Ruijie Reyee RG-EG209GS Router

Installation 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 Reyee website: https://reyee.ruijie.com
- Online support center: https://reyee.ruijie.com/en-global/support
- Case portal: https://www.ruijie.com/support/caseportal
- Community: https://community.ruijie.com
- Email support: service_rj@ruijie.com
- Live chat: https://reyee.ruijie.com/en-global/rita

Conventions

1. Signs

The signs used in this document are described as below:

Danger

An alert that calls attention to safety operation instructions that if not understood or followed when operating the device can result in physical injury.

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

This manual provides the device installation steps, hardware troubleshooting, module technical specifications, and specifications and usage guidelines for cables and connectors. It is intended for the users who have some experience in installing and maintaining network hardware. At the same time, it is assumed that the users are already familiar with the related terms and concepts.

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1 Product Overview

1.1 RG-EG209GS

The RG-EG209GS series routers are independently developed by Ruijie Networks with independent intellectual property rights. RG-EG209GS routers are a new generation of products for the small and micro enterprise offices, small hotels, and villas, providing 600Mbps of egress bandwidth to meet the user need of high-speed bandwidth. RG-EG209GS boasts the flexible multi-WAN feature and policy-based routing, enabling users to customize varied online behavior management policies. Working with the Reyee managed switches and access points, it can implement the unified network configuration through the App and perform remote management and diagnosis.

Table 1-1 RG-EG209GS Specifications

Model	10/100/1000Base-T Adaptive Ethernet Port	100Base-FX/1000Base-X SFP Port	WAN Port	LAN Port	LAN/WAN Switchable Port	Power Supply
RG-EG209GS	8	1	1	5	2	Adapter

1.2 Package Contents

Table 1-2 RG-EG209GS Package Contents

No.	Item	Quantity
1	RG-EG209GS router	1
2	Rubber pads	4
3	Power adapter	1
4	User Manual	1
5	Warranty Card	1

Note

The package contents generally contain the preceding items. The actual delivery is subject to the order contract. Please check your goods carefully against the order contract. If you have any questions, please contact the distributor.

1.3 Product Appearance

Figure 1-1 RG-EG209GS Router Appearance

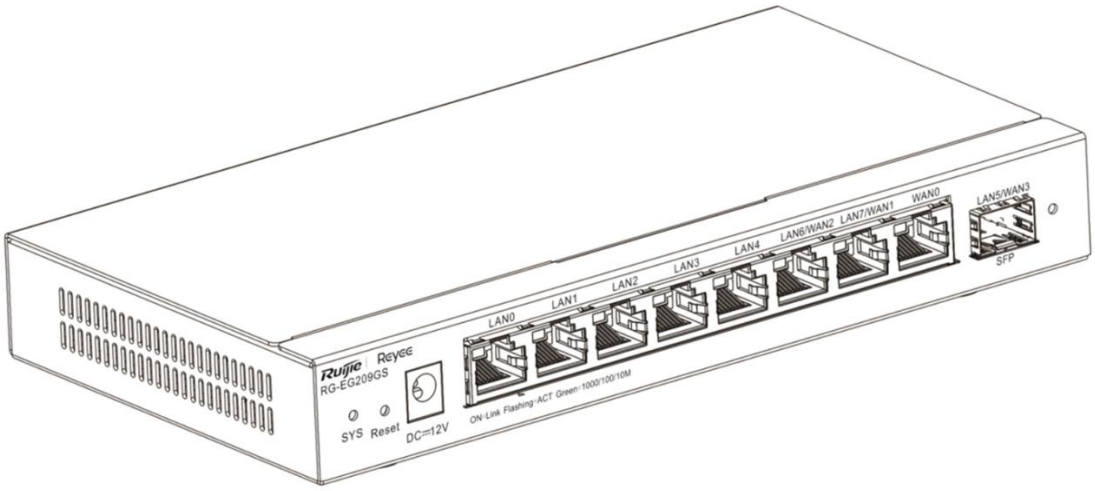


Figure 1-2 Front Panel of an RG-EG209GS Router

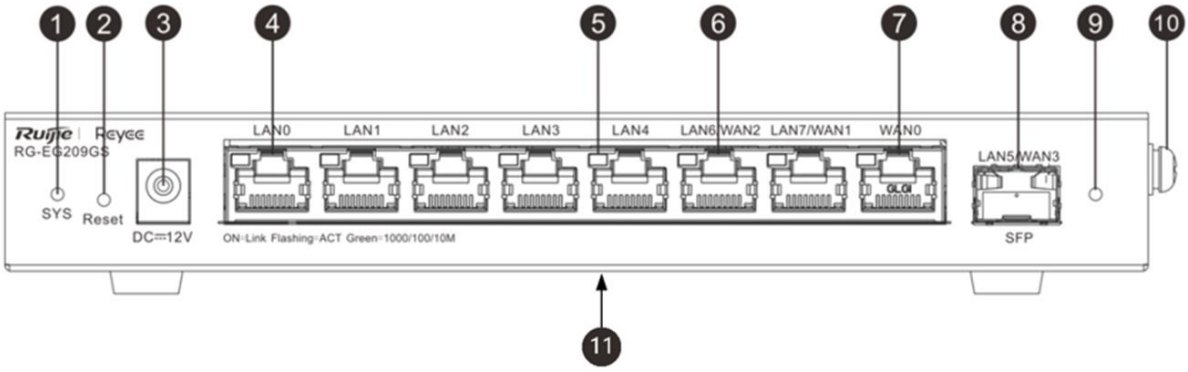


Table 1-3 Front Panel Specifications

Mark	Item	Description
1	System Status LED	See Table 1-4 for details.
2	Reset Button	● Press for less than 2 seconds to reboot the router. ● Press for more than 5 seconds until the system LED flashes to restore the router to factory default settings. (The device does not respond if you press the Reset button for 2s to 5s).
3	DC Input Plug	Connect the DC power adapter to the DC input plug on the faceplate of the router to power on the router.

