Ruijie Reyee RG-RAP52-OD Access Point

Installation Guide

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Preface

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. GUI Symbols

Interface symbol	Description	Example
Boldface	1. Button names 2. Window names, tab name, field name and menu items 3. Link	1. Click **OK**. 2. Select **Config Wizard**. 3. Click the **Download File** link.
>	Multi-level menus items	Select **System** > **Time**.

2. Signs

The signs used in this document are described as follows:

Danger

An alert that calls attention to safety instruction that if not understood or followed can result in personal 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.

3. Note

This manual provides installation steps, troubleshooting, technical specifications, and usage guidelines for cables and connectors. It is intended for users who want to understand the above and have extensive experience in network deployment and management, and assume that users are familiar with related terms and concepts.

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1 Product Overview

1.1 Package Contents

Table 1-1 Package Contents

No.	Item	Quantity
1	RG-RAP52-OD access point	1
2	Antennas	2
3	Band clamps	2
4	Mounting bracket	1
5	Cross pan head screws (ST3.5 x 25 mm)	2
6	Plastic expansion anchors (φ9 x 25.4 mm)	2
7	Warranty Card	1
8	User Manual	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 Product Appearance

Figure 1-1 Appearance of the RG-RAP52-OD Access Point



1.2.1 Front Panel

Figure 1-2 Front Panel of the RG-RAP52-OD Access Point



1.2.2 Back Panel

Figure 1-3 Back Panel of the RG-RAP52-OD Access Point

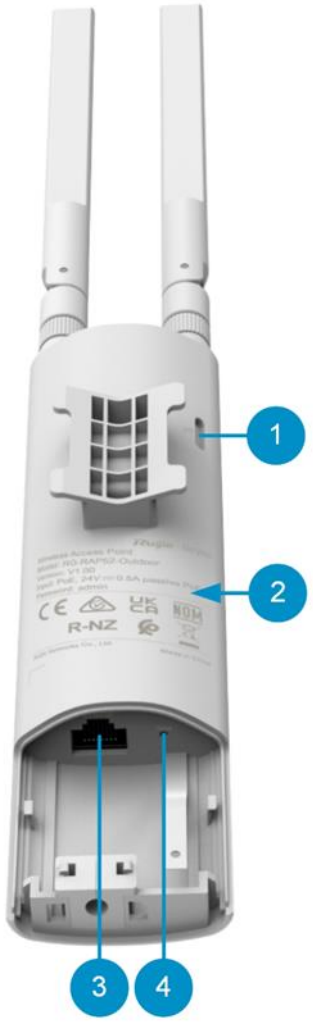


Table 1-2 LEDs

Mark	Status	Description
1	Solid blue	The device is operating normally.
	Off	The device is NOT receiving power.
	Fast blinking	The device is starting up.
	Slow blinking (at a two-second interval)	The device is not connected to the Internet.

Mark	Status	Description
	Blinking twice	● The device is resetting. ● The device is upgrading. ● The device is recovering. **Caution** Do not power off the device when the LED is in this state.

Table 1-3 Ports and Buttons

Mark	Item	Description
2	Label	The label is located on the back of the device.
3	LAN/PoE port	1 × 10/100/1000Base-T port, supporting IEEE 802.3af- or 802.3at-compliant PoE, as well as 24 V passive PoE. **Caution** For details about power supply restrictions, see 1.4 Power Supply Technical Specifications.
4	Reset button	Press and hold for less than 2 seconds: Restart the device. Press and hold for more than 5 seconds: Restore the device to factory settings.

1.3 Technical Specifications

Table 1-4 Specifications

System Specifications	Flash memory	16 MB
	RAM	128 MB DDR3
Wi-Fi Radio	5 GHz Wi-Fi	Wi-Fi 4 (IEEE 802.11a/n) Wi-Fi 5 (IEEE 802.11ac)
	2.4 GHz Wi-Fi	Wi-Fi 4 (IEEE 802.11b/g/n)
	Operating band	IEEE 802.11b/g/n, 2.400 GHz to 2.4835 GHz IEEE 802.11a/n/ac, 5.150 GHz to 5.350 GHz, 5.470 GHz to 5.725 GHz, 5.725 GHz to 5.850 GHz Note: Available bands vary with countries and regions. To use the preceding frequency bands,

		ensure that your country or region supports these frequency bands.
	Radio design	Dual-radio 4 spatial streams ● 2.4 GHz: 2 x 2, MIMO ● 5 GHz: 2 x 2, MIMO
	5 GHz channel width	Auto/20/40/80 MHz
	2.4 GHz channel width	Auto/20/40 MHz
	Maximum wireless data rate	1266 Mbps
	5 GHz wireless data rate	866 Mbps
	2.4 GHz wireless data rate	400 Mbps
	Maximum transmit power (5 GHz)	Combined power: 24 dBm (single-stream power: 21 dBm) Note: The transmit power varies according to regulations in different countries and regions.
	Maximum transmit power (2.4 GHz)	Combined power: 25 dBm (single-stream power: 22 dBm) Note: The transmit power varies according to regulations in different countries and regions.
	Maximum transmit power	Frequency bands and maximum Effective Isotropic Radiated Power (EIRP): Note: Country specific restrictions apply. ● European Union & United Kingdom: ○ 2400–2483.5 MHz, EIRP ≤ 20 dBm ○ 5470–5725 MHz, EIRP ≤ 30 dBm ● Myanmar: ○ 2400–2483.5 MHz, EIRP ≤ 23 dBm ○ 5725–5825 MHz, EIRP ≤ 30 dBm ● Thailand: ○ 2400–2483.5 MHz, EIRP ≤ 20 dBm ○ 5470–5725 MHz, EIRP ≤ 30 dBm ○ 5725–5825 MHz, EIRP ≤ 30 dBm ● Indonesia: ○ 2400–2483.5 MHz, EIRP ≤ 36 dBm ○ 5725–5825 MHz, EIRP ≤ 36 dBm ● Egypt:

