Ruijie Reyee RG-EST330F-P, EST350G, EST450G Wireless Bridges

Implementation Cookbook

Document Version: V1.0
Date: March 28, 2025

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Preface

Intended Audience

This document is intended for:

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

Technical Support

- The 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

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

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.

Note

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

Instruction

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. Instruction

This manual is used to guide users to understand the product, install the product, and complete the configuration.

- The example of the port type may be different from the actual situation. Please proceed with configuration according to the port type supported by the product.
- The example of display information may contain the content of other product series (such as model and description). Please refer to the actual display information.
- The routers and router product icons involved in this manual represent common routers and layer-3 switches running routing protocols.

Ruijie Reyee RG-EST330F-P, EST350G, EST450G Wireless Bridges Implementation Cookbook

This cookbook consists of multiple independent volumes, introducing the installation, deployment, and web-based configuration of the RG-EST330F-P, EST350G and EST450G, including:

01- Installation Guide

- 01-RG-EST330F-P Installation Guide
- 02-RG-EST350G Installation Guide
- 03-RG-EST450G Installation Guide

02- 3.0(1)B11P302 Configuration Guide

Contents

1 Overview

1.1 About the RG-EST330F-P

The RG-EST330F-P is an IEEE 802.11ac-compliant wireless bridge launched by Ruijie Reyee for applications such as video surveillance backhaul and remote data transmission in scenarios covering elevators, tower cranes, factories, campuses, and construction sites.

The RG-EST330F-P operates on the 5 GHz frequency band and supports 2x2 Multiple Input Multiple Output (MIMO) with two spatial streams, delivering a maximum wireless throughput of 867 Mbps for bridging applications. This meets users' bandwidth demands for data links. Additionally, the RG-EST330F-P supports the IEEE 802.11n standard, offering a maximum data rate of 150 Mbps on the 2.4 GHz band, which is ideal for remote device management. The RG-EST330F-P also supports IEEE 802.3af-compliant PoE and features two PoE-out ports, with a total output power of 15.4 W.

1.2 Package Contents

Table 1-1 Package Contents

No.	Item	Quantity
1	RG-EST330F-P wireless bridge	1
2	DC power adapter 24 V/1.5 A	1
3	Passive PoE injector	1
4	*Quick Start Guide*	1
5	*Warranty Card*	1
6	Band clamps	2
7	Screw kit (including four screws and four wall anchors)	1
8	Mounting template	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

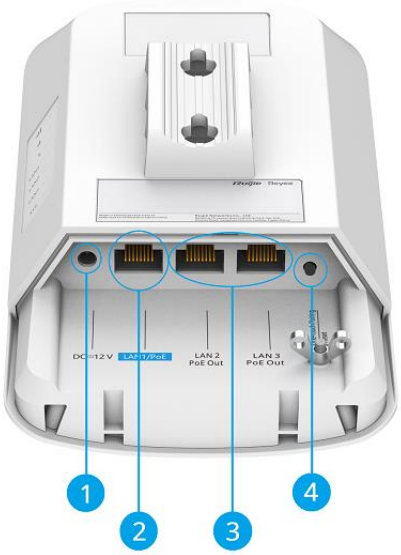
1.3.1 Appearance of the RG-EST330F-P

Figure 1-1 Front View of the RG-EST330F-P

Figure 1-2 Side and Back View of the RG-EST330F-P

1.3.2 Components on the Back Panel

Figure 1-3 Components on the Back Panel



Note

The label is located on the back of the wireless bridge.

Table 1-2 Components on the Back Panel

No.	Component	Description
1	DC power connector	Connected to a 12–24 V DC power adapter.
2	LAN1/PoE port	● 10/100BASE-T port. ● Connected to a Cat5e or higher cable. ● Supporting 24 V passive PoE power supply. ● Supporting IEEE 802.3at-compliant PoE power supply.
3	LAN2 and LAN3 PoE-out ports	● 10/100BASE-T ports. ● Supporting IEEE 802.3at-compliant PoE output.
4	Reset/One-Touch Pairing button	● Press and hold the button for less than 2s: The wireless bridge pairs with another wireless bridge in 30s (the LED blinks during pairing). ● Press and hold the button for 2s to 10s: No action is triggered. ● Press and hold the button for more than 10s: The wireless bridge is restored to factory settings.

Note

- After the One-Touch Pairing button is pressed, the wireless bridge is switched to BaseStation mode regardless of whether it is in BaseStation or CPE mode.
- During one-touch pairing, the signal LEDs on the wireless bridge in BaseStation mode blink for 1 minute (it will stop blinking after 1 minute if no bridge connection is established). The signal LEDs on the wireless bridge in CPE mode also blink until the pairing is complete.

- Only a wireless bridge that has been reset to factory settings and has not been bridged before can be switched to CPE mode through one-touch pairing.
- The one-touch pairing feature is enabled by default and can be disabled through eWeb.
- One-touch pairing is disabled during interference scanning.
- When the bridge is powered by a 12 V DC adapter, 48 V passive PoE, or IEEE802.3af standard PoE, the PoE-out function is not supported. However, when powered by a 24V passive PoE or IEEE802.3at standard PoE, the PoE-out function is supported.
- When the bridge is powered by a 12 V DC adapter, 48 V passive PoE, or IEEE802.3af standard PoE, the PoE-out function is not supported. However, when powered by a 24V passive PoE or IEEE802.3at standard PoE, the PoE-out function is supported.

Figure 1-4 LEDs

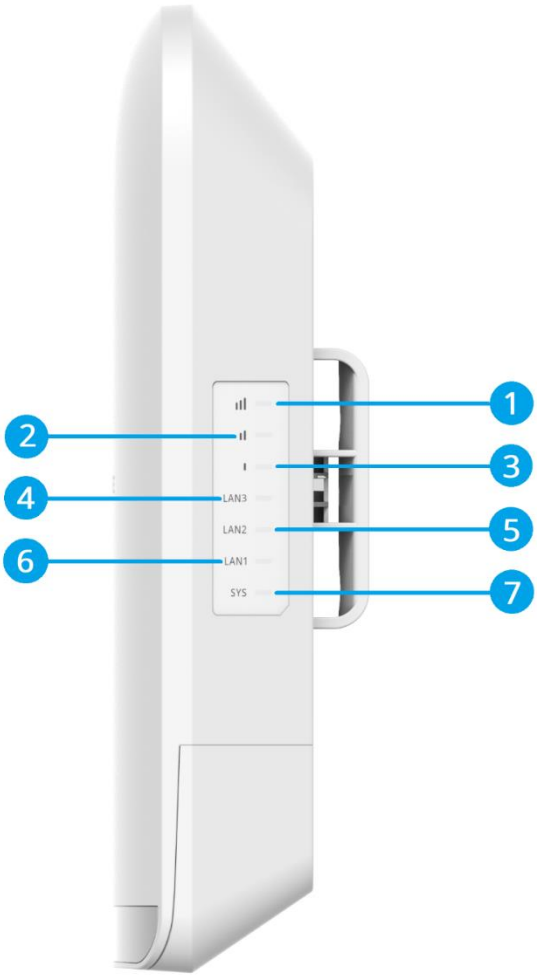


Table 1-3 LEDs

No.	LED	Description
1, 2, and 3	Signal LEDs	● LED 3, LED 2, and LED 1 off: The bridge is not paired with another bridge. ● LED 3 on or blinking: The bridge is paired with another bridge, and the Received Signal Strength Indicator (RSSI) is lower than –75 dBm. ● LED 3 on: The bridge is paired with another bridge, and the RSSI is greater than –75 dBm. ● LED 3 on and LED 2 blinking: The bridge is paired with another bridge, and the RSSI is greater than –73 dBm. ● LED 3 and LED 2 on: The bridge is paired with another bridge, and the RSSI is greater than –71 dBm. ● LED 3 and LED 2 on and LED 1 blinking: The bridge is paired with another bridge, and the RSSI is greater than –68 dBm. ● LED 3, LED 2, and LED 1 on: The bridge is paired with another bridge, and the RSSI is greater than –64 dBm. ● LED 3, LED 2, and LED 1 blinking: The bridge is pairing with another bridge.
4 and 5	Port LEDs	● Off: The port is not connected. ● Solid on: The port is connected, but is not receiving or sending data. ● Fast blinking: The port is connected, and is receiving and sending data.
6	System LED	● Off: The bridge is not powered on. ● Solid on: The bridge is operating normally. ● Slow blinking: The bridge is operating but an alarm or a power failure occurs. ● Fast blinking (8 to 10 times/second): The bridge is starting up. ● Fast blinking (2 times/second): The bridge is initializing or upgrading.

1.4 Technical Specifications

Note

The weight in the following table refers to the weight of a single device.

Table 1-4 Technical Specifications

Model	RG-EST330F-P
Radio Design	● 2.4 GHz: single-stream ● 5 GHz: dual-stream 2x2 MIMO
Protocol and Standard	● 5 GHz: 802.11ac/n/a ● 2.4 GHz: 802.11b/g/n
Operating Frequency Bands	● 2.4 GHz: 802.11b/g/n: 2.400 GHz to 2.483 GHz ● 5 GHz: 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** Country-specific restrictions apply.

Model	RG-EST330F-P
	● European Union & United Kingdom: 2400 MHz to 2483.5 MHz, EIRP ≤ 20 dBm; 5470 MHz to 5725 MHz, EIRP ≤ 30 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; 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; 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
Antenna Type	Built-in antenna (horizontal/vertical): 30°/30°
Antena Gain	● 2.4 GHz: 2 dBi ● 5 GHz: 13 dBi
Working Distance	3 km (1.86 mi)
Data Rate	● 2.4 GHz: 150 Mbps ● 5 GHz: 867 Mbps
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, CCK@5.5/11 Mbps ● OFDM: BPSK, QPSK, 16QAM, 64QAM
Receiver Sensitivity	● 11b: –91 dBm (1 Mbps), –88 dBm (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)
Max. Transmit Power	● 2.4 GHz: ≤ 100 mW (20 dBm) (adjustable) ● 5 GHz: ≤ 400 mW (26 dBm) (single stream)
Power Step	1 dBm
Dimensions (W x D x H)	198.8 mm x 102 mm x 53.4 mm (7.83 in. x 4.02 in. x 2.1 in.) (excluding packaging materials)
Package Dimensions (W x D x H)	276 mm x 165 mm x 107 mm (10.87 in. x 6.5 in. x 4.21 in.)
Weight	0.37 kg (0.82 lbs.) (excluding packaging materials) 0.91 kg (2.01 lbs.) (including packaging materials and one paie)
Service Ports	3 x 10/100BASE-T auto-negotiation ports
Button	1 x Reset/One-Touch Pairing button
LED	1 x system LED, 3 x port LEDs, and 3 x signal LEDs
Power Supply	● 24 V passive PoE input (supplied with a passive PoE injector) ● IEEE 802.3at-compliant PoE ● 12–24 V DC power supply (supplied with a 24 V DC power adapter) ● 12 V DC (solar panel)

Model	RG-EST330F-P
Power Consumption	< 9 W (without PoE Out)
Environmental	Operating temperature: –30°C to +55°C (–22°F to +131°F)
	Storage temperature: –40°C to +85°C (–40°F to +185°F)
	Operating humidity: 5% RH to 95% RH (non-condensing)
	Storage humidity: 5% RH to 95% RH (non-condensing)
Mounting	● Wall-mount ● Pole-mount
IP Rating	IP55
Certification	CE
Mean Time Between Failures (MTBF)	> 400,000 hours

Warning

Operation of this equipment in a residential area is likely to cause radio interference.

1.5 Power Supply Technical Specifications

The RG-EST330F-P can be powered by 24 V/1.5 A DC power supply, 24 V passive PoE power supply, and IEEE 802.3at-compliant PoE power supply. It is supplied with a 24 V/1.5 A DC power adapter and a passive PoE injector.

Technical specifications of the DC power adapter:

Table 1-5 Technical Specifications of the DC Power Adapter

Inner Diameter	Outer Diameter	Insertion Depth	Polarity
1.35 mm (0.05 in.)	3.5 mm (0.14 in.)	10 mm (0.40 in.)	Center: positive (+); Barrel: negative (-). Reverse polarity symbol is not allowed.

Warning

- Avoid using PoE injectors or switches of other models to power the bridges in BaseStation and CPE modes, as this may cause irreparable damage to the bridges.
- To ensure reliable operation of the bridge, use the supplied DC power adapter or passive PoE injector indoors.
- When the bridge is operating at full load, ensure the ambient temperature remains below 55°C (131°F).
- When using a DC power supply to power the device, ensure that the power output of the DC power supply is less than 100 W.

2 Safety Precautions

2.1 Safety Guidelines

Note

- To prevent personal injury and device damage, carefully read the safety guidelines before installing the equipment.
- The following safety guidelines may not cover all potential hazards.

2.1.1 General Safety Guidelines

- Do not expose the equipment to high temperatures, dust, or harmful gases. Do not install the equipment in flammable or explosive environments. Keep the equipment away from sources of electromagnetic interference (EMI), such as large radar stations, radio stations, and substations. Do not subject the equipment to unstable voltage, vibration, or excessive noise.
- The installation site should be dry. Do not install the equipment in a place near the sea. Keep the equipment at least 500 meters (1640.42 ft.) 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 Electric Safety

Warning

- Improper or incorrect electric operations may cause a fire, electric shock, and other accidents, and lead to severe and fatal personal injury and equipment damage.
- Direct or indirect contact with high voltage or mains power supply via 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 power supply is grounded, and whether the grounding is reliable.

2.2 Site Requirements

To ensure the normal operation and prolonged service life of the equipment, the installation site must meet the following requirements.

2.2.1 Installation Requirements

- The equipment should be installed in an open environment if possible. If the environment is enclosed, verify that a good ventilation and heat dissipation system is available.
- Ensure that the installation position is sturdy enough to support the weight of the RG-EST330F-P and its accessories.
- Ensure that the installation location is suitable for the RG-EST330F-P, leaving sufficient space on the front, back, left, and right sides for heat dissipation.

2.2.2 Lightning Protection Requirements

- When the connection cable between the main grounding conductor and local equipotential earthing terminal board (LEB) on each floor is short, use a stranded copper wire with a sectional area not less than 1.318 mm^2 (16 AWG) for the connection cable.
- Use a shielded network cable if possible. Ensure that devices connected to both ends of the shielded network cable are reliably grounded, and that the sheath of the shielded network cable is also grounded if possible. If no shielded network cable is available, wire the network cable through a steel pipe and bury the steel pipe for lead-in, and properly ground both ends of the steel pipe.
- The RG-EST330F-P features a built-in 4 kV surge protector, so generally no additional surge protector is needed. However, if higher surge protection is required, an external surge protector can be added, and it should be connected to a grounding cable during installation.

2.2.3 Temperature/Humidity Requirements

To ensure proper operation and extend the service life of the equipment, maintain an appropriate 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 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.

Table 2-1 Temperature and Humidity Requirements

Operating Temperature	Operating Humidity
–30°C to +55°C (–22°F to +131°F)	5% RH to 95% RH (non-condensing)

2.2.4 Electromagnetic Interference

- Take interference prevention measures for the power supply system.

- 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

Table 2-2 Tools

Common Tools	Marker, Phillips screwdriver, hammer drill, hammer, hose clamp, power cords, Ethernet cables, diagonal pliers, cable ties
Special Tools	Anti-ESD gloves, wire stripper, crimper, RJ45 connector crimping plier, and wire cutter
Meters	Multimeter and Ethernet cable tester
Relevant Devices	PC, display, and keyboard

Note

The RG-EST330F-P is not shipped with a tool kit. You need to prepare a tool kit by yourself.

2.4 Checking Before Installation

Upon unpacking the product, carefully inspect each item according to the provided package contents. If there is any discrepancy with the actual contents, please contact the supplier or distributor.

3 Installation

Caution

Before installing the equipment, make sure that you have carefully read the requirements described in Section 2 Safety Precautions.

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 equipment.
- The power supply and required current are available in the installation site.
- The selected power modules meet the system power requirements.
- The installation site meets the cabling requirements of the equipment.
- The installation site meets the site requirements of the equipment.
- The customized equipment meets the client-specific requirements.

3.2 Safety Precautions During Installation

Before installation, ensure that the installation site meets the requirements described in Section 2.2 Site Requirements, and pay attention to the following:

- Use the supplied 24 V/1.5 A DC power adapter or an equivalent power source with the same specifications to power the equipment. Do not use adapters with different specifications.
- The supplied DC power adapter and passive PoE injector support power supply over Ethernet cables up to 100 meters (328.08 ft.). Before using an Ethernet cable for power supply, ensure that the power switches on the power modules are turned off.
- Ensure that the Ethernet cable and power cord are securely connected.

3.3 Installing the RG-EST330F-P

Caution

- When installing the equipment, ensure that it is positioned to maximize the coverage area for antenna radiation.
- This installation guide is for reference only. The actual installation procedure may differ depending on the specific product.

3.3.1 Pole Mounting using Band Clamps

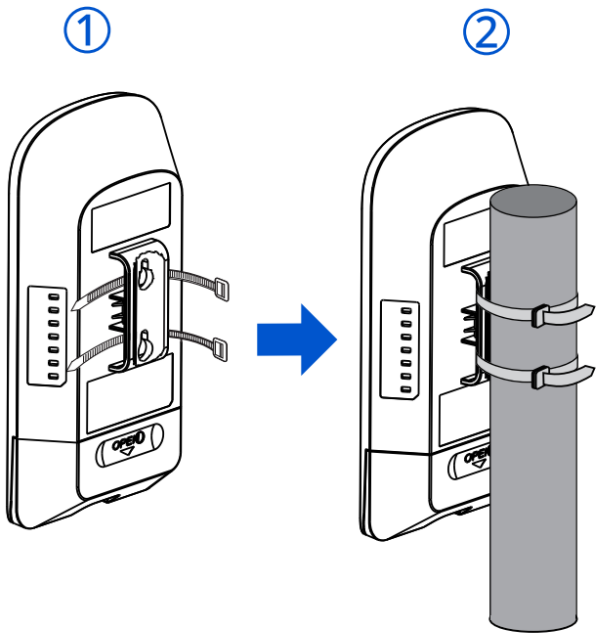
Note

The recommended pole diameter ranges from 35 mm (1.38 in.) to 89 mm (3.50 in.). If the pole falls outside this range, you will need to use hose clamps with a wall thickness of at least 2.5 mm (0.10 in.).

(1) Thread the band clamps through the mounting bracket on the back of the bridge.

(2) Tighten the band clamps to secure it to the pole.

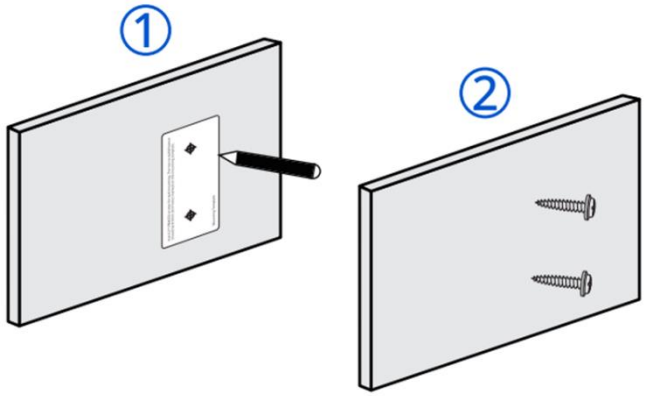
Figure 3-1 Mounting the RG-EST330F-P on a Vertical Pole



3.3.2 Mounting the RG-EST330F-P on a Wall

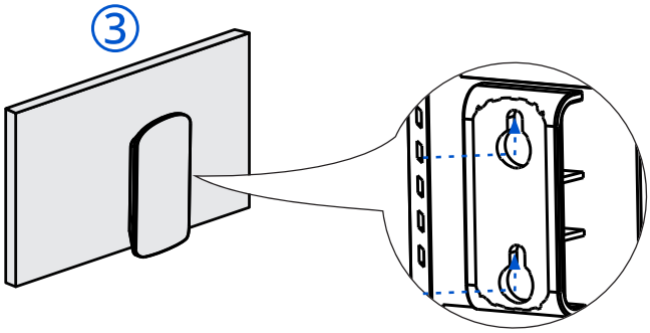
(1) Use the mounting template to mark the screw holes on the wall, then drill the holes and insert the 4.2 mm x 19 mm (0.17 in. x 0.75 in.) BA (SS) tapping screws.

Figure 3-2 Drilling Holes and Securing the Screws



(2) Align the holes on the mounting bracket with the screws, then slide the device into place.

Figure 3-3 Mounting the Device



3.4 Connecting the Cables

Warning

- After connecting the device to an Ethernet cable, cover the Ethernet port to ensure it is waterproof and dustproof.
- Do not use PoE injectors or switches of different models for power supply, as this may damage the device.
- If a solar panel is used to power the bridge, ensure that the power of the solar panel is less than 100 W.

Select or make an Ethernet cable suitable for the distance between the bridge and the power source equipment. (The bridge supports Cat5e or higher cables up to 100 meters (328.08 ft) for PoE power supply.)

You can connect the cables in the following ways:

- Connect the Ethernet cable to the passive PoE injector:

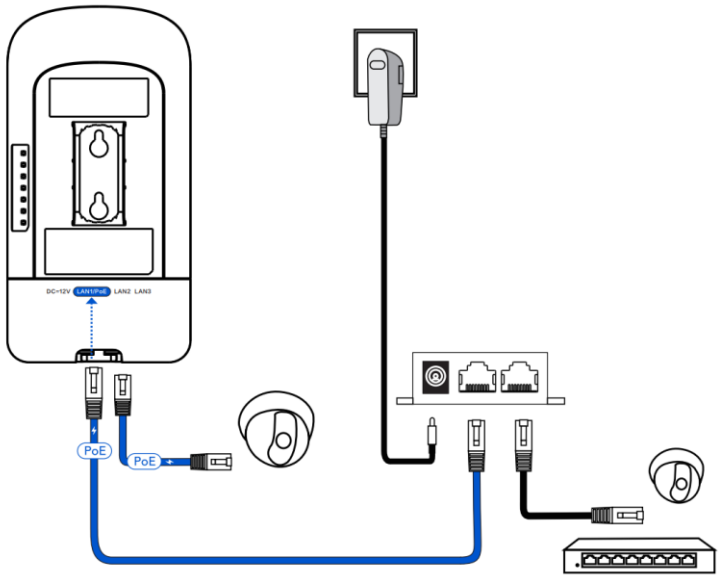
(1) Connect one end of the Ethernet cable to the PoE port of the passive PoE injector, and the other end to the LAN1/PoE port on the bridge.

(2) Connect the LAN port of the passive PoE injector to a server or IP camera.

(3) Connect the 24 V/1.5 A DC power adapter to the DC power connector of the PoE injector for power supply.

(4) Connect one end of the Ethernet cable to the LAN2 or LAN3 port on the bridge, and the other end to an IP camera.

Figure 3-4 Connecting the Ethernet Cable to the Passive PoE Injector

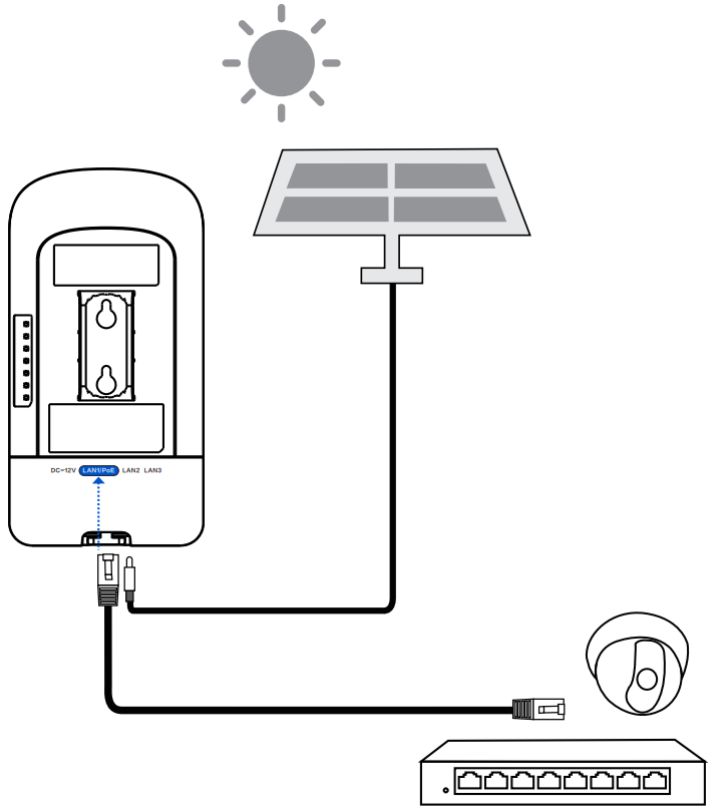


- Connect the Ethernet cable to a solar panel:

(1) Connect one end of the Ethernet cable to the LAN1/PoE, LAN2, or LAN3 port on the bridge, and the other end to a server or IP camera.

(2) Connect the 12 V/1.5 A DC solar panel to the DC connector on the bridge for power supply.

Figure 3-5 Connect the Ethernet cable to a solar panel



Solar Panel

Solar panels convert light energy from sunlight into electrical energy. The RG-EST330F-P requires a solar power panel with an output specification of 12V/1.2A DC.

Notes for Installing the Solar Panel

Because the sun's position differs between the Northern and Southern Hemispheres, the solar panel should face south in the Northern Hemisphere and north in the Southern Hemisphere to achieve optimal power output. Additionally, the tilt angle of the solar panel affects the efficiency of solar energy conversion. The optimal tilt angle varies with latitude. The following table shows the optimal tilt angles for different latitude ranges.