Mark	Item	Description
4	LAN Port	10/100/1000BASE-T Ethernet RJ45 with auto negotiation. Connect the LAN port to the PC, the switch or the access point with an Ethernet cable.
5	Link/ACT Port LED	● Solid green: The port has made a successful link. ● Blinking green: The port is transmitting or receiving traffic.
6	LAN/WAN Switchable Port	10/100/1000BASE-T Ethernet RJ45 with auto negotiation. The port is switchable between the WAN port and the LAN port.
7	WAN Port	10/100/1000BASE-T Ethernet RJ45 with auto negotiation. Connect the WAN port to the DSL/Cable Modem to establish an Ethernet connection.
8	LAN/WAN Switchable SFP Port	100Base-FX/1000Base-X SFP port. The port is switchable between the WAN port and the LAN port.
9	SFP Port LED	● Solid green: The port has made a successful link. ● Blinking green: The port is transmitting or receiving traffic.
10	Grounding Lug	Connect the grounding lug to the grounding system of the installation site with the grounding cable to provide grounding protection.
11	Nameplate	Nameplate on the bottom of the device. Contains the product name, model, I/O parameters, default IP address, etc.

Note

After the router is restored to factory default settings, the default management address is http://192.168.110.1 (default password: admin).

Table 1-4 RG-EG209GS System Status LED Description

LED Indicator	Description
System status LED	Off: The device is not powered on.
	Solid green: The device has successfully completed startup and is operating normally.
	Fast green blinking: The device is starting up.
	Slow green blinking: Restoring factory settings or upgrading firmware.
	Solid green with brief off intervals: Device not connected to Ruijie Cloud.

LED Indicator	Description
	One long green blink followed by three slow blinks: Main program is missing.
System status LED blinking frequency description: ● Fast blinking: Blink eight times per second. ● Slow blinking: Blink twice per second. ● Long blinking: Blink once every two seconds. ● Solid with brief off intervals: One long on and one short off every two seconds.	

1.4 Technical Specifications

Table 1-5 Technical Specifications of an RG-EG209GS Router

System Specifications	CPU	Dual-core processor, 880 MHz clock frequency per core
	RAM	256 MB
	Flash memory	32 MB
Port Specifications	Maximum number of WAN ports	4
	Maximum number of LAN ports	8
	Number of LAN/WAN ports	3
	Number of fixed WAN ports	1
	Number of fixed LAN ports	5
	Number of 10/100/1000BASE-T ports	8
	Number of 1GE SFP ports	1
	LEDs	1 x system status LED 9 x Ethernet port LEDs
	Reset button	1
	Total number of RJ45 ports	8
	Total number of optical ports	1
	Power supply	DC power adapter

Power Supply and Consumption	Dimensions of the DC connector	Outer diameter: 5.5 mm (0.22 in.) Inner diameter: 2.1 mm (0.08 in.) Depth: 10.0 mm (0.39 in.)
	Power input	DC adapter: ● Rated input voltage: 100 V AC to 240 V AC, 50/60 Hz ● Maximum input voltage: 90 V AC to 264 V AC Output: ● Rated output voltage: 12 V DC ● Maximum output current: 1.5 A
	Maximum power consumption	18 W
Dimensions and Weight	Weight	0.98 kg (2.16 lbs)
	Shipping weight	1.05 kg (2.31 lbs)
	Product dimensions (W x D x H)	202 mm x 108 mm x 28 mm (7.95 in. x 4.25 in. x 1.1 in.)
	Package dimensions (W x D x H)	610 mm x 370 mm x 335 mm (24.02 in. x 14.57 in. x 13.19 in.)
Environment and Reliability	Surge protection	Service port: ±4 kV for common mode Power connector: ±4 kV for common mode and ±4 kV for differential mode
	Operating temperature	0°C to 40°C (32°F to 104°F)
	Storage temperature	–40°C to +70°C (–40°F to +158°F)
	Operating humidity	10% RH to 90% RH (non-condensing)
	Storage humidity	5% RH to 95% RH (non-condensing)
	Mounting options	Desk
	Cooling	Natural cooling
	Fan	Fanless design
Certification and Regulatory Compliance	RoHS	Yes
	Certification	CE, CB, FCC, ISED, cTUVus

Warning

Operation of this equipment in a residential environment could cause radio interference.

Caution

Please use the power adapter delivered with the router by Ruijie Networks.

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 may not cover all possible dangers.

2.1.1 General Safety Precautions

- Do not place the device in a wet position, and keep the device away from liquid. Keep the chassis clean and dust-free.
- Install the device in a position far away from heat sources.
- Ensure that the cabinet and power distribution system are properly grounded.
- Do not place the device in walking areas.
- During the 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 walking areas.

2.1.2 Handling Safety

- Prevent the device from being frequently handled.
- Cut off all the power supplies and unplug all power cords before moving or handling the device.
- Keep balance and prevent personal injuries when handling the device.

2.1.3 Electric Safety

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 contact with high voltage or mains power supply through wet objects may cause fatal dangers.

- Observe local rules and regulations during electric operations. Only personnel with relevant qualifications can perform such operations.
- Check whether there are potential risks in the work area. For example, check whether the power supply is grounded, whether the grounding is reliable, and whether the ground is wet.
- Learn about the position of the indoor emergency power switch before installation. Cut off the power switch in case of accidents.
- Check the device carefully before shutting down the power supply.
- If a power supply system is equipped with a leakage protector (also referred to as “leakage current switch”

or “leakage current breaker”), the power supply will be cut off automatically when the electric leakage or electric shock occurs. The selected leakage protector should comply with the following rule:

- The rated leakage action current of each leakage protector is greater than twice of the theoretical maximum leakage current of all the power supplies in the system.

For example, if a system is equipped with 16 identical power supplies, the leakage current of each power supply is equal to or less than 3.5 mA, and the leakage current of the system totals 56 mA. A leakage protector with 30 mA rated action current supports less than five power supplies (that is, Action current of the leakage protector/2/Maximum leakage current of each power supply = 30/2/3 .5 ≈ 4.28). In other words, the leakage protector with 30 mA rated action current supports no more than four power supplies. In this case, the 16 power supplies in the system require at least four leakage protectors with 30 mA rated action current and each leakage protector supports four power supplies. If power supplies in a system differ in models, the rated leakage action current of each leakage protector divided by two is greater than the sum of maximum leakage currents of all the power supplies.

- The rated leakage non-action current of a leakage protector shall be 50% of the leakage action current. Otherwise, misoperation may easily occur due to high sensitivity and thus the leakage protector trips, devices are powered off, and services are interrupted.

Take a leakage protector with 30 mA rated leakage action current as an example. The rated leakage non-action current shall be 15 mA. When the leakage current is below 15 mA, the protector shall not act.

