Ruijie Reyee RG-EG210G-P-V3 Router

Installation Guide

Document Version: V1.2
Date: April 7, 2026
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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

This document also uses signs to indicate some important points during the operation. The meanings of these signs are as follows:

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

Featured with global-leading semiconductor technologies and communication control technologies, Ruijie EG series router is a data communication product developed by Ruijie Networks with independent intellectual property right. The EG series router is designed according to international standards, similar to the mainstream router products in the international market. By reading this manual, a network administrator familiar with mainstream router configuration commands can use this device without training.

1.1 Package Contents

Table 1-1 Package Contents

No.	Item	Quantity
1	RG-EG210G-P-V3 router	1
2	Power adapter	1
3	Power cord	1 x 1 m ± 50 mm (39.37 in. ± 1.97 in.)
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.

1.2 Specifications

Table 1-2 Technical Specifications of an RG-EG210G-P-V3 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	9

	Number of LAN/WAN ports	3
	Number of fixed WAN ports	1
	Number of fixed LAN ports	6
	Number of 10/100/1000BASE-T ports	10
	LEDs	1 x system status LED 10 x Ethernet port LEDs
	Reset button	1
	Total number of RJ45 ports	10
Power Supply and Consumption	Power supply	DC power adapter
	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 Hz to 60 Hz ● Maximum input voltage: 90 V AC to 264 V AC, 47 Hz to 63 Hz (optional) Output: ● Rated output voltage: 54 V DC ● Maximum output current: 2.4 A
	Number of PoE Out ports	8
	PoE Out standard	IEEE 802.3af/at (PoE/PoE+)
	PoE power pins	1–2 (+), 3–6 (-)
	PoE budget per port	30 W
	PoE budget	110 W
	Maximum power consumption	130 W
Dimensions and Weight	Weight	1.48 kg (3.26 lbs)
	Shipping weight	1.60 kg (3.53 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)	594 mm x 426 mm x 267 mm (23.38 in. x 16.77 in. x 10.51 in.)
Environment and Reliability	Surge protection	Service port: ±2 kV for common mode Power connector: ±2 KV for common mode and ±1 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

Warning

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

Caution

- Please avoid the vibration and collision in the process of moving and usage.
- Products should be transported in original package.

