Ruijie Reyee RG-RAP62 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

- Official Website of Ruijie Reyee: https://reyee.ruijie.com
- Technical Support Website: https://reyee.ruijie.com/en-global/support
- Case Portal: https://www.ruijienetworks.com/support/caseportal
- Community: https://community.ruijienetworks.com
- Technical Support Email: service_rj@ruijienetworks.com
- Online Robot/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 Overview

1.1 About the RG-RAP62

The RG-RAP62 is a cost-effective Wi-Fi 6 dual-band ceiling access point (AP) launched by Ruijie Reyee for indoor Wi-Fi coverage scenarios. It supports IEEE 802.3af and IEEE 802.3at standards as well as local 12 V DC power supply. Compliant with IEEE 802.11a/b/g/n/ac Wave 1/Wave 2/ax Wi-Fi standards, the RG-RAP62 features dual-stream MU-MIMO technology and built-in omni-directional antennas. It operates in both 2.4 GHz and 5 GHz bands, providing data rates of 573 Mbps in the 2.4 GHz band and 1201 Mbps in the 5 GHz band, with a combined data rate of up to 1774 Mbps. With a coverage capability of over 40 meters (131.23 ft.), the RG-RAP62 is ideal for a range of wireless applications, especially in offices, businesses, villas, hotels, and small- and medium-sized government services.

1.2 Package Contents

Table 1-1 Package Contents

No.	Item	Quantity
1	RG-RAP62 access point	1
2	Mounting bracket	1
3	Phillips pan head screws (M4 x 20 mm)	4
4	Wall anchors	4
5	User Manual	1
6	Key to securing latch	1
7	Mounting template	1
8	Warranty Card	1

Note

The package contents are subject to the purchase contract, and actual delivery may vary. Please check the items carefully against the package contents or purchase contract. If you have any questions, please contact the distributor.

1.3 Product Appearance

Figure 1-1 Product Appearance

1.3.2 Front Panel

Figure 1-2 Front Panel

Table 1-2 LEDs

No.	Item	Status	Description
1	System	Solid blue	The AP is operating normally without any alarms.

No.	Item	Status	Description
	status LED	Off	The AP is not receiving power.
		Fast blinking blue (eight blinks per second)	The AP is starting up.
		Slow blinking blue (one blink per 2 seconds)	The AP is not connected to the Internet.
		Two blue flashes	Possible cases are as follows: ● The AP is resetting. ● The AP is upgrading. ● The AP is recovering. **Caution** Do not power off the AP when its LED is in this state.
		Blinking blue (three quick flashes followed by one slow flash)	Other faults have occurred.

1.3.3 Rear Panel

Figure 1-3 Rear Panel

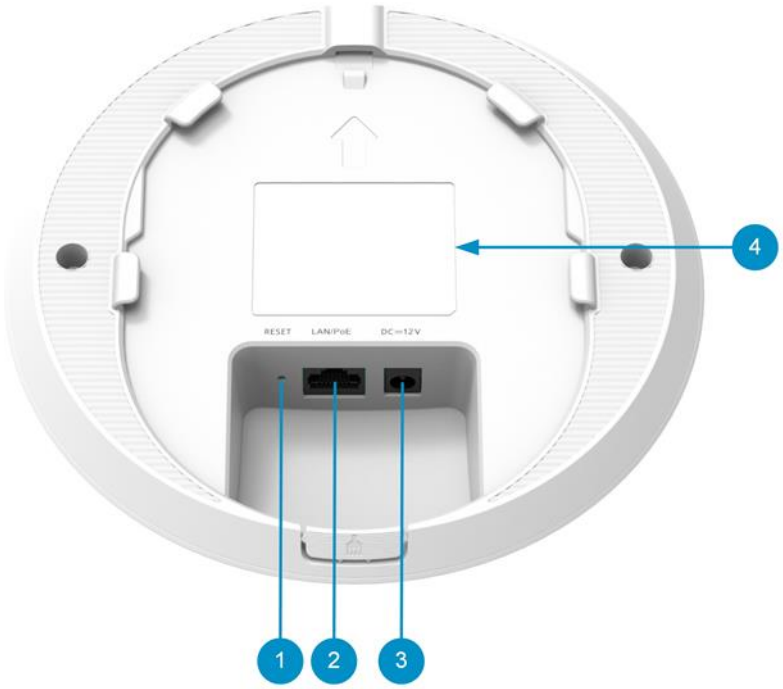


Table 1-3 Components on the Rear Panel

No.	Item	Description
1	RESET button	Press and hold for less than 2 seconds: Restart the AP.
		Press and hold for more than 5 seconds: Restore the AP to factory settings.
2	LAN/PoE port	1 x 10/100/1000BASE-T Ethernet port, supporting PoE input
3	DC⎓12 V connector	Connects to a DC power adapter for power supply. The DC power voltage is 12 V and the current is 1.5 A.
4	Label	The label is located at the bottom.

