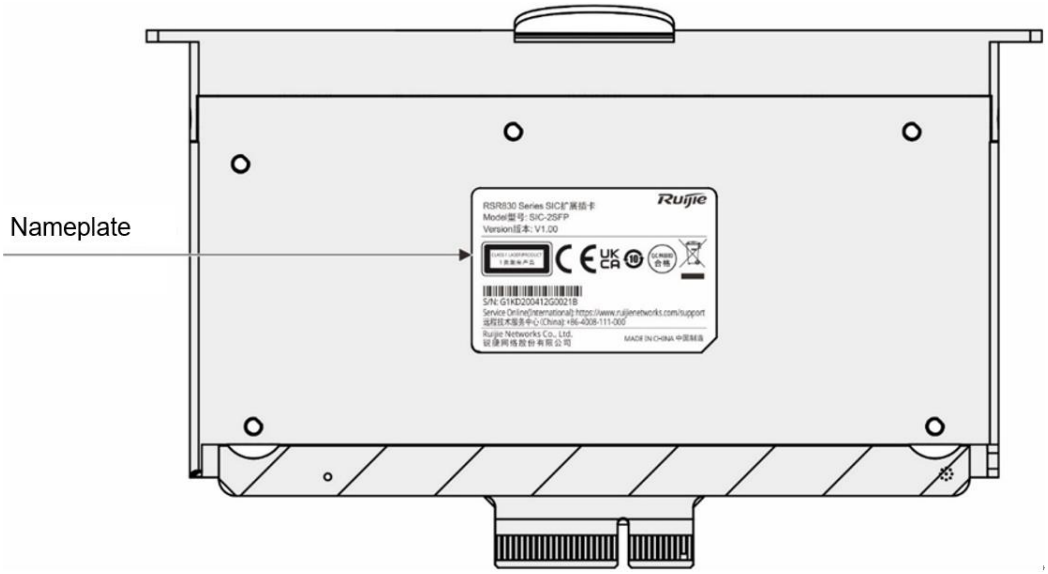
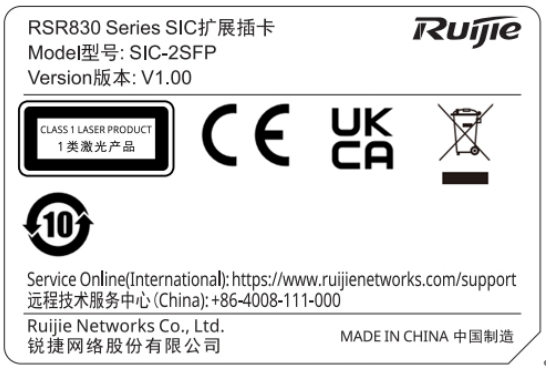


Figure 1-22 Nameplate Style



2 Preparing for Installation

2.1 Safety Precautions

Note

- To avoid personal injury and device damage, carefully read the safety precautions before you install the device.
- The following safety precautions do not cover all possible dangers.

2.1.1 General Safety Precautions

- Do not expose the device to high temperature, dusts, or harmful gases. Do not install the device in an inflammable or explosive environment. Keep the device away from Electro-Magnetic Interference (EMI) sources such as large radar stations, radio stations, and substations. Do not subject the device to unstable voltage, vibration, and noises.
- The installation site should be free from water flooding, seepage, dripping, or condensation. The installation site should be selected according to communication network planning and technical requirements for communication equipment, and considerations such as climate, hydrology, geology, earthquake, electrical power, and transportation.
- The installation site should be dry. You are not advised to install the AP in a place near the sea. Keep the device at least 500 meters (1640.42 ft.) away from the ocean. You are advised not to orient the device toward the direction of sea breeze.
- Do not place the device in walking areas.
- During installation and maintenance, do not wear loose clothes, ornaments, or any other things that may be hooked by the chassis.
- Keep tools and components away from the walking area.
- Equipment for use in locations where it is unlikely that children will be present.

2.1.2 Movement

- Do not frequently move the device.
- Cut off all power modules and unplug all power cords and cables before handling the device.

2.1.3 Electricity

Warning

- Improper or incorrect electric operations may cause a fire, electric shock, and other accidents, and lead to severe and fatal personal injury and device damage.
- Direct or indirect touch through a wet object on high-voltage and mains supply can bring a fatal danger.

- Observe local regulations and specifications when performing electric operations. Only qualified personnel can perform such operations.

- Check whether there are potential risks in the working area. For example, check whether the ground is wet.
- Find out the position of the indoor emergency power switch before installation. Cut off the power switch in the case of accidents.
- Make sure that the device is powered off when you cut off the power supply.
- Do not place the device in a wet position, and keep it away from liquid.
- Keep the router far away from grounding or surge protection devices connected to power devices.
- Keep the device away from radio stations, radar stations, high-frequency and high-current devices, microwave ovens, and other high-power wireless devices.

2.1.4 Storage

To ensure proper working of the device, store the device in an environment based on the storage temperature or humidity requirements in technical specifications.

Caution

If the device has been powered off for more than 18 months, power on the device and run it for consecutive 24 hours.

2.2 Installation Environment Requirements

The device must be installed and used indoors. The installation site must meet the following requirements to ensure the normal operation and prolonged service life of the device.

2.2.1 Load Bearing

Evaluate the weight of the device and its accessories, and ensure that the installation site meets the requirement.

2.2.2 Ventilation

Reserve sufficient space in front of air vents to ensure normal heat dissipation. After various cables are connected, bundle the cables or place them in the cable management bracket to avoid blocking air inlets.

2.2.3 Clearance

Maintain the clearance of at least 0.4 m (15.75 in.) around the device for heat dissipation.