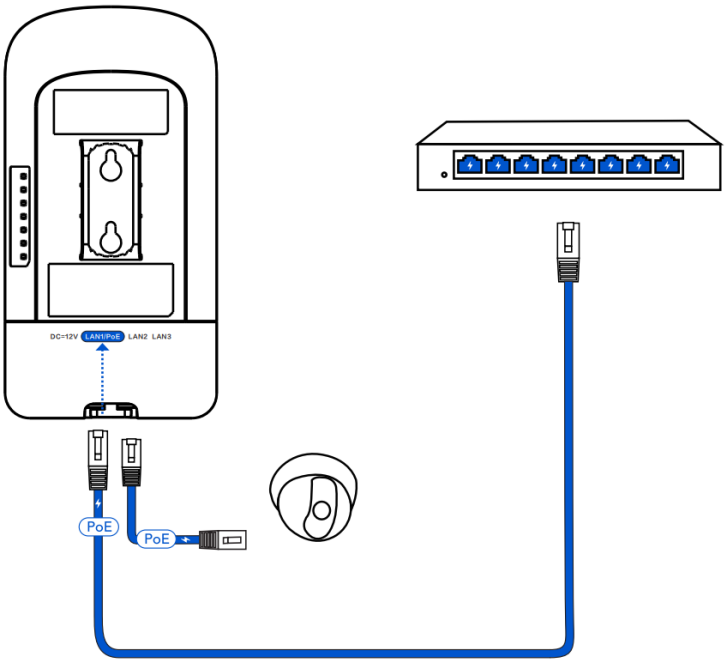
Latitude Range	Optimum Tilt
0°–10°	10°–20°
10°–20°	20°–30°
20°–30°	30°–40°
30°–40°	40°–50°
40°–50°	50°–60°
50°–60°	Approximately 60°

- Connect the Ethernet cable to a PoE switch:

(1) Connect one end of the Ethernet cable to a PoE port on the PoE switch, and the other end to the LAN1/PoE port on the bridge.

(2) Connect one end of the Ethernet cable to the LAN2 or LAN3 port on the bridge, and the other end to an IP camera.

Figure 3-6 Connect the Ethernet cable to a PoE switch



3.5 Verifying the Installation

(1) Checking the Bridge

- Verify that the external power supply meets the requirement of the wireless bridge.
- Verify that the wireless bridge is securely fastened.

(2) Checking the Power Supply

- Verify that the power cord is properly connected and meets safety requirements.
- Connect the power supply to the bridge and verify that it works properly.

4 Debugging

4.1 Powering On

(1) Checklist Before Power-on

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

(2) Recommended: After the bridge is powered on, check whether the LED status is normal.

4.2 Configuring the Bridge

- Method 1: Configure the bridge through Ruijie Reyee App

(1) The power cord is properly connected.

(2) Scan the QR code on this page or on the device to download and install Ruijie Reyee App.

(3) Log in to Ruijie Reyee App.

- Method 2: Log in to eWeb for configuration

(1) Connect the LAN port of the wireless bridge to a PC using an Ethernet cable for wired connection, or connect your smartphone or PC to the device's SSID (default SSID: @Ruijie-bxxxx) for wireless connection.

(2) Enter **10.44.77.254** in a browser to access the device's eWeb.

(3) Enter the device password (default password: admin) and click **Login** to log in to eWeb for configuration.

Caution

- Enter the initial password **admin** to log in and begin configuration.
- To ensure device security, set a password after login and change the password regularly.

5 Monitoring and Maintenance

5.1 Monitoring

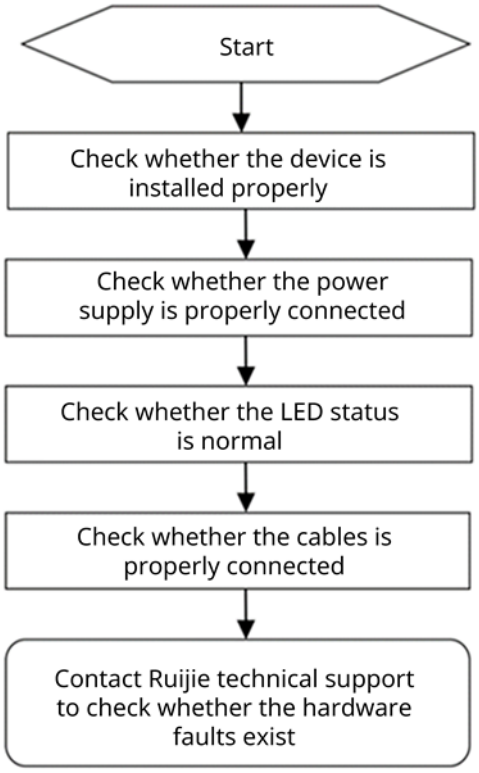
You can observe the LEDs to monitor the device in operation.

5.2 Hardware Maintenance

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

6 Common Troubleshooting

6.1 Troubleshooting Flowchart



7 Appendix

7.1 Connectors and Media

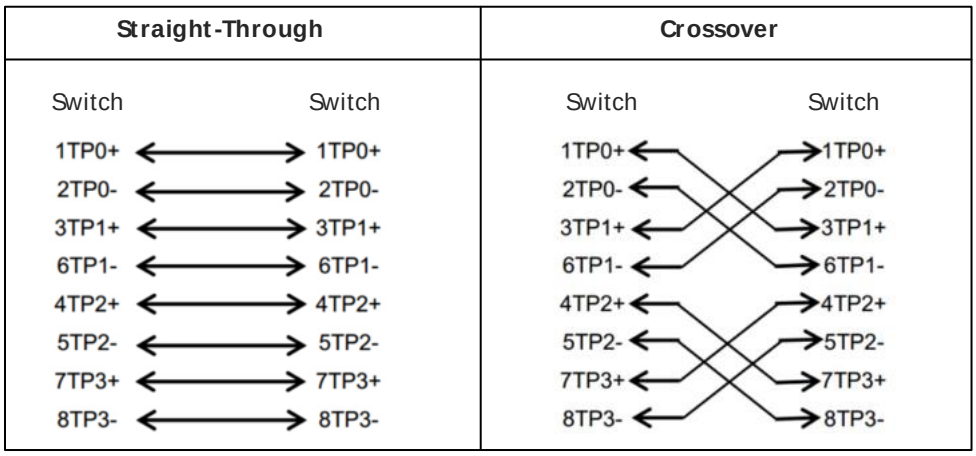
1000BASE-T/100BASE-TX/10BASE-T Port

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

Compliant with IEEE 802.3ab, 1000BASE-T requires Cat5e 100-ohm UTP or STP (STP is recommended) with a maximum distance of 100 meters (328 ft.).

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

Figure 7-1 1000BASE-T Twisted Pair Connections



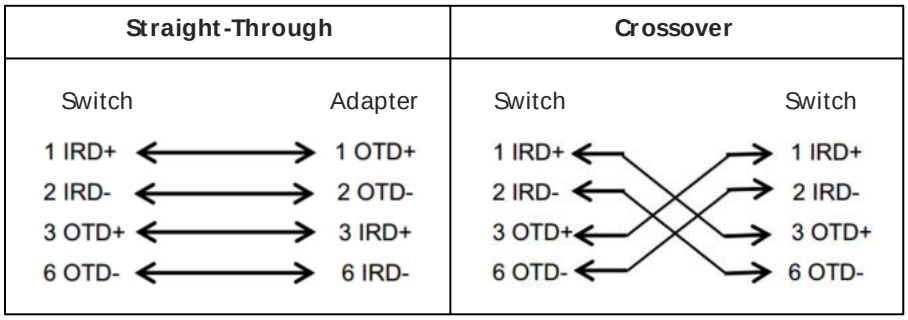
A 100BASE-TX/10BASE-T port can be interconnected using cables of the preceding specifications. For 10 Mbps, the 100BASE-TX/10BASE-T port can be connected using 100-ohm Category 3, Category 4, and Category 5 cables; for 100 Mbps, the 100BASE-TX/10BASE-T port can be connected using 100-ohm Category 5 cables with a maximum connection distance of 100 meters (328 ft.). Table 7-1 lists 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 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



Contents

1 Product Introduction

1.1 Overview

The RG-EST350G is an 802.11ac wireless bridge launched by Ruijie Reyee. It provides surveillance video backhaul function. RG-EST350G works in the 5 GHz frequency band, supports two spatial streams and 2 x 2 MIMO, and provides a wireless link speed of up to 867Mbps. The RG-EST350G utilizes the 2.4 GHz band in single-stream mode for bridge management, while the 5 GHz band is used for data transmission. The design of RG-EST350G adapts to inclement outdoor environments such as the cold and humidity. This substantially simplifies installation and maintenance.

1.2 Package Contents

Table 1-1 Package Contents

No.	Item	QTY
1	RG-EST350G (Network Video Recorder End)	1
2	RG-EST350G (Camera End)	1
3	24 V DC/0.6 A Power Adapter	2
4	Universal Joint	2
5	Universal Joint Nut	2
6	Hose Clamp	2
7	Mounting Bracket	2
8	1000 Mbps Passive PoE Injector	2
9	Product Manual	1
10	Warranty Card	1
11	Wall Anchor	6
12	Phillips Pan Head Screw (ST4.2x19)	8

Note

The package contents above are intended to provide a general overview, and are subject to the terms of the order contract. Please check your goods carefully against the package contents or order contract. If you have any questions, please contact the distributor.

1.3 Appearance

1.3.1 Appearance

Figure 1-1 Appearance of the RG-EST350G Wireless Bridge

Front View

Back View

Note

The label is located on the back of the device.

1.3.2 Ports, Buttons and LEDs

Figure 1-2 Ports, Buttons and LEDs of the RG-EST350G Wireless Bridge

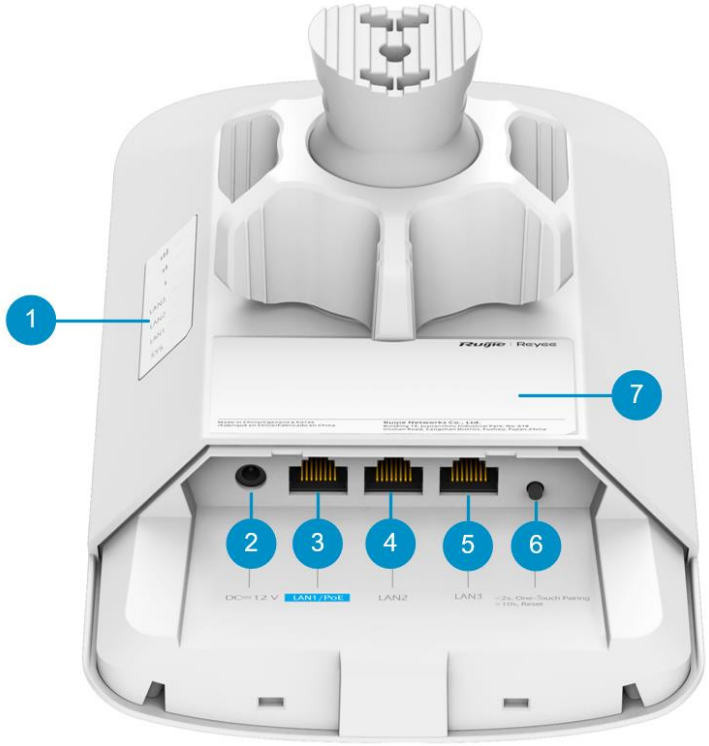


Table 1-2 Ports, Buttons and LEDs of the RG-EST350G Wireless Bridge

Mark	Item	Description
1	Status LEDs	7 status LEDs, including 1 x system LED, 3 x port LEDs and 3 x signal LEDs
2	12 V DC connector	Support 12 V/1.2 A DC power supply
3	LAN1/PoE Port	10/100/1000BASE-T Ethernet port, support 802.3af/at PoE or 24V⎓0.6A passive PoE
4	LAN2 Port	10/100/1000BASE-T Ethernet port
5	LAN3 Port	10/100/1000BASE-T Ethernet port

Mark	Item	Description
6	Reset/One-Touch Pairing button	● Press and hold the button for less than 2s: The wireless bridge pairs with another wireless bridge (the LED blinks during pairing). ● Press and hold the button for 2s to 10s: No action is triggered. ● Press and hold the button for more than 10s: Restores the wireless bridge to factory settings.
7	Label	Contains the product name, model, I/O parameters, default IP address, and other information.

Note

- After the One-Touch Pairing button is pressed, the wireless bridge is switched to the BaseStation mode regardless of whether it was in BaseStation or CPE mode.
- During one-touch pairing, the signal LEDs on the wireless bridge in BaseStation mode blink for 1 minute (it will stop blinking after 1 minute if no bridge connection is established). The signal LEDs on the bridge in CPE mode also blink until the pairing is complete.
- Only a bridge that has been reset to factory settings and has not been bridged before can be switched to the CPE mode through one-touch pairing.
- The one-touch pairing feature is enabled by default and can be disabled through eWeb.
- One-touch pairing is disabled during interference scanning.

Table 1-3 LEDs

LED	Status	Description
System LED	Solid green	The device is operating normally.
	Blinking	● Fast blinking (8 to 10 times/second): The device is starting up. ● Fast blinking (2 times/second): The device is initializing. ● Fast blinking (2 times/second): The device is upgrading.
	Off	The device is NOT receiving power.
LAN1/LAN2/LAN3 port LED	Solid green	A valid link is established, but the port is not receiving or sending data.
	Blinking green	A valid link is established, and the port is receiving or sending data.
	Off	No link is established.
Signal LEDs	Off	The device is not bridged.
	LED 1 on/blinking	The device is bridged and the RSSI is below –75 dBm.
	LED 1 on	The RSSI is above –75 dBm.

LED	Status	Description
	LED 1 on, LED 2 blinking	The RSSI is above –73 dBm.
	LEDs 1 and 2 on	The RSSI is above –71 dBm.
	LEDs 1 and 2 on, LED 3 blinking	The RSSI is above –68 dBm.
	LEDs 1, 2, and 3 on	The RSSI is above –64 dBm.
	LEDs 1, 2, and 3 blinking	The mesh pairing is in progress.

1.4 Device Specification

Table 1-4 Specifications

Model	RG-EST350G
Radio Design	● 2.4 GHz: single-stream ● 5 GHz: dual-stream 2x2 MIMO
Protocol and Standard	● 5 GHz: 802.11ac/n/a ● 2.4 GHz: 802.11b/g/n
Operating Frequency Bands	● 2.4 GHz: 802.11 b/g/n: 2.4000 GHz to 2.483 GHz ● 5 GHz: 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** Country-specific restrictions apply. ● European Union & United Kingdom: 2400 MHz to 2483.5 MHz, EIRP ≤ 20 dBm; 5470 MHz to 5725 MHz, EIRP ≤ 30 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; 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; 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
Antenna Type	Built-in antenna (horizontal/vertical): 31°/14°
Antena Gain	● 2.4 GHz: 2 dBi ● 5 GHz: 16 dBi
Working Distance	5 km (3.11 mi)
Data Rate	● 2.4 GHz: 150 Mbps ● 5 GHz: 867 Mbps
Modulation Technology	● OFDM: BPSK@6/9 Mbps, QPSK@12/18 Mbps, 16-QAM@24/36 Mbps, 64-QAM@48/54 Mbps ● MIMO-OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM

Model	RG-EST350G
Receive Sensitivity	● 11a: –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: –86 dBm (MCS0), –63 dBm (MCS9)
Max. Transmit Power	● 2.4 GHz: 100 mW ● 5 GHz: 400 mW (26 dBm) (single stream)
Power Step	1 dBm
Dimensions (W x D x H)	240 mm x 133 mm x 108 mm (9.45 in. x 5.24 in. x 4.25 in.) (excluding the mounting bracket)
Weight	0.73 kg (1.61 lbs.) (excluding packaging materials) 2.55 kg (5.62 lbs.) (including packaging materials and one paie)
Service Ports	3 x 10/100/1000BASE-T auto-negotiation ports, where LAN1/PoE port supports 24 V PoE input
Buttons	1 x Reset/One-Touch Pairing button
LED	1 x system LED, 3 x port LEDs, and 3 x signal LEDs
Power Supply	● 24 V passive PoE power supply (A passive PoE injector is delivered with the wireless bridge.) ● 12 V DC (solar panel)
Max. Power Consumption	< 12 W
Environment	Operating temperature: –30°C to +65°C (–22°F to +149°F)
	Storage temperature: –40°C to +85°C (–40°F to +185°F)
	Operating humidity: 5% RH to 95% RH (non-condensing)
	Storage humidity: 5% RH to 95% RH (non-condensing)
Mounting	● Wall-mount ● Pole-mount
IP Rating	IP55
Certification	CE
MTBF	> 400000 hours

Warning

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

Note

The weight refers to the weight of the main unit.

1.5 Power Supply Technical Specification

The RG-EST350G can be powered by 12 V/1.2 A DC power supply, 24 V passive PoE power supply, and IEEE 802.3at/af-compliant PoE power supply. It is supplied with a 24 V/0.6 A DC power adapter and a 1000 Mbps passive PoE injector.

- Technical specifications of the DC adapter:

Inner Diameter	Outer Diameter	Depth
2.10 mm ± 0.1 mm (0.083 in. ± 0.004 in.)	5.50 mm ± 0.1 mm (0.22 in. ± 0.004 in.)	10 mm ± 0.5 mm (0.39 in. ± 0.02 in.)

Warning

- For DC power supply, the DC adapter required for this wireless bridge is not included in the package. You can purchase the DC adapter separately from us.
- For PoE power supply, use the provided PoE injector in the package. Do not use other models of PoE injectors or switches for power supply as it may lead to irreparable damage to the device.
- When using a DC power supply to power the device, ensure that the power output of the DC power supply is less than 100 W.

2 Preparing for Installation

2.1 Safety Precautions

Note

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

2.1.1 General Safety Precautions

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

Caution

Please follow the correct procedures described in the installation guide to install and remove the device.

2.1.2 Handling Safety

- Avoid frequently handling the device.
- Cut off all the power supplies and unplug all power cords before moving or handling the device.

2.1.3 Electrical Safety

Warning

- Improper or incorrect electrical 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 via wet objects may cause fatal dangers.

- Observe local regulations and specifications during electrical operations. Only personnel with relevant qualifications can perform such operations.
- Check whether there are potential risks in the work area. For example, check whether the power supply is grounded, whether the grounding is reliable, and whether the ground is wet.
- Find out the location of the emergency power supply switch in the room before installation. First cut off the power supply in case of an accident.
- Be sure to make a careful check before you shut down the power supply.

- Do not place the device in a damp/wet location. Do not let any liquid enter the device.
- Keep the device far away from the grounding or lightning protection devices of power device.
- Keep the device away from high-power radio stations, radar stations, and high-frequency high-current devices.

2.2 Installation Environment Requirements

To ensure normal operation and a prolonged useful life of the device, the installation site must meet the following requirements.

2.2.1 Environment

- Install the device in a well-ventilated environment. If it is installed in a closed room, make sure there is a good cooling system.
- Make sure the site is sturdy enough to support the device and its accessories.
- Make sure the site has enough space for installing the device and leave sufficient space around the device for ventilation.

2.2.2 Surge Protection

- When the connection cable between the main grounding conductor and local equipotential earthing terminal board (LEB) on each floor is shorter than 2 meters, use a stranded copper wire with a sectional area not less than 1.318 mm^2 (16 AWG) for the connection cable.
- Use a shielded network cable if possible, ensure that devices connected to both ends of the shielded network cable are reliably grounded, and make sure that the sheath of the shielded network cable is also grounded if possible. If no shielded network cable is available, wire the network cable through a steel pipe and bury the steel pipe for lead-in, and properly ground both ends of the steel pipe.
- No additional lightning protector is required as a high-profile lightning protector is built in the device and the antenna port and power port support 4kV lightning protection. If a lightning protector of a higher profile is available, configure the lightning protector optionally. Before the configuration, connect the lightning protector to the ground cable.

2.2.3 Temperature and Humidity

To ensure the normal operation and prolonged service life of the device, maintain an appropriate temperature and humidity in the equipment room. The equipment room with too high or too low temperature and humidity for a long period may damage the device.

- In an environment with high humidity, the insulating material may have bad insulation or even leak electricity and sometimes the materials may suffer from mechanical performance change and metallic parts may get rusted.
- In an environment with low humidity, the insulating strip may dry and shrink, and static electricity is prone to occur and damage the internal circuits of the device.
- In an environment with high temperature, the device is subjected to even greater harm, as its performance may degrade significantly and its useful life may be shortened in the case of long-term exposure that expedites the aging process.

Table 2-1 Temperature and Humidity Requirements

Operating Temperature	Operating Humidity:
–30°C to +65°C (–22°F to +149°F)	5% RH to 95% RH (non-condensing)

2.2.4 Anti-interference

- Take interference prevention measures for the power supply system.
- Keep the device away from the grounding facility or lightning and grounding facility of the power device as much as possible.
- Keep the device far away from high-power radio stations, radar stations, and high-frequency high-current devices.

2.3 Tools

Table 2-2 Tools

Common Tools	Marker, Philips screwdriver, drill, hammer, hose clamp, related copper and fiber cables, diagonal pliers, cable ties
Special Tools	Anti-ESD gloves, wire stripper, crimping plier, RJ45 crimping plier, wire cutter, and waterproof adhesive tape
Meters	Multimeter, network cable tester
Relevant Devices	PC, display, and keyboard

Note

The RG-EST350G wireless bridge is not shipped with a tool kit. You need to prepare a tool kit by yourself.

2.4 Checking Before Installation

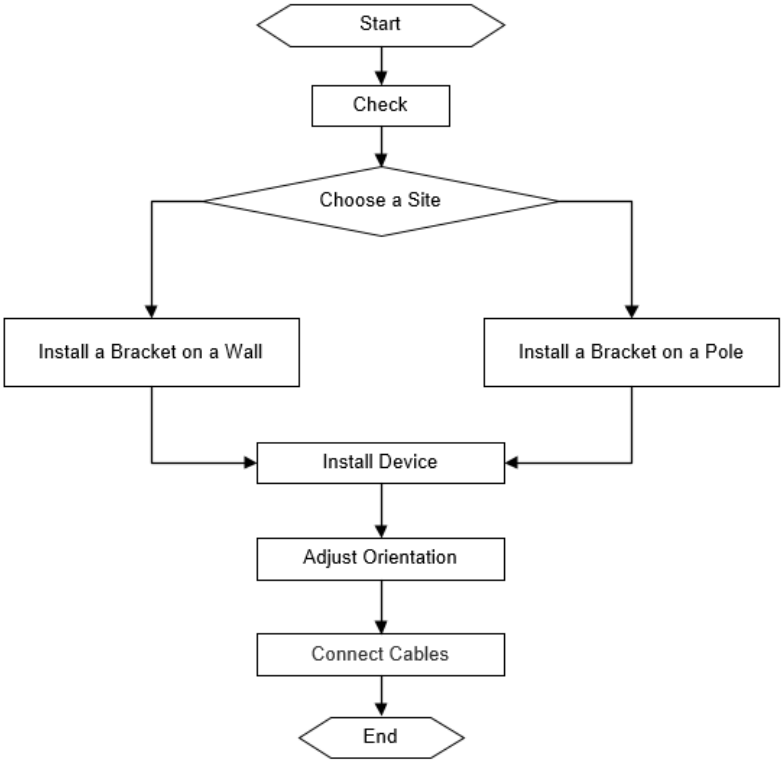
After unpacking the product, carefully inspect each item in accordance with the provided package contents. If any inconsistencies are found, please contact our local distributor.

3 Installation

Caution

Before installing the device, make sure you have carefully read the requirements described in Chapter 2.

3.1 Installation Procedure



3.2 Before You Begin

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

- The installation site provides sufficient space for heat dissipation.
- The installation site meets the temperature and humidity requirements of the device.
- The power supply and required current are available in the installation position.
- The selected power supply modules meet the system power requirement.
- The network cables have been deployed in the installation position.
- The installation site meets all described requirements.
- The device meets the customers' requirements.

3.3 Safety Precautions During Installation

The device can be mounted on a wall or a pole with adiameter of 35 mm to 89 mm (1.38 in. to 3.50 in.). If the diameter of the pole is out of the range, the customer should prepare a hose clamp. In this case, we strongly recommend you to use a hose clamp with thickness of 2.5 mm (0.10 in.) at least. Otherwise, the device may fall down and cause injuries. To ensure minimal interference when installing multiple wireless bridges in close proximity, maintain a horizontal installation distance of at least 2 meters (6.56 ft), or a vertical installation distance of at least 0.5 meters (1.64 ft) between each wireless bridge. Ensure that the horizontal angle formed by the two wireless bridges is greater than 120 degrees. The specific installation location of the wireless bridge should be determined by professionals after conducting a thorough site survey.

Before installation, ensure that the installation location meets the requirements in 2.2 Installation Environment Requirements, and pay attention to the following:

- Use the supplied 24 V/0.6 A DC power adapter or an equivalent power source with the same specifications to power the equipment. Do not use adapters with different specifications.
- When the equipment is powered by 24 V passive PoE and is operating under full load (with simultaneous 2.4 GHz, 5 GHz, and wired connectivity), the maximum recommended cable length for the Cat5e cable is 80 m (262.47 ft).
- Ensure that the Ethernet cable and power cord are securely connected.

3.4 Mounting the Device

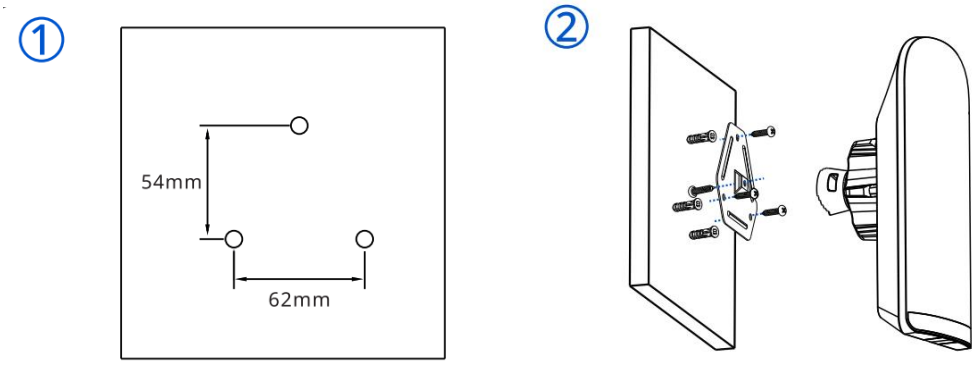
Caution

- 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.