1.4 Technical Specifications

Table 1-4 Specification

RF Design	2.4 GHz and 5 GHz dual-band dual-stream
Transmission Standards	IEEE 802.11ax, IEEE 802.11ac Wave 2/Wave 1, and IEEE 802.11a/b/g/n
Operating Frequency Bands	IEEE 802.11b/g/n/ax: 2.4 GHz to 2.4835 GHz IEEE 802.11a/n/ac/ax: 5.150 GHz to 5.350 GHz, 5.470 GHz to 5.725 GHz,, 5.725 GHz to 5.850GHz **Caution** Country-specific restrictions apply.
Antenna	2.4 GHz, two built-in omni-directional antennas (Antenna gain: 3.13 dBi) 5 GHz, three built-in omni-directional antennas (Antenna gain: 4.58 dBi)
Number of Spatial Streams	2.4 GHz, two spatial streams, 2x2 MIMO 5 GHz, two spatial streams, 2x2 MIMO
Data Rate	2.4 GHz: 573 Mbps 5 GHz: 1201 Mbps Combined: 1774 Mbps
Modulation	OFDM: BPSK @ 6/9 Mbps, QPSK @ 12/18 Mbps, 16QAM @ 24 Mbps, and 64QAM @ 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, and 1024-QAM OFDMA
Receiver 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) 11ax: 20 MHz: –85 dBm (MCS0), –58 dBm (MCS11) 11ax: 40 MHz: –82 dBm (MCS0), –54 dBm (MCS11) 11ax: 80 MHz: –79 dBm (MCS0), –52 dBm (MCS11)
Max. Transmit Power	Frequency bands and the maximum Effective Isotropic Radiated Power (EIRP): **Note** The actual transmit power may vary in different countries and regions according to the rules and regulations. ● European Union & United Kingdom o 2400–2483.5 MHz, EIRP ≤ 20 dBm o 5150–5350 MHz, EIRP ≤ 23 dBm o 5470–5725 MHz, EIRP ≤ 30 dBm ● Myanmar: o 2400–2483.5 MHz, EIRP ≤ 23 dBm o 5725–5825 MHz, EIRP ≤ 30 dBm ● Thailand: o 2400–2483.5 MHz, EIRP ≤ 20 dBm o 5150–5350 MHz, EIRP ≤ 23 dBm o 5470–5725 MHz, EIRP ≤ 30 dBm o 5725–5825 MHz, EIRP ≤ 30 dBm ● Indonesia: o 2400–2483.5 MHz, EIRP ≤ 27 dBm o 5150–5350 MHz, EIRP ≤ 23 dBm o 5725–5825 MHz, EIRP ≤ 23 dBm ● Egypt: o 2400–2483.5 MHz, EIRP ≤ 20 dBm o 5150–5350 MHz, EIRP ≤ 23 dBm
Power Step	1 dBm
Dimensions (Ø x H)	175 mm x 39 mm (6.89 in. x 1.54 in., excluding the mounting bracket)
Weight	Weight of the access point: ≤ 0.4 kg (0.88 lbs.) Weight of the mounting bracket: ≤ 0.06 kg (0.13 lbs.)
Service Ports	1 x 10/100/1000BASE-T Ethernet port, supporting PoE input
Management Port	N/A

Status LED	1 x system status LED
Power Supply	● DC power supply using a power adapter (input voltage and current: 12 V/1.5 A) **Caution** The power adapter is optional. DC connector dimensions: inner diameter: 2.1 mm (0.08 in.); outer diameter: 5.5 mm (0.22 in.); length: 10 mm (0.39 in.). ● PoE: Compliant with the IEEE 802.3af (PoE) or IEEE 802.3at (PoE+) standards. ● PoE injector: Compliant with the IEEE 802.3af (PoE) or IEEE 802.3at (PoE+) standards.
Power Consumption	≤ 12.95 W
Environmental	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: 5% to 95% RH (non-condensing)
	Storage humidity: 5% to 95% RH (non-condensing)
Mounting	Ceiling mount using screws
Certification	CE, RoHS
Mean Time Between Failures (MTBF)	> 400,000 hours

1.5 Power Supply Technical Specifications

The RG-RAP62 supports DC and PoE power supply.

- When the AP is powered by a DC power adapter, the power adapter should have a voltage of 12 V and a current of 1.5 A or higher. If you require a DC power adapter, it can be purchased separately from us. Dimensions of the DC power connector (outer diameter x inner diameter x length): 5.5 mm x 2.1 mm x 10 mm (0.22 in. x 0.08 in. x 0.39 in.).
- When the AP is powered by standard PoE, connect one end of the Ethernet cable to the LAN/PoE port on the AP, and the other end to a PoE-capable switch port or PSE. Ensure that the PoE-capable switch port or PSE is IEEE 802.3af-compliant or IEEE 802.3at-compliant.
- When the AP is powered by a PoE injector, ensure that the PoE injector complies with the IEEE 802.3af or IEEE 802.3at standards.

Caution

- The DC input power of the DC power adapter must be greater than the actual power consumption of the AP.
- When the AP is powered by a DC power adapter, you are advised to use the power adapter that comes with the Ruijie device.
- Ruijie-certified PoE adapters are recommended.

1.6 Cooling

The AP adopts a fanless design.

Caution

Ensure that there is sufficient space around the AP for heat dissipation.

2 Preparing for Installation

2.1 Safety Guidelines

Note

- To avoid personal injury or equipment damage, review the safety guidelines in this chapter before you begin the installation.
- The following safety guidelines may not include all the potentially hazardous situations.

2.1.1 General Safety Guidelines

- Do not expose the equipment to high temperature, dusts, or harmful gases. Do not install the equipment in an inflammable or explosive environment. Keep the equipment away from EMI sources such as large radar stations, radio stations, and substations. Do not subject the equipment to unstable voltage, vibration, and noises.
- The installation site should be dry. Do not install the equipment in a place near the sea. Keep the equipment at least 500 meters away from the ocean and do not face it towards the sea breeze.
- The installation site should be free from water flooding, seepage, dripping, or condensation. The installation site should be selected according to network planning, communications equipment features, and considerations such as climate, hydrology, geology, earthquake, electrical power, and transportation.