Caution

- To guarantee personal safety, the rated leakage action current of each leakage protector in the system must be equal to or less than 30 mA (human body safety current is 30 mA). When twice of the total leakage current of the system is greater than 30 mA, the system must be equipped with two or more leakage protectors.
- For the leakage current value of each power supply model, see the power supply model specifications in Chapter 1.

2.1.4 Electrostatic Discharge Safety

- Properly ground the device and floor.
- Keep the indoor installation environment clean and free of dust.
- Maintain appropriate humidity conditions.

2.1.5 Laser Safety

A device with an optical port usually supports multiple types of optical transceivers, all of which are Class I laser products. Pay attention to the following during the use of optical transceivers:

- When an optical transceiver is in operation, ensure that its port is connected to an optical fiber or covered by a dust cap to keep out dust and prevent it from burning your eyes.
- When an optical transceiver is in operation, do not look into its port after removing the optical fiber. Doing so may result in eye injury.

Warning

Do not approach or look directly into any optical port under any circumstances. This may cause permanent damage to your eyes.

2.2 Installation Environment Requirements

Install the device indoors to ensure its normal operation and prolonged service life.

The installation site must meet the following requirements.

2.2.1 Bearing Requirements

Evaluate the weight of the router and its accessories (for example, the cabinet, chassis, and power supply modules), and ensure that the ground of the installation site meets the requirements.

If the RG-EG209GS router is installed on a desk, the following conditions must be met:

- You are advised to install the device on a standard desk and maintain a proper clearance around the air vents for heat dissipation.
- The desk is properly grounded.

2.2.2 Ventilation Requirements

Maintain a minimum clearance of 100 mm (3.94 in.) around the device for air circulation and normal heat dissipation. After various cables are connected, bundle the cables or place them in the cable management bracket to avoid blocking air inlets. Dust the device every three months to avoid blocking the ventilation openings.

2.2.3 Space Requirements

It is recommended that the width of the equipment room corridor be greater than 0.8m (31.50 in.) to ensure enough space for moving chassis.

Please do not install the device against the wall. Instead, please maintain a minimum clearance of 0.4 m (15.75 in.) around the device for heat dissipation and device maintenance.

2.2.4 Temperature/Humidity Requirements

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 too high or too low 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, loosening screws.
- In a dry environment, static electricity is prone to occur and damage the internal circuits of the device.
- Too high temperatures can accelerate the aging of insulation materials, greatly reducing the reliability of the device and severely affecting its service life.

The temperature and humidity requirements of the device are as follows:

Table 2-1 Working Environment Requirements

Operating Temperature	Operating Humidity
0ºC to 40ºC (32ºF to 104ºF)	10% to 90% RH (non-condensing)

Note

The ambient temperature and humidity of the device 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 Requirements

Dust poses a major threat to the router. The indoor dust takes on a positive or negative static electric charge when falling on the router, causing poor contact of the metallic joint. Such electrostatic adhesion may occur more easily when the relative humidity is low, not only affecting the service life of the router, but also causing communication faults. The following table describes the requirements for the dust content and granularity in the equipment room.

Table 2-2 Requirements for Dust

Dust	Unit	Content
Dust particles (diameter ≥ 0.5 μm)	Particles/m^3	≤ 3.5×10^6
Dust particles (diameter ≥ 5 μm)	Particles/m^3	≤ 3.5×10^4

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. The following table lists limit values for harmful gases.

Table 2-3 Requirements for Gases

Gas	Average (mg/m^3)	Maximum (mg/m^3)
Sulfur dioxide (SO_2)	0.3	1.0
Hydrogen sulfide (H_2S)	0.1	0.5
Nitrogen dioxide (NO_2)	0.5	1.0
Chlorine gas (Cl_2)	0.1	0.3

Note

Average refers to the average value of harmful gases measured in one week. **Maximum** refers to the upper limit of harmful gases measured in one week, and the maximum value lasts up to 30 minutes every day.

2.2.6 Grounding Requirements

A proper grounding system is the basis for stable and reliable running and is indispensable for preventing lightning strikes and interference. Carefully check the grounding conditions at the installation site according to the grounding specifications, and complete grounding properly based on the actual situation.

- Safe Grounding

Ensure that the cabinet and power distribution device are securely grounded when the device uses the AC power supply. Otherwise, electric shock may occur when the insulation resistance between the power supply inside the device and the chassis becomes small.

Caution

- Please adopt protection grounding connections in buildings so that the device can be connected to the protection ground.
- Check whether the AC socket is reliably connected to the protection ground of the building. If not, a protection ground wire should be used to connect the protection ground lug of the AC socket to the protection ground of the building.
- The cross-sectional area of the protection ground cable should be at least 0.75 mm^2 (18 AWG).

- Lightning Grounding

The lightning protection system of facilities is standalone, and is composed of a lightning rod, a lower conductor, and a connector connected to the grounding system. The grounding system is usually used for power reference grounding and safety grounding of the cabinet. Lightning grounding is required only for facilities and is not required for the device.

- EMC Grounding

Grounding required for electromagnetic compatibility includes shielded grounding, filter grounding, noise and interference suppression, and level reference, which contribute to the overall grounding requirements. The grounding resistance should be smaller than 1 ohm, and the ground terminals of the cabinet should be grounded before the running of the device.

Warning

The device is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures. In this case, users are advised to take proper measures against the interference.

2.2.7 Anti-interference Requirements

Various interference sources, from either outside or inside the equipment or application system, affect the device in the conductive ways such as capacitive coupling, inductive coupling, and electromagnetic radiation. There are two types of electromagnetic interferences: radiated interference and conducted interference, depending on the type of the propagation path. When the energy, often RF energy, from a component arrives at a sensitive component via the space, the energy is known as radiated interference. The interference source can be both a part of the interfered system and a completely electrically isolated unit. Conducted interference results from the electromagnetic wire or signal cable connection between the source and the sensitive component. The interference is conducted from one unit to another unit through cables.

Conducted interference often affects the power supply of the equipment, but can be controlled by a filter. Radiated interference may affect any signal path in the equipment, and is difficult to shield.

The anti-interference requirements are as follows:

- Take interference prevention measures for the power supply system.
- Keep the device away from the grounding equipment or lightning and grounding equipment of the power

device as much as possible.

- Keep the device far away from high-frequency current devices such as high-power radio transmitting station and radar launcher.
- Take electromagnetic shielding measures when necessary.