2.2.4 Temperature and Humidity

To ensure the normal operation and prolonged service life of the device, maintain an appropriate temperature and humidity in the equipment room.

The equipment room with improper temperature and humidity for a long period may damage the device.

- In an environment with high relative humidity, the insulating material may have poor insulation or even leak electricity.
- In an environment with low relative humidity, the insulating strip may dry and shrink, resulting in screw loosening.
- In a dry environment, internal circuits are prone to static electricity.

- A high temperature can accelerate the aging process of insulation materials, greatly reducing the reliability of the device and severely affecting its service life.

Note

The ambient temperature and humidity are measured at the point that is 1.5 m (59.06 in.) above the floor and 0.4 m (15.75 in.) before the device rack when there is no protective plate in front or at the back of the rack.

2.2.5 Cleanliness

Dust poses a severe threat to the running of the device. The indoor dust falling on the device may be absorbed by the static electricity, causing bad contact of the metallic joint. Such electrostatic absorption may occur more easily when the relative humidity is low. This affects the device lifecycle and causes communication faults.

Table 2-1 Requirements for the Dust Content and Granularity in the Equipment Room

Dust	Unit	Content
Dust particles (diameter ≤ 0.5 μm)	Particles/m^3	≤ 1.4×10^7
Dust particles (0.5 μm < diameter ≤ 1 μm)	Particles/m^3	≤ 7×10^5
Dust particles (1 μm < diameter ≤ 3 μm)	Particles/m^3	≤ 2.4×10^5
Dust particles (3 μm < diameter ≤ 5 μm)	Particles/m^3	≤ 1.3×10^5

Apart from dust, the salt, acid, and sulfide in the air in the equipment room must meet strict requirements. These harmful substances will accelerate metal corrosion and component aging. Therefore, the equipment room should be properly protected against the intrusion of harmful gases, such as sulfur dioxide, hydrogen sulfide, nitrogen dioxide, and chlorine gas.

Table 2-2 Limit Values for Harmful Gases

Gas	Average (mg/m^3)	Maximum (mg/m^3)
Sulfur dioxide (SO_2)	0.2	1.5
Hydrogen sulfide (H_2S)	0.006	0.03
Nitrogen dioxide (NO_2)	0.04	0.15
Ammonia gas (NH_3)	0.05	0.15
Chlorine gas (Cl_2)	0.01	0.3

Note

Average refers to the average value of harmful gases measured in one week. **Maximum** is the upper limit of the harmful gas measured in one week for up to 30 minutes every day.

2.2.6 Anti-interference

- Take effective measures to prevent interference from power grid to the power supply system.
- Keep the device far away from the grounding facility or lightning and grounding facility of the power device as much as possible.
- Keep the device far away from high-frequency current devices such as the high-power radio transmitting station and radar launcher.
- Take electromagnetic shielding measures when necessary.

2.2.7 Surge Protection

The device can guard against lightning strikes. As an electric device, too strong lightning strikes may still damage the device. Take the following surge protection measures:

- Ensure that the neutral point of the AC power socket is in good contact with the ground.
- You are advised to install a power lightning arrester in front of the power input end to enhance surge protection for the power supply.

2.2.8 Others

When the device is installed against the wall, the following conditions must be met:

- Maintain a proper clearance around air intakes and outlets for heat dissipation.
- The installation site allows for proper cooling and ventilation. Install air conditioners in hot areas.
- The installation side is sturdy enough to support the weight of the device and its accessories.

2.3 Tools

Table 2-3 Tools

Common Tools	Phillips screwdriver, power cords, Ethernet cables, cage nuts, diagonal pliers, cable ties, and flat-blade screwdriver (for removing the decorative cover)
Special Tools	Anti-ESD glove, wire stripper, common crimping plier, RJ45 crimping plier, and wire cutter
Meter	Multimeter and bit error rate tester (BERT)
Relevant Device	PC, display, and keyboard

Note

The RG-RSR830 is not shipped with a tool kit. You need to prepare a tool kit by yourself.

3 Installation

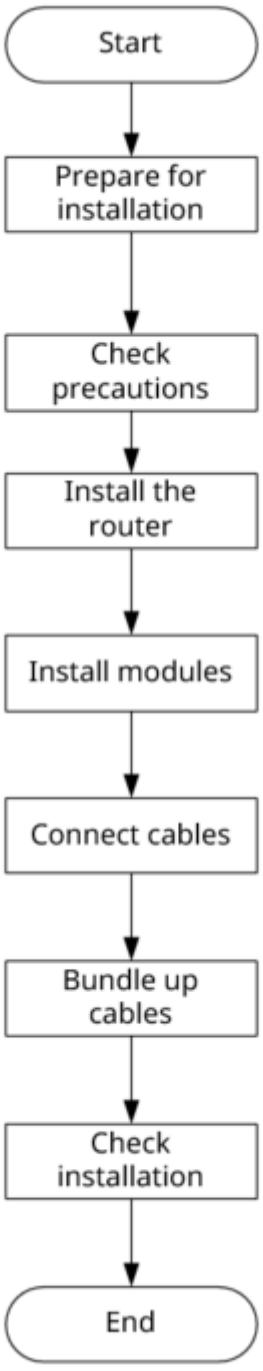
Secure the RG-RSR830 indoors.

Caution

Before installing the device, make sure that you have carefully read the requirements described in Chapter 2 .

3.1 Installation Procedure

Figure 3-1 Installation Procedure



3.2 Checking Before Installation

Carefully plan and arrange the installation location, networking, power supply, and cabling before installing the device.