		○ 2400–2483.5 MHz, EIRP ≤ 20 dBm ○ 5150–5350 MHz, EIRP ≤ 23 dBm
	Coverage range	5 GHz max: 300 m (984.25 ft.) 2.4 GHz max: 100 m (328.08 ft.) 5 GHz recommended: 150 m (492.13 ft.) 2.4 GHz recommended: 50 m (164.04 ft.) Note: The data is obtained in an ideal environment without obstruction. The signal coverage radius depends on client performance and environmental interference.
	Modulation	OFDM: BPSK @ 6/9 Mbps, QPSK @ 12/18 Mbps, 16-QAM @ 24 Mbps, 64-QAM @ 48/54 Mbps DSSS: DBPSK @ 1 Mbps, DQPSK @ 2 Mbps, and CCK @ 5.5/11 Mbps MIMO-OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
	Receive sensitivity	11b: –91 dBm (1 Mbps), –88 dBm (5.5 Mbps), –85 dBm (11 Mbps) 11a/g: –89 dBm (6 Mbps), –80 dBm (24 Mbps), –76 dBm (36 Mbps), –71 dBm (54 Mbps) 11n: –83 dBm (MCS0), –65 dBm (MCS7), –83 dBm (MCS8), –65 dBm (MCS15) 11ac: 20 MHz: –83 dBm (MCS0), –57 dBm (MCS9) 11ac: 40 MHz: –79 dBm (MCS0), –57 dBm (MCS9) 11ac: 80 MHz: –76 dBm (MCS0), –51 dBm (MCS9)
Antenna	Antenna	Integrated 2.4 GHz and 5 GHz: 2 external omnidirectional antennas
	Antenna gain (5 GHz)	4.00 dBi
	Antenna gain (2.4 GHz)	3.00 dBi
Port Specifications	Number of 10/100/1000BASE-T ports	1
	Maximum rate of the LAN port	1000 Mbps

	Reset button	1
	LEDs	1 x system status LED
Power Supply and Consumption	Power supply	PoE/PoE+
	PoE In standard	● IEEE 802.3af (PoE) ● IEEE 802.3at (PoE+)
	Passive PoE power supply	Yes, 24 V passive PoE injector
	Maximum power consumption	13.5 W
Dimensions and Weight	Product dimensions (W x D x H)	50 mm x 35.7 mm x 220 mm (1.97 in. x 1.41 in. x 8.66 in.) (excluding the mounting bracket and antenna) antenna size: 185 mm (7.28 in.)
	Package dimensions (W x D x H)	122 mm x 250 mm x 68 mm (4.80 in. x 9.84 in. x 2.68 in.)
	Color	White
	Weight	≤ 0.4 kg (0.88 lbs.) (without packaging materials)
	Shipping weight	≤ 0.5 kg (1.10 lbs.)
Environment and Reliability	Operating temperature	–30°C to +65°C (–22°F to +149°F)
	Storage temperature	–40°C to +75°C (–40°F to +167°F)
	Operating humidity	10% RH to 95% RH (non-condensing)
	Storage humidity	10% RH to 95% RH (non-condensing)
	Mounting options	Wall/Pole
	IP rating	IP65
	Surge protection	Ethernet port: ±4 kV for common mode
	MTBF	400,000 hours
Certification and Regulatory Compliance	RoHS	Yes
	Certification	CE, CB

1.4 Power Supply Technical Specifications

Caution

The RG-RAP52-OD product is currently compatible with all Ruijie PoE switches and two PoE injector models (RG-POE-AF15 and RG-POE-AT30) for power supply. However, it does not currently support power supply from RG-E-120 (GE) and RG-E-130 (GE) PoE injectors. If you encounter any power supply issues with third-party switches or PoE injectors, replace the switch or PoE injector with a compatible model.

The RG-RAP52-OD access point supports IEEE 802.3af- or 802.3at-compliant PoE, as well as 24 V passive PoE.

- When using a 24 V passive PoE adapter for power supply, use the passive PoE adapter approved by Ruijie Reyee. You are advised to purchase the adapter from us to ensure compatibility and optimal performance with our product.

  Warning

  Ensure that the pinouts of the network cable are (pins 4, 5, 7, 8).

- When using a standard PoE power source for power supply, connect one end of the Ethernet cable to the LAN/PoE port of the device, and the other end to a PoE-enabled switch port or a PoE power supply. Ensure that the PoE power supply is compliant with the IEEE 802.3af or 802.3at standard.

  Warning

  Ensure that the pinouts of the network cable are (pins 1, 2, 3, 6).

1.5 Cooling

The RG-RAP52-OD access point adopts a fanless design. Therefore, a sufficient clearance must be maintained around the device for cooling.