2.2.8 Lightning Protection Requirements

- The device can guard against lightning strikes. As an electric device, it may still be damaged by strong lightning strikes. Take the following lightning protection measures: Ensure that the grounding cable of the cabinet is in good contact with the ground.
- 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 the lightning prevention for the power supply.

2.2.9 Installation Site Requirements

Regardless of whether the device is installed into a cabinet or on a desk, the following conditions must be met:

- Maintain a proper clearance around the air vents for heat dissipation.
- The cabinet or the desk has proper ventilation and heat dissipation.
- The cabinet or the desk is strong enough to support the weight of the device and its accessories.
- The cabinet or the desk are properly grounded.

2.3 Tools

Table 2-4 Tools

Common Tools	Phillips screwdrivers, power cords, network cables, fastening bolts, diagonal pliers, and binding straps
Special Tools	Antistatic gloves, wire stripper, crimping pliers, crystal connector crimping pliers, and wire cutter
Meter	Multimeter
Relevant Devices	PC, display, and keyboard

Note

The device is delivered without a tool kit. Please prepare a tool kit yourself.

3 Installing the Router

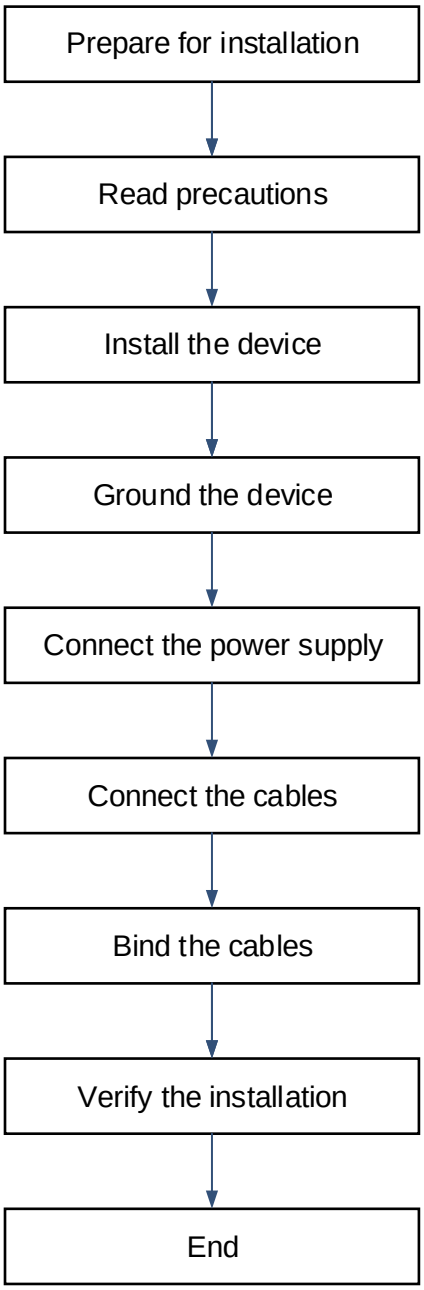
Caution

Ensure that requirements in Chapter 2 are all met.

3.1 Installation Procedure

The installation steps are shown in the following figure.

Figure 3-1 Installation Procedure



3.2 Preparing

Carefully plan and arrange the installation position, networking mode, power supply and cabling before installation. Confirm the following requirements before installation:

- The installation site provides sufficient space for heat dissipation.
- The installation site meets the temperature and humidity requirements of the device.
- The power supply and required current are available in the installation site.
- The network cables have been deployed in the installation site.
- The selected power supply modules meet the system power requirements.
- The position of the indoor emergency power switch is learned before installation. The power switch is cut off in case of accidents.

3.3 Precautions

To ensure the normal operation and prolonged service life of the device, please observe the following precautions:

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

3.4 Installing the Device

3.4.1 Mounting the Device on a Desk

If a standard 19-inch cabinet is unavailable, you can mount the device on a desk.

(1) Attach the four rubber pads to the four corners on the bottom of the device.

(2) Place the device on the desk to ensure adequate airflow and good heat dissipation.

Caution

The desk on which the device is mounted and operated must not be moved.

3.4.2 Mounting the Device on the Wall

RG-EG209GS can be mounted on the wall. (Mounting screws and wall anchors are customer-supplied.)

In actual installation, users need to determine the size and depth of the two mounting holes on the wall based on the sizes of wall anchors and screws. Ensure that the wall anchors can be inserted into the holes, and only the outer edges of the wall anchors are left outside the wall, and screws can be tightly fastened to the wall.

The steps of mounting the device on the wall are as follows:

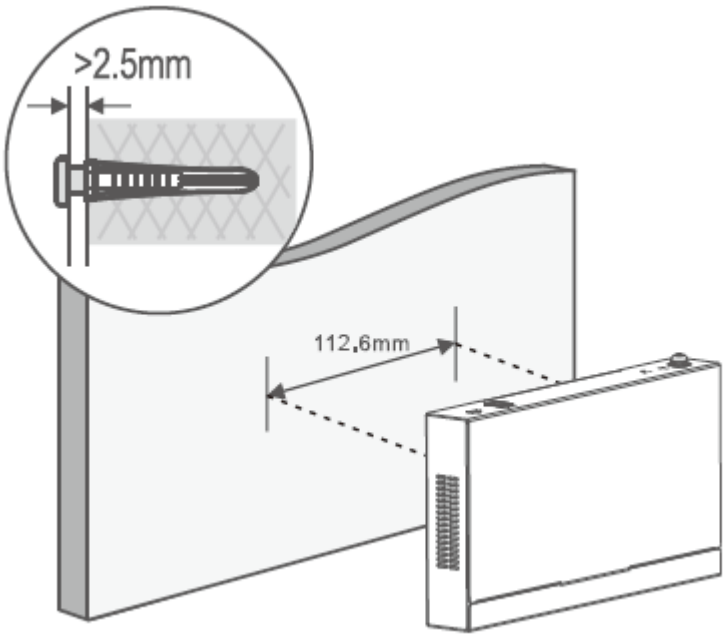
(1) As shown in Figure 3-2, drill two holes with the diameter of about 5 mm (0.20 in.) on the wall, ensure that the distance between the two holes is 112.6 mm (4.43 in.), and the line of connecting the two holes is horizontal.