Caution

Always install and remove the equipment according to the installation procedures outlined in this document.

2.1.2 Chassis-Lifting Guidelines

- After the equipment is installed, avoid handling it frequently.
- Cut off all power supplies and unplug all power cords before moving or handling the equipment.

2.1.3 Electrical Safety Guidelines

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 regulations and specifications 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 ground is wet.
- Find out the position of the indoor emergency power switch before installation. Cut off the power switch in case of accidents.

- Make sure that the equipment is powered off when you cut off the power supply.
- Do not place the equipment in a damp/wet location. Do not let any liquid enter the chassis.
- Keep the equipment far away from grounding or lightning protection devices for power equipment.
- Keep the equipment away from radio stations, radar stations, high-frequency high-current devices, and microwave ovens.

2.2 Site Requirements

Install the equipment indoors to ensure its normal operation and prolonged service life. The installation site must meet the following requirements.

2.2.1 Bearing Requirements

Ensure that the installation position is sturdy enough to support the weight of the RG-RAP62 and its accessories.

2.2.2 Space Requirements

- The equipment should be installed in an open environment if possible. If the environment is enclosed, confirm that a good ventilation and heat dissipation system is available.
- Ensure that the installation location is suitable for the RG-RAP62, leaving sufficient space on the front, back, left, and right sides for heat dissipation.

2.2.3 Ventilation Requirements

The RG-RAP62 dissipates heat naturally. Therefore, certain space needs to be reserved around the equipment for heat dissipation.

2.2.4 Temperature/Humidity Requirements

To ensure that the RG-RAP62 works properly and has a long service life, maintain a proper temperature and humidity in the operating environment. The operating environment with too high or too low temperature and humidity for a long period of time may damage the equipment.

- In an environment with high relative humidity, the insulating material may have poor insulation or even leak electricity. Sometimes high humidity may causes changes in the mechanical properties and causes rusting of metal parts.
- In an environment with low relative humidity, static electricity is prone to occur and damage the internal circuits of the equipment.
- Too high temperatures can accelerate the aging of insulation materials, greatly reducing the reliability of the equipment and severely affecting its service life.

The following table lists the temperature and humidity requirements.

Table 2-1 Temperature/Humidity Requirements

Operating Temperature	Operating Humidity
0°C to 40°C (32°F to 104°F)	5% to 95% RH (non-condensing)

2.2.5 Cleanliness Requirements

Dust poses a major threat to the equipment. The indoor dust takes on a positive or negative static electric charge when falling on the switch, 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 equipment, but also causing communication faults. The following table describes the requirements for the dust content and granularity in the machine room.

Table 2-2 Requirements for Dust

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

Apart from dust, the salt, acid, and sulfide in the air in the machine room must meet strict requirements. These harmful substances will accelerate metal corrosion and component aging. Therefore, the machine 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)	0.2	1.5
Hydrogen sulfide (H_2S)	0.006	0.03
Nitrogen dioxide (NO_2)	0.04	0.15
Ammonia gas (NH_3)	0.05	0.15
Chlorine gas (Cl_2)	0.01	0.3

Note

Average refers to the average value of harmful gases measured in one week. Maximum refers to the upper limit of harmful gases measured in one week, and the maximum value cannot last for more than 30 minutes every day.

2.2.6 Prevention of Electrostatic Discharge Damage

This equipment is engineered with stringent anti-static measures during circuit design. However, excessive static electricity can still potentially damage the printed circuit board. Static electricity in the communication network connected to the equipment primarily comes from two sources:

- Outdoor high-voltage power lines, lightning, and other external electric fields; and
- Internal systems such as flooring materials and the internal structure of the equipment

To prevent damage from static electricity, pay attention to the following:

- Keep the indoor installation environment clean and free of dust; and
- Maintain appropriate temperature and humidity conditions.

2.2.7 EMI Requirements

- Keep the equipment far away from grounding or lightning protection devices for power equipment.
- Keep the equipment away from radio stations, radar stations, high-frequency high-current devices, and microwave ovens.

2.3 Tools

Common Tools	Phillips screwdriver, cables, fastening bolts, diagonal plier, cable ties
Special Tools	Anti-ESD gloves, wire stripper, crimper, RJ45 crimping plier, wire cutter, and waterproof tape
Meters	Multimeter and bit error rate tester (BERT)

Note

The equipment is delivered without a toolkit. Prepare the preceding tools by yourself.

3 Installing the AP

The AP is required to be fixed indoors.

Caution

Before installing the equipment, ensure that guidelines and requirements in Chapter 2 have been met.

3.1 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.

