Ruijie RG-RAP72-Wall Access Point

Installation Guide

Document Version: V1.0
Date: July 26, 2024

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Preface

Intended Audience

This document is intended for:

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

Technical Support

- Ruijie Networks website: https://www.ruijienetworks.com/
- Online support center: https://ruijienetworks.com/support
- Case portal: https://caseportal.ruijienetworks.com
- Community: https://community.ruijienetworks.com
- Email support: service_rj@ruijienetworks.com
- Live chat: https://www.ruijienetworks.com/rita
- Documentation feedback: doc@ruijie.com.cn

Conventions

1. Signs

The signs used in this document are described as follows:

Danger

An alert that contains important safety instructions. Before you work on any equipment, be aware of the hazards involved and be familiar with standard practices in case of accidents.

Warning

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

Caution

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

Note

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

Specification

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

2. Note

The manual provides configuration information, including models, port types, and command line interfaces, for reference purposes only. In the event of any discrepancy or inconsistency between the manual and the actual version, the actual version shall take precedence.

Contents

1 Overview

1.1 About the RG-RAP72-Wall

The RG-RAP72-Wall is a Gigabit dual-band wall-plate access point (AP) designed for small- or medium-sized indoor scenarios covering hotels, apartments, villas, residential buildings, and small offices.

Compliant with IEEE 802.11be, IEEE 802.11ax, IEEE 802.11ac Wave 1/Wave 2, IEEE 802.11a/b/g/n protocols, this AP can operate at 2.4 GHz and 5 GHz frequency bands simultaneously. It supports the MIMO dual-stream technology and provides an access rate of 688 Mbps at 2.4 GHz and 2882 Mbps at 5 GHz, achieving a maximum wireless data rate of 3570 Mbps. It also provides four 1 Gigabit Ethernet ports for wired connection, catering to the indoor wired and wireless dual-gigabit deployment requirements.

The RG-RAP72-Wall can be mounted in junction boxes of various standards: Chinese standard (86 mm x 86 mm), European standard (86 mm x 86 mm), South African standard (114 mm x 114 mm), and US standard (108 mm x 59 mm), making it highly versatile for different installation environments.

1.2 Package Contents

Table 1-1 Package Contents

No.	Item	Quantity
1	RG-RAP72-Wall access point (with a decorative cover)	1
2	User Manual	1
3	Warranty Card	1
4	Mounting bracket	1
5	T-key to security lock	1
6	M4 x 25 mm Phillips pan head screws	4

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 your distributor.

1.3 Product Appearance

1.3.1 Appearance

Figure 1-2 Appearance

1.3.2 Front Panel

Figure 1-3 Front Panel

Table 1-2 Components on the Front Panel

No.	Component	Description
2	Reset button	Press and hold for less than 2 seconds: Restart the access point. Press and hold for more than 5 seconds: Restore the access point to factory settings.
3	LAN1 to LAN3 ports	3 x 10/100/1000BASE-T Ethernet ports for connecting wired devices.
4	LAN4 port	10/100/1000BASE-T Ethernet port for connecting to a wired device, supporting PoE output.

Table 1-3 LEDs

No.	Status	Description
1	Off	The access point is not receiving power.
	Slow blinking white (blink once every 2 seconds)	The access point is operating, but an alarm occurs.
	Fast blinking white (blink twice per second)	Possible cases: The access point is resetting. The access point is upgrading. The access point is recovering. The access point is starting up.
	Solid white	The access point is operating normally without alarms.

1.3.3 Rear Panel

Figure 1-4 Rear Panel

Table 1-4 Components on the Rear Panel

No.	Component	Description
1	WAN/PoE port	10/100/1000/2500BASE-T Ethernet port, supporting PoE input and connected to a modem or Ethernet wall outlet.
2	Label	Located on the rear panel of the access point.

1.4 Technical Specifications

Table 1-5 Technical Specifications

Radio Design	Dual-band, dual-stream
Wi-Fi Standards	IEEE 802.11be, IEEE 802.11ax, IEEE 802.11ac Wave 1/Wave 2, and IEEE 802.11a/b/g/n
Operating Frequency Bands	IEEE 802.11b/g/n/ax/be: 2.4 GHz to 2.4835 GHz IEEE 802.11a/n/ac/ax/be: 5.150 GHz to 5.350 GHz, 5.470 GHz to 5.725 GHz, 5.725 GHz to 5.850 GHz
Antenna Type	Built-in omni-directional antennas (2.4 GHz: 2.84 dBi, 5 GHz: 4.56 dBi)
Spatial Streams	2.4 GHz: 2x2 MIMO 5 GHz: 2x2 MIMO