(2) Insert wall anchors into the holes and ensure that the outer edges of the wall anchors are aligned with the wall.

(3) Put two M4 screws into the wall anchors and ensure that the distance between the inner side of the screw head and the outer edge of the wall anchors is not less than 2.5 mm (0.10 in.) so that the device can be securely mounted on the screws.

(4) Align the two mounting holes on the bottom of the chassis of the device with the screws, and then secure the device on the screws.

Figure 3-2 Mounting the Router on the Wall



Caution

The device can be mounted only on the concrete or other non-combustible walls.

3.5 Connecting the Ground Cable of the Device

The router has a grounding lug for grounding protection. Connect the grounding lug of the device to the grounding bar in the equipment room.

Precautions:

- The cross-sectional area of the ground cable should be determined according to the possible maximum current. Cables with good conductor should be used.
- Do not use bare wires.
- The resistance between the chassis and ground should be less than 1 ohm.

Caution

The cross-sectional area of the protection ground cable should be at least 2.5 mm^2 (12 AWG).

3.6 Connecting the Power Supply

The RG-EG209GS router adopt the adapter for power supply.

You are advised to use a single-phase three-core power socket or a multi-function power socket.

Please connect the power supply based on the following steps:

(1) Insert the ring of the adapter DC connector into the DC input plug of the device. Plug the end of the power cord to the power socket on the adapter and the other end into the AC power socket.

(2) Please check the status of system LED on the front panel of the device. If the LED is on, it means that the power cord is connected correctly. Otherwise, please check the power cord connection.

Caution

- Please use the power supply adapter delivered with the device to prevent accidents.
- The maintenance personnel should check whether the AC socket is reliably connected to the protection ground of the building. If not, the maintenance personnel should use a protection ground wire to connect the protection ground terminal of the AC socket to the protection ground of the building.
- During the device installation, connect the grounding cable first and disconnect it last.
- The power socket should be installed in an easily operable position near the device.

3.7 Connecting Cables

- Connect the RJ-45 connector of the delivered Ethernet cable to the Ethernet interface of the device and the other end to the management terminal.
- Insert the SMF and MMF optic cables into the corresponding ports according to the panel identification, and distinguish the transmitting and receiving ends of the fiber-optic cable.
- Insert the twisted pair cable with RJ45 connector into the corresponding interface according to the panel identification, and distinguish the crossover cable and the straight-through cable.

3.8 Bundling Cables

3.8.1 Precautions

- The power cords and other cables should be bundled in a visually pleasing way.
- When you bundle twisted pairs and fiber-optic cables, make sure that the twisted pairs and fiber-optic cables at the connectors have natural bends or bends of large radius.
- Do not bundle twisted pairs and fiber-optic cables too tightly, as this may press hard the fibers and affect their service life and transmission performance.

3.8.2 Bundling Steps

(1) Bind the drooping part of the twisted pairs and fiber-optic cables and lead them to both sides of the device for convenience.

(2) Fasten the twisted pairs and fiber-optic cables to the cable management ring or bracket. Attach the cables in the cable tray of the rack.

(3) Bundle the twisted pairs and fiber-optic cables closely along the bottom of the device and in a straight line wherever possible.

3.9 Checking after Installation

3.9.1 Checking Cable Connection

- Verify that the UTP/STP cable matches with the interface type.
- Verify that cables are properly bundled.

3.9.2 Checking Power Supply

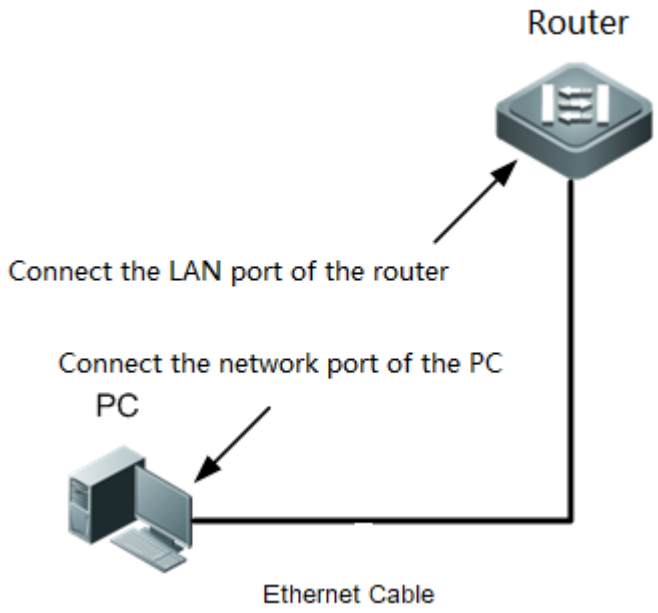
- Verify that the power supply is properly connected and compliant with safety requirements.
- Verify that the device is operational after power-on.

4 Verifying Operating Status

4.1 Setting up Configuration Environment

- Wired Connection: Connect the LAN port of the router to the network port of the PC with an Ethernet cable. Configure the PC to get an IP address automatically.
- Wireless Connection: Connect the access point to the LAN port of the router with an Ethernet cable. The access point will automatically broadcast SSID “@Ruijie-mXXXX” (XXXX are the last four characters of the MAC address on the device label.) after power-on. Perform configuration on the device after the PC is connected to the wireless network.

Figure 4-1 Configuration Environment



4.2 Checklist

4.2.1 Checklist before Power-on

- Check whether the device is properly grounded.
- Check whether the power cord is properly connected.
- Check whether the power supply voltage meets the requirement.
- Check whether the network cable is properly connected, whether the client (may be PC) is started, and whether configuration parameters are configured.