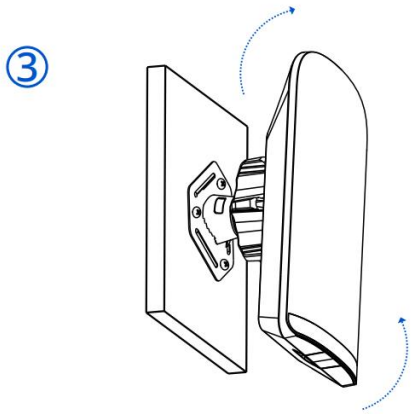
3.4.1 Wall Mounting

(1) Secure the mounting bracket on the wall.

(2) Install the device to the mounting bracket.

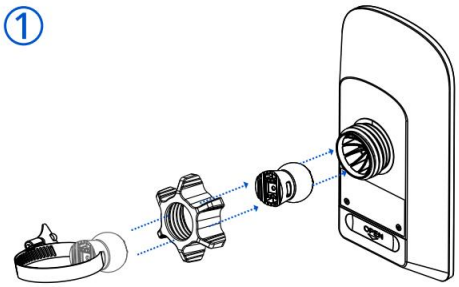


(3) Adjust the orientation.

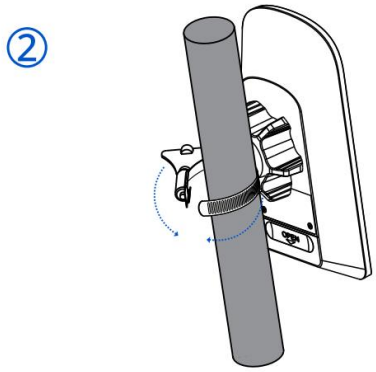


3.4.2 Pole Mounting

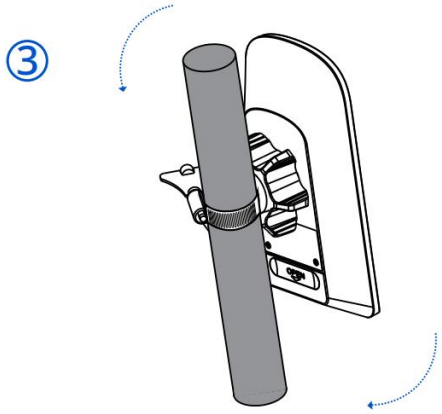
(1) Install the device to the mounting bracket.



(2) Secure the mounting bracket to the pole by threading a clamp through the mounting bracket.



(3) Adjust the orientation.



3.5 Connecting Cables

(1) Select or make a cable (CAT5e or higher) according to the distance between the wireless bridge and the PoE injector.

(2) Connect one end of the Ethernet cable to the PoE port of the 1000 Mbps passive PoE injector, and the other end to the LAN1/PoE port on the bridge. Connect the LAN port of the 1000 Mbps passive PoE injector to a server or IP camera using another Ethernet cable. Connect the 24 V/0.6 A DC power adapter to the DC power connector of the PoE injector for power supply. Alternatively, connect a 12 V DC solar panel to the DC connector of the bridge for power supply. Then, connect a LAN port on the bridge to a server or IP camera using an Ethernet cable.

Figure 3-1 Connecting the Ethernet Cable to the Passive PoE Injector

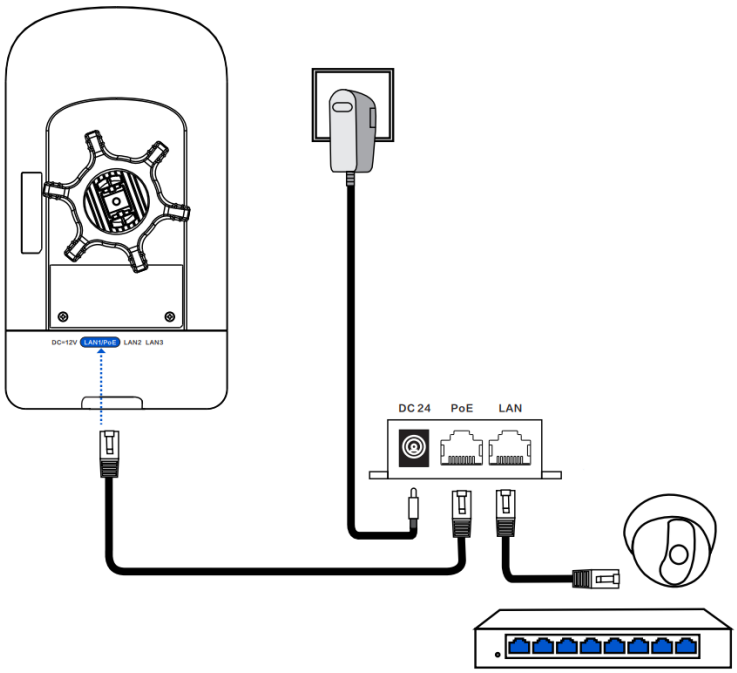
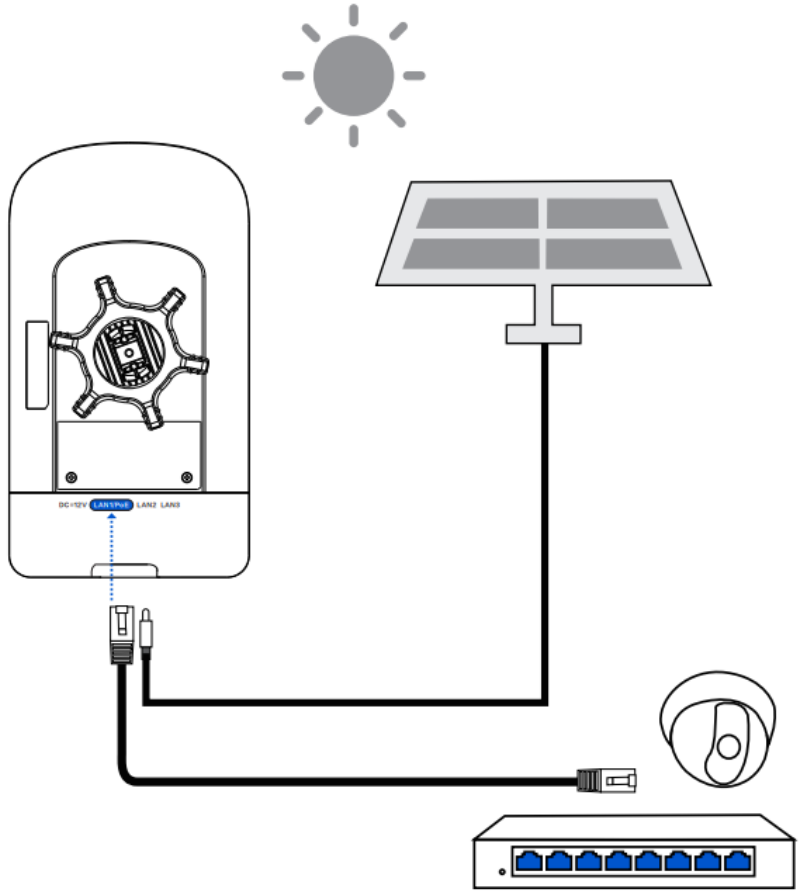


Figure 3-2 Connect the Ethernet cable to a solar panel



Solar Panel

Solar panels convert light energy from sunlight into electrical energy. The EST350G requires a solar power panel with an output specification of 12V/1.2A DC.

Notes for Installing the Solar Panel

Because the sun's position differs between the Northern and Southern Hemispheres, the solar panel should face south in the Northern Hemisphere and north in the Southern Hemisphere to achieve optimal power output. Additionally, the tilt angle of the solar panel affects the efficiency of solar energy conversion. The optimal tilt angle varies with latitude. The following table shows the optimal tilt angles for different latitude ranges.

Latitude Range	Optimum Tilt
0°–10°	10°–20°
10°–20°	20°–30°
20°–30°	30°–40°
30°–40°	40°–50°

40°–50°	50°–60°
50°–60°	Approximately 60°

Warning

- Remember to install the bottom cover for waterproof and dustproof purpose.
- Please do not use a switch or a PoE injector of another model. Otherwise, the device may be damaged.

3.6 Verifying the Installation

(1) Check the device

- Verify that the external power supply matches the specification.
- Verify that the device is firmly and reliably secured.

(2) Check the power supply

- Verify that the power cord is properly connected and meet safety requirements.
- Verify that the device works properly after power-on.

4 Debugging

4.1 Power-On

(1) Checklist Before Power-On

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

(2) Recommended: After the bridge is powered on, check whether the LED status is normal.

4.2 Configuring the Bridge

- Method 1: Configure the bridge through Ruijie Reyee App

(1) The power cord is properly connected.

(2) Scan the QR code on this page or on the device to download and install Ruijie Reyee App.

(3) Log in to Ruijie Reyee App.

- Method 2: Log in to eWeb for configuration

(1) Connect the LAN port of the bridge to a PC using an Ethernet cable for wired connection, or connect your smartphone or PC to the device's SSID (default SSID: @Ruijie-bxxxx) for wireless connection.

(2) Enter **https://10.44.77.254** in a browser to access the device's eWeb.

(3) Enter the device password (default password: admin) and click **Login** to log in to eWeb for configuration.

Caution

- Enter the initial password **admin** to log in and begin configuration.
- To ensure device security, set a password after login and change the password regularly.

5 Monitoring and Maintenance

5.1 Monitoring

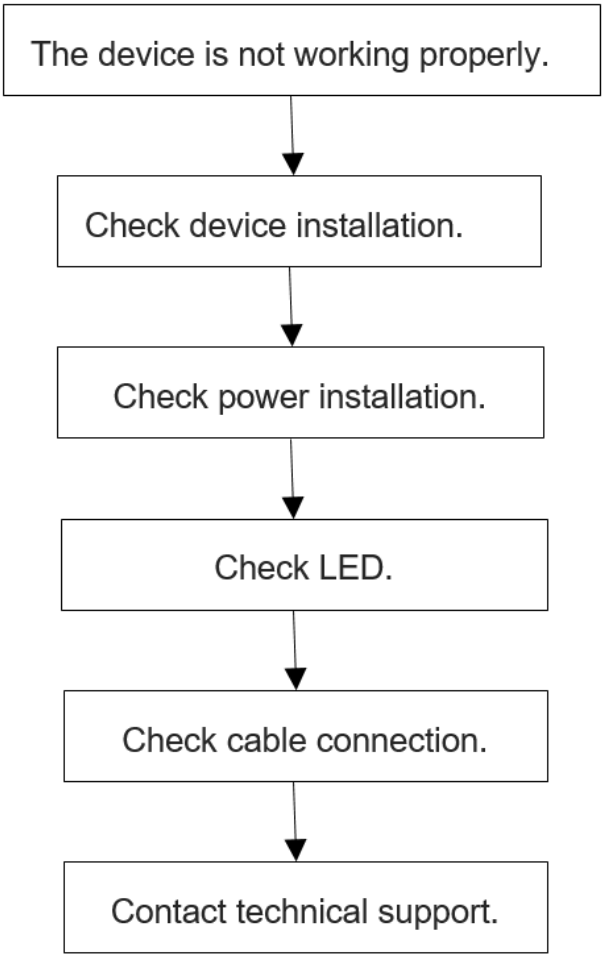
When the RG-EST350G is running, you can monitor the device status by observing the indicator.

5.2 Maintenance

If a hardware error occurs, please contact Ruijie Reyee Technical support for help.

6 Troubleshooting

6.1 General Troubleshooting Procedure



7 Appendix A Connectors and Media Description

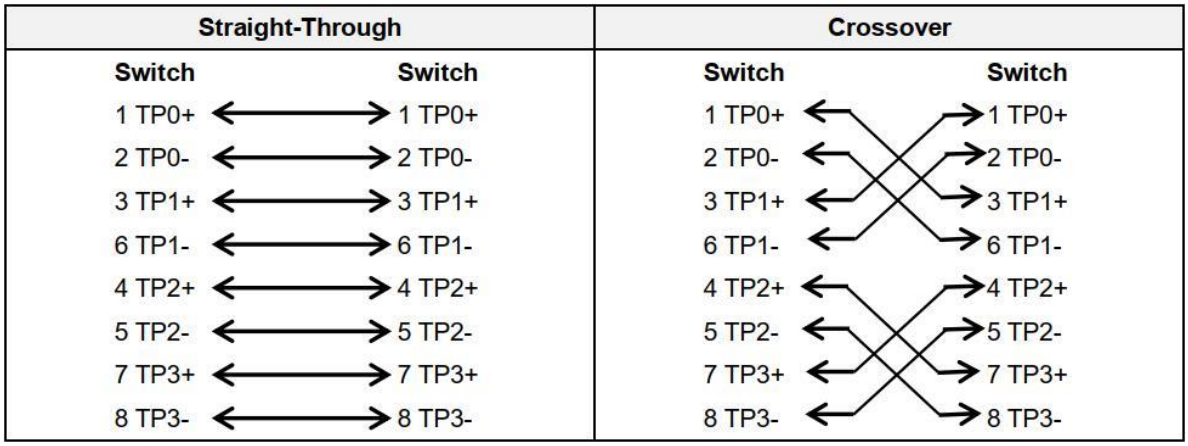
1000BASE-T/100BASE-TX/10BASE-T

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

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

1000BASE-T requires all four pairs of wires be connected for data transmission, as shown in Figure 7-1.

Figure 7-1 1000BASE-T Connection



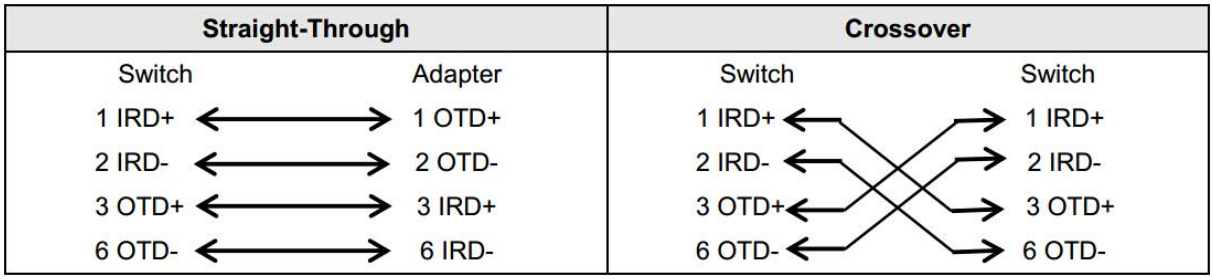
10BASE-T uses Category 3, 4, 5 100-ohm UTP/STP and 1000BASE-T uses Category 5 100-ohm UTP/STP for connections. Both support a maximum length of 100 meters. Figure 7-2 shows100BASE-TX/10BASE-T pin assignments.

Figure 7-2 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 7-3 shows wiring of straight-through and crossover cables for 100BASE-TX/10BASE-T.

Figure 7-3 100BASE-TX/10BASE-T Connection



Contents

1 Product Introduction

1.1 Overview

The RG-EST450G wireless bridge is launched by Ruijie Reyee. It utilizes the IEEE 802.11ac standard for efficient and reliable communication. Operating in the 5 GHz band and supporting 2x2 MIMO technology, this product delivers a maximum wireless rate of 867 Mbps for bridging services, ensuring more than sufficient bandwidth for delivering point to point (PTP) and point to multi-point (PTMP) services. The RG-EST450G utilizes the 2.4 GHz band in single-stream mode for bridge management, while the 5 GHz band is used for data transmission.

1.2 Package Contents

Table 1-1 Package Contents

No.	Item	Quantity
1	RG-EST450G Wireless Bridge	1
2	24 V DC/0.6 A Power Adapter	1
3	1000 Mbps Passive PoE Injector	1
4	Universal Joint	1
5	Universal Joint Nut	1
6	Hose Clamp	1
7	Mounting Bracket	1
8	Product Manual	1
9	Warranty Card	1
10	Wall Anchor	3
11	Phillips Pan Head Screw (ST4.2x19)	4

Note

The package contents above are intended to provide a general overview, and are subject to the terms of the order contract. Please check your goods carefully against the package contents or order contract. If you have any questions, please contact the distributor.

1.3 Appearance

1.3.1 Appearance

Figure 1-1 Appearance of the RG-EST450G Wireless Bridge

Front view

Back view

Note

The label is located on the back of the device.

1.3.2 Ports, Buttons and LEDs

Figure 1-2 Ports, Buttons and LEDs of the RG-EST450G Wireless Bridge

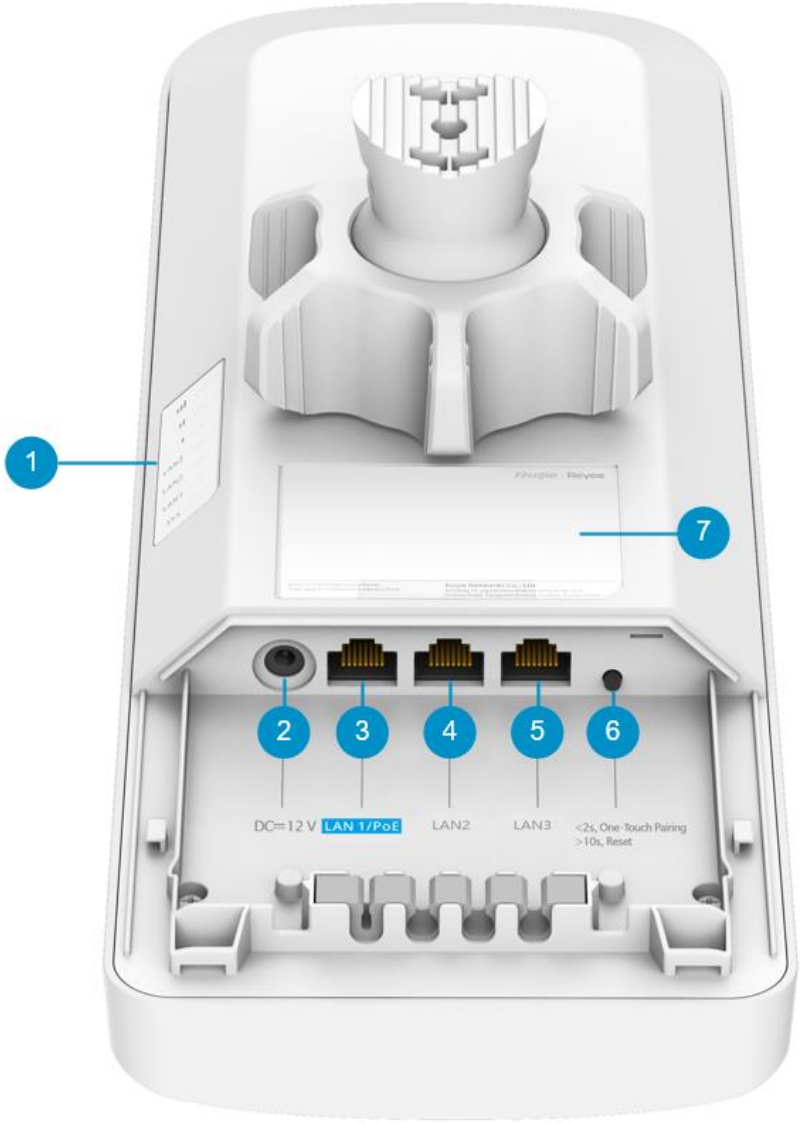


Table 1-2 Ports, Buttons and LEDs of the RG-EST450G Wireless Bridge

Mark	Item	Description
1	Status LEDs	7 status LEDs, including 1 x system LED, 3 x port LEDs and 3 x signal LEDs
2	12 V DC connector	Support 12 V/1.2 A DC power supply
3	LAN1/PoE Port	10/100/1000BASE-T Ethernet port, support 802.3af/at PoE or 24V⎓0.6A passive PoE
4	LAN2 Port	10/100/1000BASE-T Ethernet port
5	LAN3 Port	10/100/1000BASE-T Ethernet port

Mark	Item	Description
6	Reset/One-Touch Pairing button	● Press and hold the button for less than 2s: The wireless bridge pairs with another wireless bridge (the LED blinks during pairing). ● Press and hold the button for 2s to 10s: No action is triggered. ● Press and hold the button for more than 10s: Restores the wireless bridge to factory settings.
7	Label	Contains the product name, model, I/O parameters, default IP address, and other information.

Note

- After the One-Touch Pairing button is pressed, the wireless bridge is switched to the BaseStation mode regardless of whether it was in BaseStation or CPE mode.
- During one-touch pairing, the signal LEDs on the wireless bridge in BaseStation mode blink for 1 minute (it will stop blinking after 1 minute if no bridge connection is established). The signal LEDs on the bridge in CPE mode also blink until the pairing is complete.
- Only a bridge that has been reset to factory settings and has not been bridged before can be switched to the CPE mode through one-touch pairing.
- The one-touch pairing feature is enabled by default and can be disabled through eWeb.
- One-touch pairing is disabled during interference scanning.

Table 1-3 LEDs

LED	Status	Description
System LED	Solid green	The device is operating normally.
	Blinking	● Fast blinking (8 to 10 times/second): The device is starting up. ● Fast blinking (2 times/second): The device is initializing. ● Fast blinking (2 times/second): The device is upgrading.
	Off	The device is NOT receiving power.
LAN1/LAN2/LAN3 port LED	Solid green	A valid link is established, but the port is not receiving or sending data.
	Blinking green	A valid link is established, and the port is receiving or sending data.
	Off	No link is established.
Signal LEDs	Off	The device is not bridged.
	LED 1 on/blinking	The device is bridged and the RSSI is below –75 dBm.

LED	Status	Description
	LED 1 on	The RSSI is above –75 dBm.
	LED 1 on, LED 2 blinking	The RSSI is above –73 dBm.
	LEDs 1 and 2 on	The RSSI is above –71 dBm.
	LEDs 1 and 2 on, LED 3 blinking	The RSSI is above –68 dBm.
	LEDs 1, 2, and 3 on	The RSSI is above –64 dBm.
	LEDs 1, 2, and 3 blinking	The mesh pairing is in progress.

1.4 Technical Specifications

Table 1-4 Specifications

Model	RG-EST450G
Radio Design	● 2.4 GHz: single-stream ● 5 GHz: dual-stream 2x2 MIMO
Protocol and Standard	● 5 GHz: 802.11ac/n/a ● 2.4 GHz: 802.11b/g/n
Operating Frequency Bands	● 2.4 GHz: 802.11 b/g/n: 2.4000 GHz to 2.483 GHz ● 5 GHz: 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** Country-specific restrictions apply. ● European Union & United Kingdom: 2400 MHz to 2483.5 MHz, EIRP ≤ 20 dBm; 5470 MHz to 5725 MHz, EIRP ≤ 30 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; 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; 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
Antenna Type	Built-in antenna (horizontal/vertical): 120°/13°
Antena Gain	● 2.4 GHz: 2 dBi ● 5 GHz: 15 dBi
Working Distance	5 km (3.11 mi)

Model	RG-EST450G
Data Rate	● 2.4 GHz: 150 Mbps ● 5 GHz: 867 Mbps
Modulation Technology	● OFDM: BPSK@6/9 Mbps, QPSK@12/18 Mbps, 16-QAM@24/36 Mbps, 64-QAM@48/54 Mbps ● MIMO-OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
Receive Sensitivity	● 11a: -89 dBm (6 Mbps), –80 dBm (24 Mbps), –76 dBm (36 Mbps), –71dBm (54 Mbps) ● 11n: –83 dBm@MCS0, –65 dBm@MCS7, –83 dBm@MCS8, –65dBm@MCS15 ● 11ac: –86 dBm (MCS0), –63 dBm (MCS9)
Max. Transmit Power	● 2.4 GHz: 100 mW ● 5 GHz: 400 mW (26 dBm) (single stream)
Power Step	1 dBm
Dimensions (W x D x H)	355 mm x 124 mm x 48 mm (13.98 in. x 4.88 in. x 1.89 in.) (excluding the mounting bracket)
Weight	0.83 kg (1.83 lbs.) (excluding packaging materials) 1.61 kg (3.55 lbs.) (including packaging materials)
Service Ports	3 x 10/100/1000BASE-T auto-negotiation ports, where LAN1/PoE port supports 24 V PoE input
Buttons	1 x Reset/One-Touch Pairing button
LED	1 x system LED, 3 x port LEDs, and 3 x signal LEDs
Power Supply	● 24 V passive PoE power supply (A passive PoE injector is delivered with the wireless bridge.) ● 12 V DC (solar panel)
Max. Power Consumption	< 12 W
Environment	Operating temperature: –30°C to +65°C (–22°F to +149°F)
	Storage temperature: –40°C to +85°C (–40°F to +185°F)
	Operating humidity: 5% RH to 95% RH (non-condensing)
	Storage humidity: 5% RH to 95% RH (non-condensing)
Mounting	● Wall-mount ● Pole-mount
IP Rating	IP55
Certification	CE
MTBF	> 400000 hours

Warning

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

Note

The weight refers to the weight of the main unit.

1.5 Power Supply Technical Specifications

The RG-EST450G can be powered by 12 V/1.2 A DC power supply, 24 V passive PoE power supply, and IEEE 802.3at/af-compliant PoE power supply. It is supplied with a 24 V/0.6 A DC power adapter and a 1000 Mbps passive PoE injector.