Data Rate	2.4 GHz: 688 Mbps 5 GHz: 2882 Mbps Combined: 3570 Mbps
Modulation	OFDM: BPSK@6/9 Mbps, QPSK@12/18 Mbps, 16QAM@24 Mbps, 64QAM@48/54 Mbps DSSS: DBPSK@1 Mbps, DQPSK@2 Mbps, CCK@5.5/11 Mbps MIMO-OFDM: BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM, 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: –85 dBm (MCS0), –65 dBm (MCS7), –85 dBm (MCS8), –65 dBm (MCS15) 11ac: 20 MHz: –85 dBm (MCS0), –60 dBm (MCS9) 11ac: 40 MHz: –82 dBm (MCS0), –57 dBm (MCS9) 11ac: 80 MHz: –79 dBm (MCS0), –54 dBm (MCS9) 11ax: 80 MHz: –79 dBm (MCS0), –52 dBm (MCS11) 11ax: 160 MHz: –76 dBm (MCS0), –49 dBm (MCS11) 11be: 80 MHz: –79 dBm (MCS0), –52 dBm (MCS13) 11be: 160 MHz: –76 dBm (MCS0), –49 dBm (MCS13)
Max. Transmit Power	Frequency bands and maximum Effective Isotropic Radiated Power (EIRP): **Note** Country specific restrictions apply. • European Union & United Kingdom: ○ 2400 MHz to 2483.5 MHz, EIRP ≤ 20 dBm ○ 5150 MHz to 5350 MHz, EIRP ≤ 23 dBm ○ 5470 MHz to 5725 MHz, EIRP ≤ 30 dBm • United States: ○ 2400 MHz to 2483.5 MHz, max output power ≤ 30 dBm & EIRP ≤ 36 dBm ○ 5150 MHz to 5250 MHz, max output power ≤ 30 dBm & EIRP ≤ 36 dBm ○ 5250 MHz to 5350 MHz, max output power ≤ 24 dBm & EIRP ≤ 30 dBm ○ 5470 MHz to 5725 MHz, max output power ≤ 24 dBm & EIRP ≤ 30 dBm ○ 5725 MHz to 5850 MHz, max output power ≤ 30 dBm & EIRP ≤ 36 dBm • Myanmar: ○ 2400 MHz to 2483.5 MHz, EIRP ≤ 23 dBm

	○ 5725 MHz to 5825 MHz, EIRP ≤ 30 dBm ● Thailand: ○ 2400 MHz to 2483.5 MHz, EIRP ≤ 20 dBm ○ 5150 MHz to 5350 MHz, EIRP ≤ 23 dBm ○ 5470 MHz to 5725 MHz, EIRP ≤ 30 dBm ○ 5725 MHz to 5825 MHz, EIRP ≤ 30 dBm ● Indonesia: ○ 2400 MHz to 2483.5 MHz, EIRP ≤ 27 dBm ○ 5150 MHz to 5350 MHz, EIRP ≤ 23 dBm ○ 5725 MHz to 5825 MHz, EIRP ≤ 23 dBm ● Egypt: ○ 2400 MHz to 2483.5 MHz, EIRP ≤ 20 dBm ○ 5150 MHz to 5350 MHz, EIRP ≤ 23 dBm
Power Step	1 dBm
Dimensions (W x D x H)	124 mm x 86 mm x 24 mm (4.88 in. x 3.39 in. x 0.94 in.) (The height indicates the distance that the access point protrudes from the wall once installed.)
Net Weight	≤ 0.5 kg (1.10 lbs.)
Service Ports	● 1 x 10/100/1000/2500BASE-T Ethernet uplink port, supporting PoE input. ● 4 x 10/100/1000BASE-T Ethernet downlink ports for connecting wired devices, with LAN4 supporting PoE output.
Management Port	N/A
Status LED	1 x system status LED (white)
Power Supply Options	IEEE 802.3at compliant PoE+ (Under normal operation. The PoE Output function is enabled for LAN4 port and the maximum power output is 10 W.), compatible with IEEE 802.3af compliant PoE (the PoE OUT function of LAN4 port is disabled when IEEE 802.3af compliant PoE is used.).
Max. Power Consumption	≤ 15 W (when the PoE output of LAN 4 port is disabled.)
Environment	Operating temperature: 0°C to 40°C (32°F to 104°F)
	Operating humidity: 5% to 95% (non-condensing)
	Storage temperature: –40°C to +70°C (–40°F to +158°F)
	Storage humidity: 5% to 95% (non-condensing)
Mounting	Junction box-mount
Color	White
Safety Regulations	CE, FCC, ISED, and cTUVus
Surge Protection	2 kV

Mean Time Between Failure (MTBF)	> 400,000 hours

1.5 Technical Specifications of Power Supply

The RG-RAP72-Wall adopts PoE input and supports IEEE 802.3af/802.3at compliant PoE power supply (The PoE OUT function of LAN4 port is disabled when IEEE 802.3af compliant PoE power supply is used.)

When PoE is used, ensure that the power sourcing equipment (PSE) is at least IEEE 802.3af capable. For optimal device performance, it is recommended that a PSE that complies with the IEEE 802.3at standard should be used. Alternatively, you are advised to use a PoE adapter certified by Ruijie.