3.2 Safety Precautions During Installation

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

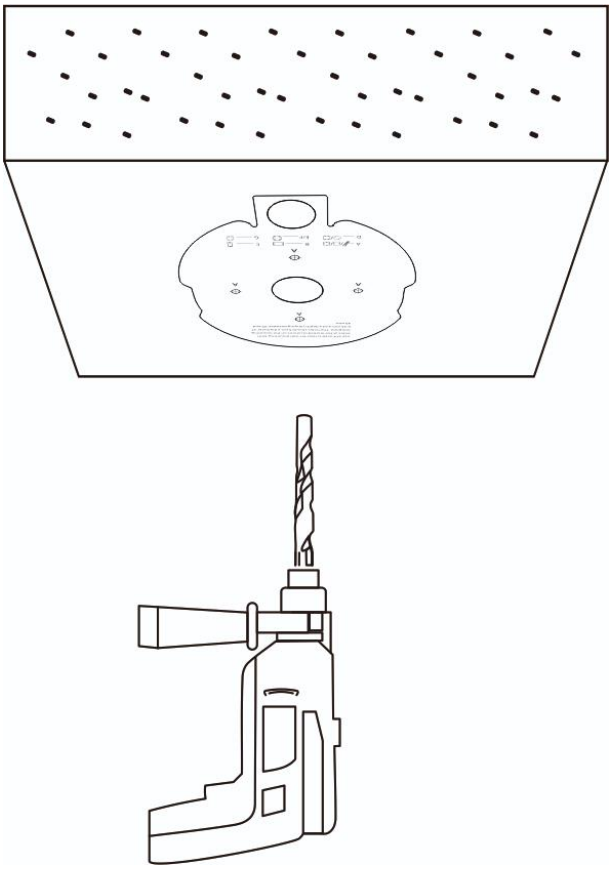
- Do not power on the AP during installation.
- Place the AP in a well-ventilated environment.
- Do not subject the AP to high temperatures.
- Keep the AP away from high-voltage power cables.
- Install the AP indoors.
- Do not expose the AP in a thunderstorm or strong electric field.
- Keep the AP clean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

3.3 Installing the AP

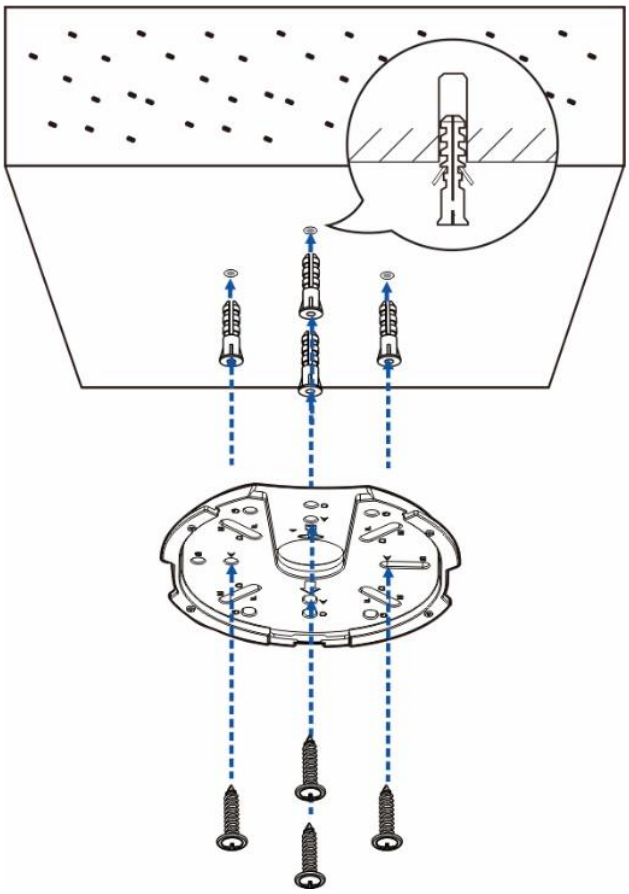
Note

- For indoor environments, ceiling mounting is preferred because it offers a broader coverage area than wall mounting.
- This installation guide is for reference only. The actual installation procedure may differ depending on the specific physical product.

(1) Drill holes in the ceiling or wall using the mounting template.



(2) Secure the mounting bracket to the ceiling or wall using wall anchors and Phillips pan head screws (M4 x 20 mm).