- Technical specifications of the DC adapter:

Inner Diameter	Outer Diameter	Depth
2.10 mm ± 0.05 mm (0.083 in. ± 0.002 in.)	5.50 mm ± 0.05 mm (0.22 in. ± 0.002 in.)	10 mm (0.35 in.)

Warning

- For DC power supply, the DC adapter required for this wireless bridge is not included in the package. You can purchase the DC adapter separately from us.
- For PoE power supply, use the provided PoE injector in the package. Do not use other models of PoE injectors or switches for power supply as it may lead to irreparable damage to the device.
- When using a DC power supply to power the device, ensure that the power output of the DC power supply is less than 100 W.

2 Preparing for Installation

2.1 Safety Precautions

Note

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

2.1.1 General Safety Precautions

- Do not expose the device to high temperature, dusts, or harmful gases. Do not install the device in an inflammable or explosive environment. Keep the device away from EMI sources such as large radar stations, radio stations, and substations. Do not subject the device to unstable voltage, vibration, and noises.
- The installation site should be far away from the sea. Keep the device at least 500 meters (1640 ft.) away from the seaside and do not face it toward the wind from the sea.
- The installation site should be free from water flooding, seepage, dripping, or condensation. The installation site shall be selected according to network planning and features of communications device, and considerations such as climate, hydrology, geology, earthquake, electric power, and transportation.

Caution

Please follow the correct procedures described in this installation guide to install and remove the device.

2.1.2 Handling Safety

- Avoid frequently handling the device.
- Cut off all the power supplies and unplug all power cords before moving or handling the device.

2.1.3 Electrical Safety

Warning

- Improper or incorrect electrical 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 via wet objects may cause fatal dangers.

- Observe local regulations and specifications during electrical operations. Only personnel with relevant qualifications can perform such operations.
- Check whether there are potential risks in the work area. For example, check whether the power supply is grounded, whether the grounding is reliable, and whether the ground is wet.

2.2 Installation Environment Requirements

To ensure normal operation and a prolonged service life of the device, the installation site must meet the following requirements.

2.2.1 Environment

- Install the device in a well-ventilated environment. If it is installed in a closed room, make sure there is a good cooling system.
- Make sure the site is sturdy enough to support the device and its accessories.
- Make sure the site has enough space for installing the device and leave sufficient space around the device for ventilation.

Bridge Type	Distance Between Base Station and Customer Premises Equipment (CPE)	Recommended Installation Height (Above the Obstacle)
5 GHz bridge	500 m (0.13 mi.)	2.6 m (8.53 ft.)
	1 km (0.62 mi.)	3.5 m (11.48 ft.)
	2 km (1.24 mi.)	5.2 m (17.06 ft.)
	3 km (1.86 mi.)	6.3 m (20.67 ft.)
	4 km (2.49 mi.)	7.3 m (23.95 ft.)
	5 km (3.11 mi.)	8.2 m (26.9 ft.)
	6 km (3.73 mi.)	9 m (29.53 ft.)
	7 km (4.35 mi.)	9.7 m (31.82 ft.)
	8 km (4.97 mi.)	10.5 m (34.45 ft.)
	9 km (5.59 mi.)	11 m (36.09 ft.)
	10 km (6.21 mi.)	11.6 m (38.06 ft.)
	11 km (6.84 mi.)	12 m (39.37 ft.)
	12 km (7.46 mi.)	12.8 m (41.99 ft.)
	13 km (8.08 mi.)	13.3 m (43.64 ft.)
	14 km (8.70 mi.)	13.8 m (45.28 ft.)
	15 km (9.32 mi.)	14.3 m (46.92 ft.)
2.4 GHz bridge	50 m (164.04 ft.)	1.2 m (3.94 ft.)
	100 m (328.08 ft.)	1.7 m (5.58 ft.)
	300 m (984.25 ft.)	3 m (9.84 ft.)

Bridge Type	Distance Between Base Station and Customer Premises Equipment (CPE)	Recommended Installation Height (Above the Obstacle)
	500 m (1640.42 ft.)	4 m (13.12 ft.)

2.2.2 Surge Protection

- When the connection cable between the main grounding conductor and local equipotential earthing terminal board (LEB) on each floor is short, use a stranded copper wire with a sectional area not less than 1.318 mm2 (16 AWG) for the connection cable.
- Use a shielded network cable if possible. Ensure that devices connected to both ends of the shielded network cable are reliably grounded, and that the sheath of the shielded network cable is also grounded if possible. If no shielded network cable is available, wire the network cable through a steel pipe and bury the steel pipe for lead-in, and properly ground both ends of the steel pipe.
- The device has a built-in high-grade surge arrester with a 6KV surge protection capability. Generally, additional surge arrester is not required. If a higher surge protection level is required, a surge arrester can be installed and must be grounded.

2.2.3 Temperature and Humidity

To ensure the normal operation and prolonged service life of the device, maintain an appropriate temperature and humidity in the equipment room. The equipment room with too high or too low temperature and humidity for a long period may damage the device.

- In an environment with high humidity, the insulating material may have bad insulation or even leak electricity and sometimes the materials may suffer from mechanical performance change and metallic parts may get rusted.
- In an environment with low humidity, the insulating strip may dry and shrink, and static electricity is prone to occur and damage the internal circuits of the device.
- In an environment with high temperature, the device is subjected to even greater harm, as its performance may degrade significantly and its useful life may be shortened in the case of long-term exposure that expedites the aging process.

Table 2-1 Temperature and Humidity Requirements

Operating Temperature	Operating Humidity
–30°C to 65°C (–22°F to +149°F)	5% RH to 95% RH (non-condensing)

2.2.4 Anti-Interference

- Take interference prevention measures for the power supply system.
- Keep the device away from the grounding facility or lightning and grounding facility of the power device as much as possible.
- Keep the device away from high-power radio stations, radar stations, and high-frequency high-current

devices.

2.3 Tools

Table 2-2 Tools

Common Tools	Marker, Phillips screwdriver, hammer drill, power cords, Ethernet cables, and diagonal plier
Special Tools	Anti-ESD gloves, wire stripper, crimping plier, RJ45 crimping plier, wire cutter, and waterproof adhesive tape
Meters	Multimeter
Relevant Devices	PC, display, and keyboard

Note

The RG-EST450G wireless bridge is not shipped with a tool kit. You need to prepare a tool kit by yourself.

2.4 Checking Before Installation

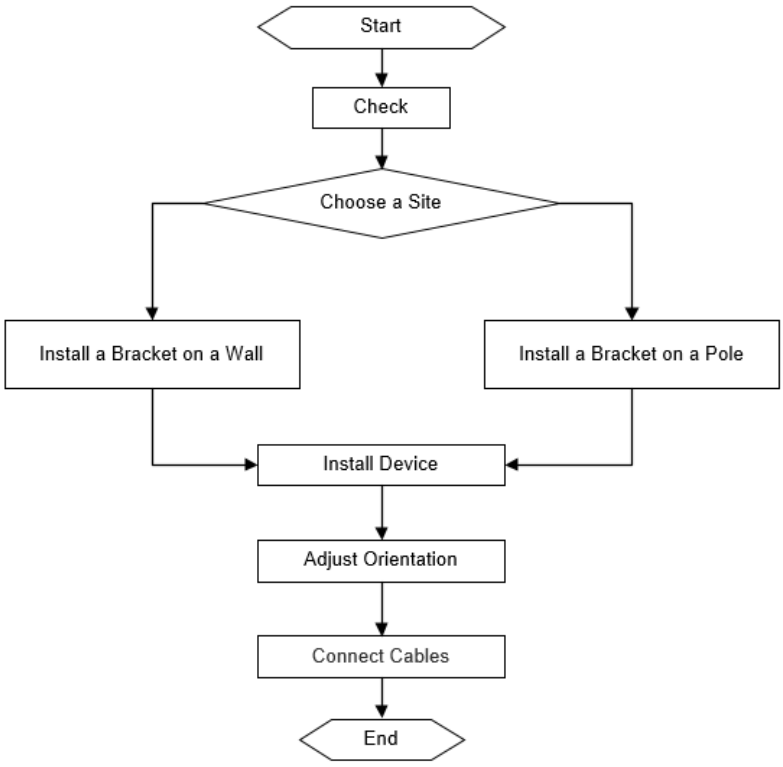
After unpacking the product, carefully inspect each item in accordance with the provided package contents. If any inconsistencies are found, please contact our local distributor.

3 Installation

Caution

Before installing the device, make sure that you have carefully read the requirements described in Chapter 2.

3.1 Installation Procedure



3.2 Before You Begin

Carefully plan and arrange the installation location, networking mode, power supply, and cabling of the device before installation. Confirm the following points before installation:

- The installation site provides sufficient space for heat dissipation.
- The installation site meets the temperature and humidity requirements of the device.
- The power supply and required current are available in the installation site.
- The selected power supply modules meet the system power requirement.
- The network cables have been deployed in the installation site.
- The installation site meets all requirements described in this guide.
- The device meets the customers' requirements.

3.3 Safety Precautions During Installation

To ensure minimal interference when installing multiple wireless bridges in close proximity, maintain a horizontal installation distance of at least 2 meters (6.56 ft), or a vertical installation distance of at least 0.5 meters (1.64 ft) between each wireless bridge. Ensure that the horizontal angle formed by the two wireless bridges is greater than 120 degrees. The specific installation location of the wireless bridge should be determined by professionals after conducting a thorough site survey.

Before installation, ensure that the installation location meets the requirements in 2.2 Installation Environment Requirements, and pay attention to the following:

- Use the supplied 24 V/0.6 A DC power adapter or an equivalent power source with the same specifications to power the equipment. Do not use adapters with different specifications.
- When the equipment is powered by 24 V passive PoE and is operating under full load (with simultaneous 2.4 GHz, 5 GHz, and wired connectivity), the maximum recommended cable length for the Cat5e cable is 80 m (262.47 ft.).
- Ensure that the Ethernet cable and power cord are securely connected.

3.4 Mounting the Device

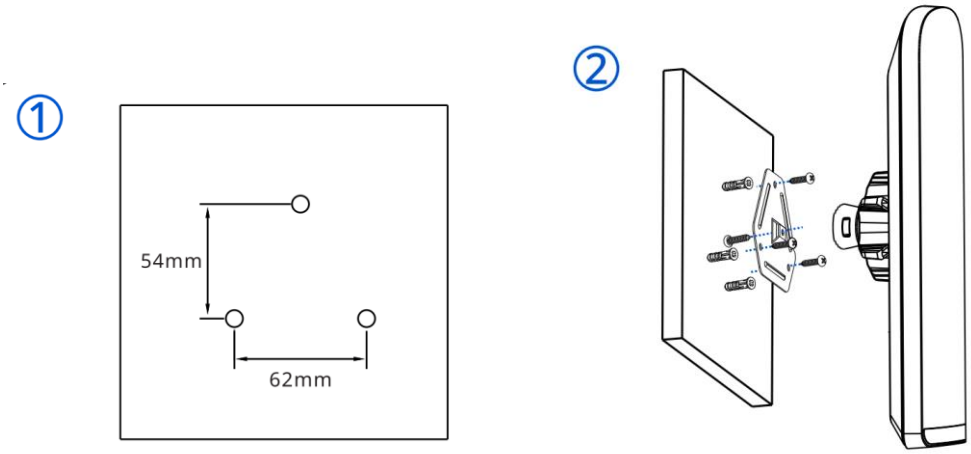
Caution

- 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.

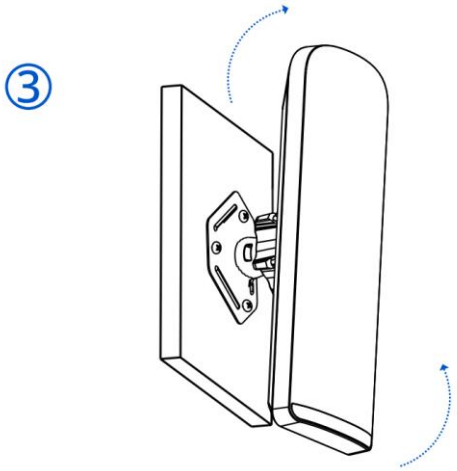
3.4.1 Wall Mounting

(1) Secure the mounting bracket on the wall.

(2) Install the device to the mounting bracket.

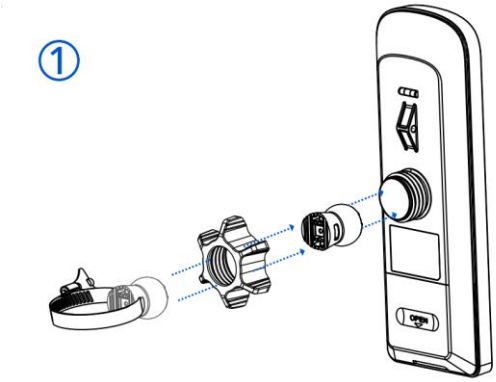


(3) Adjust the orientation.

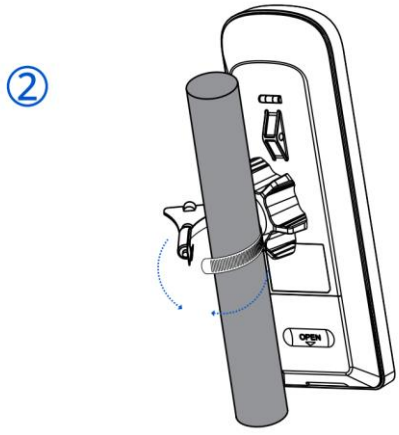


3.4.2 Pole Mounting

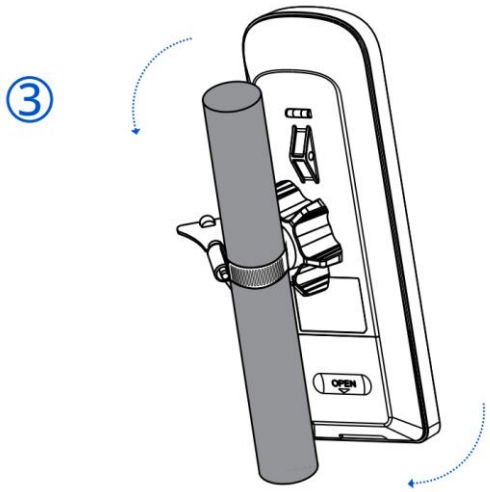
(1) Install the device to the mounting bracket.



(2) Secure the mounting bracket to the pole by threading a clamp through the mounting bracket.



(3) Adjust the orientation.



3.5 Connecting Cables

(1) Select or make an Ethernet cable suitable for the distance between the bridge and the power source equipment. (The bridge supports Cat5e or higher cables up to 100 meters (328.08 ft) for PoE power supply.)

(2) Connect one end of the Ethernet cable to the PoE port of the 1000 Mbps passive PoE injector, and the other end to the LAN1/PoE port on the bridge. Connect the LAN port of the 1000 Mbps passive PoE injector to a server or IP camera using another Ethernet cable. Connect the 24 V/0.6 A DC power adapter to the DC power connector of the PoE injector for power supply. Alternatively, connect a 12 V DC solar panel to the DC connector of the bridge for power supply. Then, connect a LAN port on the bridge to a server or IP camera using an Ethernet cable.

Figure 3-1 Connecting the Ethernet Cable to the Passive PoE Injector

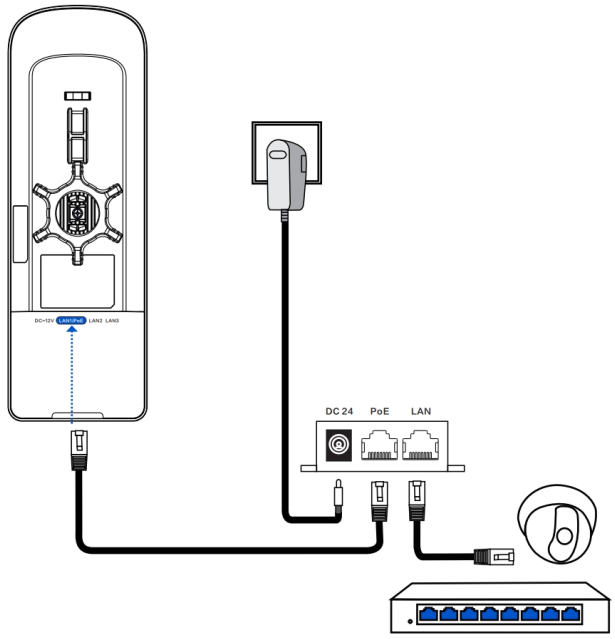
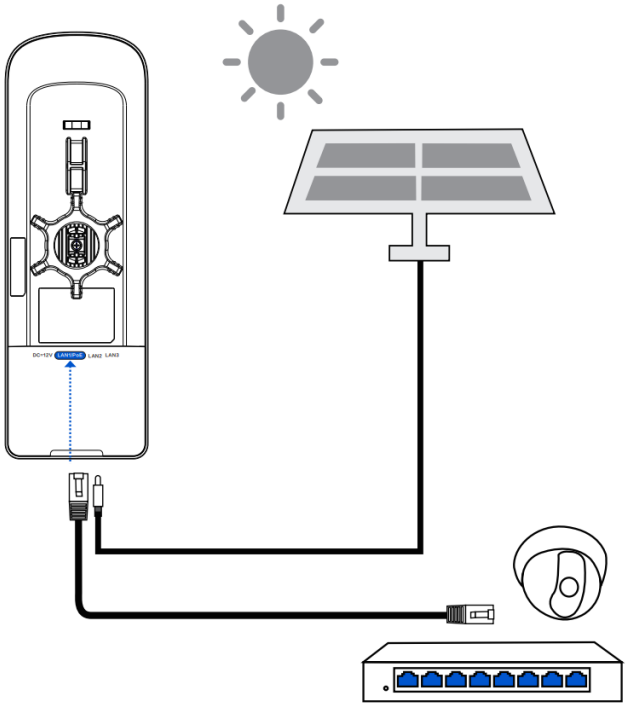


Figure 3-2 Connect the Ethernet cable to a solar panel



Solar Panel

Solar panels convert light energy from sunlight into electrical energy. The EST350G requires a solar power panel with an output specification of 12V/1.2A DC.

Notes for Installing the Solar Panel

Because the sun's position differs between the Northern and Southern Hemispheres, the solar panel should face south in the Northern Hemisphere and north in the Southern Hemisphere to achieve optimal power output. Additionally, the tilt angle of the solar panel affects the efficiency of solar energy conversion. The optimal tilt angle varies with latitude. The following table shows the optimal tilt angles for different latitude ranges.

Latitude Range	Optimum Tilt
0°–10°	10°–20°
10°–20°	20°–30°
20°–30°	30°–40°
30°–40°	40°–50°
40°–50°	50°–60°
50°–60°	Approximately 60°

Warning

- After the Ethernet cable is securely connected to the device, cover the device with a waterproof cover to shield it from potential water and dust damage.

- Do not use other models of PoE injectors or switches for power supply as it may lead to irreparable damage to the device.

3.6 Verifying the Installation

(1) Check the device

- Verify that the external power supply matches the specification.
- Verify that the device is firmly and reliably secured.

(2) Check the power supply

- Verify that the power cord is properly connected and meet safety requirements.
- Verify that the device works properly after power-on.

4 Debugging

4.1 Power-On

(1) Checklist Before Power-On

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

(2) Recommended: After the bridge is powered on, check whether the LED status is normal.

4.2 Configuring the Bridge

- Method 1: Configure the bridge through Ruijie Reyee App

(1) The power cord is properly connected.

(2) Scan the QR code on this page or on the device to download and install Ruijie Reyee App.

(3) Log in to Ruijie Reyee App.

- Method 2: Log in to eWeb for configuration

(1) Connect the LAN port of the bridge to a PC using an Ethernet cable for wired connection, or connect your smartphone or PC to the device's SSID (default SSID: @Ruijie-bxxxx) for wireless connection.

(2) Enter **https://10.44.77.254** in a browser to access the device's eWeb.

(3) Enter the device password (default password: admin) and click **Login** to log in to eWeb for configuration.

Caution

- Enter the initial password **admin** to log in and begin configuration.
- To ensure device security, set a password after login and change the password regularly.

5 Monitoring and Maintenance

5.1 Monitoring

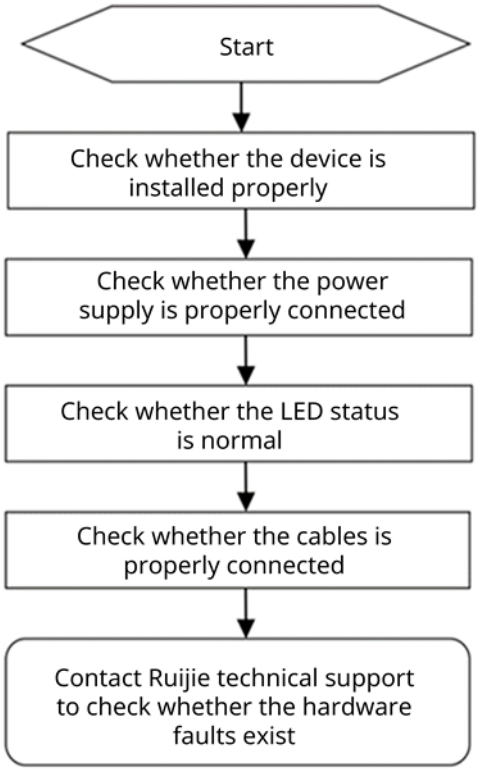
You can observe the LED status to monitor the device in operation.

5.2 Hardware Maintenance

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

6 Common Troubleshooting

6.1 Troubleshooting Flowchart



7 Appendix

7.1 Connectors and Media

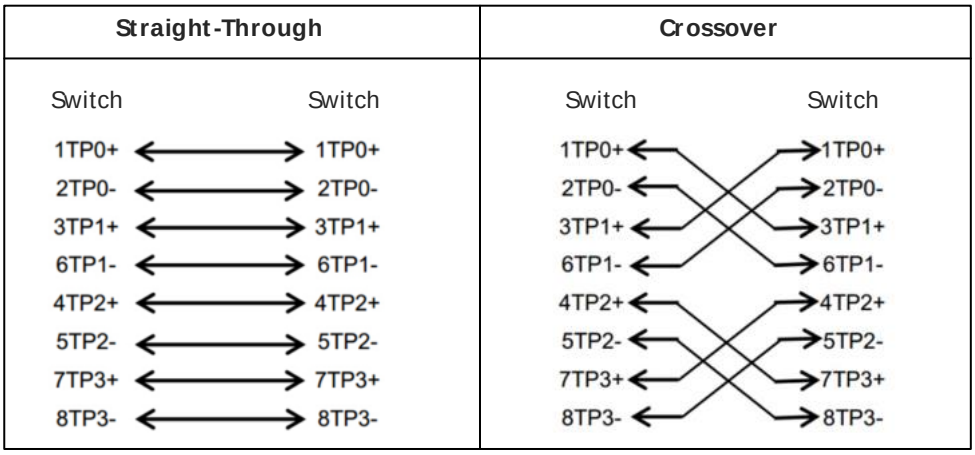
1000BASE-T/100BASE-TX/10BASE-T Port

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

Compliant with IEEE 802.3ab, the 1000BASE-T port 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



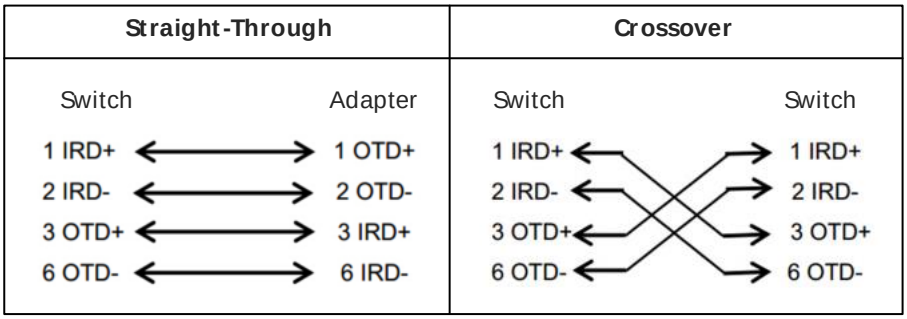
100BASE-TX/10BASE-T can be interconnected using cables of the preceding specifications. For 10 Mbps, the 100BASE-TX/10BASE-T port can be connected using 100-ohm Category 3, Category 4, and Category 5 cables; for 100 Mbps, the 100BASE-TX/10BASE-T port can be connected using 100-ohm Category 5 cables with a maximum connection distance of 100 meters. 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 pair cables for a 100BASE-TX/10BASE-T port.

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



Contents

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1 Change Description

This chapter describes the major changes in software and hardware of different versions and related documentation. For details about hardware changes, see the release notes published with software versions.

1.1 3.0(1)B11P302

1.1.1 Hardware Change

The following table lists the applicable hardware models of this version.

Model	Hardware Version
RG-EST350G	V1.xx
RG-EST450G	V1.xx
RG-EST330F-P	V1.xx

1.1.2 Software Feature Change

This is the baseline version, with no changes to software features.

2 Login

2.1 Configuration Environment Requirements

- Browser: Google Chrome, Internet Explorer 9.0, 10.0, and 11.0, and some Chromium/Internet Explorer kernel-based browsers (such as 360 Extreme Explorer) are supported. Exceptions such as garble or format error may occur if an unsupported browser is used.
- Resolution: 1024 x 768 or a higher resolution is recommended. If other resolutions are used, the page fonts and formats may not be aligned, the GUI is less artistic, or other exceptions may occur.

2.2 Default Configuration

Table 2-1 Default Web Configuration

Item	Default Value
IP address	10.44.77.254
Password	You can enter the initial password "admin" to log in, and directly start the configuration after login.

2.3 Logging In to Web Interface on a PC

2.3.1 Connecting to the Device

You can open the management page and complete the bridge configuration only after connecting a PC to the bridge. You can connect a PC to the bridge in either of the following ways.