1.6 Cooling

The RG-RAP72-Wall adopts the fanless design. Therefore, when installing the AP, ensure that there is sufficient clearance around the AP for heat dissipation.

2 Preparing for Installation

2.1 Safety Guidelines

Note

- To avoid personal injury and equipment damage, carefully read the safety precautions before you install the access point.
- The following safety precautions may not cover all possible hazardous situations.

2.1.1 General Precautions

- Do not expose the access point to high temperature, dusts, or harmful gases. Do not install the AP in an inflammable or explosive environment. 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 noise.
- Keep the access point at least 500 (0.31 miles) 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 and communications equipment features, and considerations such as climate, hydrology, geology, earthquake, electrical power, and transportation.
- Ensure that the access point and power distribution system are properly grounded.

Caution

Follow the procedures in the user manual to install and remove the access point.

2.1.2 Handling Safety

- Do not move the access point frequently.
- Cut off all the power supplies and unplug all power cords before moving or handling the access point.

2.1.3 Electricity Safety

Warning

- Improper or incorrect electric operations may cause a fire, electric shock, and other accidents, and lead to severe and fatal personal injury and equipment damage.
- Direct or indirect contact with high voltage or mains power supply via wet objects may cause fatal dangers.

- Always observe the local regulations and standards. Only trained and qualified personnel should be allowed to operate the equipment.
- Check whether there are potential risks in the work area. For example, check whether the power supply is grounded, whether the grounding is reliable, and whether the ground is wet.
- Learn about the position of the indoor emergency power switch before installation. Cut off the power switch in case of accidents.

- Check the access point carefully before shutting down the power supply.
- Keep the access point far away from the grounding facility and lightning protection facility of the power equipment.
- Keep the access point far away from radio stations, radar stations, high-frequency high-current devices, and microwave ovens.

2.2 Site Requirements

The access point must be installed and used indoors. For normal operation and prolonged service life of the access point, the installation site must meet the following requirements.

2.2.1 Bearing

Evaluate the weight of the access point and its accessories, and ensure that the installation site (wall) can bear the weight.

2.2.2 Ventilation

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

2.2.3 Temperature and Humidity

To ensure the normal operation and prolonged service life of the access point, maintain an appropriate temperature and humidity. Working in an environment with too high or too low temperature and humidity for a long period may damage the access point.

- When exposed to high relative humidity, insulating materials may exhibit poor insulation capabilities, increasing the risk of electrical leakage.
- When exposed to low relative humidity, the insulating strip may dry out and shrink, increasing the risk of static electricity generation.
- In a dry environment, static electricity is prone to occur and damage the internal circuits of the access point.
- High temperature environments can be detrimental to the access point, leading to reduced performance and a shorter service life. Prolonged exposure to elevated temperatures can expedite the access point's aging process.

2.2.4 Cleanliness

Dust poses a major threat to the device. The indoor dust can cause electrostatic adhesion when falling on the device, causing poor contact of the metallic joint. Such electrostatic adhesion occurs more easily when the indoor relative humidity is low, not only affecting the service life of the device, but also causing communication failure easily. The following table lists the requirements on the dust content and diameter in the equipment room.

Table 2-1 Dust and Particles

Particle Size	Unit	Content
≥ 0.5 μm	Particles/m^3	≤ 1.4 x 10^7
≥ 1 μm	Particles/m^3	≤ 7 x 10^5

≥ 3 μm	Particles/m^3	≤ 2.4 x 10^5
≥ 5 μm	Particles/m^3	≤ 1.3 x 10^5

Apart from dust, the salt, acid, and sulfide in the air of the equipment room must meet strict requirement. These harmful substances will accelerate metal corrosion and component aging. The equipment room should be protected from harmful gases (such as sulfur dioxide, hydrogen sulfide, nitrogen dioxide, ammonia, and chlorine). The following table lists the limits of harmful gases in the equipment room.

Table 2-2 Hazardous 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

The average value is measured over one week. The maximum value is the upper limit of the harmful gas measured in one week for up to 30 minutes every day.

2.2.5 Grounding

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

2.2.6 Electromagnetic Interference

- Keep the access point far away from the grounding system or the lightning protection grounding system and f the power facility.
- Keep the access point far away from radio stations, radar stations, high-frequency high-current devices, and microwave ovens.

2.3 Tools

Table 2-3 Tools

Common Tools	Phillips screwdriver, power cords, Ethernet cables, diagonal plier, and binding straps
Special Tools	ESD gloves, wire stripper, crimping plier, RJ45 crimping plier, wire cutter, and waterproof adhesive tape

Meters	Multimeter

Note

This device is delivered without a toolkit. Prepare the preceding tools by yourself.

3 Installing the Access Point

Caution

Before installing the access point, make sure you have carefully read the requirements in Chapter 2.

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 access point.
- 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 access point.
- The installation site meets the site requirements of the access point.
- The customized access point meets the client-specific requirements.