1.3 Appearance

Figure 1-1 Appearance of RG-EG210G-P-V3

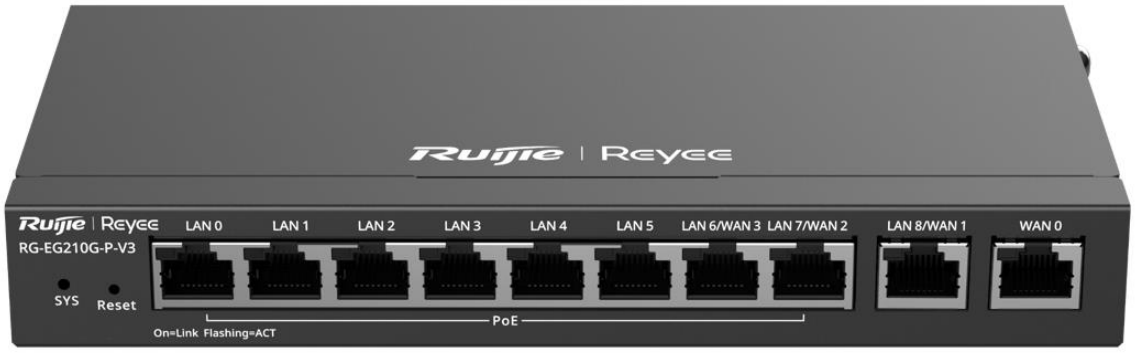


Figure 1-2 Front Panel of RG-EG210G-P-V3

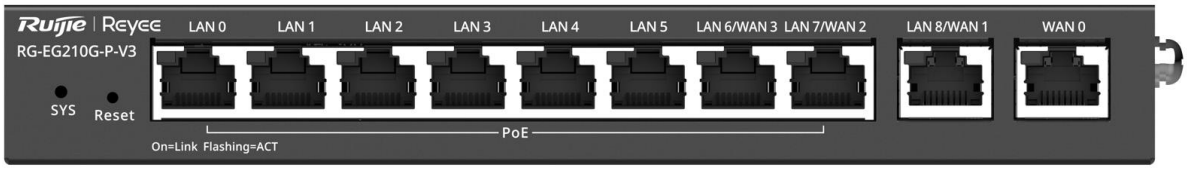
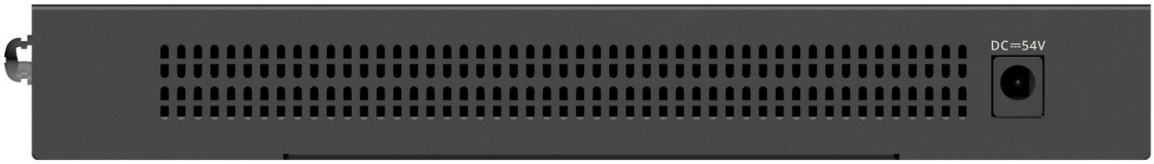


Figure 1-3 Back Panel of RG-EG210G-P-V3



1.4 Interface

Interface	Description
WAN	1 WAN port, used to connect to the DSL/Cable modem for Internet access.
LAN	9 LAN ports, used to connect the computer to the switch or access point (AP). The LAN6, LAN7 and LAN8 port can be used as a WAN port via the Web configuration.

1.5 LED Indicator

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.
	One long green blink followed by three slow blinks: Main program is missing.
	One long green blink followed by one slow blink: PoE power overload or insufficient power supply to the device.
Link/ACT LED	Solid green: the port is up. Blinking green: data is being transceived on the port.
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.	

1.6 Button

Button	Description
Reset	Press the button for less than 2 seconds, the system will restart; press for more than 5 seconds until the system status LED blinks, the system will restore the factory settings and restart. The default management IP address is http://192.168.110.1.

2 Preparation

The router acts as the critical transfer station of network connections, and its normal service is crucial to the normal operation of the entire network.

- Do not place the device in a watery place and prevent any liquid from entering into it.
- Keep the device away from heat sources.
- Ensure the normal grounding of device.
- Wear an anti-static wrist strap to install and maintain the device.
- Do not wear loose clothes to avoid hooking any parts. Before operation, tighten your band, shawl and sleeves.
- Keep tools and parts away from the walkway to avoid damage.
- Use the uninterruptible power supply (UPS) to avoid power failure and other interferences.
- If the system time is incorrect, check whether you have set the clock. If the clock is not set, the time may not be correct; if the clock has been set precisely and the time is still incorrect, the built-in button cell of device may have ran out, which is typically happened after 10-year service.
- Install and use the device in restricted access locations.

Caution

Use of wrong battery may cause damage to the device. Do not replace the battery by yourself. Please contact the technical support for help.

Note

- Install and use the device in restricted access locations.
- Invite professionals and related technicians to install this type of device.

Caution

Where a plug on the power supply cord is used as the disconnect device, the installation instructions shall state that for pluggable equipment, the socket-outlet shall be easily accessible. For pluggable equipment intended for installation by an ordinary person, the installation instructions shall be made available to the ordinary person.

2.1 Installation Environment

Ruijie EG series router products are for indoor use only. To ensure normal operation and prolong their service life, the installation site must meet the following requirements:

2.1.1 Temperature/humidity requirements

To ensure normal operation and prolong the service life of the device, the equipment room must maintain constant temperature and humidity. If the equipment room is overheated for a long time, the insulation materials

may result in defective insulation and even electric leakage. If the relative humidity is low, the insulation spacer may result in dry shrinkage, which will make screws looser and easily generate static electricity in the dry environment, thus damaging the interior circuits on the device. Excessively high temperature will accelerate the aging of insulation materials and compromise the reliability and even service life of the device. The temperature/humidity requirements are shown below (detailed difference between products is described in Product Overview):

Temperature	Relative Humidity
0°C to 40°C (32°F to 104°F)	10% to 90%

Note

The temperature/humidity of working environment indicates the value measured at 1.5 m above the floor and 0.4 m ahead of the equipment frame when there is no protection plate on the front and rear side of the equipment frame.