- Wired Connection

  Connect a local area network (LAN) port of the bridge to the network port of the PC, and set the IP address of the PC. See 2.3.2 Configuring the IP Address of the Management PC.

- Wireless Connection

  On a mobile phone or laptop, search for wireless network @**Ruijie-b***XXXX*. (XXXX is the last four digits of the MAC address of each device, and the MAC address can be found at the rear side of each bridge.) In this mode, you do not need to set the IP address of the management PC, and you can skip the operation in 2.3.2 Configuring the IP Address of the Management PC.

2.3.2 Configuring the IP Address of the Management PC

Configure an IP address for the management PC in the same network segment as the default IP address of the device (The default device IP address is 10.44.77.254, and the subnet mask is 255.255.255.0.) so that the management PC can access the device. For example, set the IP address of the management PC to 10.44.77.10.

Caution

The IP address of the management PC cannot be set to 10.44.77.253, because this IP address is reserved by the device. If the management PC uses this IP address, it cannot access the device.

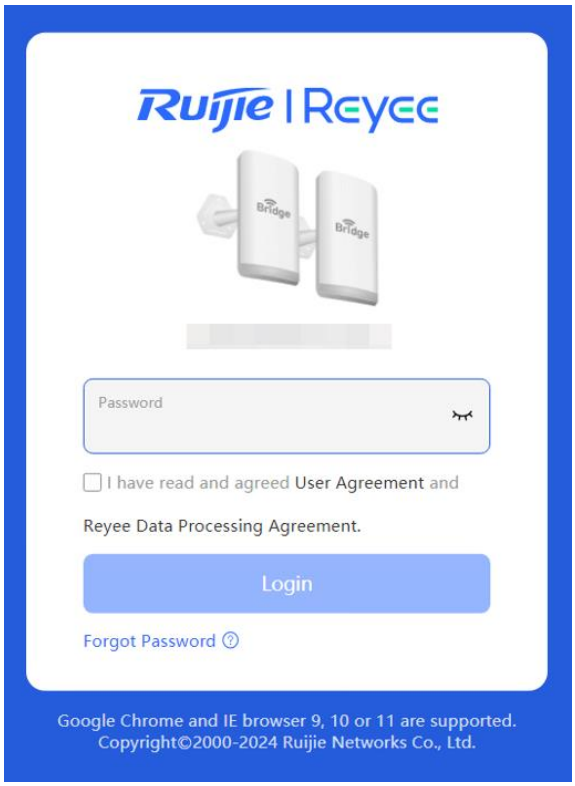
2.3.3 Logging in to the Web Interface

(1) Enter the IP address (10.44.77.254 by default) of the bridge in the address bar of the browser to open the login page.

Note

- By logging in to the IP address 10.44.77.253, you will be redirected to the home page of the primary device on the self-organizing network.
- If the static IP address of the device is changed, or the device obtains a new dynamic IP address, the new IP address can be used to access the web management system of the device as long as the management PC and the device are in the same network segment of a LAN.

(2) On the web page, enter the password and click **Login** to enter the web management system.



Caution

- The default password for the device upon first login is admin. To ensure device security, you need to reset the device password after the first login. For details, see 2.4.2 Configuring Project Settings
- The login page will be locked for 60 seconds if you enter incorrect passwords multiple times. You can press and hold the Reset button on the device for more than 10 seconds when the device is powered on to restore it to factory settings. After the restoration, you can use the default IP address and password for login.
- Restoring factory settings will delete the existing configuration and you are required to configure the device again at your next login. Therefore, exercise caution when performing this operation.

2.4 Initial Setup

Specification

The initial setup page will be displayed only when the device is first configured or restored to factory settings.

2.4.1 Configuration Steps

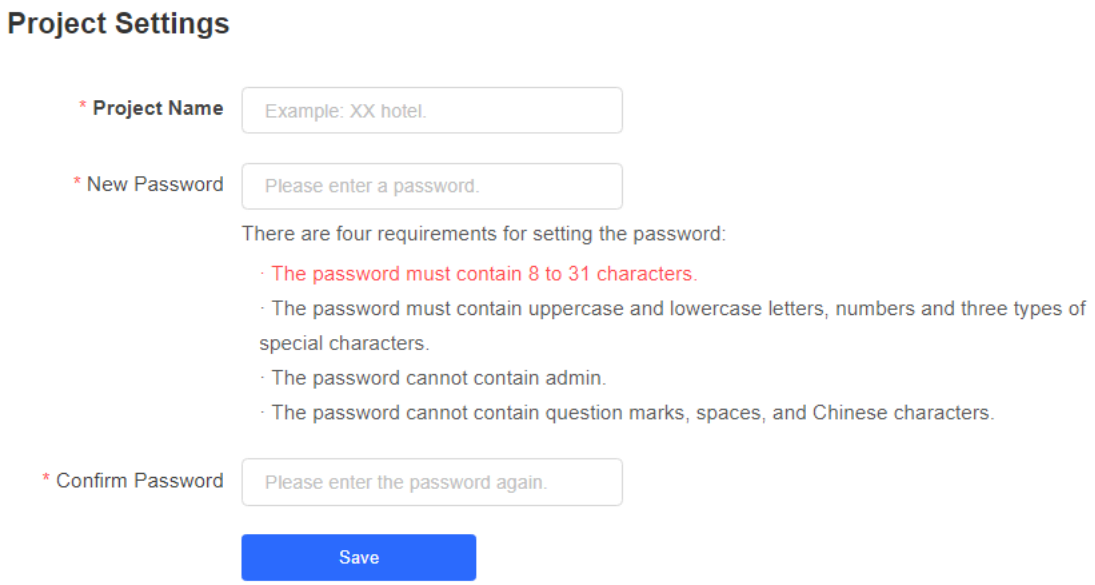
(1) Configure project settings. For details, see 2.4.2 Configuring Project Settings.

(2) Configure the WDS group settings. Based on your usage scenario, choose whether to create a new WDS group or to add devices to an existing one. For creating a new WDS group, see 2.4.3 1. Creating a New WDS Group. For adding devices to an existing WDS group, see 2.4.3 2. Adding Devices to an Existing WDS Group.

2.4.2 Configuring Project Settings

To ensure device security, you need to reset the device password after the first login. Enter the project name and password.

Click **Save**.



2.4.3 Configuring WDS Group Settings

Specification

This step will be skipped if the devices are delivered as a pair or have been bridged using the WDS button.

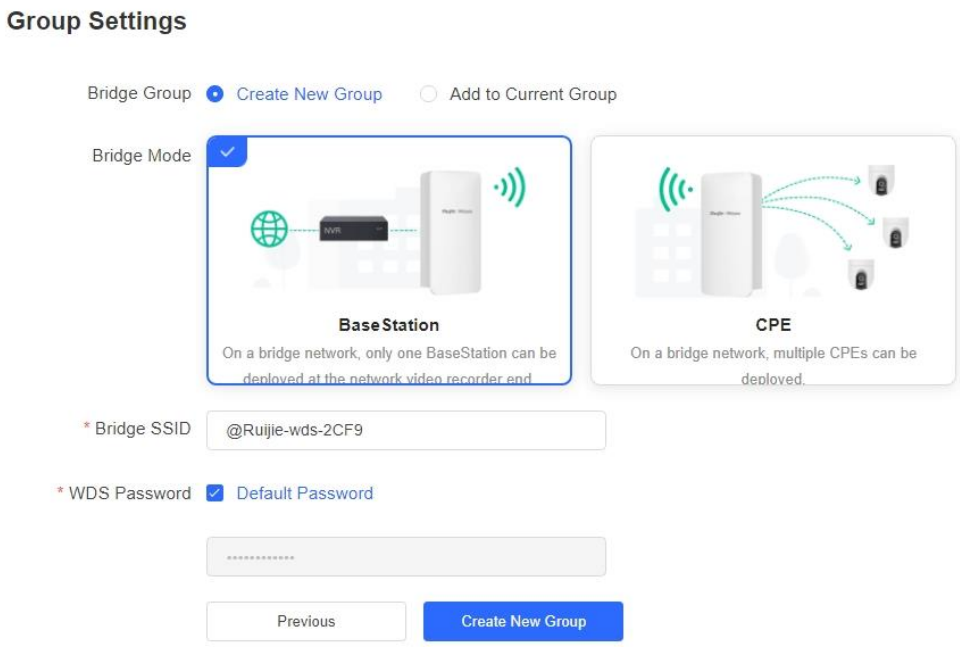
1. Creating a New WDS Group

- **Configuration in BaseStation Mode**

(1) Set **Bridge Group** to **Create New Group**.

(2) Set **Bridge Mode** to **BaseStation**.

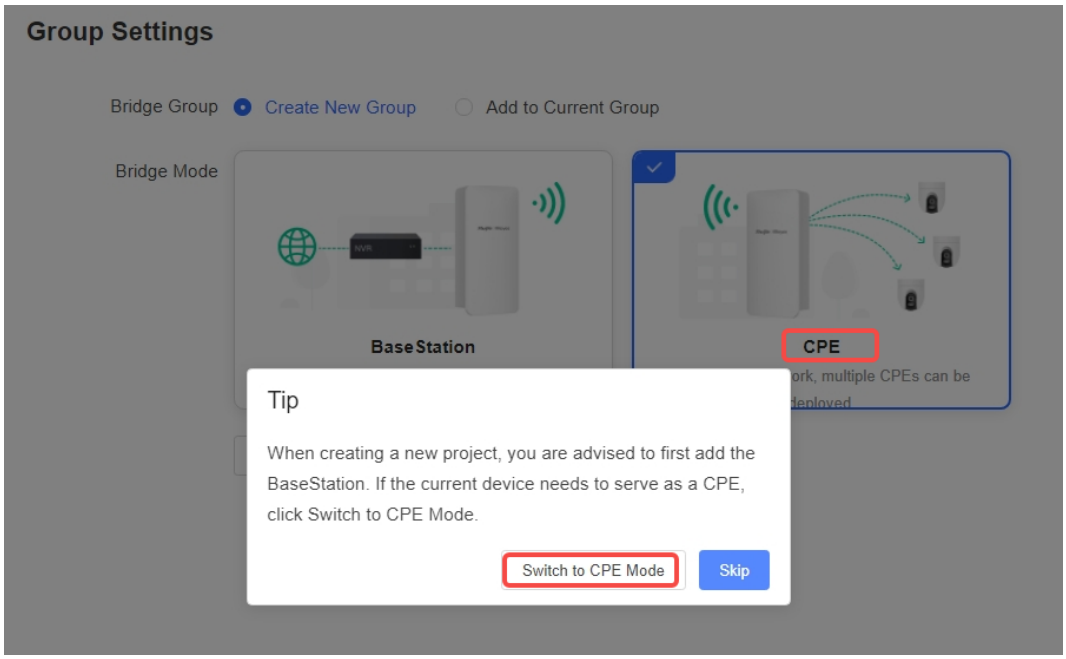
(3) Enter the WDS SSID and WDS password, and click **Create Bridge Group**.



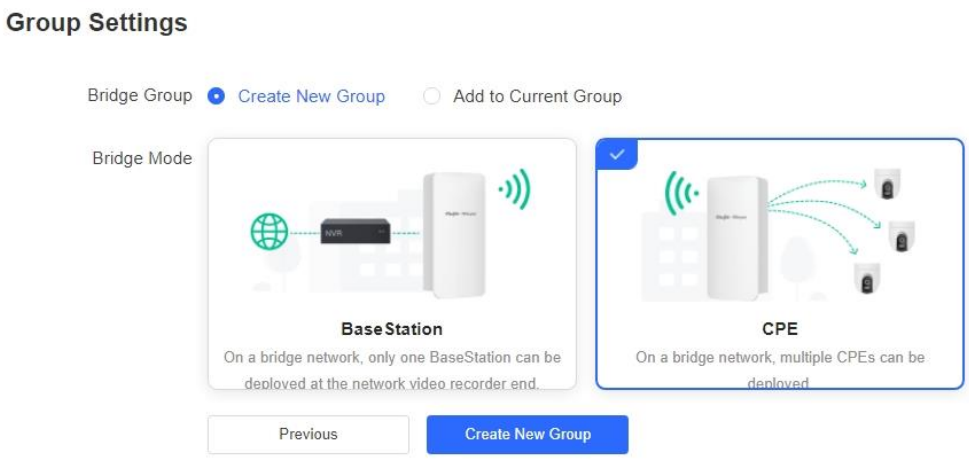
- **Configuration in CPE Mode**

(1) Set **Bridge Group** to **Create New Group**.

(2) Set **Bridge Mode** to **CPE**. A pop-up window is displayed. Click **Switch to CPE Mode**.



(3) Click **Create Bridge Group**.



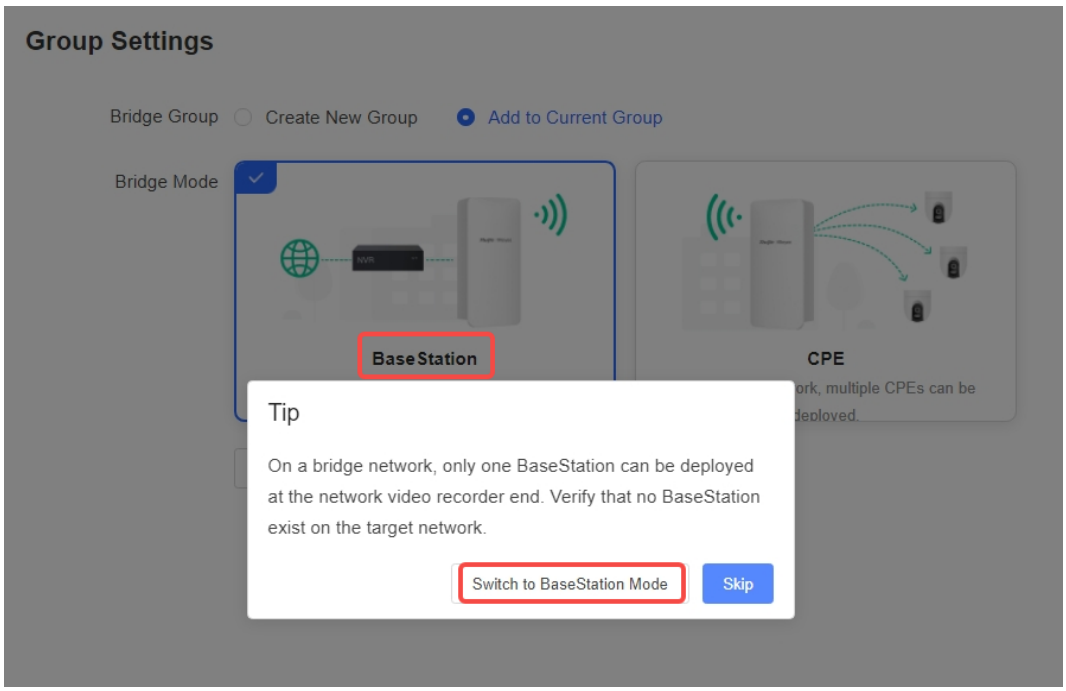
2. Adding Devices to an Existing WDS Group

(1) Set **Bridge Group** to **Add to Current Group**.

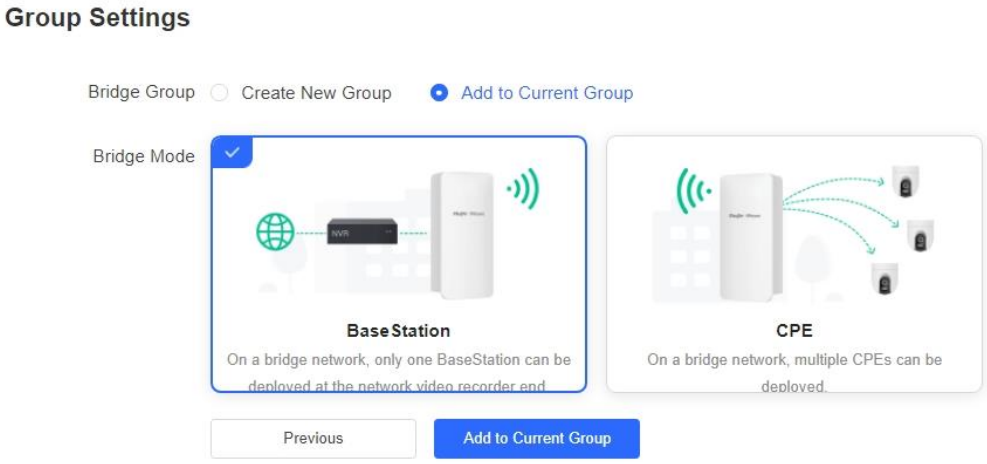
(2) Select the bridge mode.

Note

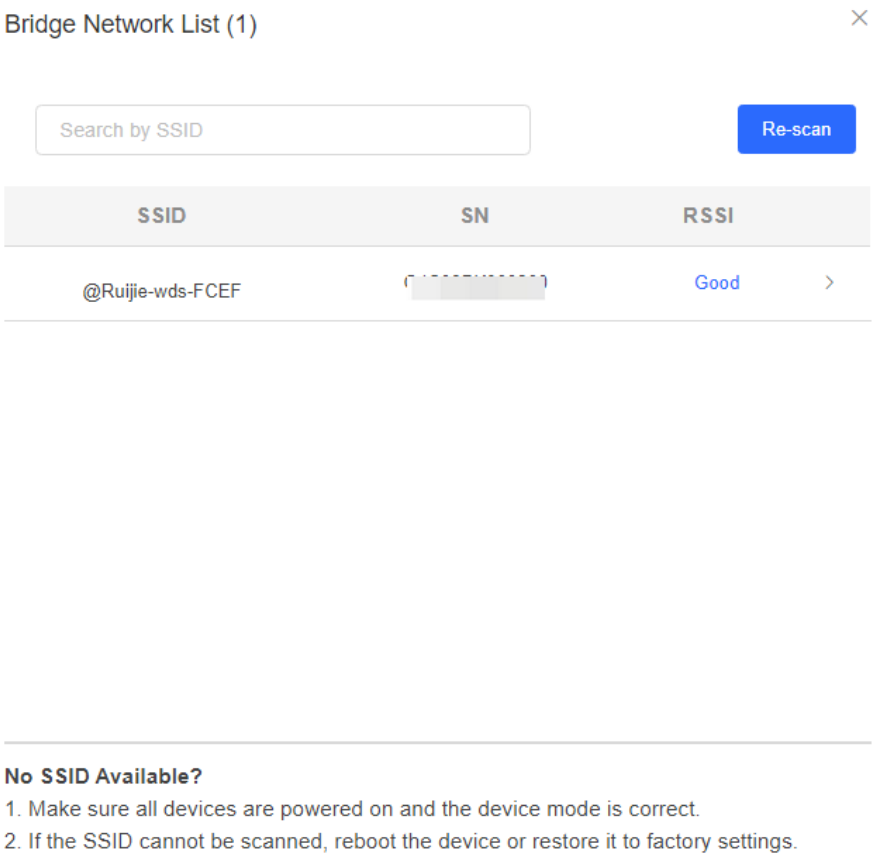
To set the device to the BaseStation mode, click **Switch to BaseStation Mode** on the pop-up window that is displayed.

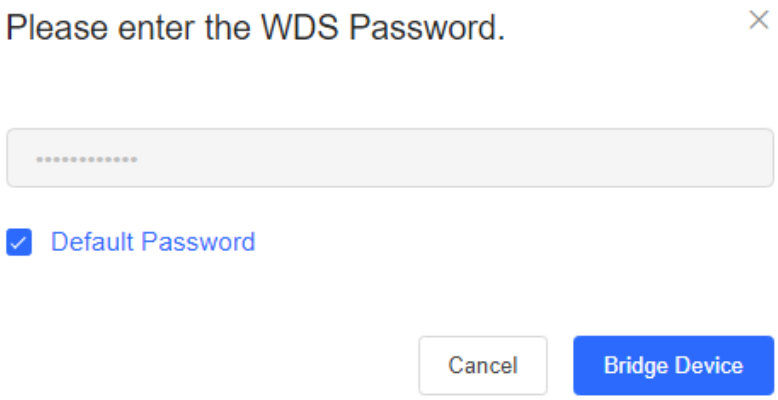


(3) Click **Add to Current Group**.



(4) The device automatically detects available WDS groups. Select the WDS SSID from the **Bridge Network List**, enter the WDS password, and click **Bridge Device**.





2.5 Introduction to the Web Interface

2.5.1 Frequently-Used Controls on the Web Interface

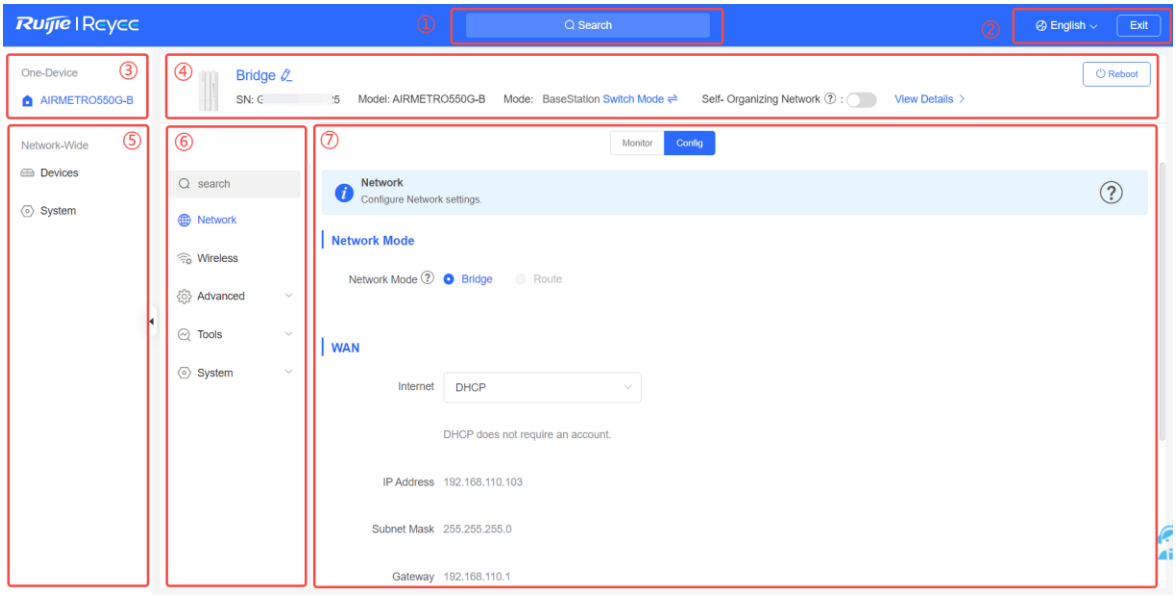
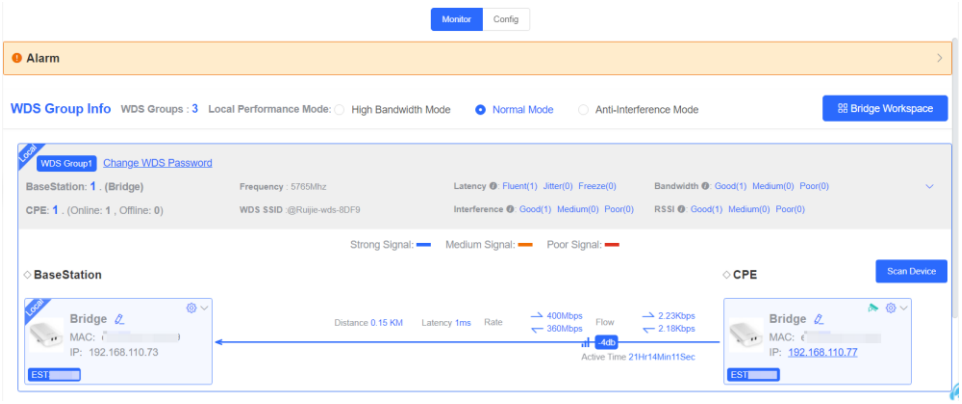


Table 2-2 Frequently-Used Controls on the Web Interface

No.	Description
①	Navigate to common functions of the device, including network-wide management, device, and system functions.
②	Switch the language of the web interface and exit the web interface.
③	Click the device under the **One-Device** menu to access the device monitoring or configuration page. ● When Self-Organizing Network (SON) is enabled: The **One-Device** menu displays the current login device and the primary device on the self-organizing network. If the current login device is the primary device on the self-organizing network, it is indicated by the

No.	Description
	icon. ○ The icon indicates the primary device on the self-organizing network. ○ The icon indicates the current login device. ● When SON is disabled: The **One-Device** menu displays the current login device, indicated by the icon.
④	Current device information, work mode, SON status, and the reboot button.
⑤	The navigation bar for network-wide management, which includes common functions applicable to all devices on the self-organizing network.
⑥	● **Network-Wide**: Displays the navigation bar for managing and configuring all devices on the network. ● **One-Device**: Displays the navigation bar for configuring common functions specific to a single device.
⑦	Device monitoring and configuration interfaces In pane ③, select a device and click **Monitor**. WDS group information related to the device is displayed.  In pane ③, select a device and click **Config**. Click a configuration item in pane ⑥ to configure the corresponding function on the device.

2.5.2 Network-wide Management Interface

Click a configuration item under the **Network-Wide** menu on the left navigation bar to manage and configure devices on the self-organizing network. The configuration functions and displayed content on the network-wide management interface vary depending on whether the primary device on the self-organizing network is an RG-EST series bridge.

1. The Primary Device on the Self-Organizing Network Is a Bridge

When the primary device on the self-organizing network is an RG-EST series bridge, the **Network-Wide** menu only include **Devices** and **System** tabs.

- Network-wide device management

Choose **Network-Wide** > **Devices**.