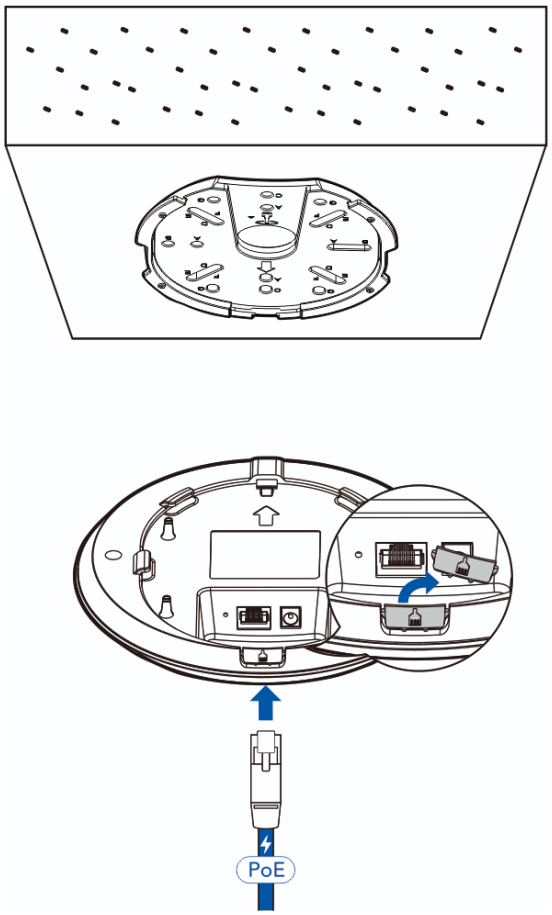


Caution

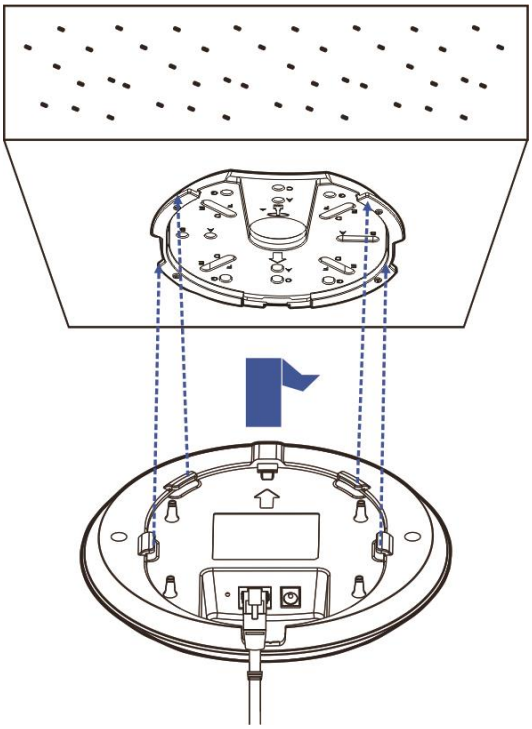
The plane deviation of the wall in a specific area should be within 2 mm (0.08 in.), and the recommended torque for installation is 4kgf.cm. In case of uneven installation site, mount the AP on a protruding wall.

(3) Connect cables according to the actual topology. The following describes how to connect cables on the AP side.

- Ethernet cable: Connect one end of the Ethernet cable to the LAN/PoE port (supporting PoE input) on the rear of the AP.
- DC power cord: When DC power supply is used, connect one end of the power cord to the 12 V DC power connector on the rear of the AP.



(4) Align the slots on the rear of the AP with the square feet on the mounting bracket, and slide the AP into the mounting bracket slowly to ensure that the AP is secured.

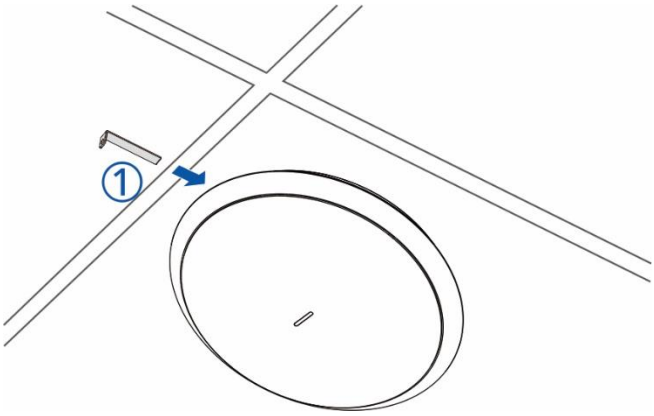


Caution

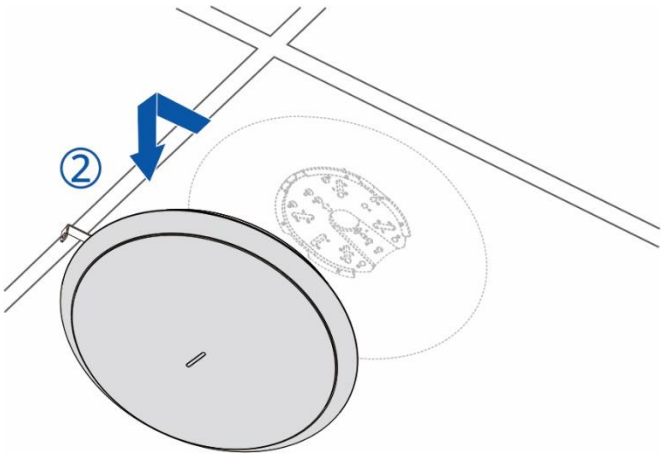
- Before securing the AP to the mounting bracket, connect the cables first.
- The slots on the rear of the AP must be aligned with and slid into the square feet on the mounting bracket. Do not press the slots into the square feet by force.
- After the installation is complete, check whether the AP is secured.

3.4 Removing the AP

(1) Insert the key to security latch into the reserved slot.



(2) Slide down the AP as indicated by the arrow.



3.5 Connecting Cables

Connect twisted pairs with the LAN/PoE port on the AP. See 7.1 Connectors and Media for supported wiring of twisted pairs.

Caution

- Avoid a small bend radius at the connector.
- You are advised not to use Ethernet cables with protective caps for the RG-RAP62, as they complicate the assembly of the Ethernet cables.

3.6 Bundling Cables

Precautions

- Bundle the cable in a visually pleasing way.
- Bend twisted pairs naturally or to a large radius close to the connector.
- Do not over-tighten the twisted pair bundle as it may reduce the cable life and performance.

Bundling Steps

(1) Bundle the hanging part of the twisted pairs using cable ties and lead them to the LAN/PoE port of the AP by convenience.

(2) Fasten the twisted pair cables to the cable trough of the mounting bracket.

(3) Extend the twisted pair cables under the AP and route them in a straight line.

3.7 Verifying the Installation

- Verify that the AP is securely fastened.
- Verify that the twisted pair cable matches the port type.
- Verify that the cables are properly bundled.
- Verify that the PSE is IEEE 802.3af-compliant or IEEE 802.3at-compliant.