2.1.2 Cleanliness

The dust is also a major threat to the safe operation of device. The dust accumulated on the device may cause electrostatic adsorption and result in poor contact. It will not only compromise the service life of device but also cause communication failure. When the indoor relative humidity is low, such electrostatic adsorption will occur more easily.

Maximum Diameter (μm)	0.5	1	3	5
Maximum Density (Particles/m^3)	1.4×10^7	7×10^5	2.4×10^5	1.3×10^5

Apart from the dust, the device is also sensitive to the hydrochloric acid sulfide contained in the air. These noxious gases will accelerate metal wastage and the aging of certain parts. The upper limits of noxious gases (Sulfur dioxide, Sulfured hydrogen, Nitrogen dioxide, Ammonia and Chlorine) in the following table:

Gas	Average (mg/m^3)	Maximum (mg/m^3)
SO_2	0.2	1.5
HS	0	0.03
NO_2	0.04	0.15
N_2	0.05	0.15
Cl_2	0.01	0.3

2.1.3 ESD

The router has already given consideration to electrostatic prevention during circuit design, but excessively strong static electricity will still damage the circuit board. The static electricity in the communication network connected with the device is mainly from:

- Outdoor high-voltage transmission line, lightning and other exterior electric fields.

- Indoor environment, flooring material, complete appliance structure and other in-house systems.

To avoid the damage caused by static electricity, we shall:

- Properly ground the device and floor.
- Apply indoor dust control.
- Maintain proper temperature and humidity.
- Before touching the circuit board, wear an anti-static wrist strap and an anti-static uniform.
- Place the circuit board disassembled face up on the antistatic workbench or in the electromagnetic shielded bag.
- When observing or transferring the circuit board of router, touch the outer edge of circuit board and avoid direct contact with the components on the circuit board.

2.1.4 Anti-Interference

The interference as mentioned herein refers to electromagnetic or electrical interference, and the anti-interference requirements are described below:

- Effective power grid interference control measures shall be taken against the power supply system.
- The working ground of the router shall be kept far away from the grounding device or lightning grounding device of power equipment instead of sharing.
- The router shall be kept far away from high-power radio-transmitting station, radar-transmitting station and other high-frequency & heavy-current devices.
- Electromagnetic shielding measures shall be taken whenever necessary.

2.1.5 Installation Site

No matter the router is installed in the cabinet or on the workbench, the following requirements shall be met:

- Make sure sufficient room has been reserved for the air intake and air vent of router to facilitate the heat elimination of the router chassis. Please install the router on a clean and flat surface. In heated areas, the air conditioning system shall be equipped.
- Make sure the workbench is equipped with a good ventilation and cooling system.
- Make sure the workbench is steady enough and capable of withstanding the weight of the router and its accessories.
- Make sure the workbench is properly grounded.

2.2 Installation Tools and Devices

Please prepare the following tools and devices:

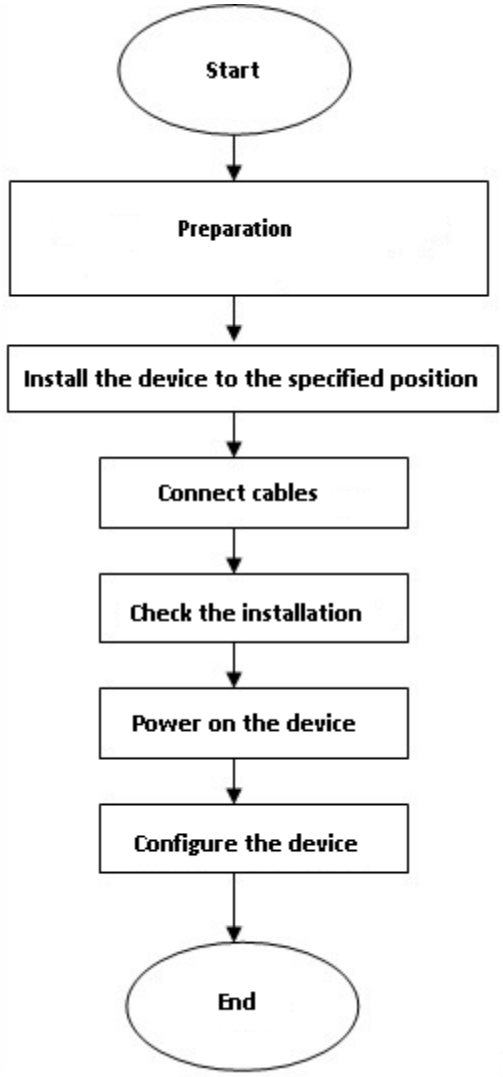
Installation Tools	Phillips screwdriver, ESD wrist strap
Cables	Power cables, configuration cables, Ethernet cables, grounding wires
Devices	HUB or switch, configuration terminal (PC with hyper-terminal), power socket

3 Installing the Router

3.1 Installation Flowchart

Please take the following steps:

Figure 3-1 Installation Flowchart



3.2 Mounting the Router

Mounting the router refers to installing the device to the specified position. Upon completion of installation preparation, fix the router to the specified position.

Mounting on a Workbench

In most cases, the user does not have a standard cabinet. Instead, the user can place the device on a clean workbench. Although it is easy and simple, you shall pay attention to the following:

- Guarantee the steadiness and good grounding of the workbench.
- Attach the rubber pads onto the small holes at the bottom of the router, and maintain a minimum of 10 cm around the device.
- Do not place heavy things on the device.

3.3 Installing Power Cables

The requirements of Ruijie EG series router products on AC power supply are described below (refer to *Product Overview* for detailed parameters):

100–240 V / 50/60 Hz.

RG-EG series router uses 3-conductor power cables. You are suggested to use a single-phase 3-conductor outlet or a multifunction microcomputer outlet with neutral connector. The neutral point of the power supply shall be securely grounded in the building. In most buildings, the neutral point of a power supply has been grounded during the construction. You need to make sure the power supply is properly grounded.

Please take the following steps:

- Plug one end of the power cable into the power socket on the backpanel of the router, and plug the other end into the AC power supply outlet.
- Check whether the power LED on the front panel of the router lights up or not. The LED indicator will light up if the power supply is properly connected.

3.4 Checking after the Installation

After completing the mechanical installation of router, perform the following checks before powering on the device:

- If the device is installed on the workbench, check whether sufficient room is reversed around the device to ensure heat elimination and whether the workbench is steady.
- Check whether the power supply meets the requirements.
- Check whether the earth wire of device is properly connected.
- Check whether the device is connected correctly to the configuration terminal.

4 Quick Configuration

4.1 Connecting Devices

Connecting to AP

(1) Connect the AP device to the EG router via network cable.

(2) Power on the devices.

(3) The AP device broadcasts an SSID with a prefix starting with @Ruijie-mXXXX.

Connecting to PC

(1) Connect the PC to the EG router via network cable.

(2) Enable the PC to automatically obtain the IP address.

4.2 Power-on Startup

Checks before Power-on

Before power-on, perform the following checks on the router:

- Whether the power cable and the ground wire are properly connected.
- Whether the power voltage is consistent with the requirement of the router.
- Whether the configuration cable is properly connected, and whether the microcomputer or terminal for device configuration is started or configured.