2 Preparing for Installation

2.1 Safety Precautions

Note

- To prevent device damage and physical injury, please read the safety precautions carefully in this chapter.
- The following safety precautions do not cover all possible hazardous situations.

2.1.1 Installation Safety

- Do not expose the AP to high temperature, dust, or harmful gases.
- Do not install the AP in an area prone to fire or explosions.
- Keep the AP away from EMI sources such as large radar stations, radio stations, and substations.
- Do not subject the AP to unstable voltage, vibration, and noises.
- The installation site should be dry. Keep the AP at least 500 m (1640.42 ft.) away from the ocean and do not face it towards the sea breeze.
- The installation site should be free from water including possible flooding, seepage, dripping, or condensation. The installation site should be selected according to network planning and communications equipment features, and considerations such as climate, hydrology, geology, earthquake, electrical power, and transportation.

Caution

Follow the installation instructions described in the guide correctly to install or remove the AP.

2.1.2 Handling Safety

- Do not move the installed AP frequently.
- Turn off all power supplies and unplug all power cables before you remove the AP.

2.1.3 Electrical Safety

Warning

- Any non-standard and inaccurate electrical operation can cause an accident such as fire or electric shock, thus causing severe even fatal damages to humans and devices.
- Direct or indirect contact with a wet object (or your finger) on the high voltage and power line can be fatal.

- Please observe local regulations and specifications when performing electrical operations. Relevant operators must be qualified.
- Carefully check for any potential hazards in the working area such as damp/wet ground or floors.
- Find the location of the emergency power supply switch in the room before installation. Cut off the power

supply first in case of an accident.

- Be sure to make a careful check before shutting down the power supply.
- Do not place the device in a damp/wet location. Do not let any liquid enter the chassis.
- Keep the AP far away from grounding or lightning protection devices for power equipment.
- Keep the AP away from radio stations, radar stations, high-frequency high-current devices, and microwave ovens.

2.2 Installation Environment Requirements

For normal operation and prolonged service life of the access point, the installation site must meet the following requirements.

2.2.1 Ventilation

The access point adopts natural cooling. Reserve a sufficient clearance around the access point to ensure proper ventilation.

2.2.2 Temperature and Humidity

See the following table for temperature and humidity requirements.

Table 2-1 Temperature and Humidity Requirements

Temperature	Humidity
–30°C to +65°C (–22°F to +149°F)	10% to 95%RH (non-condensing)

To ensure the normal operation and service life of the AP, maintain appropriate temperature and humidity in the equipment room. Improper room temperature and humidity can cause damage to the device.

- High relative humidity may affect insulation materials, resulting in poor insulation and even electrical leakage. Sometimes it may lead to changes in the mechanical properties of materials and corrosion of metal parts.
- Low relative humidity can dry and shrink insulation sheets and cause static electricity that can damage the circuitry.
- High temperatures greatly reduce device reliability and shorten service life.

2.2.3 Waterproofing

The Ethernet cable must be pressed into the silicone pad before being connected to the Ethernet port on the device. Then, install the back cover to ensure effective waterproofing. (For more details, see the following installation sections.)

- Seal the unused ports using the connector plugs or cable glands to ensure that the access point is watertight.
- The cable glands must be used for all cables that are threaded through the ports to prevent exposing the access point interior to environmental elements. See 3.4.2 Connecting the Ethernet Cable for details.

2.2.4 EMI

- Keep the AP as far away from the grounding equipment of the power device and the lightning prevention equipment as possible.

- Keep the AP away from radio stations, radar stations, high-frequency high-current devices, and microwave ovens.

2.3 Tools

Table 2-2 Tools

Common Tools	Phillips screwdriver, cables, cage nuts, diagonal plier, and band clamp
Special Tools	ESD gloves, wire stripper, crimping plier, RJ45 crimping plier, wire cutter, and waterproof adhesive tape
Meters	Multimeter and bit error rate tester (BERT)

Note

The RG-RAP52-OD is delivered without a tool kit. The tool kit is customer-supplied.