The following requirements must be met before installation:

- The installation location provides sufficient clearance for heat dissipation.
- The installation location meets temperature and humidity requirements of the device.
- The power supply and required current are available in the installation location.
- The Ethernet cables are deployed in the installation location.
- The selected power supply meets system power requirements.
- Locate the indoor emergency power switch before installation. Cut off the power in case of accidents.

3.3 Precautions

To ensure the normal operation and prolonged service life of the router, observe the following safety precautions:

- Do not power on the device during installation.
- Place the device in a well-ventilated environment.
- Do not subject the device to high temperature.
- Keep the device away from high-voltage power cables.
- Install the device indoors.
- Do not expose the device to a thunderstorm or strong electric field.
- Keep the device clean and dust-free.
- Cut off the power supply before cleaning the device.
- Do not wipe the device with a damp cloth.
- Do not clean the device with liquid.
- Do not open the enclosure when the device is working.
- Secure the device.

3.4 Installing the Device

3.4.1 Installing the Device on the Workbench

The device is placed on a clean workbench in most situations. Pay attention to the following points:

- Ensure that the workbench is sturdy.
- Reserve the clearance of 10 cm (3.94 in.) around the router for heat dissipation.
- Do not place heavy objects on the device.

3.4.2 Installing the Device Against a Wall

The RG-RSR830 can be wall mounted against a wall:

(1) Drill two holes in parallel on the wall, with a spacing of 200 mm (7.87 in.).

(2) Tap the wall anchors into the holes and drive the screws into the wall anchors.

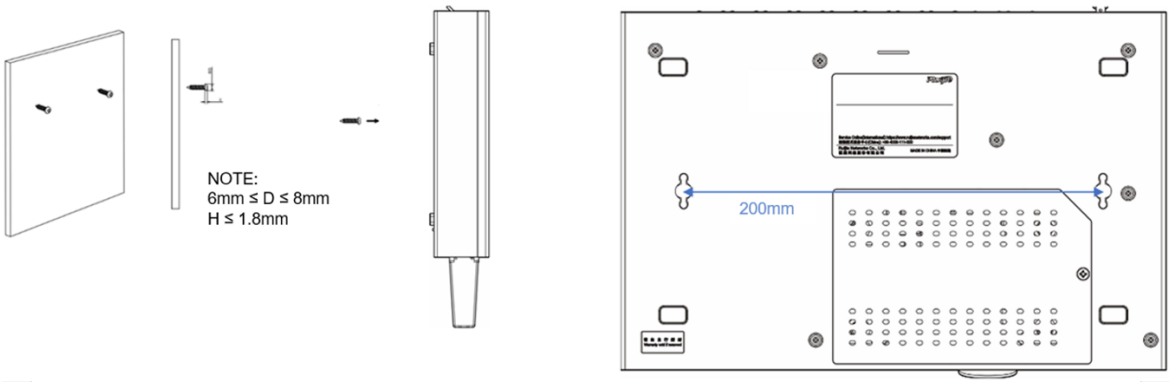
(3) Align the two mounting holes at the bottom of the device with the screws mounted on the wall, and pull the device down slightly so that it hangs from the screws.

Pay attention to the following points:

- Do not place the router in a place where it will be exposed to moisture or excessive heat.
- Keep the router away from devices with strong electromagnetic interference, such as Bluetooth devices, microwave ovens, or cordless phones.

The router can be mounted on the wall as shown in the following figure.

Figure 3-2 Mount on the Wall



Caution

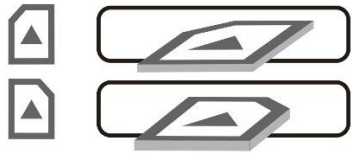
- The screw head should have a diameter ranging from 6mm (0.24 in.) to 8 mm (0.31in.) (6 mm ≤ D ≤ 8 mm), with a maximum height of 1.8 mm (0.07 in.). The distance between two screws should measure precisely 200 mm (7.87 in.). The screw should have a minimum length of 20 mm (0.79 in.), with a visible portion above the wall measuring at least 4.5 mm (0.18 in.) in order to withstand the weight of the product.

3.4.3 Installing a SIM Card on a LTE Expansion Module

(1) Use a Phillips screwdriver to remove the screws on the SIM card slot cover anticlockwise, and remove the cover.

(2) As shown in Figure 3-3, insert the SIM card into the slot, and ensure that the SIM card is securely installed in the slot.

Figure 3-3 Installing a SIM Card



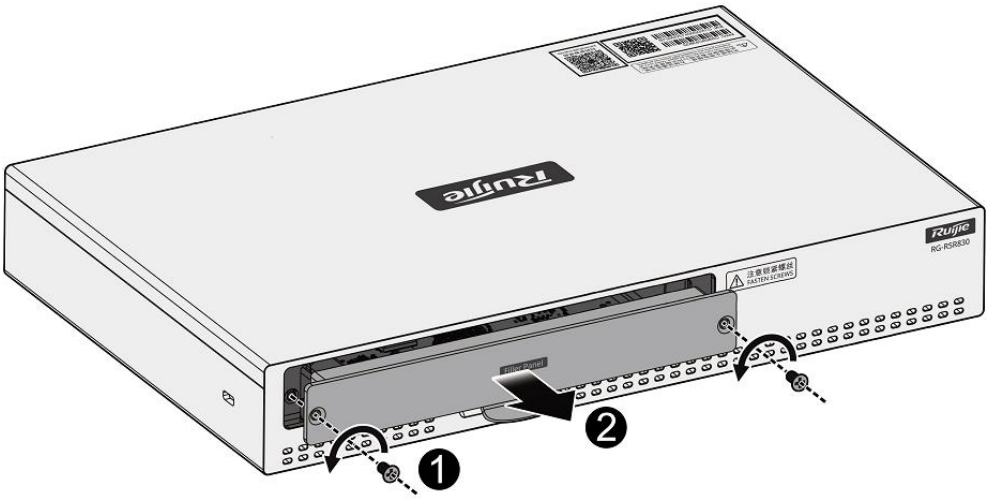
(3) Install the cover and tighten the screws clockwise.