Caution

Before powering on the router, be aware of the location of the power switch of the router to timely cut off power supply in case of any accident.

Powering on the Router

- Turn on the power supply switch of the router.

Checks after Power-on

After the router is powered on, check the following items:

- Whether the LED indicators on the front panel of the router works normally.

Refer to the indicators in *Product Overview*.

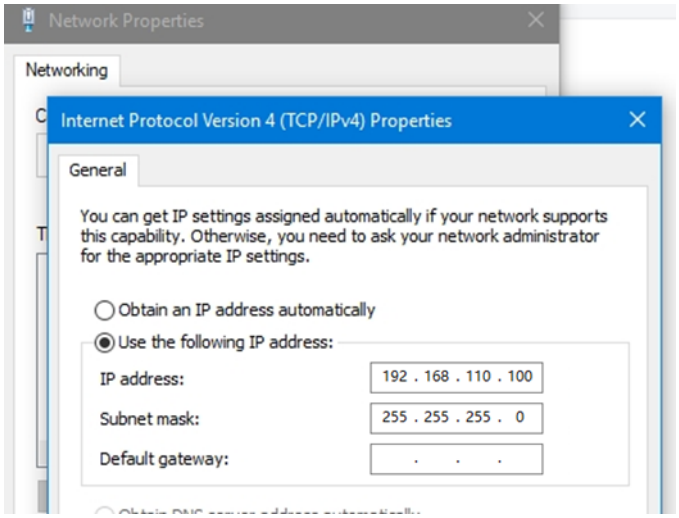
- Whether the Web-based system is available.

The default management IP address is http://192.168.110.1.

4.3 Log In to the Web Interface

(1) Start up the PC and configure the local connection attribute on the PC. Change the static IP address of the PC to 192.168.110.XXX (2–254).

Figure 4-1 Change the IP Address of the PC



(2) Open a browser, enter 192.168.110.1 into the address bar of the browser, and press **Enter**.

Caution

Use the default password "admin" to log in to the switch for the first time. To ensure security, you are advised to change the password after login, and update the password regularly.

4.4 Configuring Router

To use the router, you need to properly configure the router as required. Refer to the relevant Web-based configuration guide for details about router configuration.

5 Troubleshooting

5.1 Power Supply

Refer to *Product Overview* for the normal state descriptions of LED indicators. If abnormity occurs, perform the following checks:

- Whether the power switch is turned on.
- Whether the power supply of the router is turned on.
- Whether the power cable is properly connected.
- Whether the power supply to the router meets relevant requirements.

Caution

Do not plug or pull the power cable when the device is powered on. If everything is ok but the Status LED still does not light up, contact with a local distributor or technical support personnel.

5.2 Configuration System

After the router is powered on, the Web-based configuration system is available if the device works normally. If not, please check:

- Whether the power system works normally.
- Whether the network cable is properly connected.
- Whether the network card of the computer is using DHCP to obtain the IP address.

6 Appendix

6.1 Connectors and Connection Media

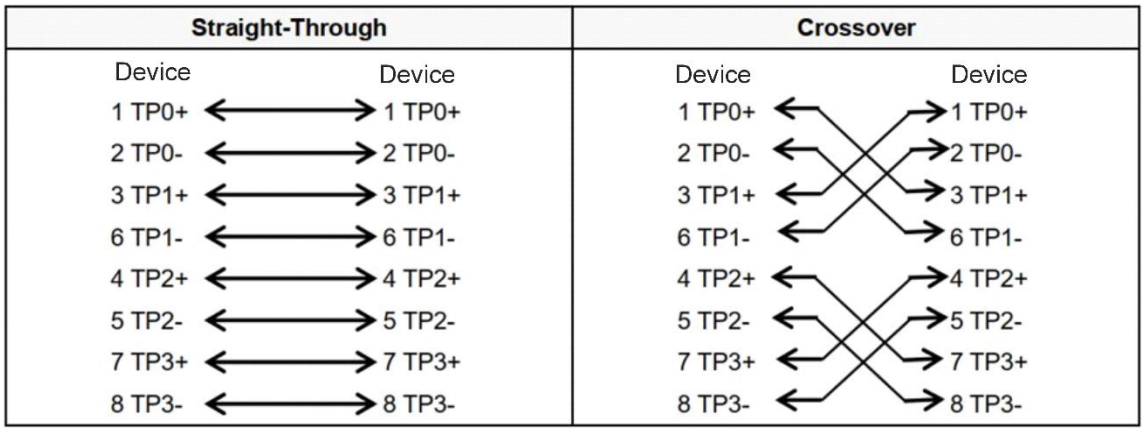
6.1.1 1000BASE-T/100BASE-TX/10BASE-T Ports