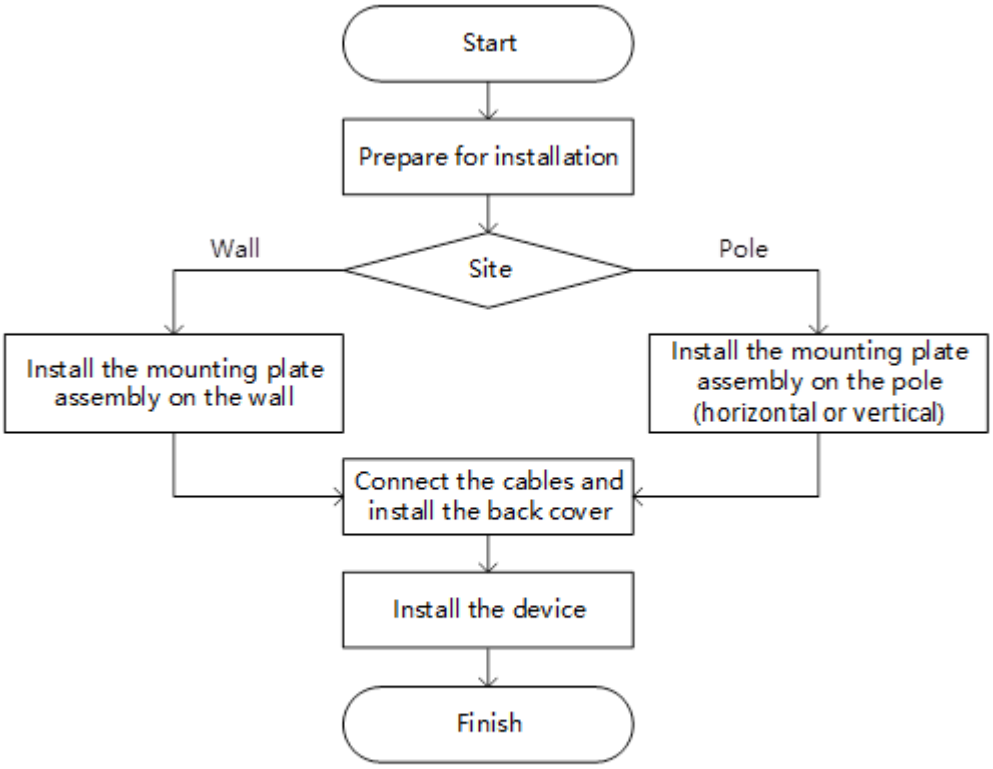
3 Installing the AP

The RG-RAP52-OD access point must be fixed outdoors.

⚠ Caution

Before installing the AP, make sure you have carefully read the requirements described in Chapter 2 and the requirements are all met.

3.1 Installation Flowchart



3.2 Before You Begin

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 proper ventilation.
- The installation site meets the temperature and humidity requirements of the AP.
- The power supply and required current are available in the installation site.

- The selected power supply modules meet the system power requirements.
- The installation site meets the cabling requirements of the AP.
- The installation site meets the site requirements of the AP.
- The customized AP meets the client-specific requirements.

3.3 Precautions

The outdoor access point can be mounted on a wall or a pole with a diameter ranging from 50 mm to 70 mm (1.97 in. to 2.76 in.). If the diameter of the pole is out of this range, please prepare a hose clamp that can hold the pole. The thickness of the hose clamp should be at least 2.5 mm (0.10 in.). The installation site is determined by the technical personnel who conducts a site survey.

Please make sure that the installation site meets with the following requirements in 2.2 Installation Environment Requirements and observe the following precautions:

- Do not power on the AP during installation.
- Install the AP in a well-ventilated location.
- Do not subject the AP to high temperature.
- Keep the AP away from high voltage cables.
- Do not expose the AP in a thunderstorm or strong electric field.
- Cut off the power switch before cleaning the AP.
- Do not wipe the device with a damp cloth.
- Do not wash the device with liquid.
- Do not open the enclosure when the AP is working.
- Secure the AP tightly.
- The device should be installed at a height beyond the reach of the human body.

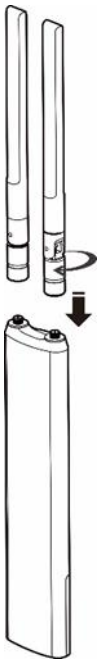
3.4 Installing the AP

Note

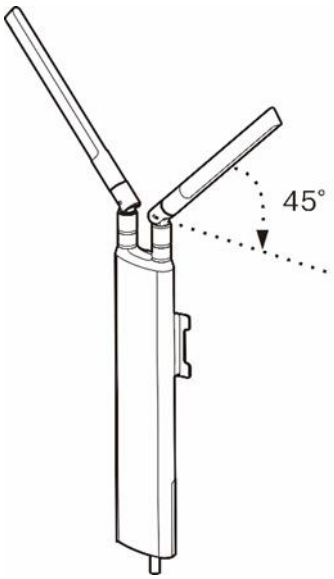
- Install the device in a manner that maximizes the coverage area of the antenna.
- The schematic diagram provided is for reference purposes only. The actual product should be installed based on its physical specifications and design.

3.4.1 Installing the Antenna

(1) Remove the antennas from the packaging and attach them to the antenna connectors on the AP. Tighten the antennas in a clockwise direction to securely fasten them in place.



(2) Verify that the antennas are properly tightened. Then, adjust the antennas by bending them at a 45-degree angle to enhance wireless signal coverage.

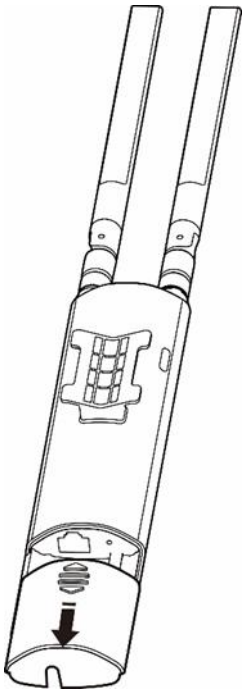


3.4.2 Connecting the Ethernet Cable

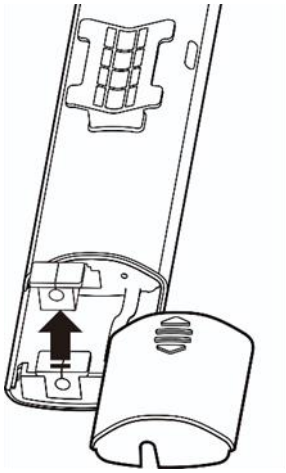
⚠ Caution

Ensure that the RJ45 connector of the Ethernet cable is properly connected to the AP. Incorrect connection of the RJ45 connector may result in abnormal network connection. When removing the Ethernet cable, first pull it out from the waterproof silicone slot, and then disconnect the RJ45 connector from the AP.