3.2 Precautions

To ensure normal operation and prolonged service life of the access point, observe the following precautions:

- Do not power on the access point during installation.
- Install the access point in a well-ventilated location.
- Do not subject the access point to high temperature.
- Keep the access point away from high voltage cables.
- Do not expose the access point in a thunderstorm or strong electric field.
- Cut off the power switch before cleaning the access point.
- Do not open the enclosure when the access point is working.
- Secure the access point tightly.

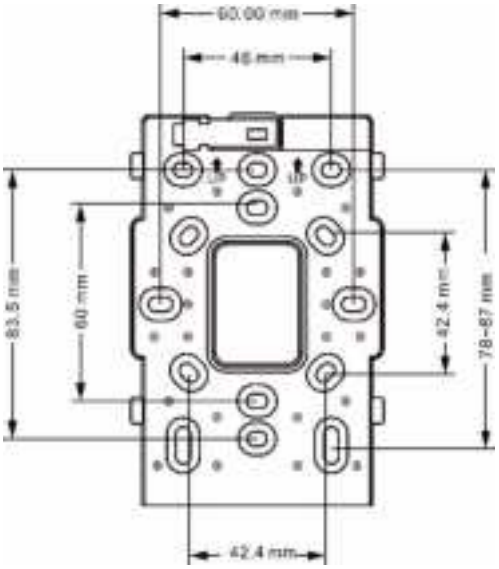
3.3 Installing the Access Point

Caution

The schematic diagram provided is for reference purposes only. The actual product should be installed based on its physical specifications and design.

The following figure shows the mounting bracket dimensions.

Figure 3-1 Dimensions of the Mounting Bracket

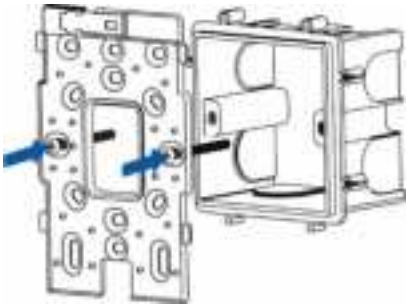


The access point can be installed on various junction boxes, including Chinese-standard and European-standard 86-mm junction boxes, American-standard 118-mm junction box, and South African-standard 120-mm junction box. To mount the access point on a Chinese-standard 86-mm junction box, follow these steps:

(1) Secure the mounting bracket to the junction box using screws.

- Chinese-standard 86 mm x 86 mm Junction Box

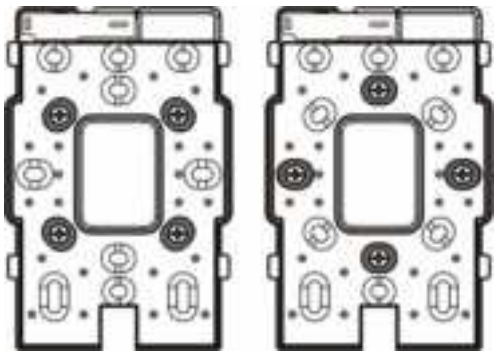
Figure 3-2 Chinese-standard 86 mm x 86 mm Junction Box



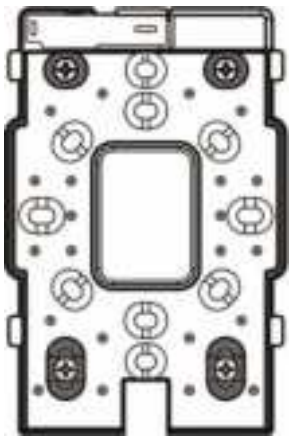
Caution

The following are brackets on European-standard 86 mm x 86 mm junction box, South African-standard 114 mm x 114 mm junction box, and American-standard 108 mm x 59 mm junction box. The access point can be mounted horizontally or vertically on a South African-standard junction box.

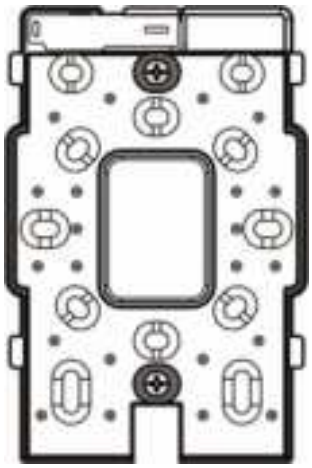
- European-standard 86 mm x 86 mm Junction Box