4 Commissioning

4.1 Setting Up the Configuration Environment

After powering on the AP through a DC power adapter or a PSE, ensure that the power cord is properly connected and meets safety requirements.

4.2 Powering on the AP

4.2.1 Checklist Before Power-On

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

4.2.2 Checklist After Power-on

- Verify the LED status.
- After the AP is powered on, verify that the SSID can be searched by a mobile phone or other wireless devices.

4.3 Troubleshooting Power Supply Failures

You can determine whether there is a power system failure by checking the LED status on the front panel of the RG-RAP62. For the LED status description, see Table 1-2 LEDs. Perform the following checks in the case of any abnormality:

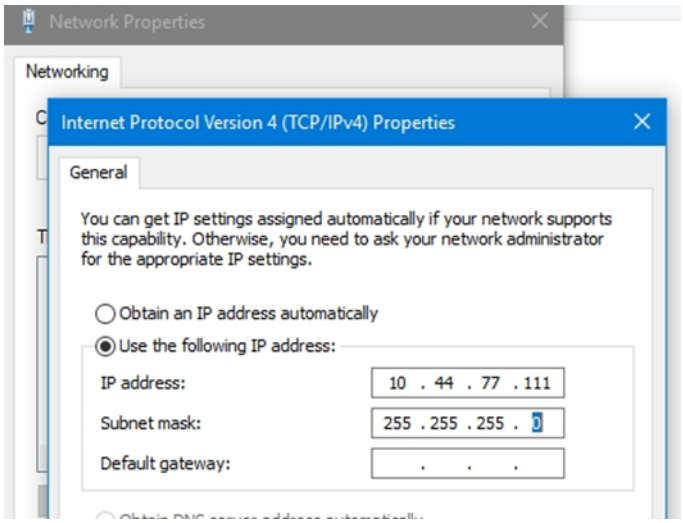
- Verify that the AP is properly powered.
- Verify that the Ethernet port is correctly connected.

Note

If the AP cannot be powered on after all the preceding items are verified, contact your local distributor or technical support.

4.4 Logging In to the Web GUI

(1) Power on the PC and configure the local connection attribute on the PC. Set the IP address of the PC to 10.44.77.XXX (1 to 255, excluding 254).



(2) Open a browser on the PC and enter 10.44.77.254 to log in to the web interface. The default password is admin for the first login. For security purposes, change the default password after login.

5 Monitoring and Maintenance

5.1 Monitoring

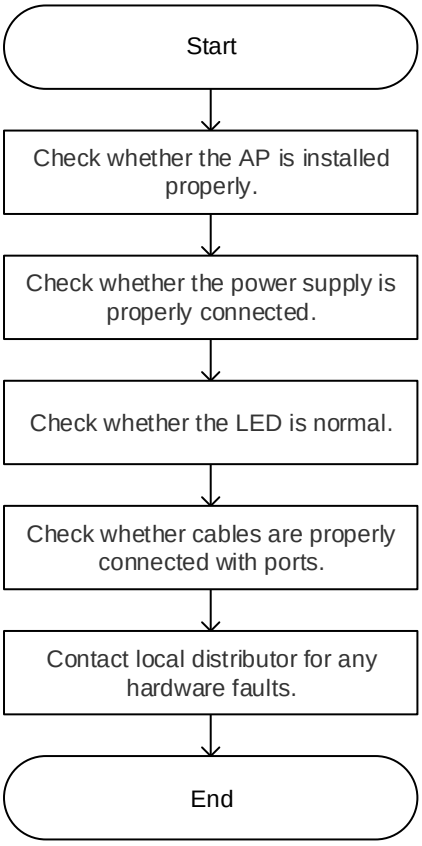
When the RG-RAP62 is operating, you can monitor the device running status by observing the LED. For LED status description, see Table 1-2 LEDs.

5.2 Hardware Maintenance

If the hardware is faulty, contact your local distributor.

6 Common Troubleshooting

6.1 Troubleshooting Flowchart



6.2 Common Faults

6.2.1 Why Is the LED Off After the AP Is Powered On?

- If you use a PoE power supply, verify that the PSE is IEEE 802.11at-compliant, and then verify that the cable is connected properly.
- If you use a power adapter, verify that the power adapter is connected with an active power outlet, and then verify that the power adapter works properly.

6.2.2 Ethernet Port Is Not Working After the Ethernet Cable Is Plugged In

Verify that the device at the other end of the Ethernet cable is working properly, and then verify that the Ethernet cable is capable of providing the required data rate and is properly connected.

6.2.3 A Client Cannot Discover the AP

(1) Verify that the AP is properly powered.

(2) Verify that the Ethernet port is correctly connected.

(3) Verify that the AP is correctly configured.

(4) Move the client closer to the AP.