4.2.2 Checklist after Power-on

After power-on, check the following item:

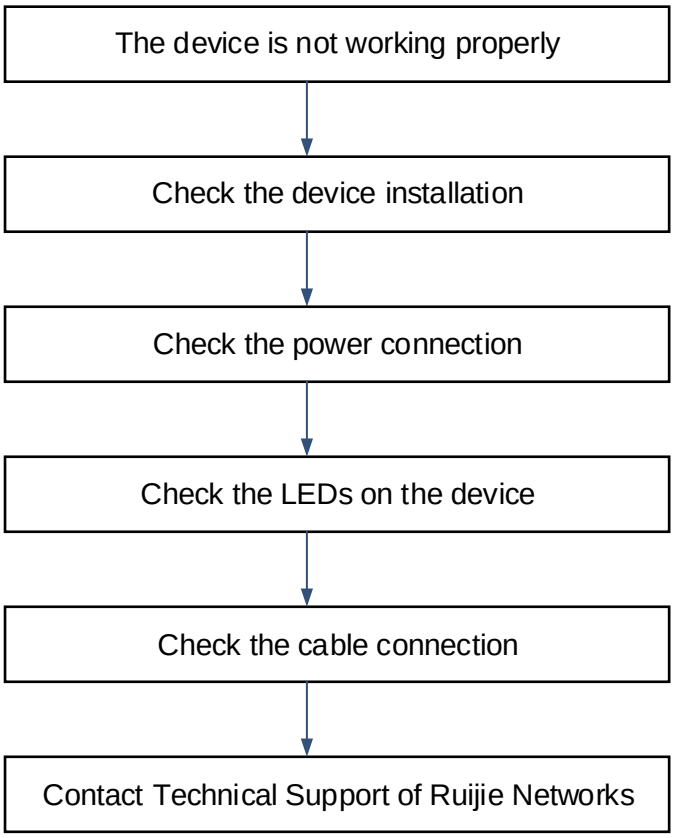
- Check the device indicator status.

4.3 Configuring the Router

You can perform specific configuration on the device as required. For details, please refer to the related user manual.

5 Troubleshooting

5.1 General Troubleshooting Procedure



5.2 Common Troubleshooting Procedures

5.2.1 Password Loss

Press the **Reset** button for more than 5 seconds to restore the device to factory default settings and reset the system login password.

5.2.2 System LED Error

Cut off all power supplies first. Check if the cables have been correctly connected and the power socket is functional. Check whether the power cord is tightly connected to the power socket. Check whether the adapter DC connector works properly.

6 Appendix

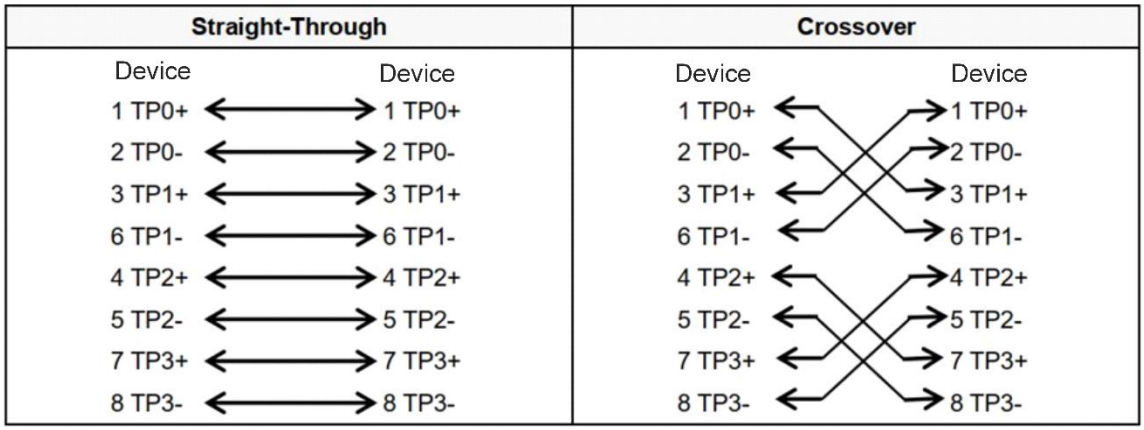
6.1 Connectors and Media

6.1.1 1000BASE-T/100BASE-TX/10BASE-T

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

Compliant with IEEE 802.3ab, 1000BASE-T requires Category 5e 100-ohm UTP or STP (STP is recommended) with a maximum distance of 100 meters (328 feet). 1000BASE-T requires all four pairs of wires be connected for data transmission, as shown in Figure 6-1.

Figure 6-1 1000BASE-T Connection



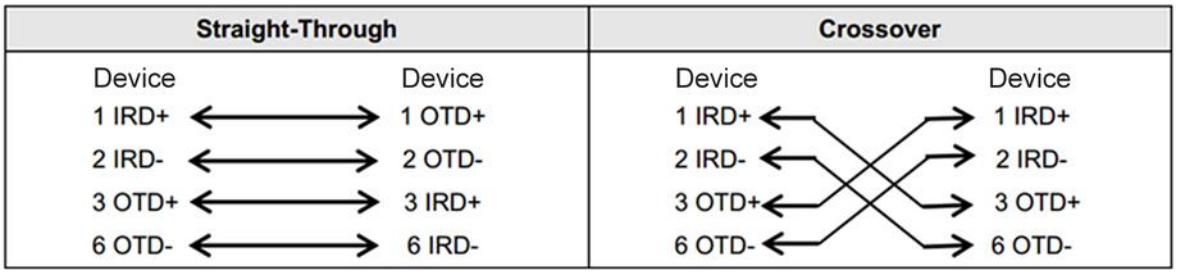
10BASE-T uses Category 3.4, 5, 5 100-ohm UTP/STP and 1000BASE-T uses Category 5 100-ohm UTP/STP for connections. Both support a maximum length of 100 meters. The following table shows 100BASE-TX/10BASE-T pin assignments.

Table 6-1 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 6-2 shows wiring of straight-through and crossover cables for 100BASE-TX/10BASE-T.

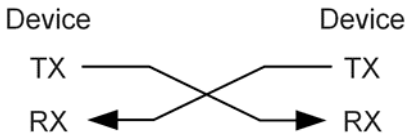
Figure 6-2 100BASE-TX/10BASE-T Twisted Pair Connection



6.1.2 Fiber-Optic Cable Connection

Please choose SMF or MMF optic cables according to the module types.

Figure 6-3 Fiber-Optic Cable Connection



6.2 Mini-GBIC and SFP Modules

We provide GE SFP modules (Mini-GBIC modules) according to the SFP port types. You can select the module to fit your specific needs. Apart from the following GE SFP modules, Mini-GBIC-GT modules are also provided for selection. The following models and technical specifications of some GE SFP modules are listed for your reference. For details, see *Ruijie Transceiver Installation and Reference Guide*.