○ American-standard 108 mm x 59 mm Junction Box

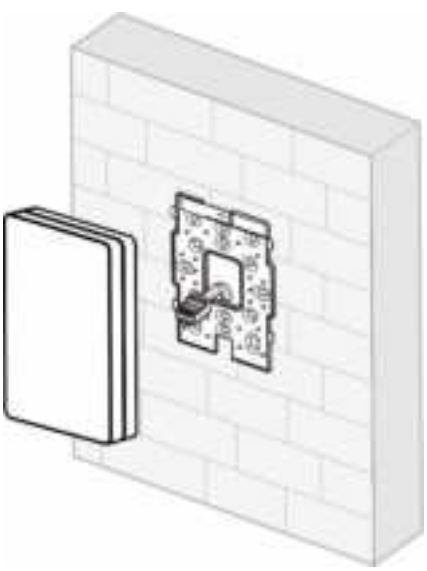


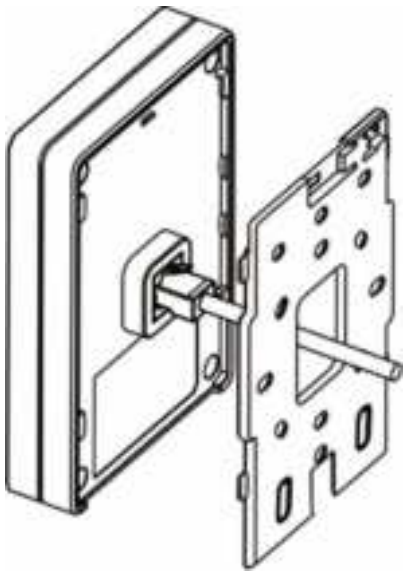
○ South African-standard 114 mm x 114 mm Junction Box



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

- Ethernet cable: Connect one end of the Ethernet cable to the WAN/PoE port on the back of the AP. This port supports PoE input.
- Ethernet cable: Connect one end of the Ethernet cable to one of LAN 1 to LAN 4 ports on the bottom of the AP. LAN 4 port supports PoE output.

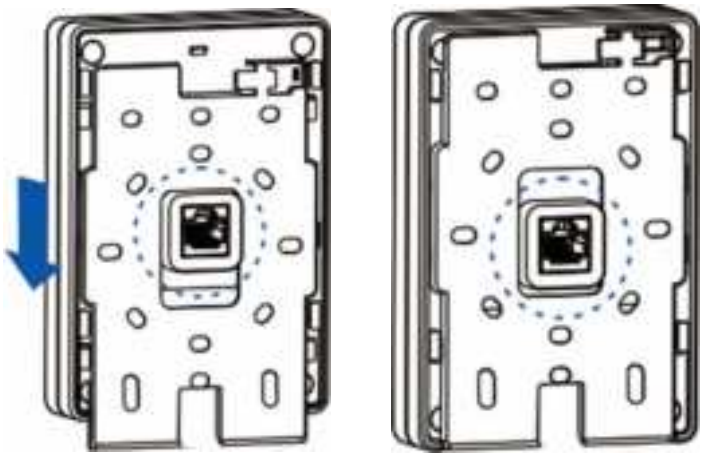




Caution

- Make sure that the cables at the connectors have natural bends or bends of large radius instead of small radius.
- When the access point is powered by PoE power supply, make sure that the PSE connected to the WAN/PoE port of the access point is 802.3af/802.3at capable. If the 802.3af compliant PoE power supply is adopted, the PoE output function of LAN 4 port is disabled.)

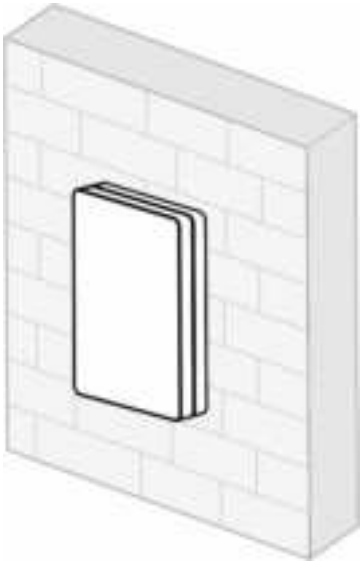
(3) Align the upper edge of the WAN port on the access point with the upper edge of the hole on the mounting bracket. Slide the access point downward to secure it on the mounting bracket.



Caution

Keep the key to the security lock (T-key) handy after installation. This product is designed with anti-theft function. You need to use the T-key to remove the access point.

(4) The installation is complete.



3.4 Bundling Cables

Note

- The cables should be bound in a visually pleasing way.
- When you bundle twisted pairs, make sure that the 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 of cable bundling are as follows:

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

(2) Secure the cables in the cable management trough of the mounting bracket.

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

3.5 Checklist After Installation

(1) Checking the Access Point

- The external power supply matches with the requirement of the access point.
- The access point is securely fastened.

(2) Checking the Cable Connection

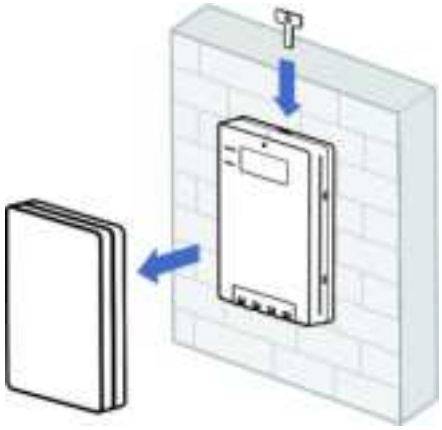
- The cable type matches the port type.
- The cables are properly bundled.