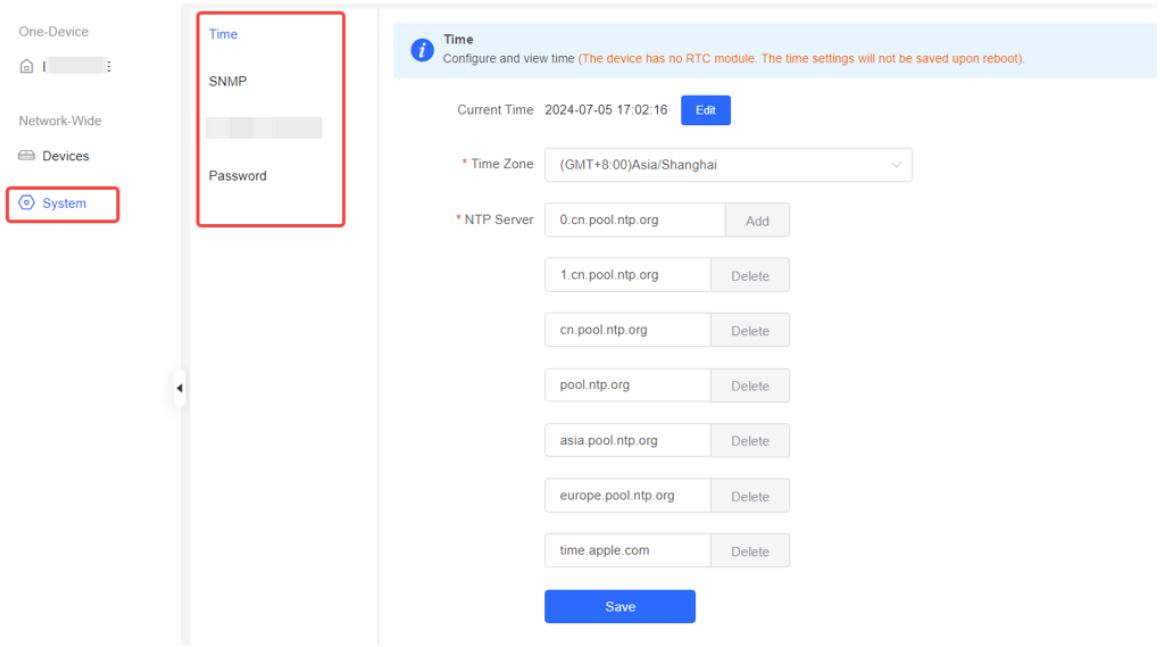
You can view all devices on the self-organizing network on the device list. Click **Manage** or **Reboot** to configure or reboot the selected device.

Note

Configuration and reboot operations are only supported on devices that have SON enabled. For details, see2.6 Self-Organizing Network.

- Network-wide system settings

Choose **Network-Wide** > **System**.



Click **System** under the **Network-Wide** menu. Select a tab from the navigation bar on the right to configure and manage devices on the network.

(1) **Time**: For details, see 8.5 Configuring System Time.

(2) **SNMP**: For details, see 8.9 Configuring SNMP.

(3) **Password**: For details, see 8.1 Configuring Management Password.

2. The Primary Device on the Self-Organizing Network Is Not a Bridge

When the primary device on the self-organizing network is not an RG-EST series bridge, the **Network-Wide** menu includes **Workspace, Devices**, **Clients** and **System**. In addition, the physical topology of the whole network is displayed on the web interface.

- Network-wide workspace

Choose **Network-Wide** > **Workspace**.

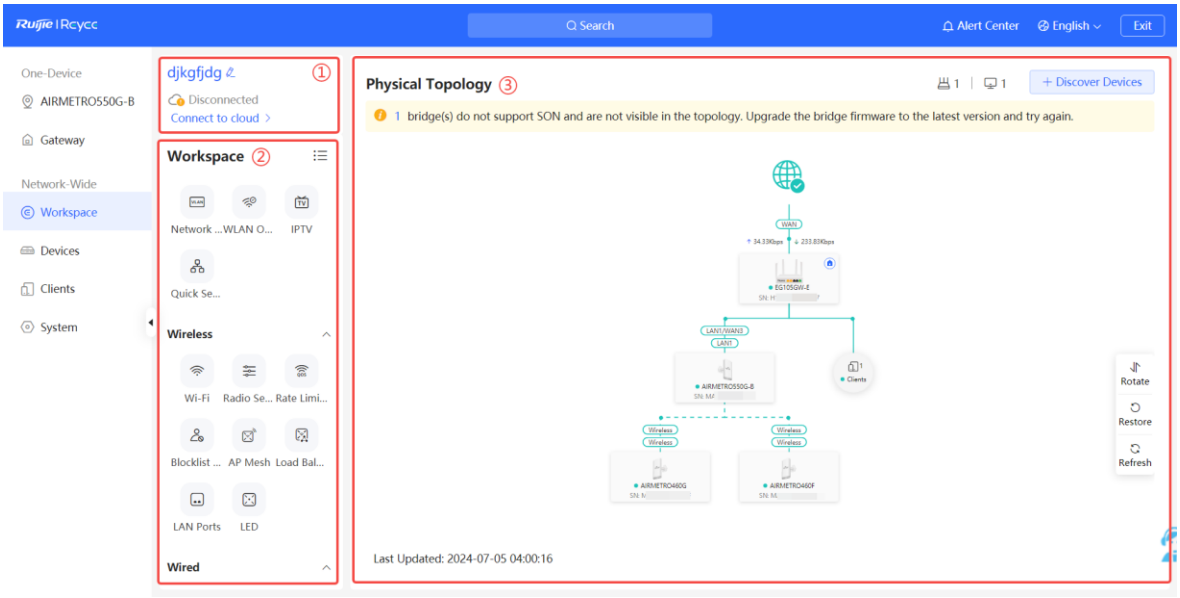


Table 2-3 Description of the Workspace

No.	Description
①	Displays the project name and whether the project is managed in Ruijie Cloud.
②	Displays the network-wide configuration items, including network-wide service network planning, wireless functions, wired functions, and network-wide system functions. For details about function configuration, follow the steps below: (1) Log in to the Reyee official website at https://reyee.ruijie.com/en-global/. (2) Click Search on the top right corner, enter the product model in the search box, and press **Enter**. (3) The product details page is displayed. (4) Click **Resources** on the page to obtain the configuration guide of the product.
③	Displays the physical topology of the network. Click any device in the topology to access the device configuration interface. Click **+ Discover Devices** on the top right corner to add devices.

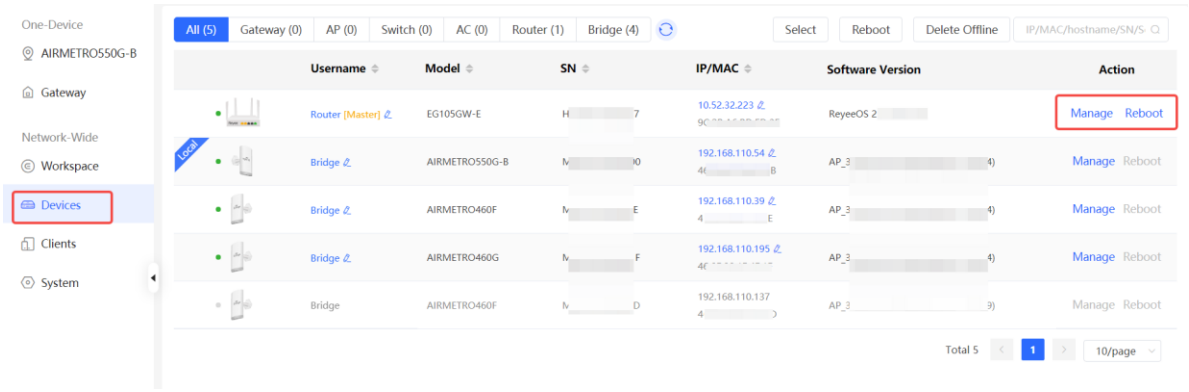
- Network-wide device management

Choose **Network-Wide** > **Devices**.

The device list displays all devices on the self-organizing network. Click **Manage** or **Reboot** to configure or reboot the selected device.

Specification

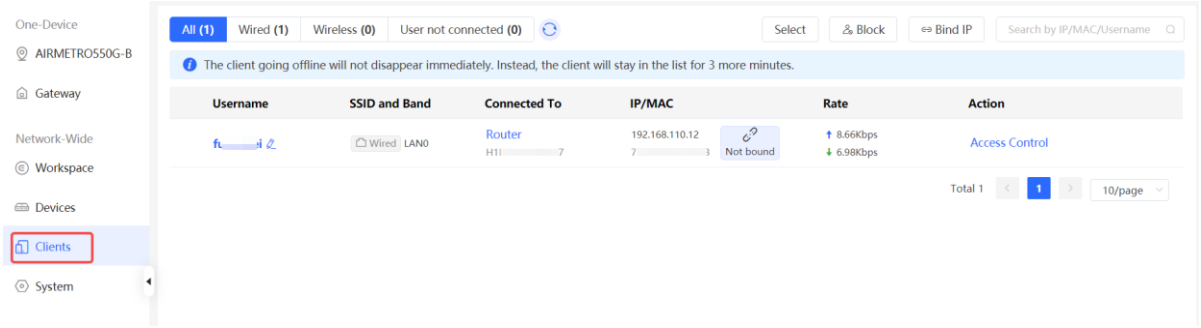
- When the primary device on the self-organizing network is not a bridge, restarting a bridge is not supported on the **Devices** page. You need to go to the device configuration page to perform the operation. For details, see8.4 Rebooting the Device.
- When the primary device on the self-organizing network is a bridge, the Device page only displays bridges on the network.



- Network-wide client management

Choose **Network-Wide** > **Clients**.

You can view wired clients, wireless clients, and clients not connected on the network. The list displays the client name, connection mode, associated device, IP/MAC addresses, IP binding status, rate, and related operations.



(1) Click **Not Bound** in the **IP/MAC** column to bind the client to a static IP address.

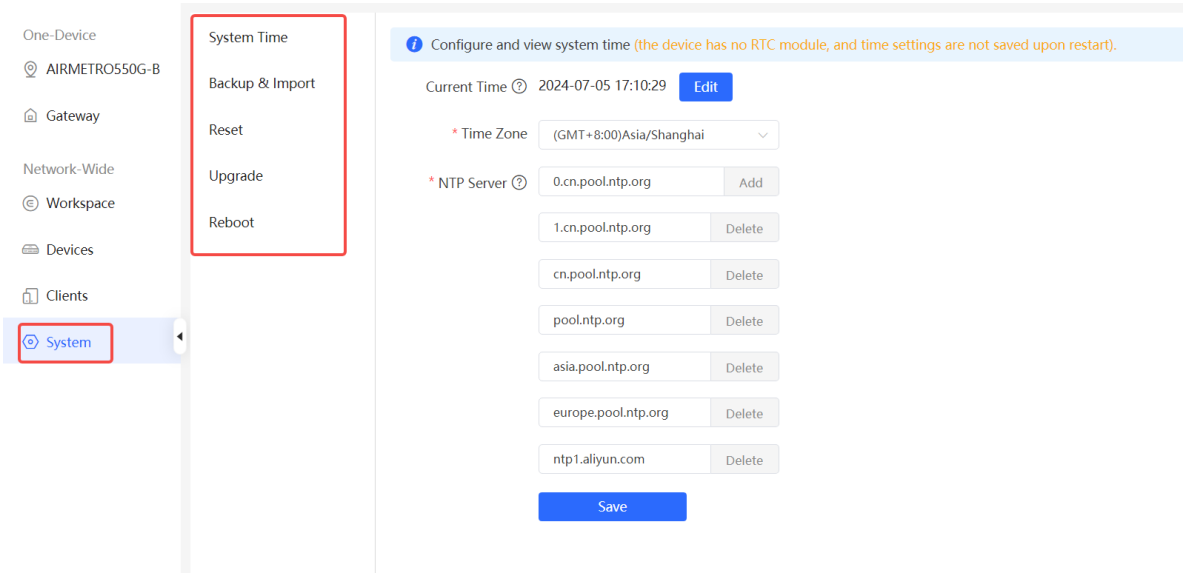
(2) Click a button in the **Action** column to perform the corresponding operations on the client:

- Wired clients: Only access control can be configured.
- Wireless clients: Access control, client association, and blacklisting can be configured.

- Network-wide system settings

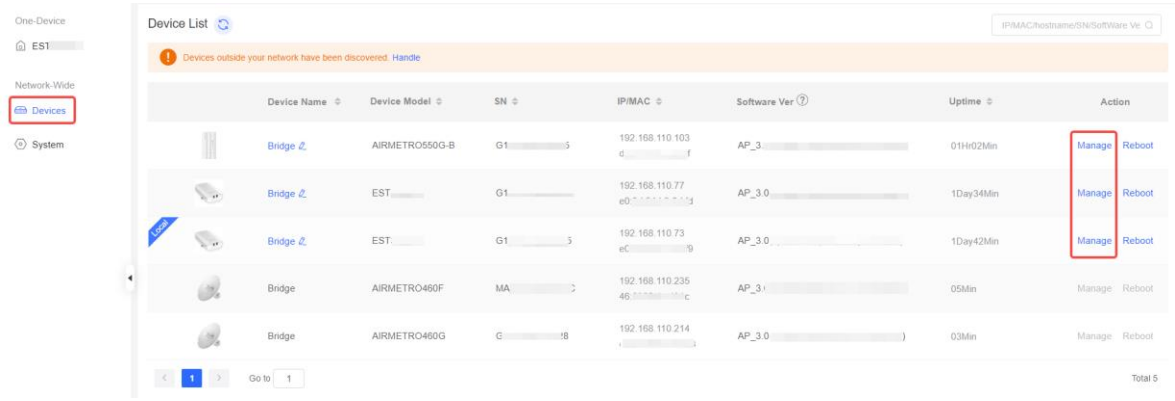
Choose **Network-Wide** > **System**.

Click **System** under the **Network-Wide** menu and select a tab from the navigation bar on the right to configure and manage devices on the network. The specific functions and function support are subject to the primary device. For details, see the configuration guide of the primary device.

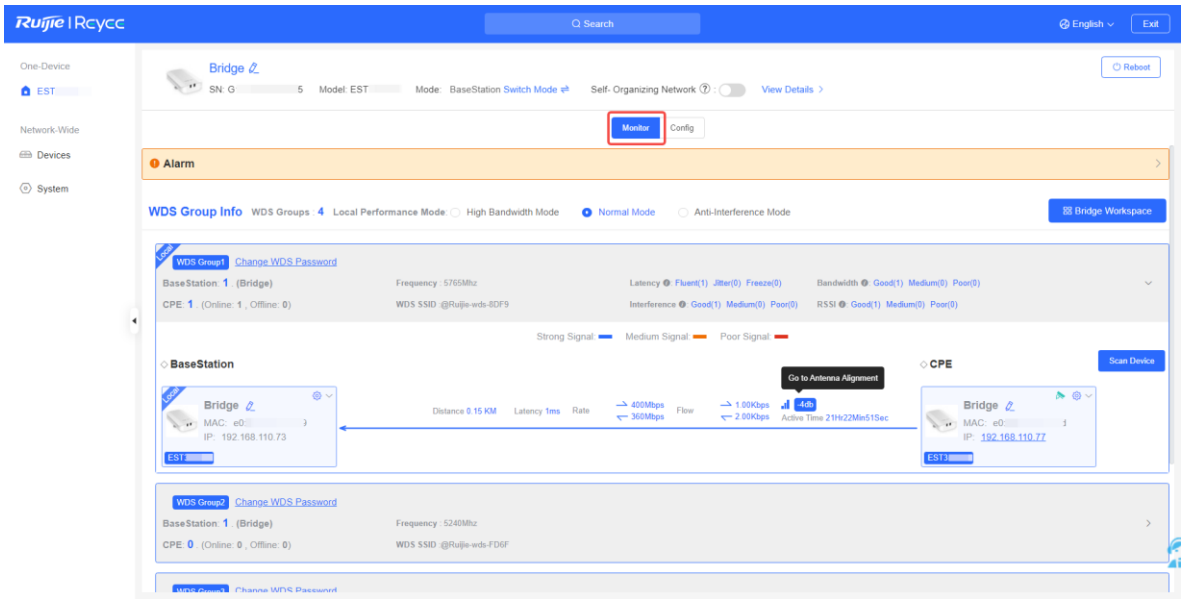


2.5.3 One-Device Web Interface

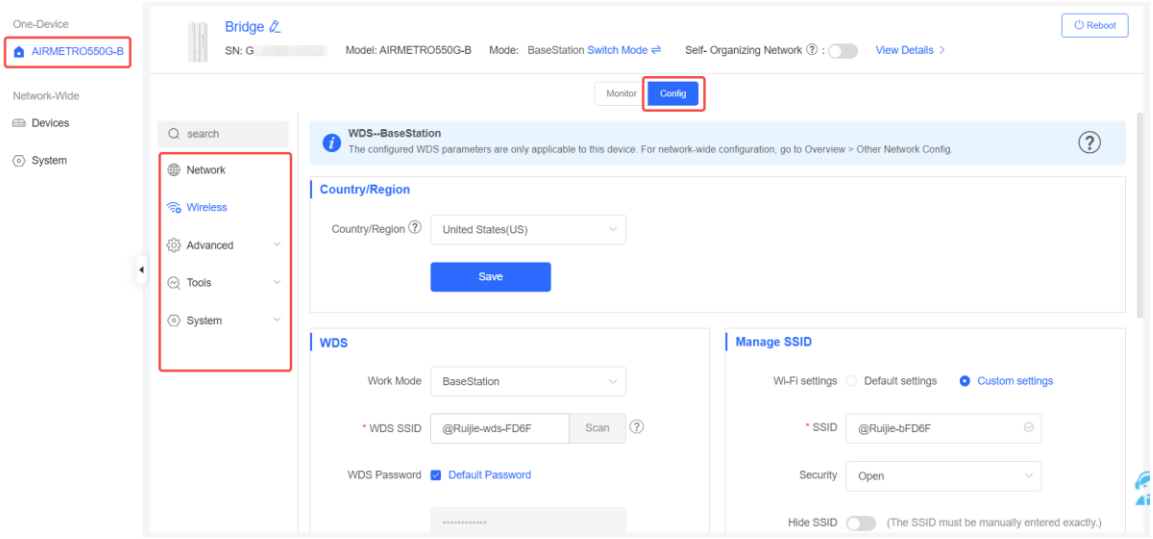
- Method 1: Click the device under the **One-Device** menu on the left.
- Method 2: Choose **Network-Wide** > **Devices** on the left, and click **Manage** to manage the device.



Monitoring page: Click **Monitor**. The page displays WDS information on the network.

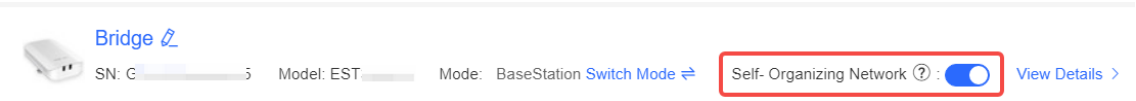


Configuration page: Click **Config** to manage and configure the selected device.



2.6 Self-Organizing Network

The **Self-Organizing Network** function is enabled by default.



Standalone mode: When the **Self-Organizing Network** function is disabled, the device will not be discovered on the network, and will operate in standalone mode. After logging into the web interface, you can only configure and manage the current login device. If you only need to configure one device or do not wish to apply global configurations to the device, you can disable the **Self-Organizing Network** function.

Self-Organizing Network mode: When the **Self-Organizing Network** function is enabled, the device can be discovered on the network, and can discover other devices on the network. These devices connect with each other based on their status to form a network, and synchronize global configurations. You can log in to any device on the network to configure and manage all devices on the network. Enabling this function enhances network management efficiency. You are advised to keep this function enabled.

When the device works in Self-Organizing Network mode, the web interface provides two configuration modes: Network-Wide mode and One-Device mode. For details, see 2.5.2 Network-wide Management and 2.5.3 One-Device Web Interface.

2.7 Adding Devices to the Self-Organizing Network

Specification

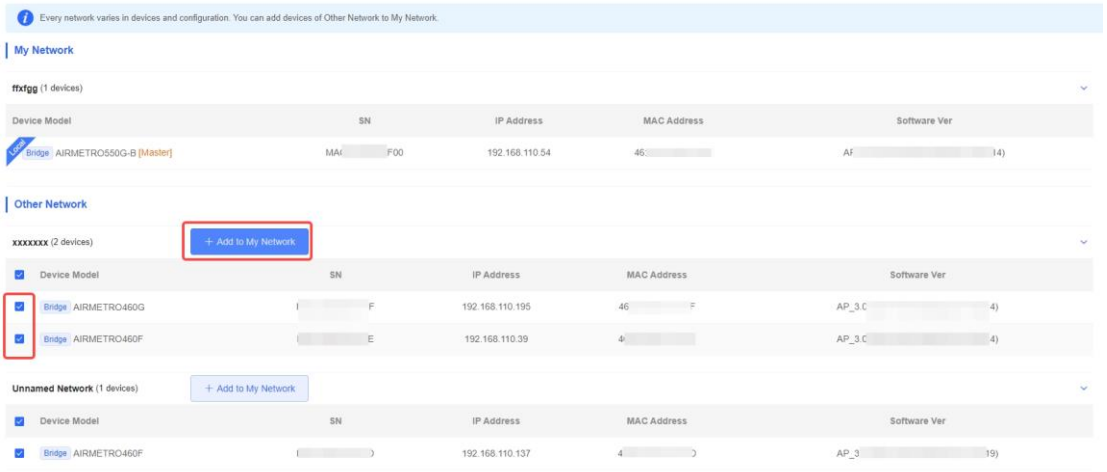
When the **Self-Organizing Network** function is enabled, the ability to discover and add devices is subject to the primary device. If the primary device is an RG-EST series bridge, only other bridges on the network can be discovered and added. If the primary device is not an RG-EST series bridge, all types of Reyee devices can be discovered and added.

2.7.1 The Primary Device on the Self-Organizing Network Is a Bridge

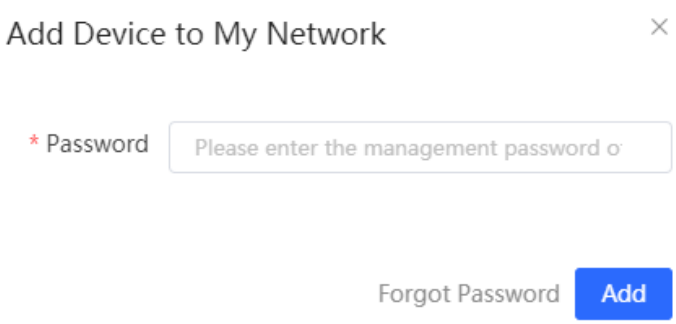
Choose **Network-Wide** > **Devices**.

(1) A prompt is displayed under **Device List**. Click **Handle** to add the unconnected devices or other networks to the current network.

(2) After you are redirected to the network list page, expand **Other Network** to select the target devices and click **Add to My Network**.



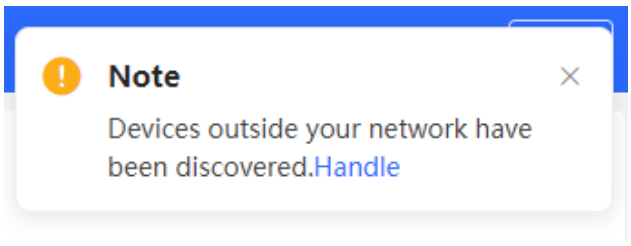
(3) You do not need to enter a password if the device hasn't been configured previously. If the device already has a password, you must enter the device's management password. Adding the device will fail if the password entered is incorrect.



2.7.2 The Primary Device on the Self-Organizing Network Is Not a Bridge

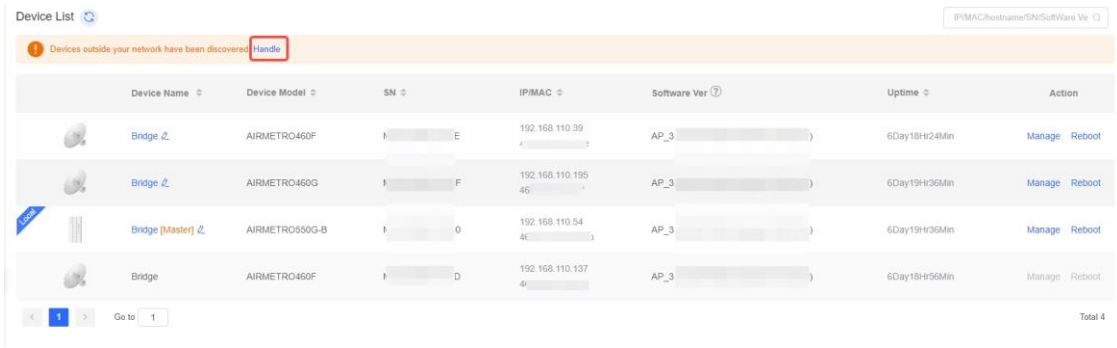
(1) Add devices to a network:

- Method 1: When a new device joins the network via a wired connection, the system prompts that there are other devices not yet connected. Click **Handle** to add the unconnected devices or other networks to the current network.