(1) Push the back cover of the AP downwards to remove the back cover.



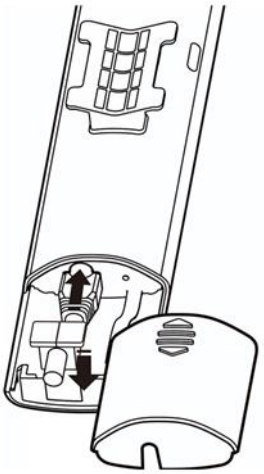
(2) Remove the silicone pad on the device.



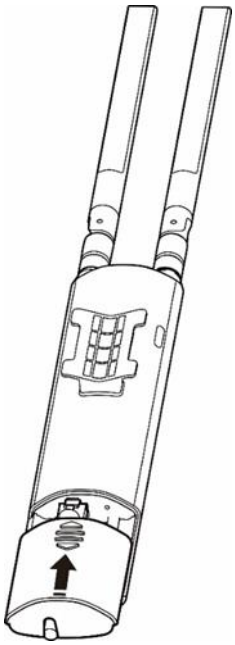
(3) Fully insert the Ethernet cable into the opening of the silicone pad, leaving about 5 cm from the RJ45 connector.



(4) Insert the RJ45 connector into the LAN/PoE port on the device, and then put the silicone pad back into the slot on the device.



(5) Install the back cover of the AP.



3.4.3 Installing the AP

Warning

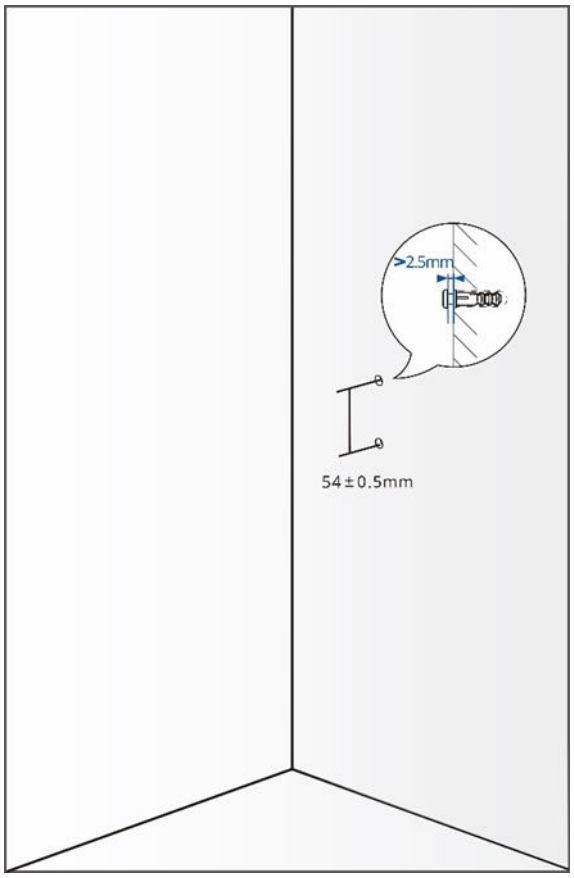
- The installation site should be free from water flooding, seepage, dripping, or condensation.
- When installing this device, ensure that the antenna end is facing upwards and the device is mounted perpendicular to the ground. Avoid tilting, leveling, or inverting the installation, as it may compromise the device's dust and water resistance performance.
- Power on the device only after it is properly installed.

If the installation site does not meet any of the requirements mentioned above, you are advised to take effective waterproof measures such as using a waterproof plaster or adhesive tape.

1. Mounting the AP on a Wall

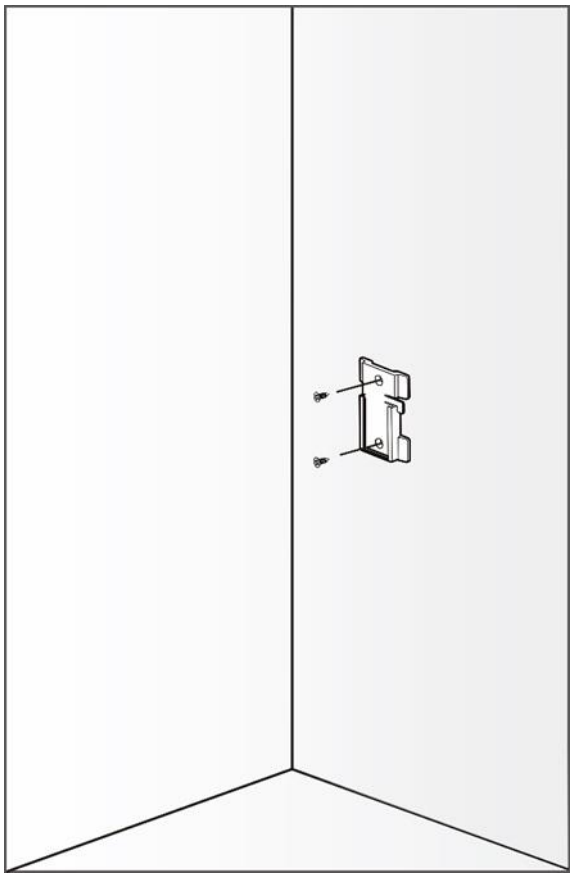
The mounting bracket and cross pan head screws (3.5 mm × 25 mm) are required for wall mounting. Please follow the installation procedure outlined below:

(1) Place the mounting bracket against the wall and adjust its position (pay attention to the designated areas for the AP and antennas). Use a marker to mark the positions for the wall anchors, with the center distance of the mounting hole being 54±0.5 mm (2.13 in. ±0.02 in.). Next, use an electric drill to create a 3.5 mm (0.14 in.) hole.