(3) Checking the Power Supply

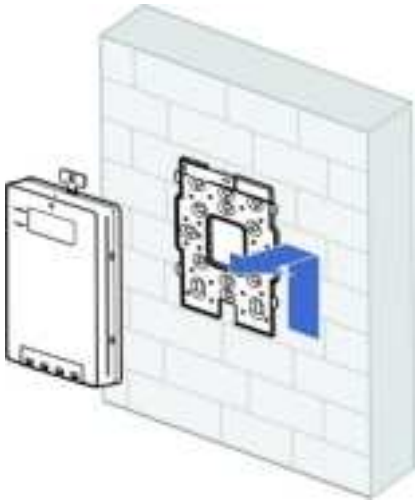
- The power cord is properly connected and meets safety requirements.
- The access point is operational after power-on.

3.6 Removing the Access Point

(1) Remove the cover horizontally and insert the T-key into the square hole on the top of the access point.



(2) Push the access point upward to remove it from the mounting bracket.



4 Verifying Operating Status

4.1 Setting Up the Configuration Environment

When the AP is powered on through PoE, pay attention to the following points:

- Verify that the power cord is properly connected and compliant with safety requirements.
- Connect the access point with the debugging device through an Ethernet cable.

4.2 Powering on the Access Point

4.2.1 Checklist Before Power-On

- Verify that the power cord is properly connected.
- Verify that the power sourcing equipment connected to the WAN/PoE port supports IEEE 802.3af/802.3at. If 802.3af compliant PoE power supply is adopted, the 5 GHz SSID is disabled by default.

4.2.2 Checklist After Power-on

- Verify the LED status.
- After the AP is powered on, check whether the SSID (@Ruijie-mXXXX for multiple devices and @Ruijie-sXXXX for a single device) can be detected by a mobile phone or other wireless devices.

5 Monitoring and Maintenance

5.1 Monitoring

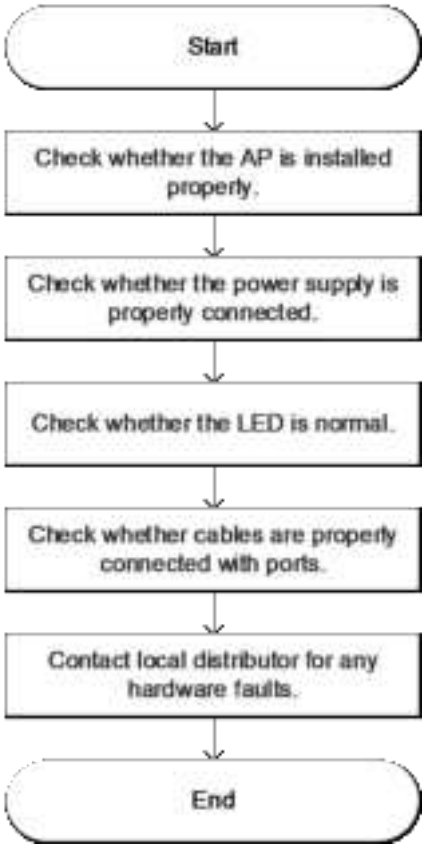
You can observe the LED color to monitor the access point status.

5.2 Maintenance

If the hardware is faulty, please contact local distributor.

6 Common Troubleshooting

6.1 General Troubleshooting Flowchart



6.2 Common Faults

- Why the LED off is after the access point is powered on?

  Verify that the PSE connected to the WAN/PoE port of the access point is 802.3af/802.3at compliant. Check whether the Ethernet cable is connected properly and works normally.

- Why does Ethernet port not work after the Ethernet cable is plugged in?

  Check whether the peer device is working properly. Then verify that the Ethernet cable is capable of providing the required data rate and is properly connected.

- Why can’t clients discover the access point?

  - Verify that the access point is properly powered.
  - Verify that the Ethernet port is correctly connected.
  - Verify that the access point is correctly configured.
  - Move the client endpoint to adjust the distance between the client and the access point.

- Why can’t clients discover the 5 GHz SSID?
  - Verify that the PSE supplying power to the access point is 802.3at compliant.
  - Verify that the access point is configured with the 5 GHz SSID.
  - Log in to the web interface and choose **One-Device** > **Config** > **Advanced** > **PoE Settings** to verify that the **Power Mode** is set to **IEEE 802.3at**.