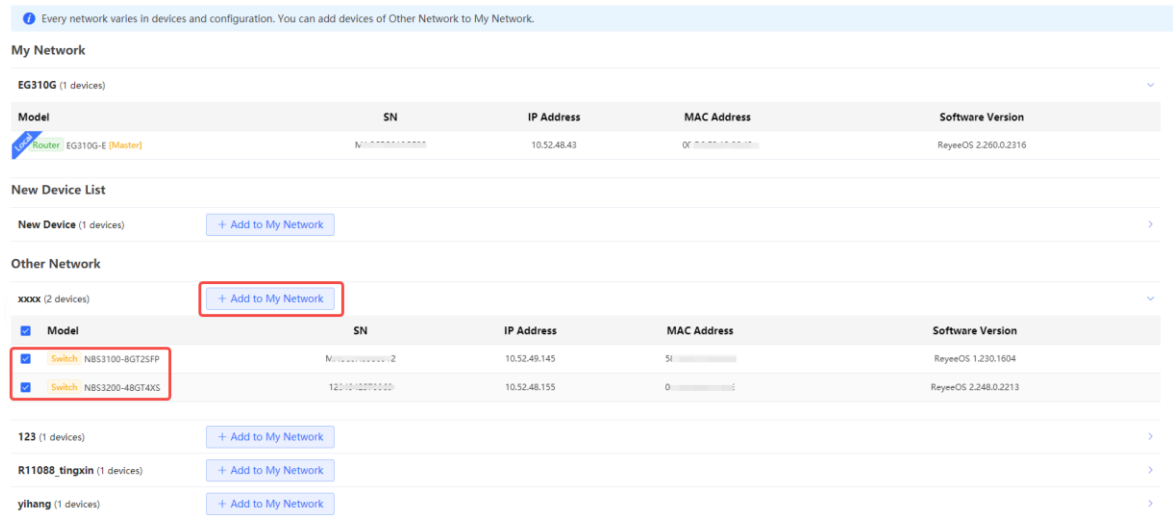


- Method 2: Choose **Network-Wide** > **Workspace** > **Physical Topology**, and click **+ Discover Devices**.

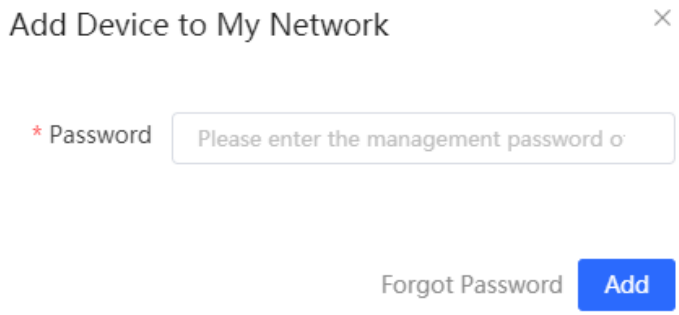
- Method 3: Choose **Network-Wide** > **Devices**. A prompt is displayed under **Device List**. Click **Handle** to add unconnected devices or other networks to the current network.



(2) After you are redirected to the network list page, expand **Other Network** to select the devices to be added and click **Add to My Network**.



(3) You do not need to enter a password if the device hasn't been configured previously. If the device already has a password, you must enter the device's management password. Adding the device will fail if the password entered is incorrect.



3 Wi-Fi Network Settings

3.1 Overview

3.1.1 BaseStation and CPE

Wireless bridges purchased in pairs can be automatically paired after power-on. The wireless bridge also supports manual pairing by connecting to the Wi-Fi signal broadcast by another bridge. For details, see 3.3 Scanning to Pair and Add Devicess. In a paired WDS group, bridges can work in BaseStation or Customer Premises Equipment (CPE) mode.

- **BaseStation**: A bridge sending bridging signals is generally connected to the NVR end in a surveillance room. A WDS group can contain at most one BaseStation.
- **CPE**: A bridge that enables customers to access ISP's communication services is generally connected to the camera end. A WDS group can contain multiple CPE.

3.1.2 WDS Wi-Fi and Management Wi-Fi

- **WDS Wi-Fi**: A BaseStation broadcasts the WDS Wi-Fi signal. A CPE accesses the WDS Wi-Fi and upload videos or other data to the BaseStation.
- **Management Wi-Fi**: Both the BaseStation and the CPE can broadcast a dedicated management Wi-Fi network for device management purposes. You can connect to this network to configure and manage your devices.

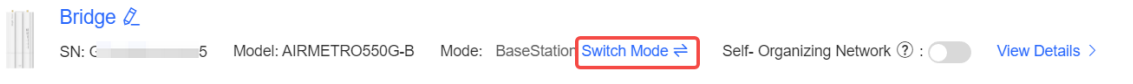
3.2 Switching Between BaseStation Mode and CPE Mode

Specification

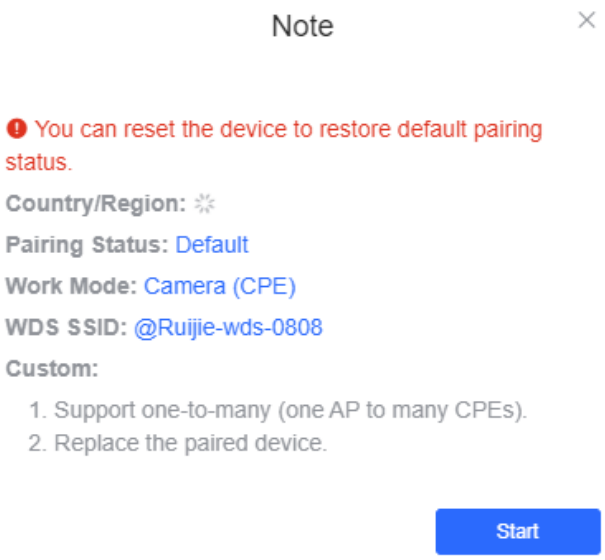
The CPE functions are available only when the wireless bridge switches from the BaseStation mode to the CPE mode.

If the original BaseStation fails, you need to set the new device to BaseStation mode to replace the faulty device. If multiple CPE are required, a newly added device joining the WDS group must be switched to CPE mode.

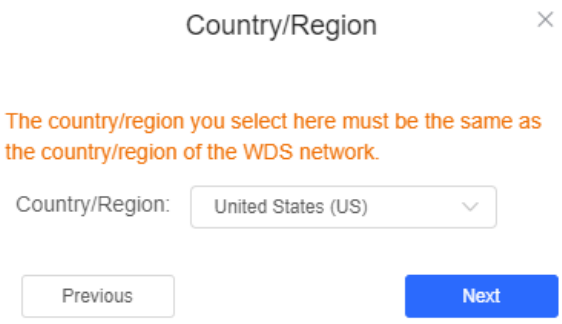
(1) You can check the current mode in the upper right corner of the web page and click **Switch Mode** to switch the mode.



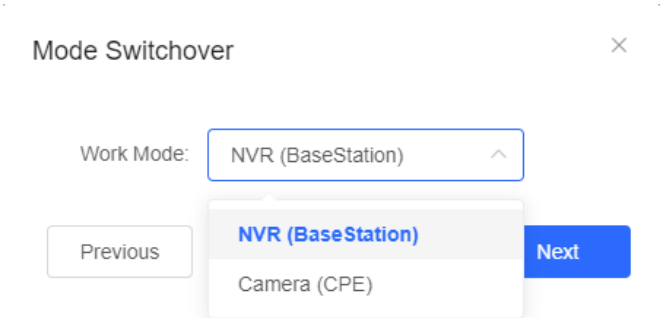
(2) In the displayed dialog box, click **Start**.



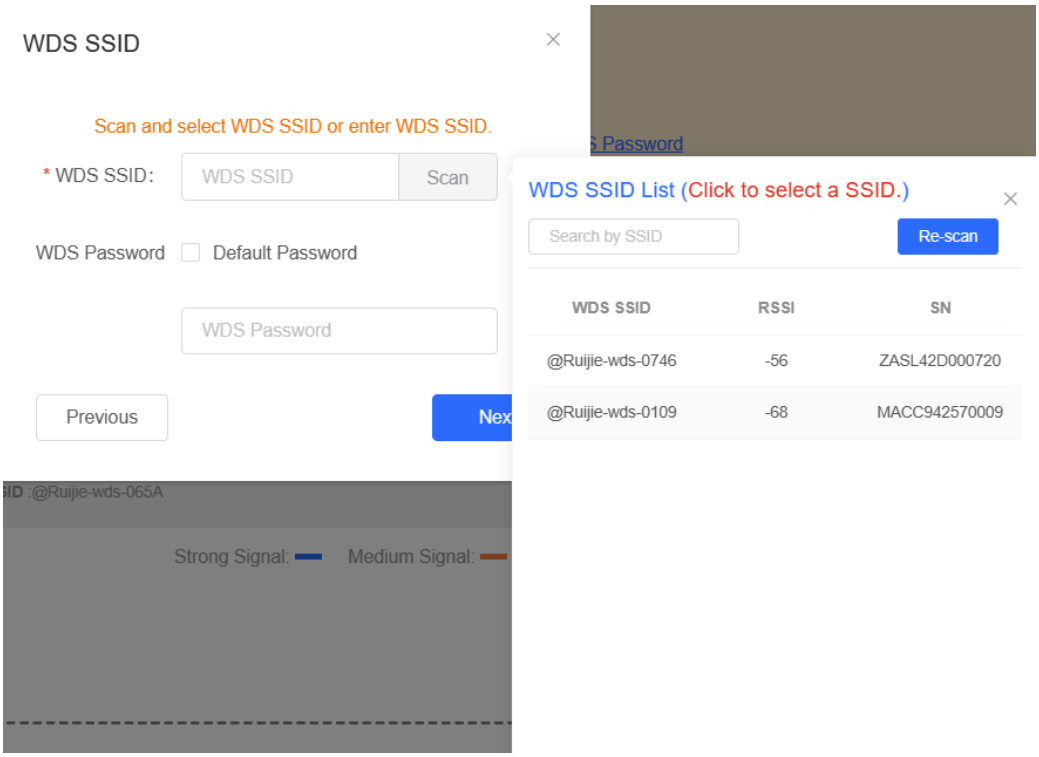
(3) Click **Next**.



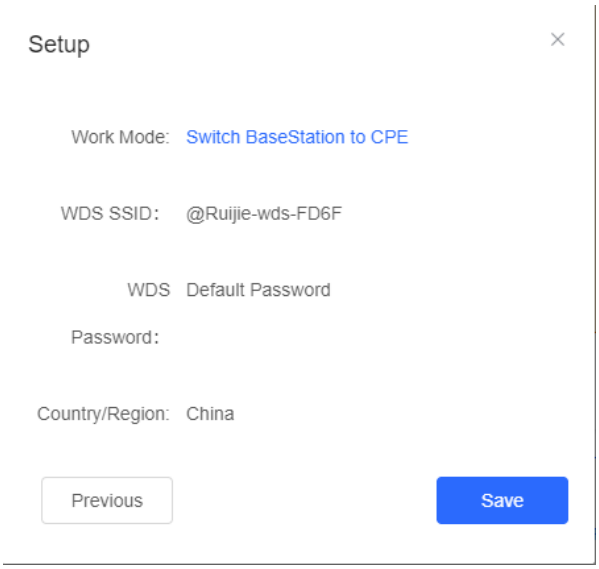
(4) Select a mode from the **Work Mode** drop-down list.



(5) Click **Scan**. A list of camera (CPE) is displayed. Select the target camera (CPE), enter the WDS password, and click **Next**.



(6) Verify the settings on the **Setup** page. Then, click **Save**.



Caution

Switching the mode will reboot the device. Therefore, exercise caution when performing this operation.

3.3 Scanning to Pair and Add Devices

3.3.1 Overview

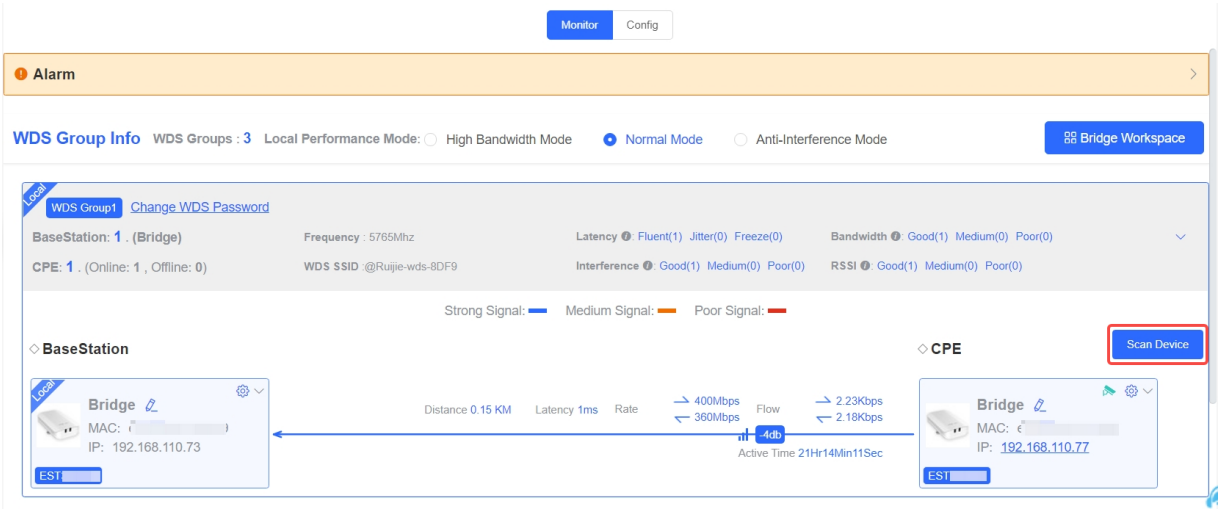
When a wireless bridge is added to a WDS group or connected to another wireless bridge, you can scan the surrounding wireless bridges, compare their models, serial numbers, and other information, and then select the bridging target.

3.3.2 Configuration Steps

Choose **One-Device** > **Monitor** > **WDS Group Info**.

1. Scanning Surrounding Devices

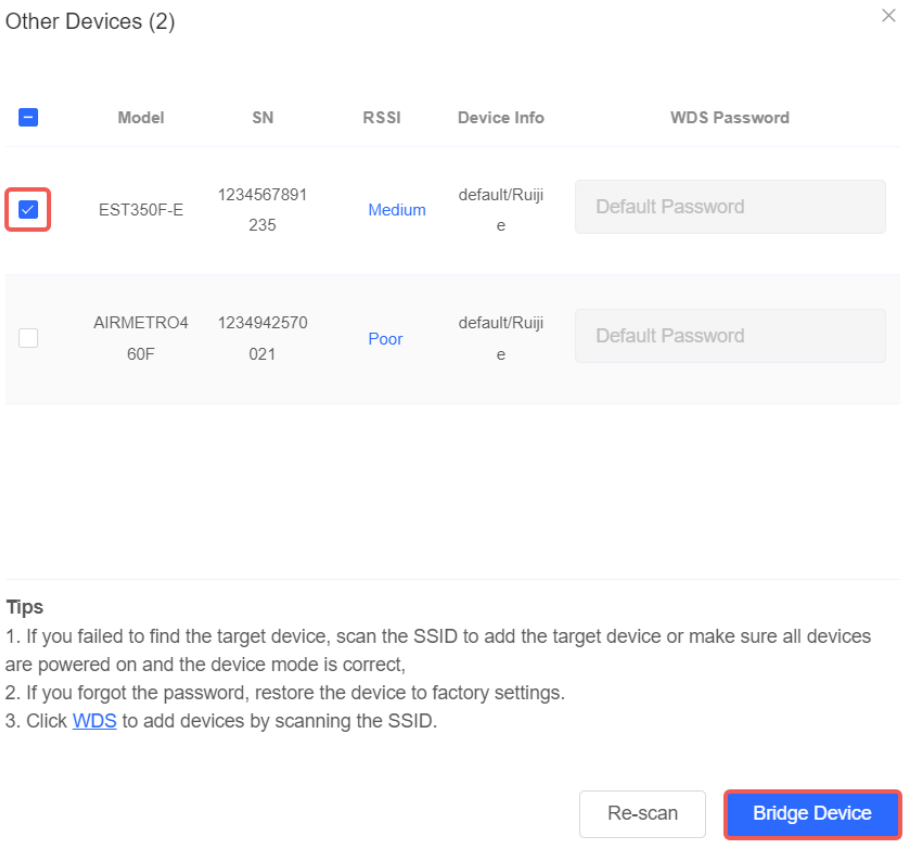
Go to the home page and click **Scan Device**.



2. Selecting a Device for Pairing

Select the desired device, enter the bridging password in the **WDS Password** field, and click **Bridge Device**. The selected device will be bridged.

If no device is displayed, click **Re-scan**.

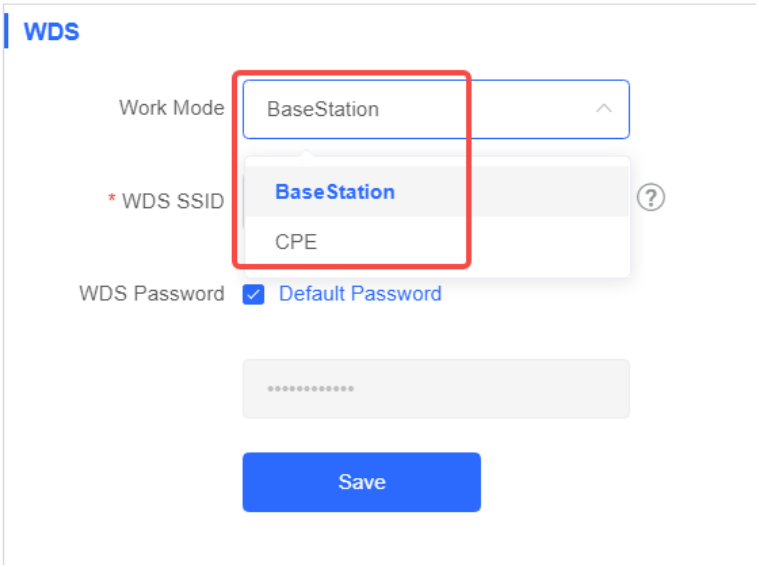


3.4 Configuring the WDS Wi-Fi for a Single BaseStation or CPE

3.4.1 Configuring the Work Mode

Choose **One-Device** > **Config** > **Wireless** > **WDS**.

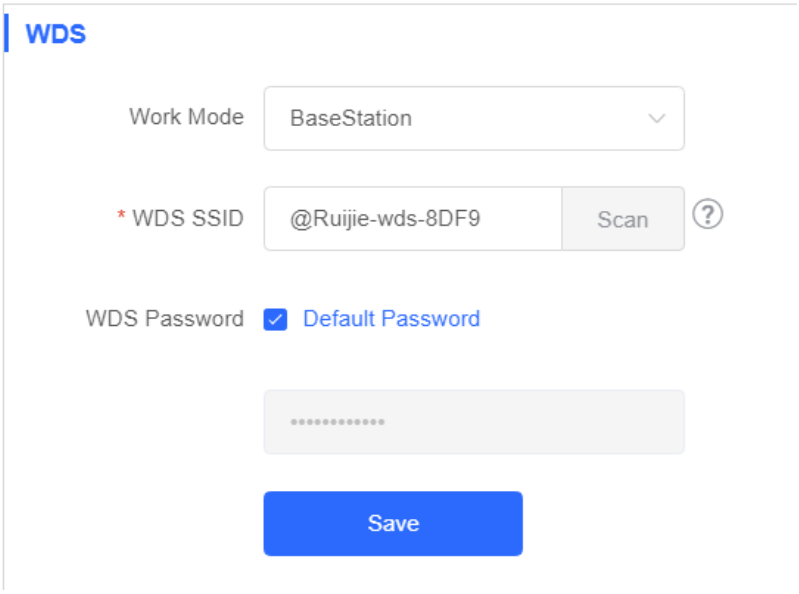
Select the work mode as **BaseStation** or **CPE**.



3.4.2 Setting the WDS SSID

Go to the configuration page:

- Method 1: **Choose One-Device** > **Config** > **Wireless > WDS**.



- Method 2: **Choose One-Device** > **Monitor** > **WDS Group Info** > **BaseStation/CPE**.

To prevent network exceptions, you are advised to keep the default WDS SSID unless otherwise specified.

If a new WDS SSID is set for a device in a WDS group, other bridges in the group need to change to the new SSID as well to connect with this device.

When a new device is connected, you can either configure a new WDS SSID or click **Scan** to select a target WDS SSID.

To check the WDS SSIDs of WDS groups, choose **One-Device** > **Monitor** > **WDS Group Info**. For details, see 3.9 Displaying WDS Group Information.

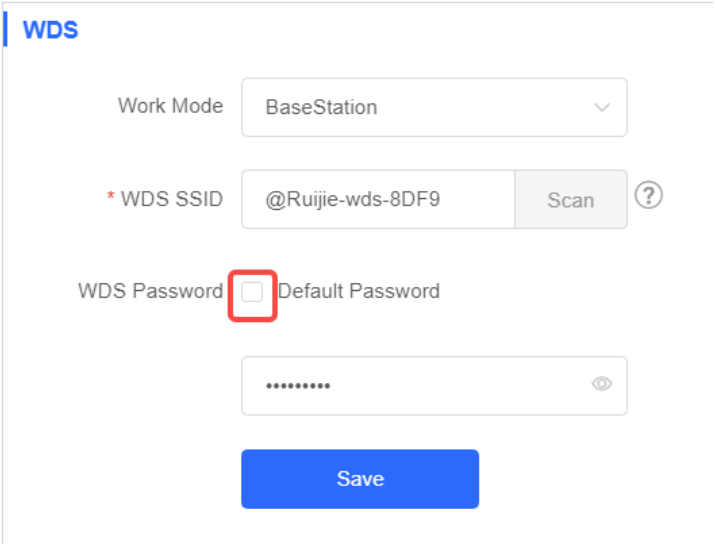
Caution

Configuring a WDS SSID will disconnect the WDS link. Incorrect WDS SSID will cause a WDS connection failure. Therefore, exercise caution when performing this operation.

3.4.3 Configuring the WDS Password

Choose **One-Device** > **Config** > **Wireless > WDS**.

A correct WDS password is required for a successful WDS link. To prevent unauthorized devices from connecting to the WDS Wi-Fi network, high-security passwords are used for devices by default, and the password for devices of the same model is the same. You are advised to change the password for devices in the entire network or in a WDS group to prevent others from accessing the network using a device of the same model.



Caution

- WDS passwords can be configured only for CPE devices, and not for the BaseStation.
- Configuring a WDS password will disconnect the WDS link. An incorrect WDS password will cause a WDS connection failure. Therefore, exercise caution when performing this operation.

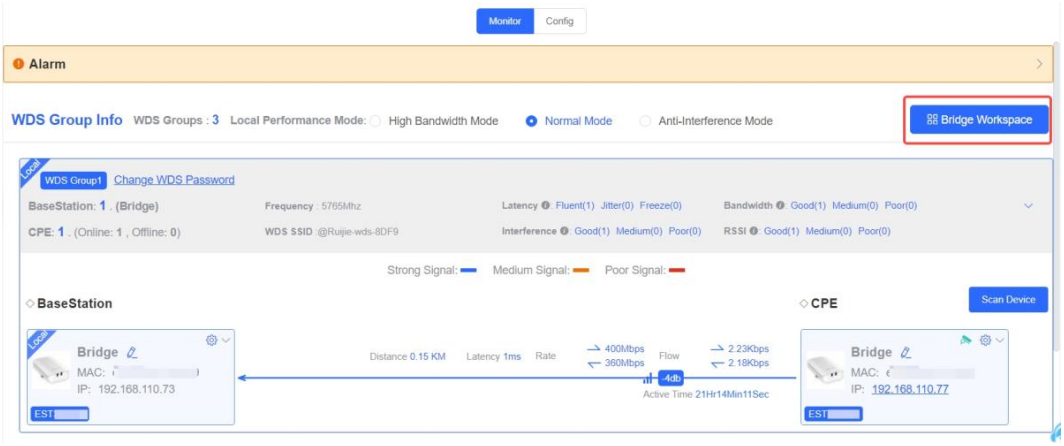
3.4.4 Saving the Settings

After changing the WDS SSID or password, click **Save** to activate settings at once.

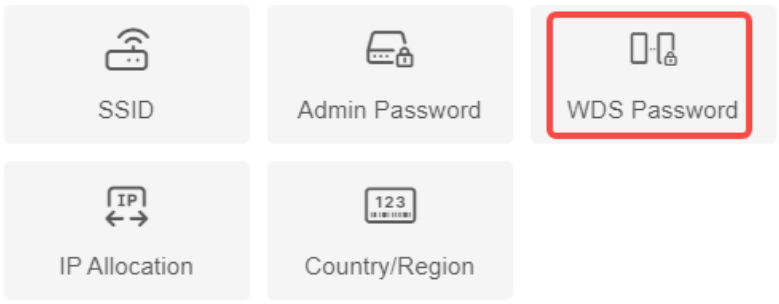
3.5 Configuring the WDS Password for a LAN

Choose **One-Device** > **Monitor** > **WDS Group Info**.

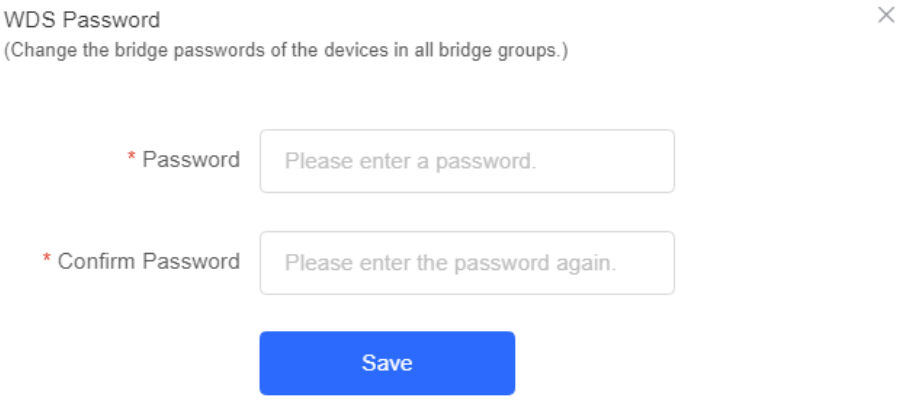
(1) Click **Bridge Workspace**.



(2) Click **WDS Password**.



(3) Enter the password in the displayed dialog box, and click **Save**.