The 1000BASE-T/100BASE-TX/10BASE-T is a port that supports adaptation of three rates, and automatic MDI/MDIX Crossover at these three rates.

The 1000BASE-T complies with IEEE 802.3ab, and uses the cable of 100-ohm Category-5 or Category 5 Enhanced UTP or STP, which can be up to 100 m.

The 1000BASE-T port uses four pairs of wires for transmission, all of which must be connected. Figure 6-1 shows the connections of the twisted pairs used by the 1000BASE-T port.

Figure 6-1 Four Twisted Pairs of the 1000BASE-T



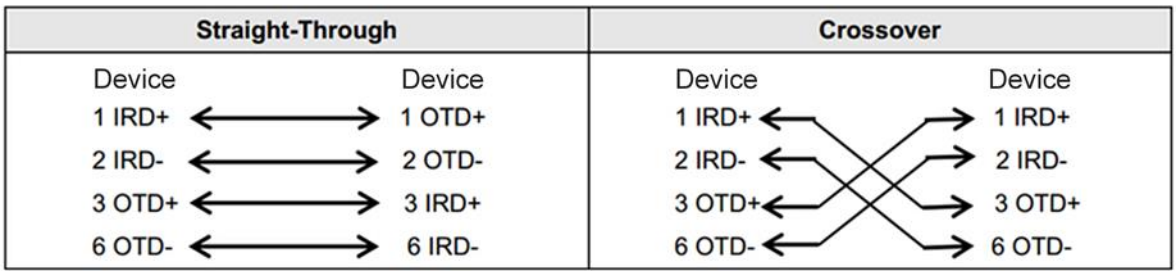
In addition to the above cables, the 100BASE-TX/10BASE-T can also use 100-ohm Category-3, 4, 5 cables for 10 Mbps, and 100-ohm Category-5 cables for 100 Mbps, both of which can be up to 100 m. Table 6-1 shows the pinouts of the 100BASE-TX/10BASE-T.

Table 6-1 Pinouts of the 100BASE-TX/10BASE-T

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 the straight-through and crossover cable connections for the 100BASE-TX/10BASE-T.

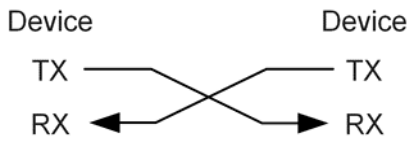
Figure 6-2 Connections of the Twisted Pairs of the 100BASE-TX/10BASE-T



6.1.2 Optical Fiber Connection

For the optical fiber ports, select single-mode or multiple-mode optical fibers for connection according to the fiber module connected. The connection schematic diagram is shown in Figure 6-3:

Figure 6-3 Optical Fiber Connections



6.2 Cabling Recommendations in Installation

When the device is installed in standard 19-inch cabinets, the cables are tied in the binding rack on the cabinet by the cabling rack, and top cabling or bottom cabling is adopted according to the actual situation in the equipment room. All cable connectors should be placed at the bottom of the cabinet in an orderly manner instead of outside the cabinet easy to touch. Power cables 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 position of the DC power distribution box, AC socket, or lightning protection box.