Table 6-2 Mini-GBIC (SFP) Transceiver Module Models and Specifications

GBIC/SFP Module Model	Wavelength (nm)	Fiber Type	Support DDM (Yes/No)	Transmit Power (dBm)		Receive Power (dBm)	
				Min	Max	Min	Max
MINI-GBIC-SX-MM850	850	MMF	No	-9.5	-3	-17	0
MINI-GBIC-LX-SM1310	1310	SMF	No	-9.5	-3	-20	-3
GE-eSFP-SX-MM850	850	MMF	Yes	-9.5	-3	-17	0
GE-eSFP-LX-SM1310	1310	SMF	Yes	-9.5	-3	-20	-3
GE-SFP-LX-SM1310	1310	SMF	No	-9.5	-3	-20	-3
MINI-GBIC-LH40-SM1310	1310	SMF	Yes	-2	3	-22	-3
GE-SFP-SX-SM1310-BIDI	1310	MMF	No	-10	-5	-17	-3
GE-SFP-SX-SM1550-BIDI	1550	MMF	No	-10	-5	-17	-3
GE-SFP-LX20-SM1310-BIDI	1310TX/1550 RX	SMF	Yes	-9	-3	-20	-3
GE-SFP-LX20-SM1550-BIDI	1550TX/1310 RX	SMF	Yes	-9	-3	-20	-3
GE-SFP-LH40-SM1310-BIDI	1310TX/1550 RX	SMF	Yes	-5	0	-24	-1
GE-SFP-LH40-SM1550-BIDI	1550TX/1310 RX	SMF	Yes	-5	0	-24	-1
MINI-GBIC-ZX50-SM1550	1550	SMF	Yes	-5	0	2	3
MINI-GBIC-ZX80-SM1550	1550	SMF	Yes	0	4.7	-22	-3
MINI-GBIC-ZX100-SM1550	1550	SMF	Yes	0	5	-30	-9
GE-SFP-SX	850	MMF	No	-9.5	-3	-17	0
GE-SFP-LX	1310	SMF	No	-9.5	-3	-20	-3
SFP-MM850	850	MMF	No	-9.5	-3	-17	0
SFP-SM1310	1310	SMF	No	-9.5	-3	-20	-3

Table 6-3 Copper GE SFP Transceiver Module Model

Standard	1000Base-T SFP Transceiver Module Model	Support DDM(Yes/No)
1000Base-T	Mini-GBIC-GT	No

Table 6-4 SFP Transceiver Module Cabling Specifications

GBIC/SFP Module Model	Connector	Fiber Type	Core Size (um)	Max Cable Distance
MINI-GBIC-SX-MM850	LC	MMF	62.5/125	275 m
			50/125	550 m
MINI-GBIC-LX-SM1310	LC	SMF	9/125	10 km
GE-eSFP-SX-MM850	LC	MMF	62.5/125	275 m
			50/125	550 m
GE-eSFP-LX-SM1310	LC	SMF	9/125	10 km
GE-SFP-LX-SM1310	LC	SMF	9/125	10 km
MINI-GBIC-LH40-SM1310	LC	SMF	9/125	40 km
GE-SFP-SX-SM1310-BIDI	LC	MMF	50/125	500 m
GE-SFP-SX-SM1550-BIDI	LC	MMF	50/125	500 m
GE-SFP-LX20-SM1310-BIDI	LC	SMF	9/125	20 km
GE-SFP-LX20-SM1550-BIDI	LC	SMF	9/125	20 km
GE-SFP-LH40-SM1310-BIDI	LC	SMF	9/125	40 km
GE-SFP-LH40-SM1550-BIDI	LC	SMF	9/125	40 km
MINI-GBIC-ZX50-SM1550	LC	SMF	9/125	50 km
MINI-GBIC-ZX80-SM1550	LC	SMF	9/125	80 km
MINI-GBIC-ZX100-SM1550	LC	SMF	9/125	100 km
GE-SFP-SX	LC	MMF	62.5/125	275 m
			50/125	550 m
GE-SFP-LX	LC	SMF	9/125	10 km
Mini-GBIC-GT	RJ45 Ethernet Cable	Category 5 or Better UTP/STP Cable		100 m

Caution

- For fiber modules with a cable distance of more than or equal to 40 km (24.85 miles), insert an on-line optical attenuator in the link to avoid the optical receiver overload if the short-distance single mode fiber (SMF) is adopted.
- The transceiver modules are laser products. Do not approach or stare at any fiber port under any circumstances, as this may cause permanent damage to your eyes.
- Ensure that the port is covered with a dust cap so as to keep out dust if it is not connected with a fiber-optic cable.

Table 6-5 BIDI Transceiver Module Pairs

Rate/Distance	BIDI Transceiver Module Pairs
GE/500 m	GE-SFP-SX-SM1310-BIDI GE-SFP-SX-SM1550-BIDI
GE/20 km	GE-SFP-LX20-SM1310-BIDI GE-SFP-LX20-SM1550-BIDI
GE/40 km	GE-SFP-LH40-SM1310-BIDI GE-SFP-LH40-SM1550-BIDI

Caution

- BIDI transceiver modules must be used in pairs. For example, if the GE-SFP-LX20-SM1310-BIDI transceiver module is used on one end, the GE-SFP-LX20-SM1550-BIDI transceiver module must be used on the other end.

6.3 Cabling

When the RG-EG209GS router is installed in a standard 19-inch cabinet, secure the cables around the cable management brackets. Top cabling or bottom cabling is adopted according to the actual situation in the equipment room. All transferred cable connectors should be placed at the bottom of the cabinet in an orderly manner instead of outside the cabinet that is easy to touch. Power cords are routed beside the cabinet, and top cabling or bottom cabling is adopted according to the actual situation in the equipment room, such as the positions of the DC power distribution box, AC socket, or lightning protection box.