7 Appendix

7.1 Ports, Connectors, and Media

7.1.1 2500BASE-T/1000BASE-T/100BASE-TX/10BASE-T Ports

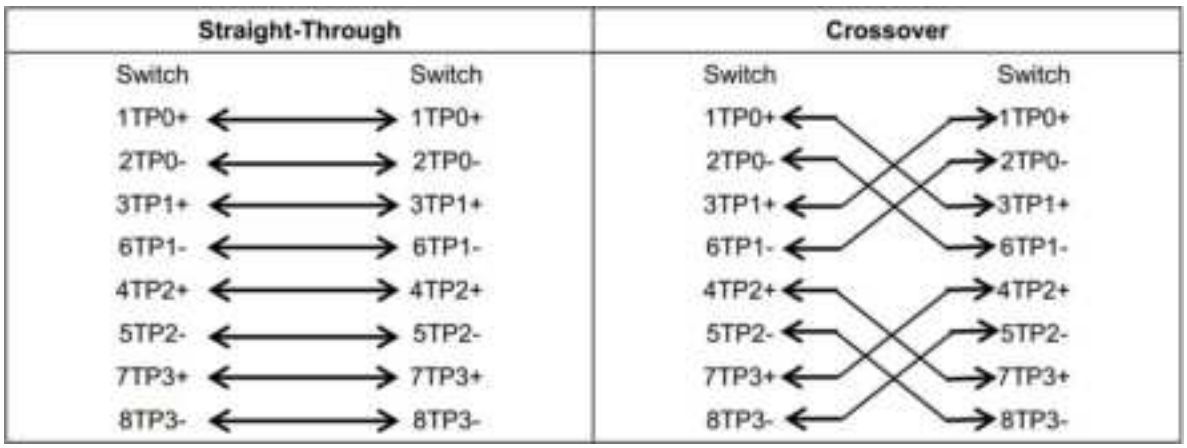
2500BASE-T/1000BASE-T/100BASE-TX/10BASE-T ports are Ethernet ports with auto-negotiation of four data rates: 10 Mbps, 100 Mbps, 1000 Mbps, and 2500 Mbps. They supports auto MDI/MDIX Crossover, and use RJ 45 connectors.

Compliant with the IEEE 802.3bz standard, a 2500BASE-T port requires 100-ohm Category 6 or 5e unshielded twisted pair (UTP), or shielded twisted pair (STP) (recommended) cables, and supports a maximum distance of 100 meters (328 feet). When PoE power supply is used, Category 6 STP cables are recommended, and both the port and the cable should be properly shielded.

Compliant with the IEEE 802.3ab standard, a 1000BASE-T port requires 100-ohm Category 6 or 5e unshielded twisted pair (UTP) or shielded twisted pair (STP) (recommended) cables, and supports a maximum distance of 100 meters (328 feet). When PoE power supply is used, Category 6 STP cables are recommended, and both the port and the cable should be properly shielded.

The 2500BASE-T/1000BASE-T port all four pairs of wires to be connected for data transmission. Figure 7-1 shows the connection of four pairs of wires for the 2500BASE-T/1000BASE-T port.

Figure 7-1 2500BASE-T/1000 BASE-T Twisted Pair Connections



A 100BASE-TX/10BASE-T port can also be connected using 100-ohm Category 5 cables, and supports a maximum distance of 100 meters (328 feet).

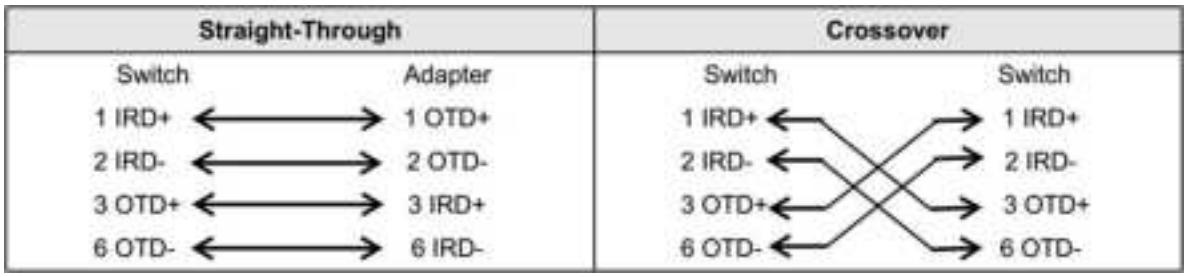
Table 7-1 shows 100BASE-TX/10BASE-T pin assignments.

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

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

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



7.2 Recommended Cabling

When installing the RG-RAP72-Wall, route the cables through the cable management brackets. Top cabling or bottom cabling is adopted according to the actual situation in the equipment room. All conversion connectors should be placed at the bottom of the rack instead of outside the rack that is easily accessible. 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 locations of the DC power distribution box, AC power socket, or surge protection box.