3.4.4 Installing an Expansion Module on the Device

The following example installs the SIC-5G-G.

(1) Remove the rear faceplate of the device.

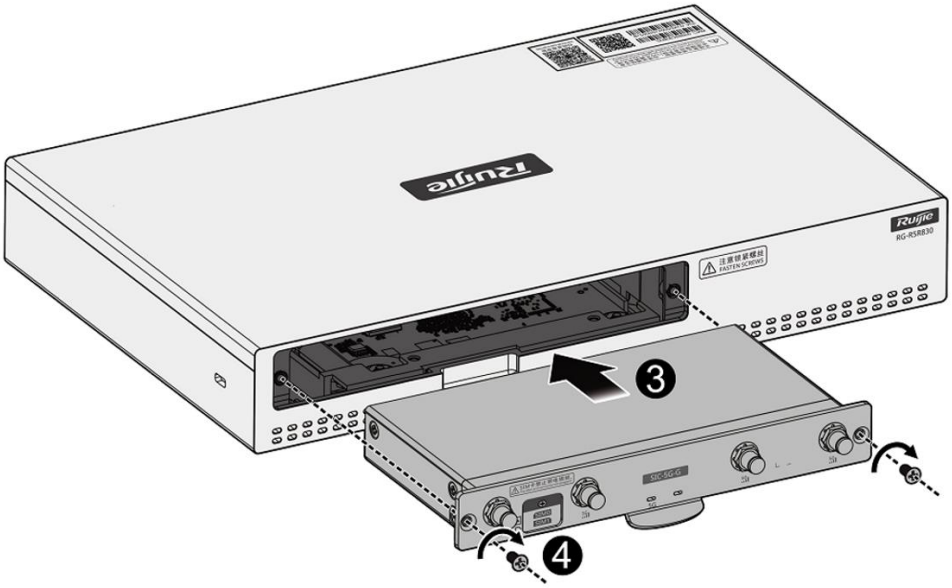
Figure 3-4 Removing the Rear Faceplate of the Device



(2) Align the expansion module with the opening edge of the expansion module slot in the rear panel of the router, and push the expansion module into the router until the expansion module is flush with the rear panel of the router.

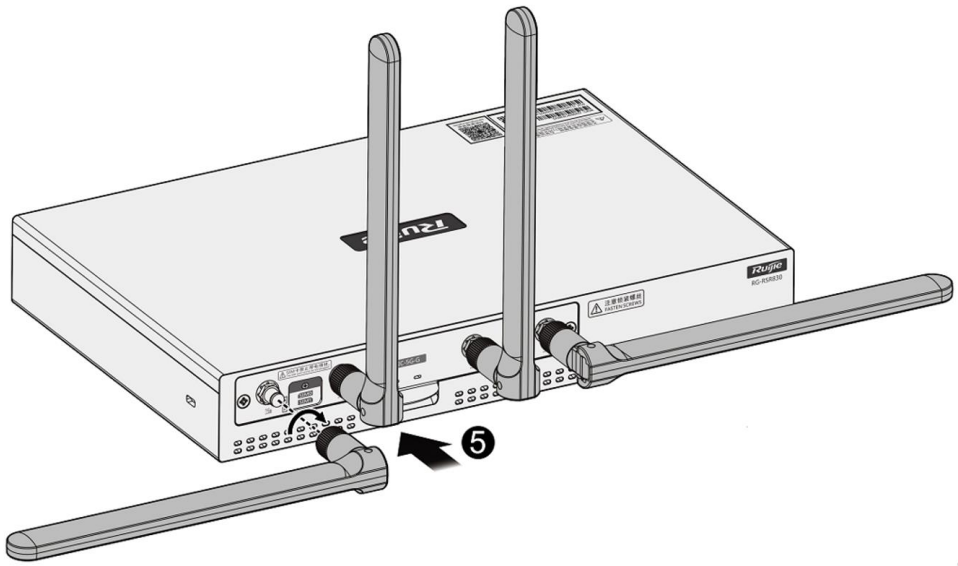
(3) Use the screws removed from the rear faceplate to secure the expansion module.

Figure 3-5 Installing the Expansion Module



(4) Install the antenna clockwise on the expansion module.

Figure 3-6 Installing the Antenna



3.5 Connecting Cables

Connect a twisted pair cable to the LAN port of the device. For details about the twisted-pair cable connection sequence supported by the device, see 7.2 Connectors and Media.

Caution

By default, **Bits per second** is **9600**, **Data bits** is **8**, **Parity** is **None**, **Stop bits** is **1**, and **Flow control** is **None** for the console port. The console port is used only when you want to configure the device manually.

3.6 Bundling Cables

3.6.1 Precautions

- Bundle power cords and other cables neatly.
- Make sure that twisted pair cables at the connectors have natural bends or bends of a large radius.
- Do not bind twisted pair cables too tightly, as this may press the fibers and affect their service life and transmission performance.

3.6.2 Bundling Steps

(1) Bundle the hanging part of the twisted pair cables using cable ties and route them to the LAN port of the device.

(2) Secure the twisted pair cables to the cable management trough of the 86 mm junction box.

(3) Tightly attach the twisted pair cables to the bottom of the device and keep them as straight as possible.

3.7 Verifying Installation

3.7.1 Checking the Device

- Verify that the external power supply matches the device.
- Verify that the device is securely fastened.