6.2.1 Requirement for the minimum cable bend radius

- The bend radius of a power cord, communication cable, and flat cable should be greater than five times their respective diameters. The bend radius of these cables that often bend or suffer removal/insertion should be greater than seven times their respective diameters.
- The bend radius of a common coaxial cable should be greater than seven times its diameter. The bend radius of this type of cables that often bend or suffer removal/insertion should be greater than 10 times its diameter.
- The bend radius of a high-speed cable (SFP cable, for example) should be greater than five times its diameter. The bend radius of this type of cables that often bend or suffer removal/insertion should be greater than 10 times its diameter.

6.2.2 Requirement for the minimum fiber bend radius

- The diameter of a fiber tray to hold fibers cannot be less than 25 times the diameter of the fiber.
- When moving an optical fiber, the bend radius of the fiber should be equal to or greater than 20 times the

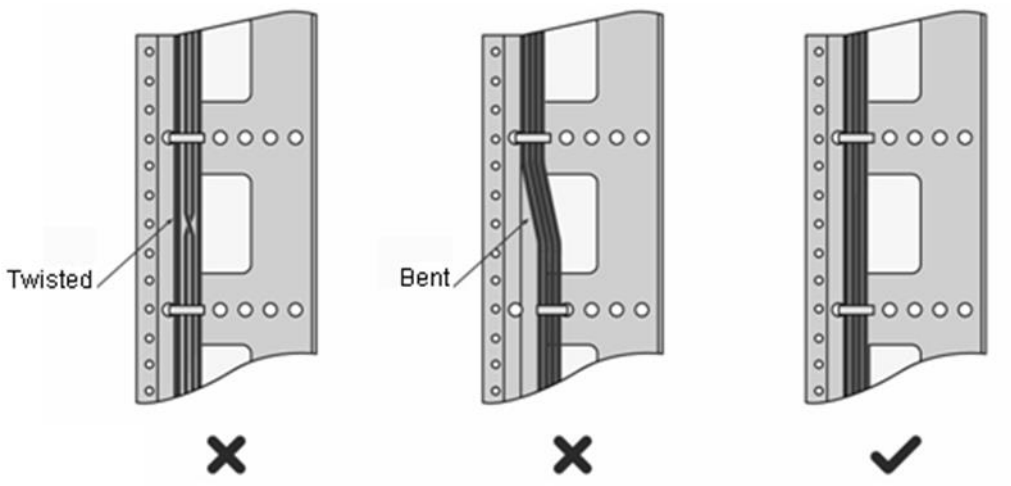
diameter of the fiber.

- During cabling of an optical fiber, the bend radius of the fiber should be equal to or greater than 10 times the diameter of the fiber.

6.2.3 Precautions for Bundling up Cables

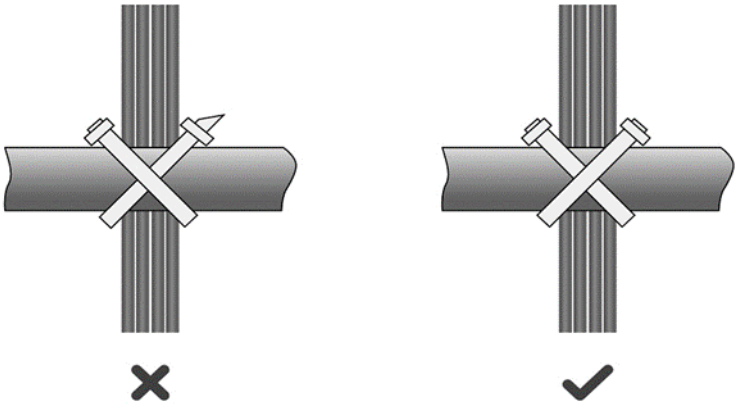
- Before bundling cables, correctly mark labels and stick the labels to cables where appropriate.
- Cables should be neatly and properly bundled, as shown in Figure 6-4.