Requirements for the Minimum Bend Radius of an Ethernet Cable

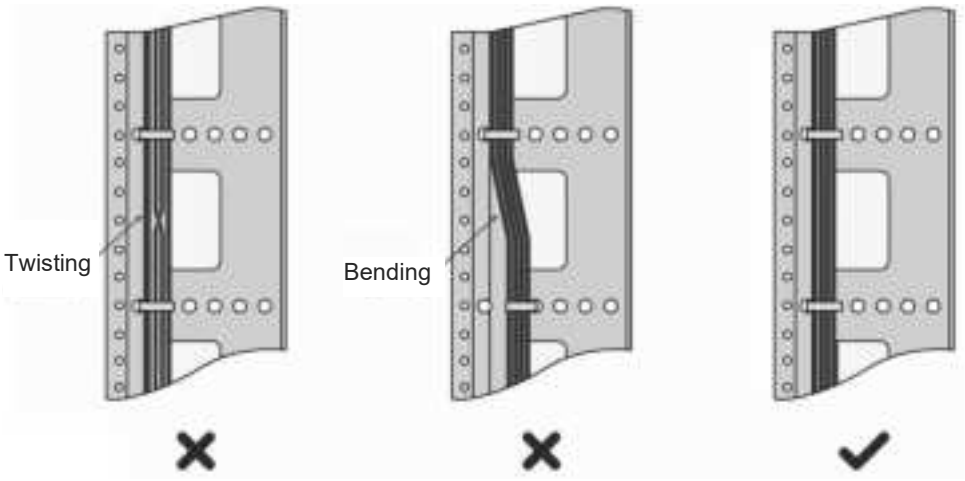
- The bend radius of a fixed power cord, Ethernet cable, or flat cable should be over five times greater than their respective external diameter. The bend radius of these cables that are often bent or plugged should be over seven times greater than their respective external diameter.
- The bend radius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

Precautions for Bundling Cables

- Before cables are bundled, mark labels and stick the labels to cables wherever appropriate.

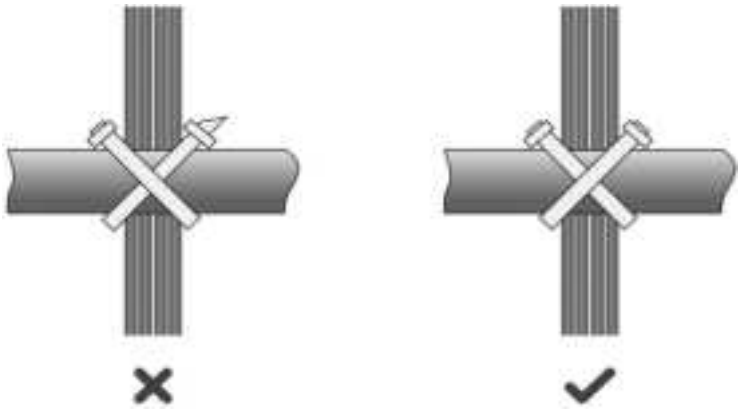
- Cables should be neatly and properly bundled in the rack without twisting or bending, as shown in Figure 7-3.

Figure 7-3 Bundling Cables (1)



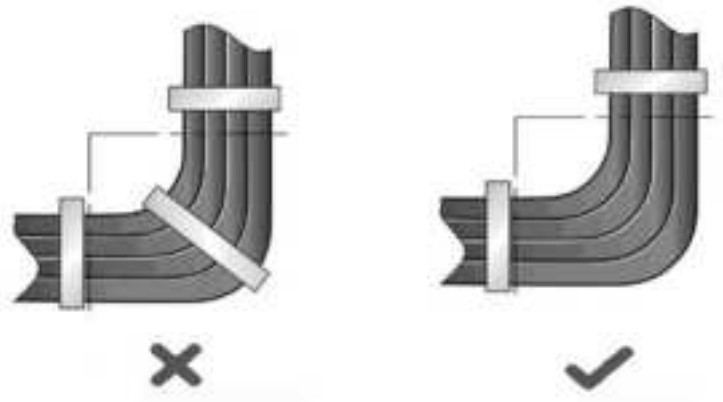
- Cables of different types (such as power cords, signal cables, and ground cables) should be separated in cabling and bundling. Mixed bundling is prohibited. When they are close to each other, you are advised to adopt crossover cabling. In the case of parallel cabling, maintain a minimum distance of 30 mm (1.18 in.) between power cords and signal cables.
- The cable management brackets and cabling troughs inside and outside the rack should be smooth without sharp corners.
- The metal hole traversed by cables should have a smooth and fully rounding surface or an insulated lining.
- Use cable ties to bundle up cables properly. 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, as shown in Figure 7-4.

Figure 7-4 Bundling Cables (2)



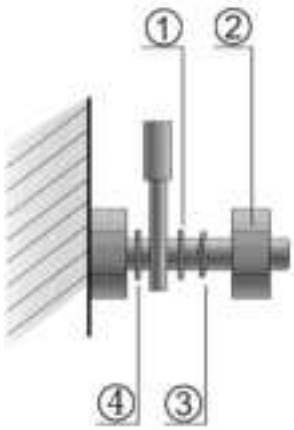
- When cables need to be bent, bundle them up but do not tie them where the cables will be bent, as shown in Figure 7-5.

Figure 7-5 Bundling 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.
- Do not bind 220V or 48V power cords to the guide rails of moving parts.
- The power cords connecting moving parts such as door grounding cables should be reserved with a margin after being assembled to avoid suffering tension or stress. When 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.
- 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 Screw 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.
- 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.)

- Do not tie cables or bundles in a knot.
- For wiring terminal sockets (such as circuit breakers) with cord end terminals, the metal part of the cord end terminal should not be exposed outside the terminal socket when assembled.