3.7.2 Checking the Cable Connection

- Make sure that the twisted pair cable matches the port.
- Verify that the cables are properly bundled.

3.7.3 Checking Power Supply

- Verify that the power cord is properly connected and compliant with safety requirements.
- Turn on the power supply to supply power to the device. Verify that the device works properly.

4 Verifying the Operating Status

4.1 Setting Up the Configuration Environment

Power on the router using a power adapter.

When setting up the environment, pay attention to the following points:

- When the device is powered through a power adapter, ensure that the power cord is properly connected and meets safety requirements.
- When the PC is connected to the serial port of the device for commissioning, ensure that the PC and other devices are well grounded.

4.2 Powering On the Device

4.2.1 Checklist Before Power-on

- The power cord is properly connected.
- The input voltage meets the requirement.

4.2.2 Checklist After Power-on

After power-on, you are advised to check the following list to ensure the normal operation of the device:

- Check that information is displayed on the terminal interface.
- The LED statuses are normal.

5 Monitoring and Maintenance

5.1 Monitoring

5.1.1 LEDs

You can observe the LEDs to monitor the device in operation.

5.1.2 CLI Commands

You can run related commands on the CLI of the device to remotely monitor the device status, including:

- Port configuration and status
- System logs

Note

- For details about the commands, see the configuration guide.
- The device supports remote maintenance.

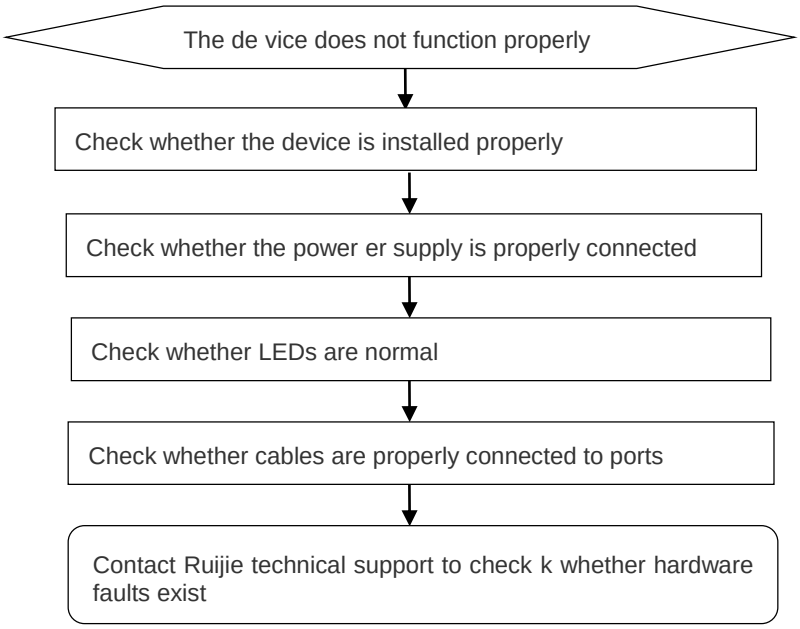
5.2 Hardware Maintenance

If the hardware is faulty, contact Ruijie technical support.

6 FAQs

6.1 Troubleshooting Flowchart

Figure 6-1 General Troubleshooting Flowchart



6.2 Common Faults

6.2.1 Ethernet Port Is Not Working After the Ethernet Cable Is Installed

Check whether the device at the other end of the Ethernet cable is working properly. Check whether the Ethernet cable is capable of providing the required data rate and is properly connected.

6.2.2 The LED Is Off for a Long Time

Check whether the power module is properly connected.

7 Appendix

7.1 Mini-GBIC (SFP) Modules

Ruijie provide supporting SFP modules (mini-GBIC modules) based on the port types of switch modules. You can select a module to suit your specific needs. This document provides models and technical specifications of some 1000M SFP modules for reference. For details about the technical specifications, see the *Ruijie Transceiver Installation and Reference Guide*.

Table 7-1 Models and Specifications of 1000M Mini-GBIC (SFP) Optical Modules

GBIC/SFP	Wavelength (nm)	Optical Fiber Type	DDM Supported (Yes/No)	Intensity of Transmitted Light (dBm)		Intensity of Received Light (dBm)	
				min	max	min	max
MINI-GBIC-SX-MM850	850	Multi-mode	No	-9.5	-3	-17	0
MINI-GBIC-LX-SM1310	1310	Single-mode	No	-9.5	-3	-20	-3
GE-SFP-SX	850	Multi-mode	No	-9.5	-3	-17	0
GE-SFP-LX	1310	Single-mode	No	-9.5	-3	-20	-3
GE-SFP-SX-SM1550-BIDI	1550TX/1310RX	Multi-mode	No	-10	-5	-17	-3
GE-SFP-SX-SM1310-BIDI	1310TX/1550RX	Multi-mode	No	-10	-5	-17	-3
GE-eSFP-SX-MM850	850	Multi-mode	Yes	-9.5	-3	-17	0
GE-eSFP-LX-SM1310	1310	Single-mode	Yes	-9.5	-3	-20	-3
GE-SFP-LX-SM1310	1310	Single-mode	No	-9.5	-3	-20	-3
GE-SFP-LX03-SM1550-BIDI	1550TX/1310RX	Single-mode	Yes	-9	-3	-20	-3
GE-SFP-LX03-SM1310-BIDI	1310TX/1550RX	Single-mode	Yes	-9	-3	-20	-3
GE-SFP-LX20-SM1310-BIDI	1310TX/1550RX	Single-mode	Yes	-9	-3	-20	-3