7 Appendix

7.1 Connectors and Media

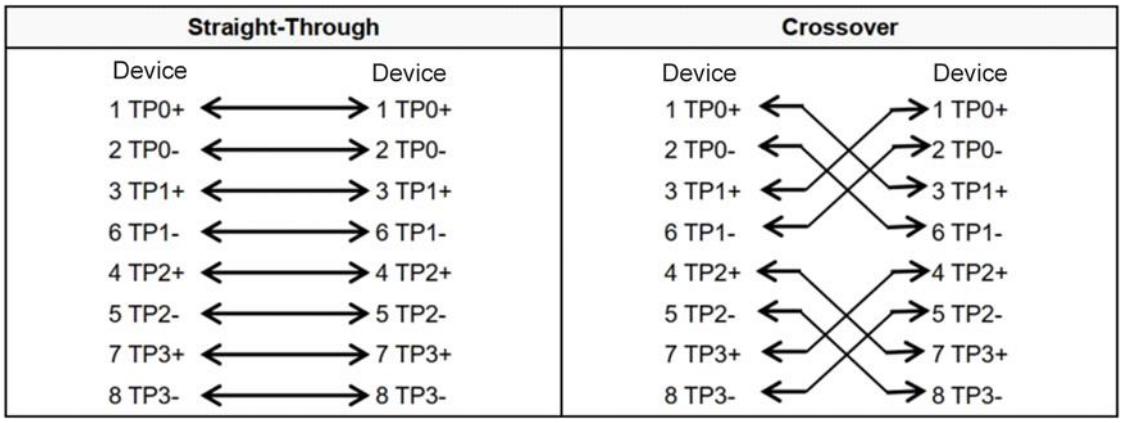
7.1.1 10/100/1000BASE-T Port

A 10/100/1000BASE-T port supports three rates with auto-negotiation, and supports the automatic MDI/MDIX crossover function at these three rates.

Compliant with IEEE 802.3ab, the 1000BASE-T port requires Cat5/5e or higher 100-ohm unshielded twisted pair (UTP) or shielded twisted pair (STP) cables with a maximum distance of 100 m (328.08 ft.).

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

Figure 7-1 1000BASE-T Twisted Pair Connections



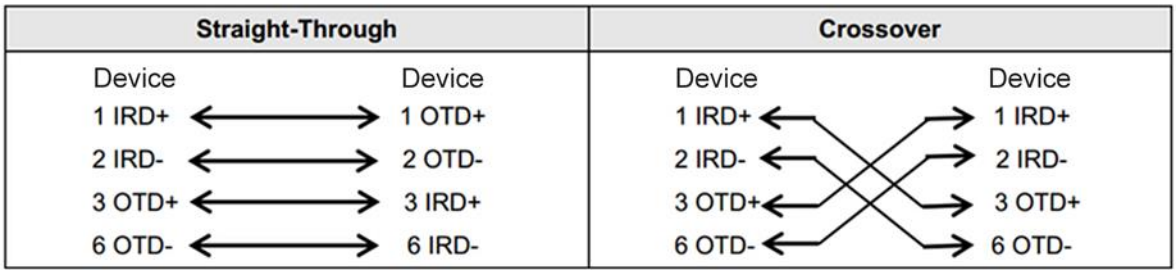
In addition to cables with the above-mentioned specifications, the 10BASE-T/100BASE-TX port can be connected using 100-ohm Cat3, Cat4, and Cat5 cables at 10 Mbps data speed or using 100-ohm Cat5 cables at 100 Mbps data speed with a maximum distance of 100 m (328.08 ft.). The following table shows 10BASE-T/100BASE-TX pin assignments.

Table 7-1 10BASE-T/100BASE-TX 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 10BASE-T/100BASE-TX port.

Figure 7-2 10BASE-T/100BASE-TX 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 adapted connectors should be placed at the bottom of the rack in an orderly manner, and cannot be exposed outside the rack. Power cords are routed upward or downward beside the rack close to the location of the DC power distribution box, AC socket, or surge protection box in the equipment room.

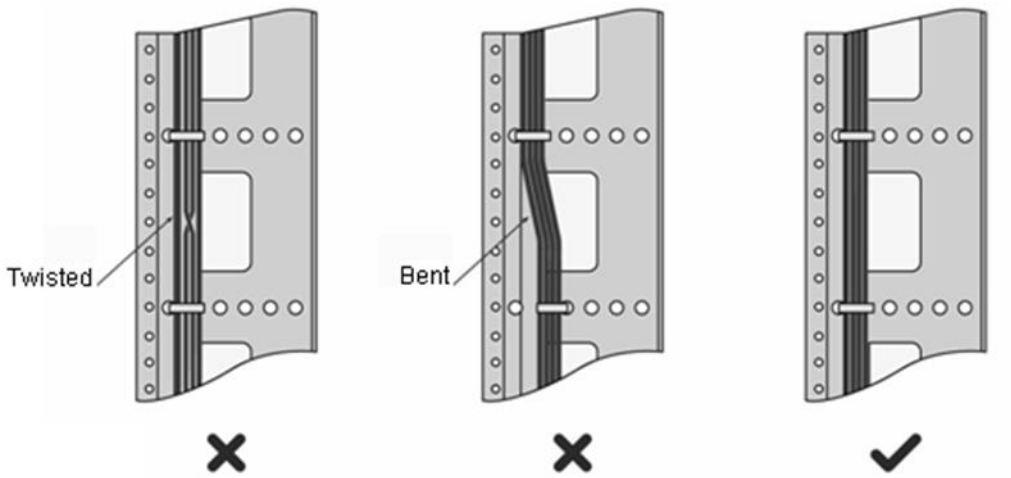
7.2.1 Requirements for the Minimum Bend Radius of Ethernet Cables

- The bend radius of a fixed power cord, Ethernet 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 these cables that are often bent or plugged should be over 10 times greater than their respective diameters.
- The minimum bend radius of a high-speed cable, such as an SFP+ cable, should be over five times greater than its diameter. The bend radius of these cables that are often bent or plugged should be over 10 times greater than their respective diameters.