Figure 6-4 Bundling Up Cables (1)



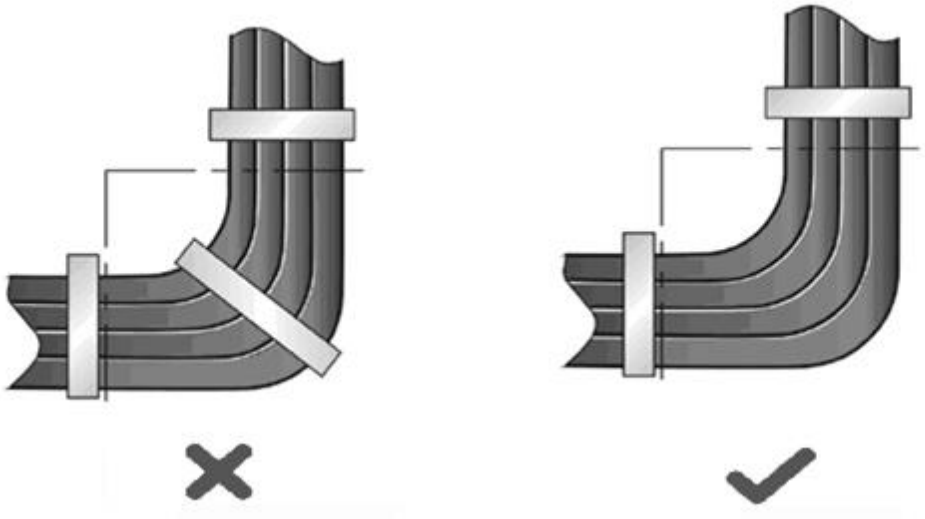
- Cables of different types (such as power cords, signal cables, and grounding cables) should be separated in cabling and bundling. When they are close, crossover cabling can be adopted. In the case of parallel cabling, power cords and signal cables should maintain a space equal to or greater than 30 mm.
- The binding rack and cabling slot 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.
- Proper buckles should be selected to bundle up cables. It is forbidden to connect two or more buckles to bundle up cables.
- After bundling up cables with buckles, you should cut off the remaining part. The cut should be smooth and trim, without sharp corners, as shown in Figure 6-5.

Figure 6-5 Bundling Up Cables (2)



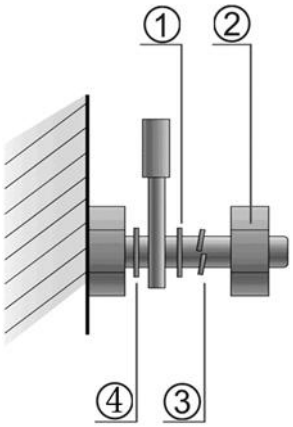
- When cables need to bend, you should first bundle them up. However, the buckle cannot be bundled within the bend area. Otherwise, significant stress may be generated in cables, breaking cable cores. As shown in Figure 6-6.

Figure 6-6 Bundling Up 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 cabling slot. The proper position indicates a position that will not affect device running or cause device damage or cable damage during commissioning.
- The power cords cannot be bundled on the guide rails of moving parts.
- The power cables connecting moving parts such as door grounding wires should be reserved with some access after assembled. When the moving part reaches the installation position, the remaining part should not touch heat sources, sharp corners, or sharp edges. If heat sources cannot be avoided, high-temperature cables should be used.
- When using screw threads to fasten cable terminals, the bolt or screw must be tightly fastened, and anti-loosening measures should be taken, as shown in Figure 6-7.

Figure 6-7 Cable Fastening



① Flat Washer	③ Spring Washer
② Nut	④ Flat Washer

- The hard power cable should be fastened by the terminal connection area to prevent stress.
- Do not use self-tapping screws to fasten terminals.
- Power cables 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.
- Binding by using buckles should be performed according to the 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 solder-less terminal blocks (such as air switches) of the cold pressing terminal type, the metal part of the cold pressing terminal should not be exposed outside the terminal block when assembled.