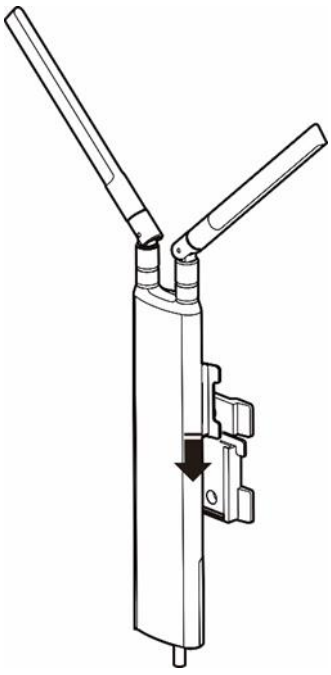


(2) Attach the mounting bracket to the wall with two cross pan head screws (3.5 mm × 25 mm).

> ⚠ Caution
>
> When installing the mounting bracket, ensure that the opening of the bracket is facing upwards.



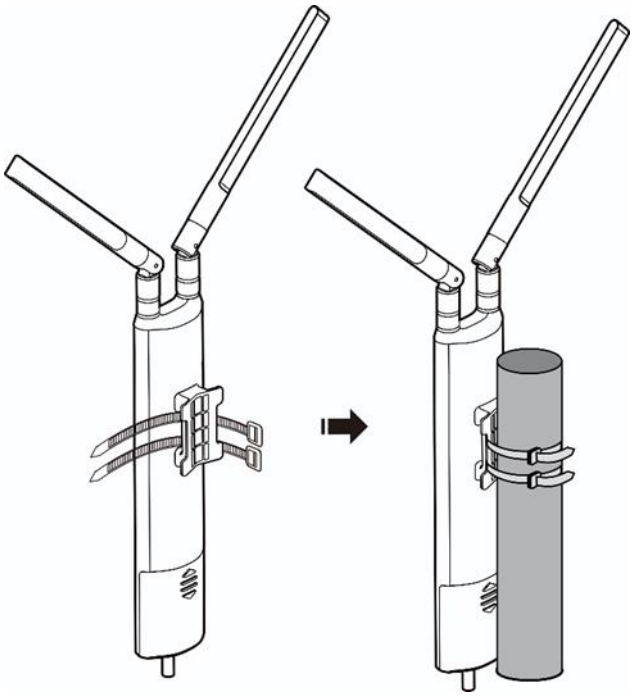
(3) Push and slide the AP downwards to lock it in place. The installation is complete.



2. Mounting the AP on a Vertical Pole

(1) Thread the band clamp through the hole on the back panel of the AP.

(2) Wrap the band clamps around the pole and pull it tight. The installation is complete.



3.5 Bundling Cables

⚠ Caution

- The power cords and other cables should be bound in a visually pleasing way.
- Make sure that the twisted pair cables at the connectors have natural bends or bends of large radius.
- Do not over tighten cable bundle as it may reduce the cable life and performance.

The steps for cable bundling are as follows:

(1) Bundle the drooping part of the cables and place the bundle as near the ports as possible.

(2) Route the cables under the AP and run them in straight line.

3.6 Checklist After Installation

(1) Checking the AP

- Verify that the external power supply matches with the requirement of the AP.
- Verify that the AP is securely fastened.

(2) Checking Cable Connections

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

(3) Checking Power Supply

- Verify that the power cord is properly connected and compliant with safety requirements.
- Verify that the AP works properly when powered by the power supply.

4 Debugging

4.1 Setting up Configuration Environment

Use a 24 V passive PoE adapter or PoE power source to supply power to the device.

- Before powering on the device using a 24 V passive PoE adapter or PoE power source, verify that the power cord is properly connected, and that the configuration environment meets the safety requirements.
- Before performing debugging over a serial port connection, verify that both the PC and the PoE switch are properly grounded.

4.2 Powering on the AP

4.2.1 Checklist Before Power-on

- Verify that the access point has adequate earth ground.
- Verify that the power cord is properly connected.
- Verify that the input voltage meets with the requirement of the access point.

4.2.2 Checklist After Power-on

- Verify that there is system log printed on the terminal interface.
- Verify the LED status.

5 Monitoring and Maintenance

5.1 Monitoring

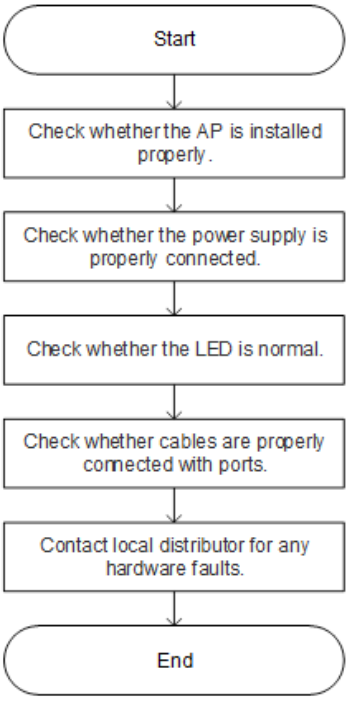
When RG-RAP52-OD is operating, you can monitor its status by observing the LEDs.