GE-SFP-LX20-SM1550-BIDI	1550TX/1310RX	Single-mode	Yes	-9	-3	-20	-3

Table 7-2 Cabling Specifications of SFP Modules

SFP Model	Port Type	Optical Fiber Type	Core Size (um)	Max Cabling Distance
MINI-GBIC-SX-MM850	LC	Multi-mode	62.5/125	275m
			50/125	550m
MINI-GBIC-LX-SM1310	LC	Single-mode	9/125	10 km
GE-eSFP-SX-MM850	LC	Multi-mode	62.5/125	275 m
			50/125	550 m
GE-eSFP-LX-SM1310	LC	Single-mode	9/125	10 km
GE-SFP-LX-SM1310	LC	Single-mode	9/125	10 km
GE-SFP-SX-SM1310-BIDI	LC	Multi-mode	50/125	500 m
GE-SFP-SX-SM1550-BIDI	LC	Multi-mode	50/125	500 m
GE-SFP-LX03-SM1550-BIDI	LC	Single-mode	9/125	3 km
GE-SFP-LX03-SM1310-BIDI	LC	Single-mode	9/125	3 km
GE-SFP-LX20-SM1310-BIDI	LC	Single-mode	9/125	20 km
GE-SFP-LX20-SM1550-BIDI	LC	Single-mode	9/125	20 km
SDH155-SFP-SX-MM850	LC	Multi-mode	62.5/125	500 m
SDH155-SFP-SX-MM1310	LC	Multi-mode	62.5/125	2 km
SDH155-SFP-LH15-SM1310	LC	Single-mode	9/125	15 km
GE-SFP-SX	LC	Multi-mode	62.5/125	275 m
			50/125	550 m

GE-SFP-LX	LC	Single-mode	9/125	10 km
Mini-GBIC-GT	RJ45 cable	Cat 5 unshielded or shielded twisted pair cables or higher		100 m

Cuation

- An optical module is a laser transmitter. Do not stare at any light source to prevent it from burning your eyes.
- To keep the module clean, make sure that the dust cap is mounted when it is not connected to cables.

7.2 Connectors and Media

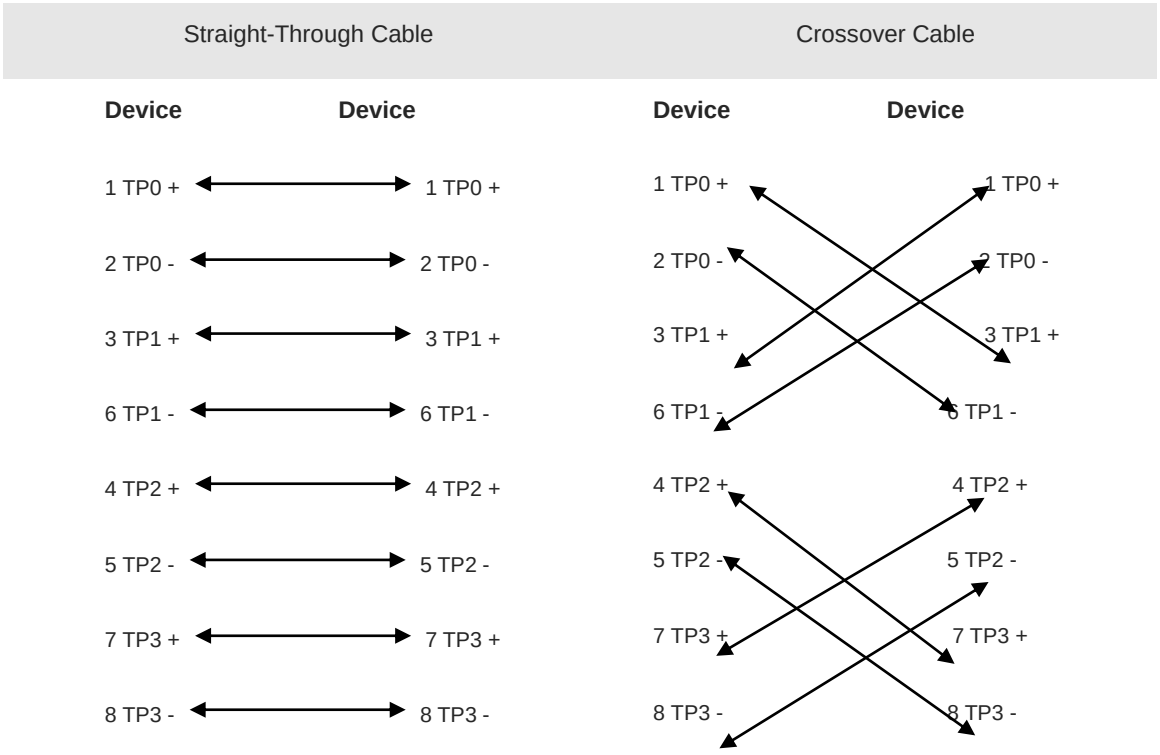
- 1000BASE-T/100BASE-TX/10BASE-T port

The 1000BASE-T/100BASE-TX/10BASE-T is a 10/100/1000 Mbps auto-negotiation port that supports auto MDI/MDIX crossover.

In compliance with IEEE 802.3ab, the 1000BASE-T port requires 100-ohm Category (CAT) 5/5e Unshielded Twisted Paired (UTP) or Shielded Twisted Pair (STP) with a maximum distance of 100 meters (328.08 ft.).

The 1000BASE-T port requires all four pairs of wires to be connected for data transmission. The following figure shows the four pairs of wires for the 1000BASE-T port.