6.3.1 Requirements for the Minimum Cable Bend Radius

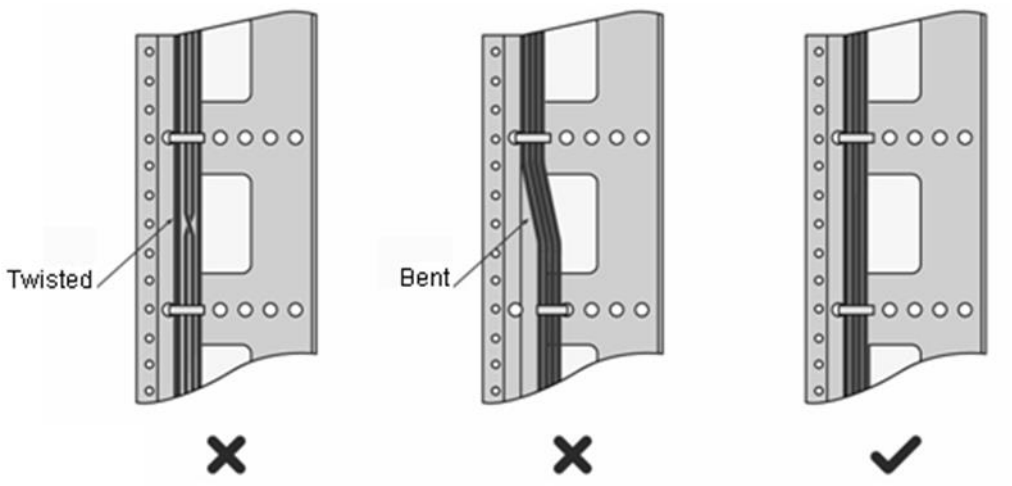
- The bend radius of a fixed power cord, network cable, or flat cable should be over five times greater than their respective diameters. The bend radius of these cables that are often bent or plugged should be over seven times greater than their respective diameters.
- The bend radius of a fixed common 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 bend radius of a fixed high-speed cable (such as SFP+ cable) should be over five times greater than its diameter. The bend radius of the fixed high-speed cable that is often bent or plugged should be over 10 times greater than its diameter.

6.3.2 Precautions for Bundling up Cables

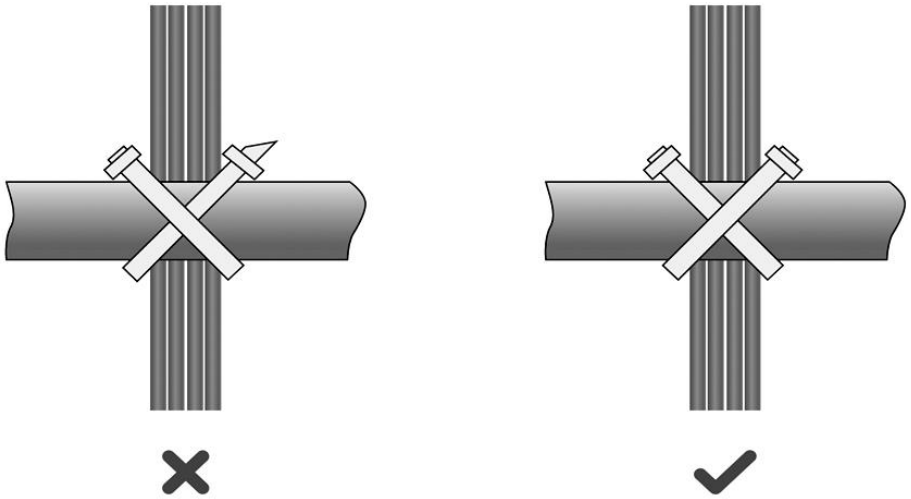
- Before cables are bundled, mark labels and stick the labels to cables wherever appropriate.
- Cables should be neatly and properly bundled in the cabinet without twisting or bending.

Figure 6-4 Binding Cables (1)



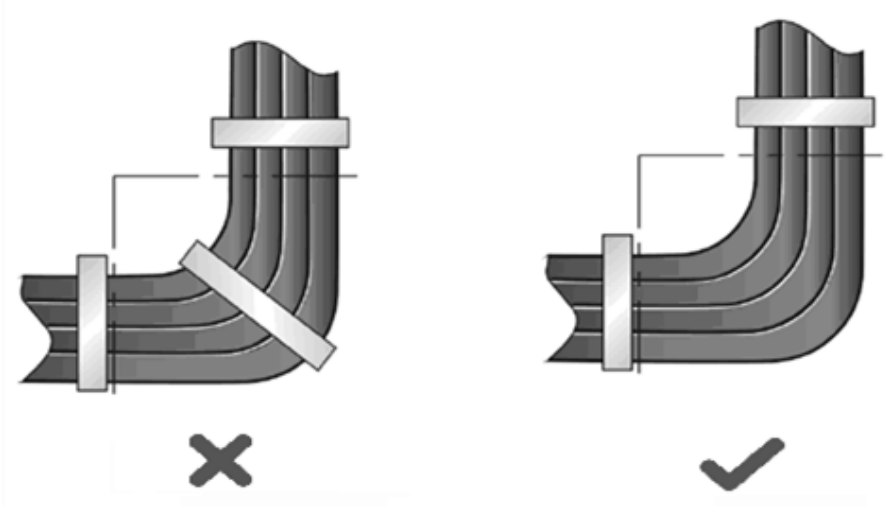
- Cables of different types (such as power cords, signal cables, and ground cables) should be separated in cabling and bundling. Mixed bundling is not allowed. When they are close to each other, it is recommended to adopt crossover cabling. In the case of parallel cabling, maintain a minimum distance of 30 mm (1.18 in.) between power cords and signal cables.
- The cable management brackets and cabling troughs inside and outside the cabinet 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. Please 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.

Figure 6-5 Binding Cables (2)



- When cables need to be bent, please bundle them up but do not tie them where the cables will be bent. Otherwise, considerable stress may be generated in cables, breaking cable cores.

Figure 6-6 Binding Cables (3)



- Cables not to be 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.
- 220 V and –48 V power cords must not be bundled on the guide rails of moving parts.
- The power cords connecting moving parts such as door grounding wires should be reserved with some access after being assembled to avoid suffering tension or stress. After the moving part is 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. If heat sources cannot be avoided, high-temperature cables should be used.
- When screw threads are used to fasten cable terminals, the bolt or screw must be tightly fastened, and anti-

loosening measures should be taken.

Figure 6-7 Cable Fastening

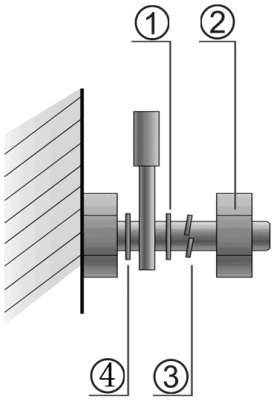


Table 6-6 Cable Fastening Components

No.	Components
1	Flat washer
2	Nut
3	Spring washer
4	Flat washer

- Hard power cords should be fastened in the terminal connection area to prevent stress on terminal connection 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 based on the following table.

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

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