5.2 Maintenance

If the hardware is faulty, please contact Ruijie technical support for assistance.

6 Troubleshooting

6.1 General Troubleshooting Flowchart



6.2 Common Faults

- The status LED is off after the AP is powered on.
  - If the AP is powered by PoE, verify that the PSE is compliant with the IEEE 802.3af or 802.3at standard, and that the Ethernet cable is properly connected.
  - If the AP is powered by a DC adapter, verify that the adapter has mains input and works properly and the adapter supports 24 V DC output.
- The Ethernet port or the optical port does not work after the Ethernet cable or the optical cable is plugged in.
  - Check whether the peer device is working properly. Then verify that the cable is capable of providing the required data rate and is properly connected.
- The client cannot find the AP.
  - Verify that the AP is properly powered.
  - Verify that the Ethernet port or the optical port is correctly connected.
  - Verify that the AP is correctly configured.
  - Move the client device to adjust the distance between the client and the AP.

7 Appendixes

7.1 Connectors and Media

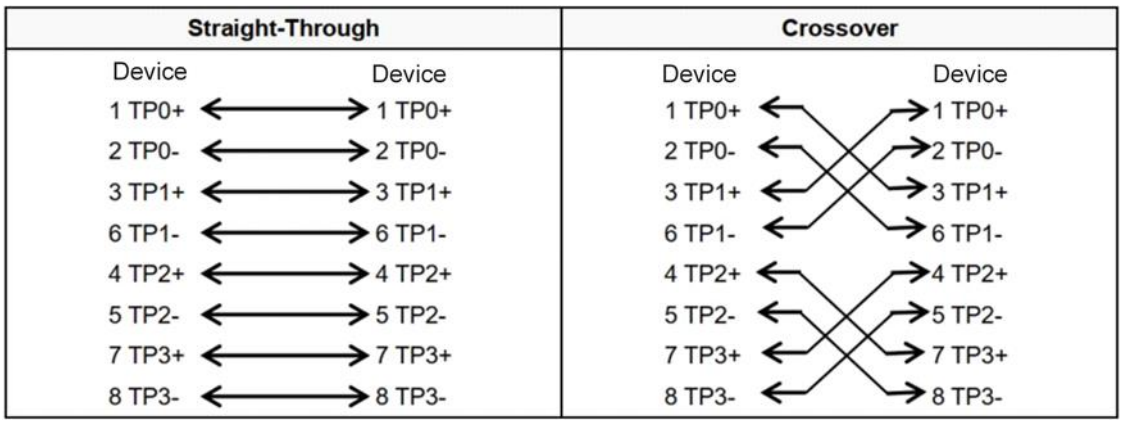
1000BASE-T/100BASE-TX/10BASE-T Port

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

Compliant with IEEE 802.3ab, 1000BASE-T requires Category 5e 100-ohm UTP or STP (recommended) with a maximum distance of 100 meters (328 feet).

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



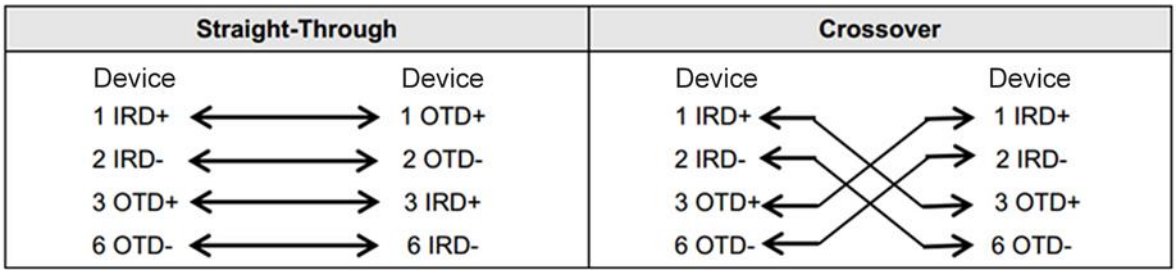
100BASE-TX/10BASE-T can be interconnected using cables of the preceding specifications. For 10 Mbps, the 100BASE-TX/10BASE-T port can be connected using 100-ohm Category 3, Category 4, and Category 5 cables; for 100 Mbps, the 100BASE-TX/10BASE-T port can be connected using 100-ohm Category 5 cables with a maximum distance of 100 meters (328 ft.). The following table shows 100BASE-TX/10BASE-T pin assignments.

Table 7-1 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

The following figure shows feasible connections of the straight-through and crossover twisted pairs for a 100BASE-TX/10BASE-T port.

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



7.2 Cabling Recommendations

During installation, route cable bundles upward or downward along the sides of the rack depending on the actual situation in the equipment room. All cable connectors used for transit should be placed at the bottom of the cabinet rather than be exposed outside of the cabinet. 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.