Figure 7-1 1000BASE-T Twisted Pair Connections



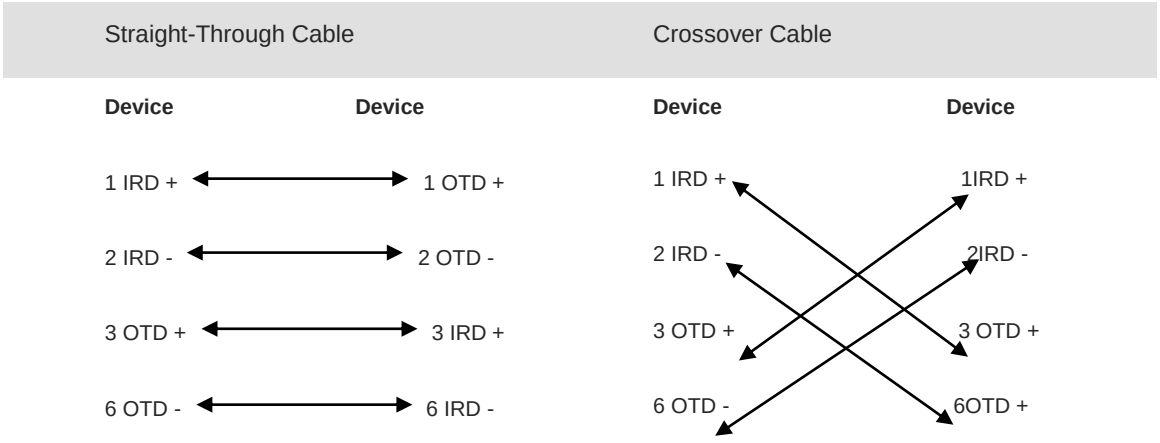
100BASE-TX/10BASE-T uses CAT 3, CAT 4, and CAT 5 100-ohm UTP/STP, and 1000BASE-T uses CAT 5 100-ohm UTP/STP for connections with a maximum distance of 100 meters (328 ft.). Table 7-3 shows 100BASE-TX/10BASE-T pin assignments.

Table 7-3 100BASE-TX/10BASE-T Pin Assignments

Pin	Socket	Plug
1	Input Receive Data+	Output Transmit Data+
2	Input Receive Data-	Output Transmit Data-
3	Output Transmit Data+	Input Receive Data+
6	Output Transmit Data-	Input Receive Data-
4, 5, 7, 8	Not used	Not used

Figure 7-2 shows wiring of straight-through and crossover cables for the 100BASE-TX/10BASE-T port.

Figure 7-2 100BASE-TX/10BASE-T Twisted Pair Connections



7.3 Cabling Recommendations

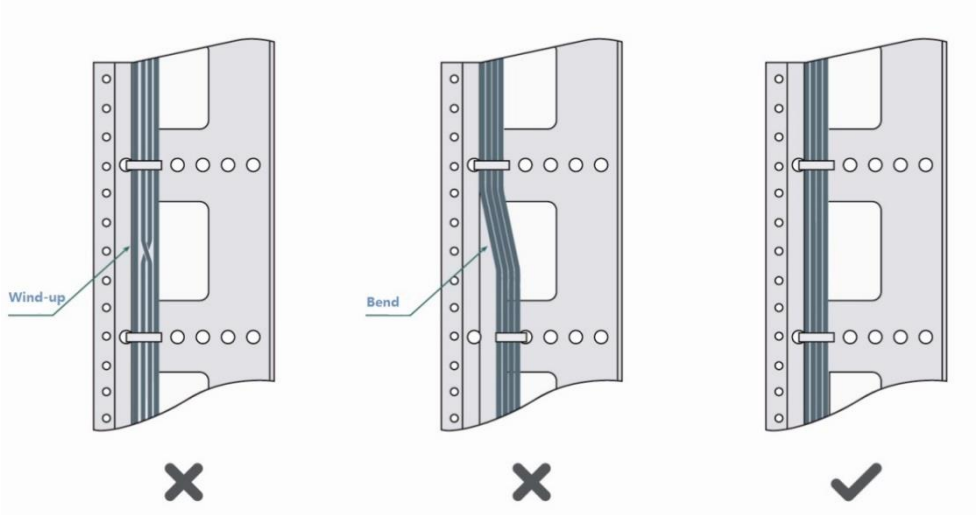
During installation, route cable bundles upward or downward alongside the rack depending on the actual situation in the equipment room. All cable connectors should be positioned at the bottom of the cabinet and should not be exposed outside. Power cords should be routed upward or downward alongside the cabinet, in close proximity to the DC power distribution cabinet, AC socket, or surge protection box.

- Requirements for the Minimum Cable Bend Radius
  - The bend radius of a fixed power cord, network cable, or flat cable should be over five times greater than its diameter. The bend radius of these cables that are often bent or plugged should be over seven times greater than its diameter.
  - The bend radius of a fixed common coaxial cable should be over seven times greater than its diameter. The bend radius of the common coaxial cable that is often bent or plugged should be over 10 times greater than its diameter.

- The minimum bend radius of a high-speed cable such as an SFP+ cable should be over five times its diameter. If the cable is constantly bent, plugged, or unplugged, the bend radius should be over 10 times greater than its diameter.