7.2.2 Precautions for Cable Bundling

- Before cables are bound, mark labels and stick them to cables wherever appropriate.
- Cables should be neatly and properly bound in the cabinet without twisting or bending, as shown in Figure 7-3.

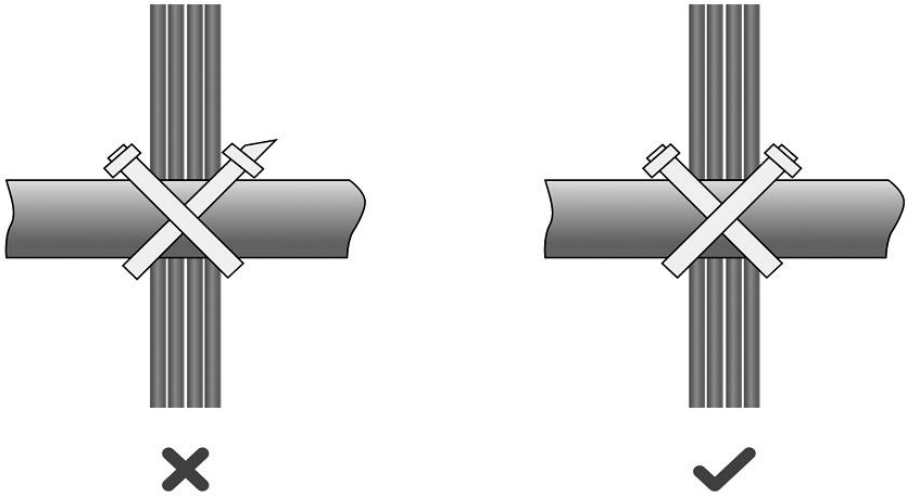
Figure 7-3 Bundling Cables



- Route and bundle power, signal, ground cables separately. Mixed bundling is not allowed. When the cables are close to each other, crossover cabling is recommended. In the case of parallel cabling, maintain a minimum distance of 30 mm (1.18 in.) between power cords and signal cables.
- The cable management brackets and cabling troughs inside and outside the rack should be smooth without sharp corners.

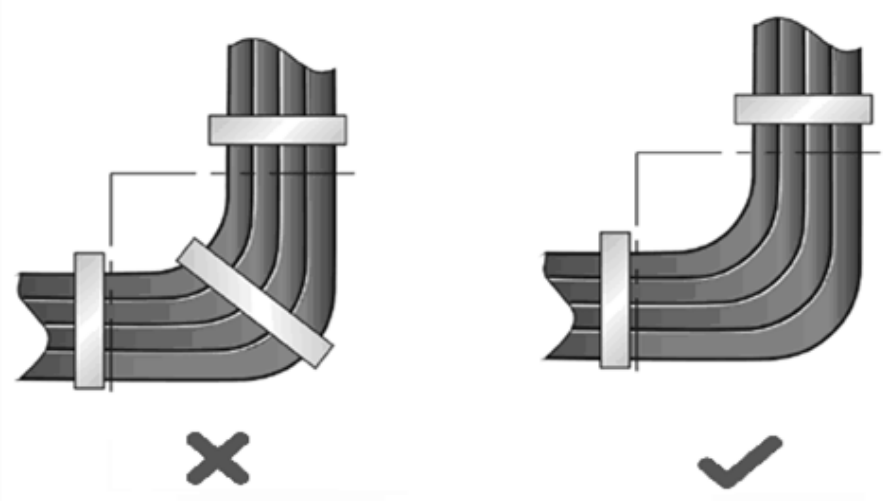
- The metal holes traversed by cables should have a smooth and fully rounded surface or an insulated lining.
- Use cable ties to bundle up cables properly. Do not connect two or more cable ties to bundle up cables.
- After bundling up cables with cable ties, cut off the remaining part. The cut should be smooth and trim without sharp corners, as shown in Figure 7-4.

Figure 7-4 Cutting off an Excess Cable Tie



- When cables need to be bent, bind them first, but do not tie cable ties within the bend. Otherwise, stress may be generated on the cables and causes the wires inside to break, as shown in Figure 7-5.

Figure 7-5 Binding Cables

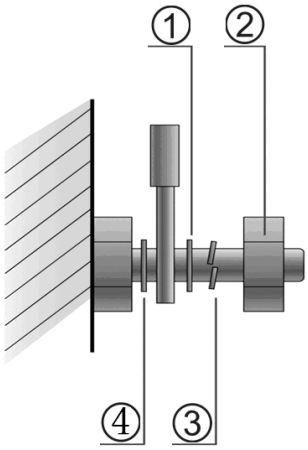


- Cables not to be assembled or the remaining parts of cables should be folded and placed in a proper position of the rack or cable trough. The proper position refers to a position that does not affect the device running or damage the equipment or cables.
- Do not bind power cords to the guide rails of moving parts.
- The power cords connecting moving parts such as door grounding cables should be reserved with some excess after being assembled. This can avoid tension or stress on power cords. After the moving part arrives

at the position of the power cords, the remaining cable part should not touch heat sources, sharp corners, or sharp edges. If heat sources cannot be avoided, high-temperature cables should be used.

- When using screw threads to secure a cable lug, ensure that the bolt or screw is properly tightened and take measures to prevent it from loosening, as shown in Figure 7-6.

Figure 7-6 Fastening Cable Lugs



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.

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 cord end terminal type, the metal part of the cord end terminal should not be exposed outside the terminal block when assembled.