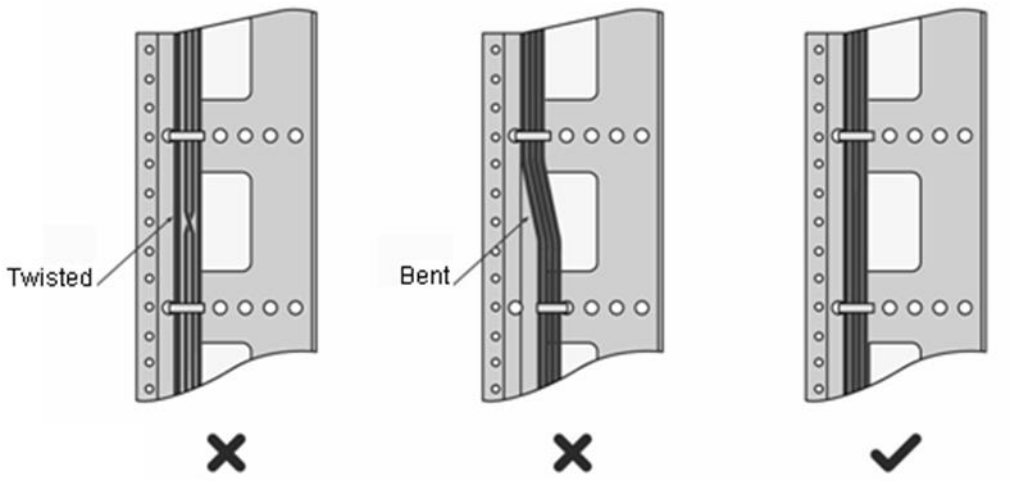
7.2.1 Requirements for Cable Bend Radius

- 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 an 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.

7.2.2 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 rack without twisting or bending.

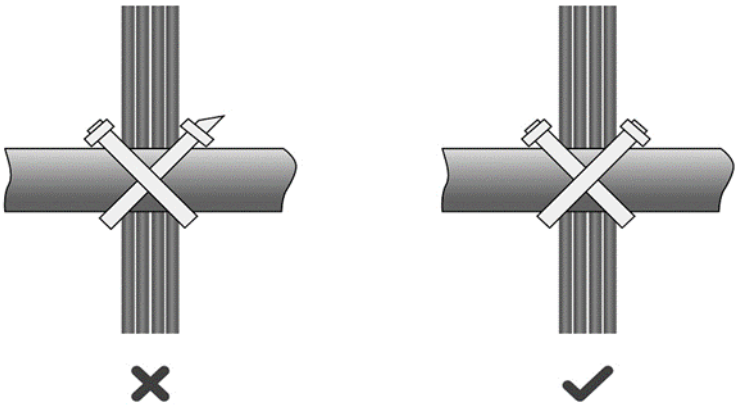
Figure 7-3 Bundling up Cables (1)



- Cables of different types (such as power cords, signal cables, and grounding cables) should be separated in cabling and bundling. Mixed bundling is disallowed. When they are close to each other, you are advised 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.

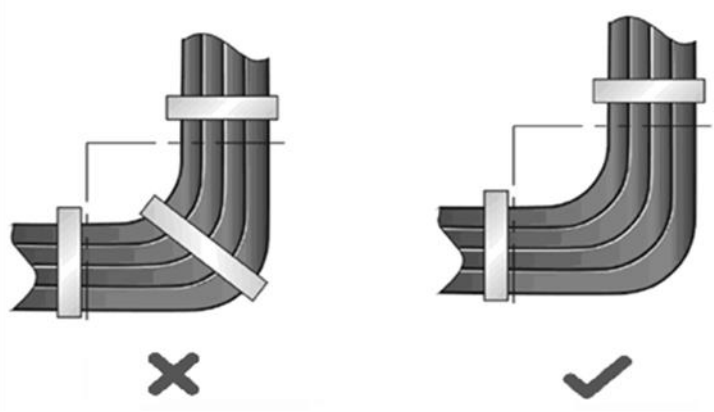
- The metal hole traversed by cables should have a smooth and fully rounding surface or an insulated lining.
- Use cable ties to bundle up cables properly. Please do not connect two or more cable ties to bundle up cables.
- After bundling up cables with cable ties, cut off the remaining part. The cut should be smooth and trim, without sharp corners.

Figure 7-4 Bundling up Cables (2)



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

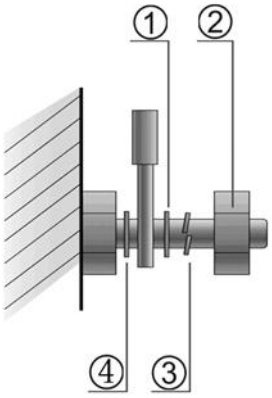
Figure 7-5 Bundling up Cables (3)



- Cables not to be assembled or remaining parts of cables should be folded and placed in a proper position of the rack or cable trough. The proper position refers to a position that does not affect device running or damage the device 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 grounding cables 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 anchor or screw must be tightly fastened, as shown in Figure 7-6.

Figure 7-6 Cable Fastening



1.	Flat Washer	3.	Spring Washer
2.	Nut	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.
- Binding by using buckles should be performed according to Table 7-2.

Table 7-2 Cable Bunch

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 air switches) of the cold pressing terminal type, the metal part of the cord end terminal should not be exposed outside the terminal block when assembled.