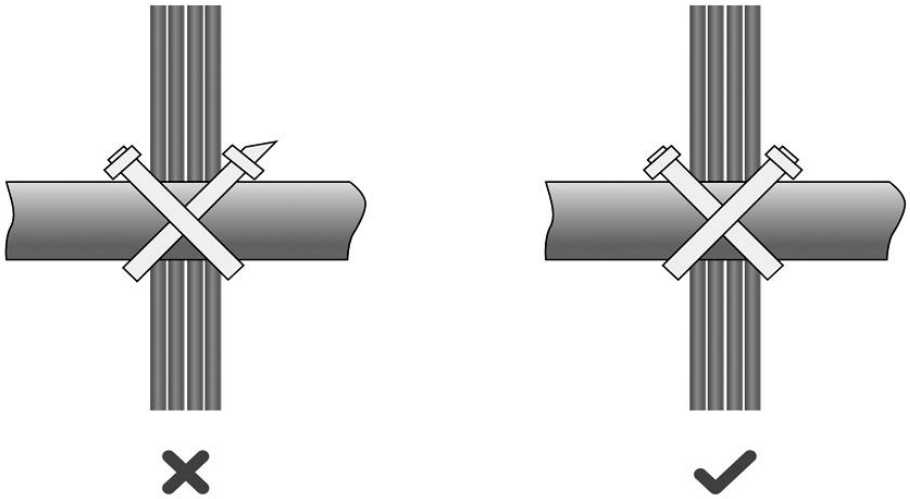
- Precautions for Bundling up Cables
  - Before cables are bundled, mark labels and stick the labels to cables wherever appropriate.
  - Cables should be neatly and properly bundled in the rack without twisting or bending, as shown in Figure 7-3.

Figure 7-3 Bundling Up Cables (1)



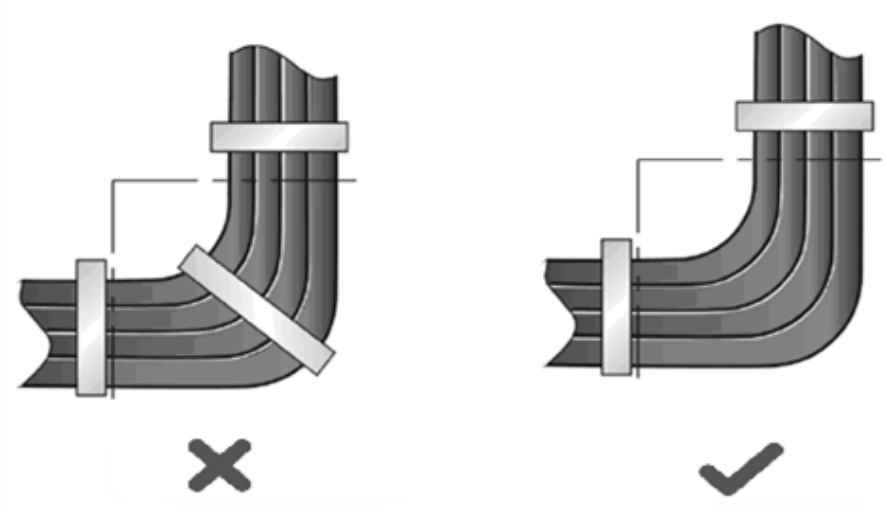
  - Power, signal, and grounding cables must be routed and bundled separately. Mixed bundling is not allowed. When they are close to each other, crossover cabling is recommended. In the case of parallel cabling, maintain a minimum distance of 30 mm (1.18 in.) between power cords and signal cables.
  - The cable management brackets and cabling troughs inside and outside the rack should be smooth without sharp corners.
  - The metal hole traversed by cables should have a smooth and fully rounding surface or an insulated lining.
  - Use cable ties to bundle up cables properly. Do not connect two or more cable ties to bundle up cables.
  - After bundling up cables with cable ties, cut off the remaining part. The cut should be smooth and trim, without sharp corners, as shown in Figure 7-4.

Figure 7-4 Bundling Up Cables (2)



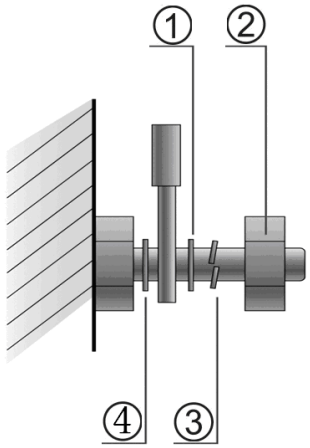
- When cables need to be bent, bundle them up but do not tie cable them where the cables will be bent, as shown in Figure 7-5.

Figure 7-5 Bundling Up Cables (3)



- Cables that are not assembled or remaining parts of cables should be folded and placed in a proper position of the cabinet or cable trough. The proper position refers to a position that does not affect device running or damage the router or cable.
- Do not bind 220 V and –48 V power cords to rails for moving parts.
- Leave a certain length of the power cord connecting moving parts such as grounding cables, to avoid stress on the cable. When moving parts are installed, the remaining cable part should not touch heat sources, sharp corners, or sharp edges. If heat sources cannot be avoided, high-temperature cables should be used.
- When screw threads are used to fasten cable terminals, the anchor or screw must be tightly fastened, as shown in Figure 7-6.

Figure 7-6 Cable Fastening



Notes:
① Flat washer
② Nut
③ Spring washer
④ Flat washer

- When using a stiff cable, fix it near the cable lug to avoid stress on the lug and cable.
- Do not use self-tapping screws to fasten terminals.
- Power cords of the same type and in the same cabling direction should be bundled up into cable bunches, with cables in cable bunches clean and straight.
- Bundle up cables by using cable ties.

Table 7-4 Bundling Spacing Requirements

Cable Bunch Diameter	Distance Between Every Binding Point
10 mm (0.39 in.)	80–150 mm (3.15–5.91 in.)
10–30 mm (0.39–1.18 in.)	150–200 mm (5.91–7.87 in.)
30 mm (1.18 in.)	200–300 mm (7.87–11.81 in.)

- No knot is allowed in cabling or bundling.
- For wiring terminal sockets (such as circuit breakers) with cord end terminals, the metal part of the cord end terminal should not be exposed outside the terminal socket when assembled.