Caution

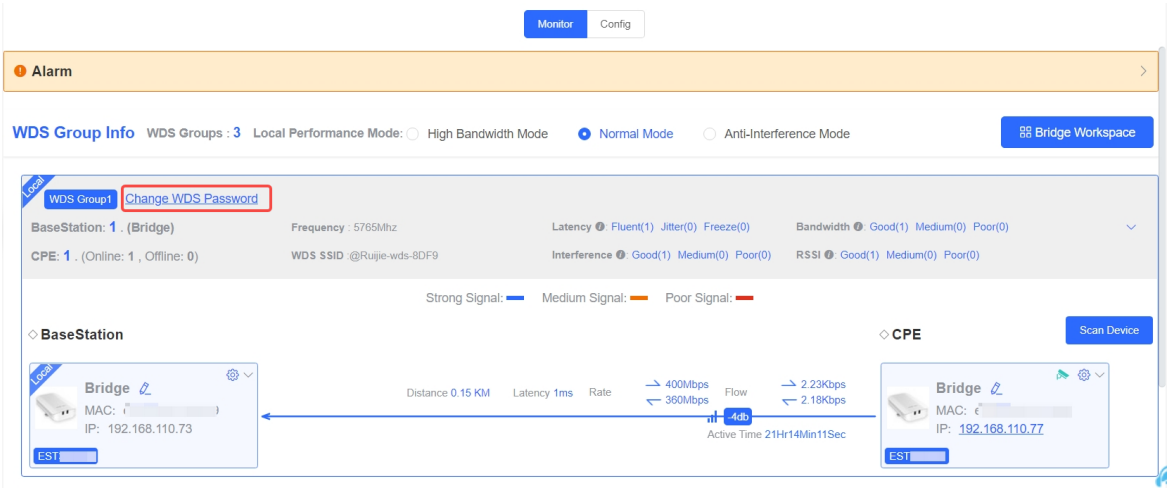
- When configuring the WDS password for the entire network, ensure that all devices in the network are online. Otherwise, the WDS passwords of the devices will be inconsistent.
- Configuring the WDS password for the entire network will reconnect all devices in the network. Therefore, exercise caution when performing this operation.
- If there is an unbridged device in the network, the WDS password cannot be configured.

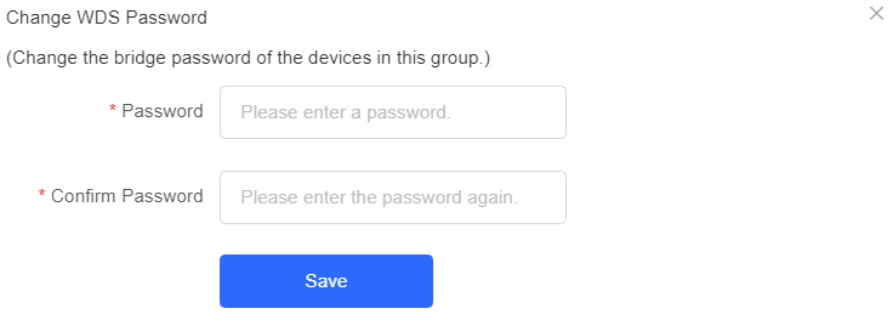
3.6 Configuring the WDS Password for a WDS Group

Choose **One-Device** > **Monitor** > **WDS Group Info**.

The default WDS password of devices is the same. Changing the WDS password can prevent others from illegally accessing the user network by using a device of the same model.

When configuring the WDS password for bridges in the entire network is unavailable or unnecessary, you can click **Change WDS Password** to configure the WDS password for bridges in the WDS group. If there is an unbridged device in the group, the **Change WDS Password** function will be unavailable.





Caution

When configuring the WDS password for a WDS group, ensure that all devices in the group are online. Otherwise, WDS passwords of the devices will be inconsistent.

Configuring the WDS password for a WDS group will reconnect devices in the group. Therefore, exercise caution when performing this operation.

If there is an unbridged device in the WDS group, this function will be unavailable.

3.7 Configuring the Management Wi-Fi for a Single BaseStation or CPE

Choose **One-Device** > **Config** > **Wireless > Manage SSID**.

Note

The management SSID is used only for accessing the web interface and managing devices. It cannot be used for Internet access, and is isolated from the service network.

3.7.1 Selecting the Work Mode

1. Default Configuration

When Default Settings is selected, the management SSID of the device will automatically be hidden after 2 hours, making it inaccessible for connection.

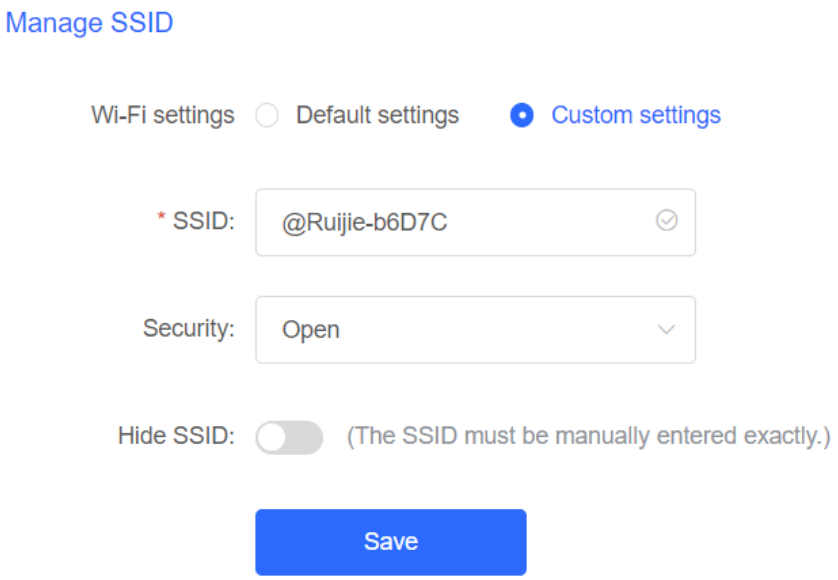
2. Custom Configuration

SSID: Indicates the Wi-Fi name to which the mobile phone or management PC connects for access.

Security: The options include **Open**, **WPA-PSK**, **WPA2-PSK**, and **WPA_WPA2-PSK**. You are advised to choose **WPA_WPA2-PSK** and set a password for security purpose.

Hide SSID: When the **Hide SSID** switch is toggled on, mobile phones or PCs cannot discover the SSID. You need to manually enter the SSID and password for access. This can prevent the SSID from being accessed by unauthorized users.

You can view the network-wide management SSID for each bridge group at **One-Device** > **Monitor** > **WDS Group Info** > **Bridge Workspace** > **SSID**. For details, see3.8 Configuring the Management Wi-Fi and Password for a LAN.



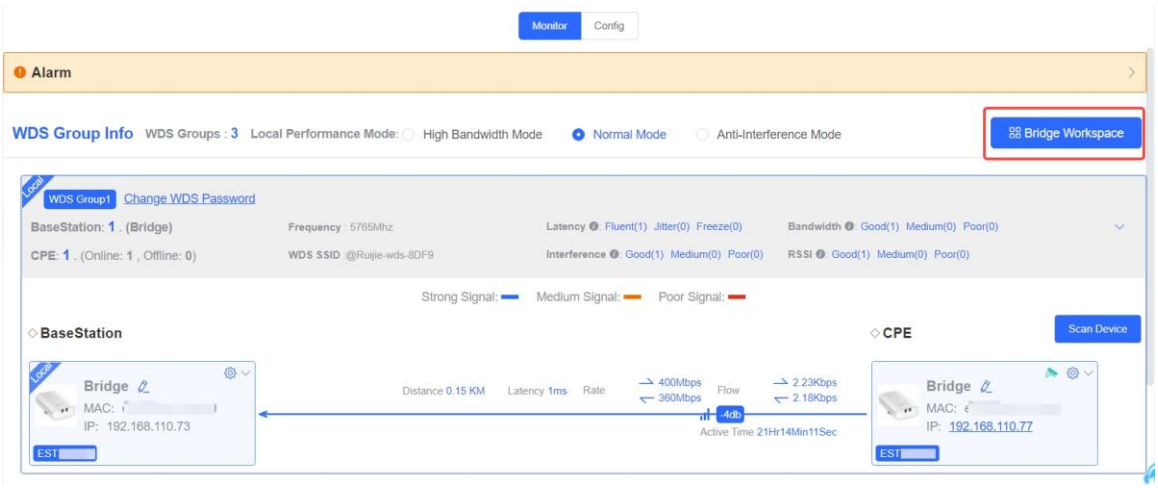
3.8 Configuring the Management Wi-Fi and Password for a LAN

Choose **One-Device** > **Monitor** > **WDS Group Info**.

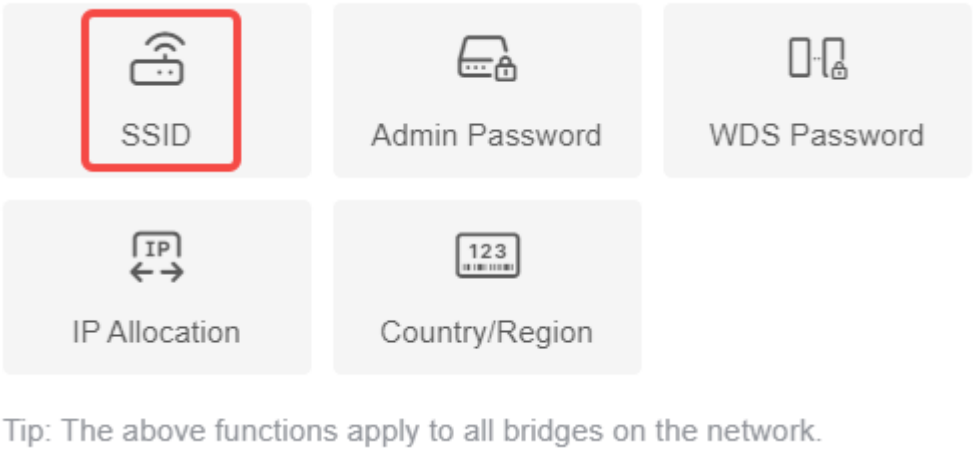
Note

The management SSID is used only for accessing the web interface and managing devices. It cannot be used for Internet access, and is isolated from the service network.

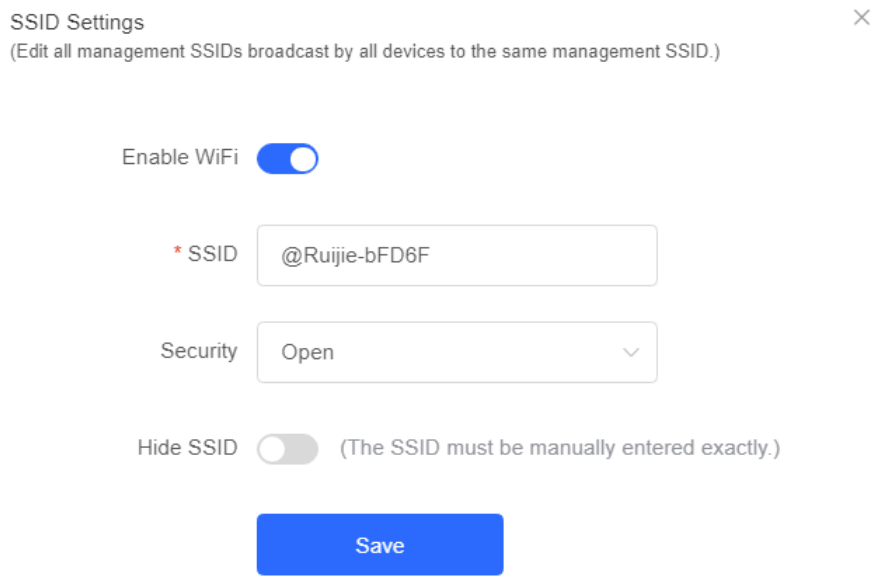
(1) Click **Bridge Workspace**.



(2) Click **SSID**.



(3) Set related parameters.



The default SSID for device management is @Ruijie-bXXXX. (XXXX is the last four digits of the MAC address of each device, and the default management SSID varies with each device.) Click **SSID** on the page to set the same management SSID and password for all bridges in the LAN.

Enable Wi-Fi: Choose whether to enable the management Wi-Fi for all devices in the network.

SSID: The SSID is the name of the management Wi-Fi network.

Security: The options include **Open**, **WPA-PSK**, **WPA2-PSK**, and **WPA_WPA2-PSK**. You are advised to choose **WPA_WPA2-PSK** and set a password for security purpose.

Hide SSID: When the **Hide SSID** switch is toggled on, mobile phones or PCs cannot discover the SSID. Users need to manually enter the SSID and password for access. This can prevent the SSID from being accessed by unauthorized users.

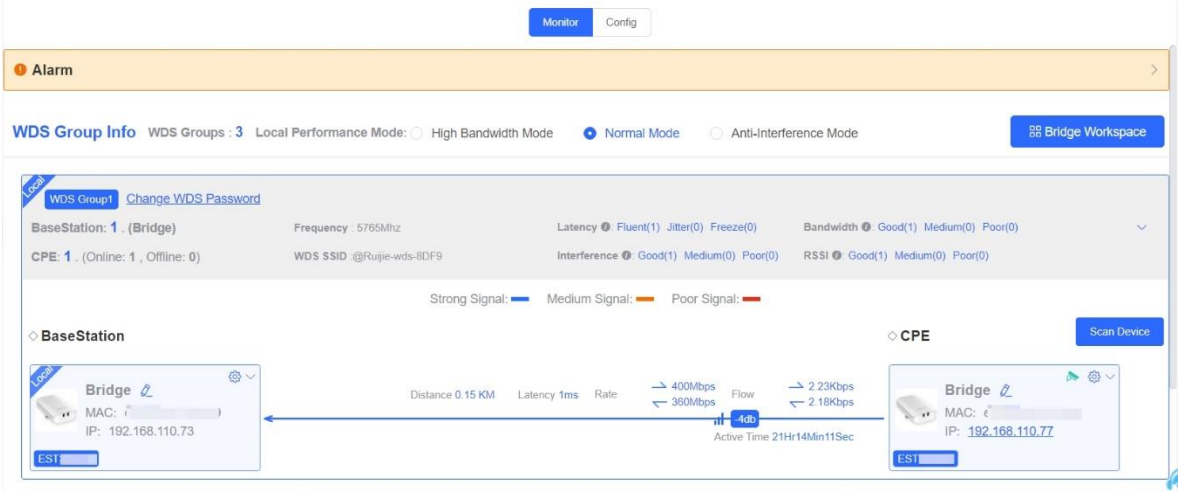
Caution

After the configuration is saved, the BaseStation and CPE devices in the network will be reconnected. Therefore, exercise caution when performing this operation.

3.9 Displaying WDS Group Information

Choose **One-Device** > **Monitor** > **WDS Group Info**.

Displayed WDS group information includes the number of Base Stations and CPE in the group, current working channel, SSID, latency, interference, wireless bandwidth and quality, RSSI and quality, data rate, real-time traffic, and uptime. Hover the cursor over to view the detailed information of every item.



Note

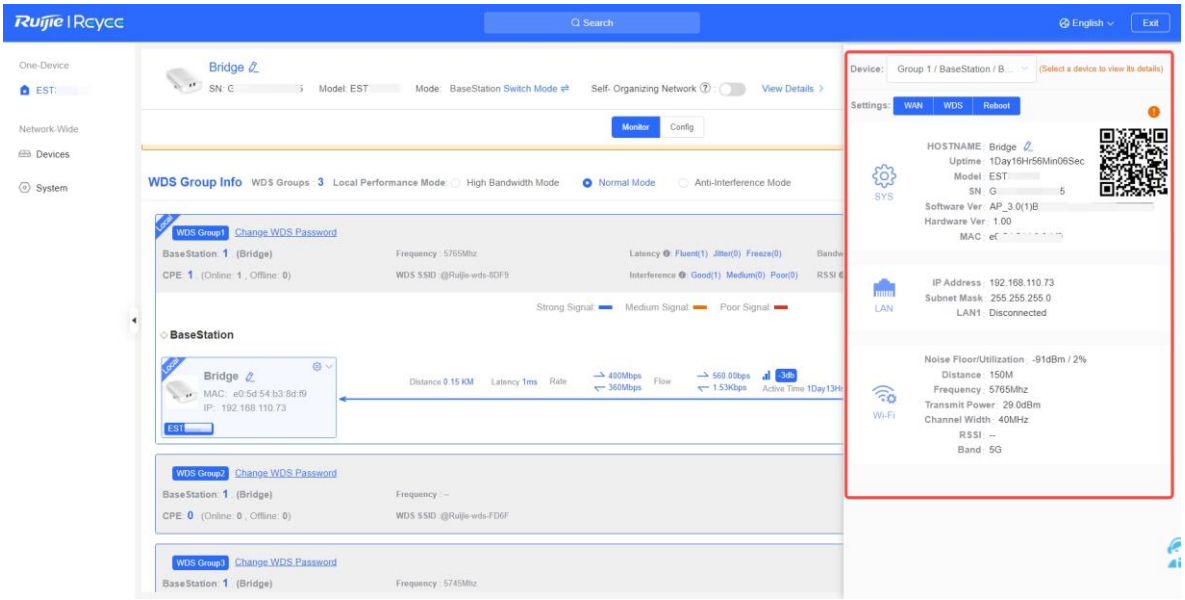
BaseStation is at the NVR end, while CPE is at the camera end.

3.10 Displaying the Information About a Bridge

Choose **One-Device** > **Monitor** > **WDS Group Info** > **BaseStation** or **CPE**.

Click the 

icon of a device to display the basic information about the device in the right panel of the page, including the hostname, uptime, model, SN, MAC address, software and hardware versions, IP address, subnet mask, LAN port status, noise floor/utilization, distance, frequency, transmit power, channel width, RSSI, and band.



Specification

The device at the NVR end does not involve channel width and RSSI, and only the device at the camera end does.

3.11 Configuring the Country/Region Code for a Bridge

3.11.1 Getting Started

The country/region code switch will take effect on a single device. Configuring the country/region code for a single device in bridging state will result in bridge disconnection. For network-wide country/region code configuration, please refer to 3.12 Setting the Country/Region Code for a WDS Group for details.

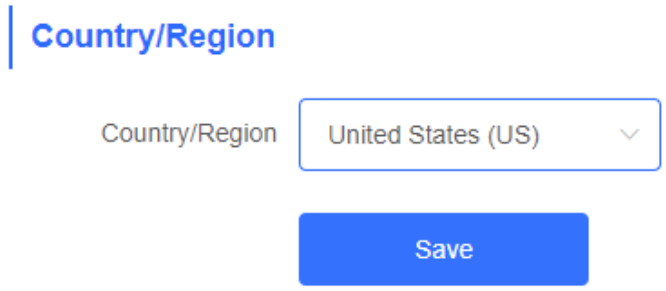
Caution

If you change the country/region code in the case of device disconnection, WDS connection may fail.

3.11.2 Configuration Steps

Choose **One-Device** > **Config** > **Wireless** > **Country/Region**.

Choose the target country/region from the drop-down list, and click **Save**.



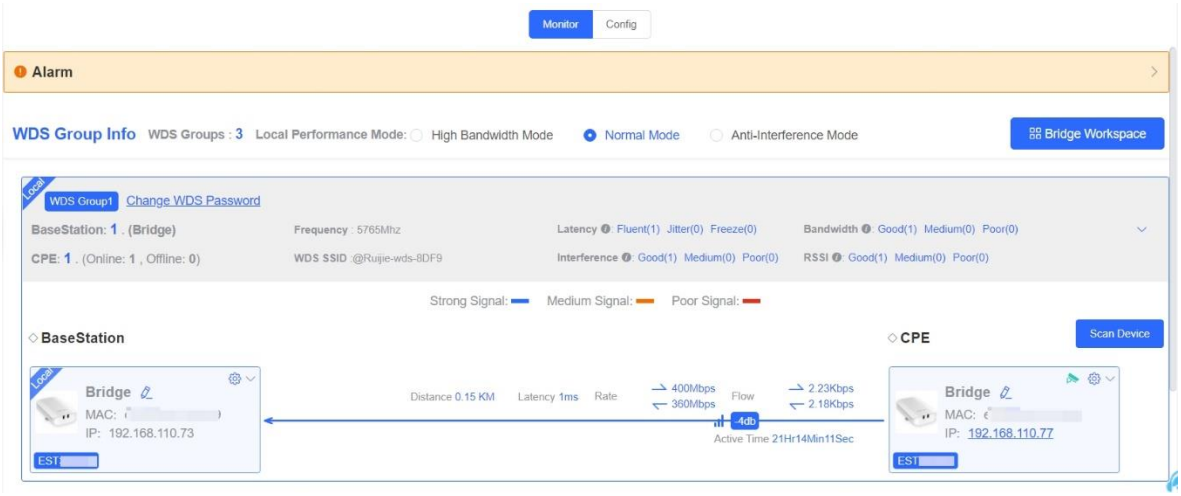
Caution

- After the country/region code is changed, the Wi-Fi network will restart, and the BaseStation and the camera will be reconnected after the Wi-Fi network is restarted.
- The current channel may be switched to **Auto** because it is not supported by the country/region. Therefore, exercise caution when performing this operation.

3.12 Setting the Country/Region Code for a WDS Group

3.12.1 Getting Started

The country/region code switch will take effect on all devices on the network, including those listed on the homepage of the web interface. Therefore, before configuring the country/region code, you are advised to go to the homepage and check whether the target devices are on the current network and their bridging status is normal.



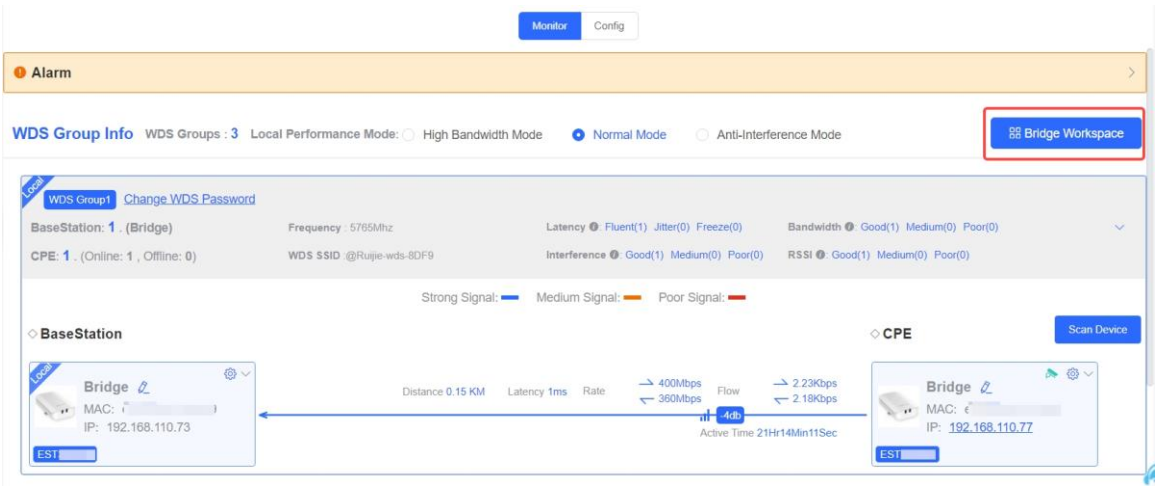
Caution

If the target device is not on the network or if the bridge is disconnected during the country/region code switch, it may lead to the device being unable to bridge properly.

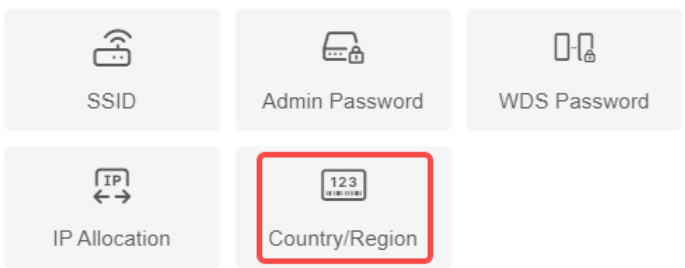
3.12.2 Configuration Steps

Choose **One-Device > Monitor > WDS Group Info**.

(1) Click **Bridge Workspace**.

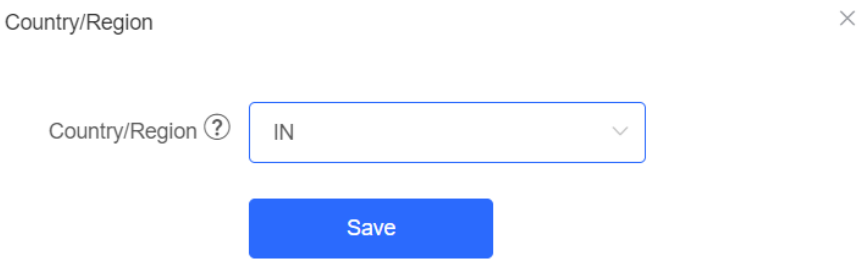


(2) Click **Country/Region**.



Tip: The above functions apply to all bridges on the network.

(3) After setting the country/region code, click **Save**.



3.13 Setting the SSID for a Single Bridge

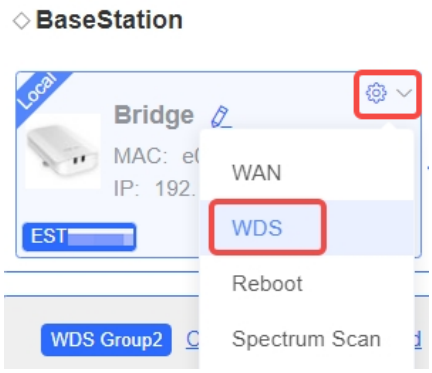
3.13.1 Overview

The device detects the surrounding wireless environment and selects the appropriate configuration upon power-on. However, network freezing caused by wireless environment changes cannot be prevented. You can also analyze the wireless environment around the bridge and manually select appropriate parameters.

3.13.2 Getting Started

Go to the configuration page:

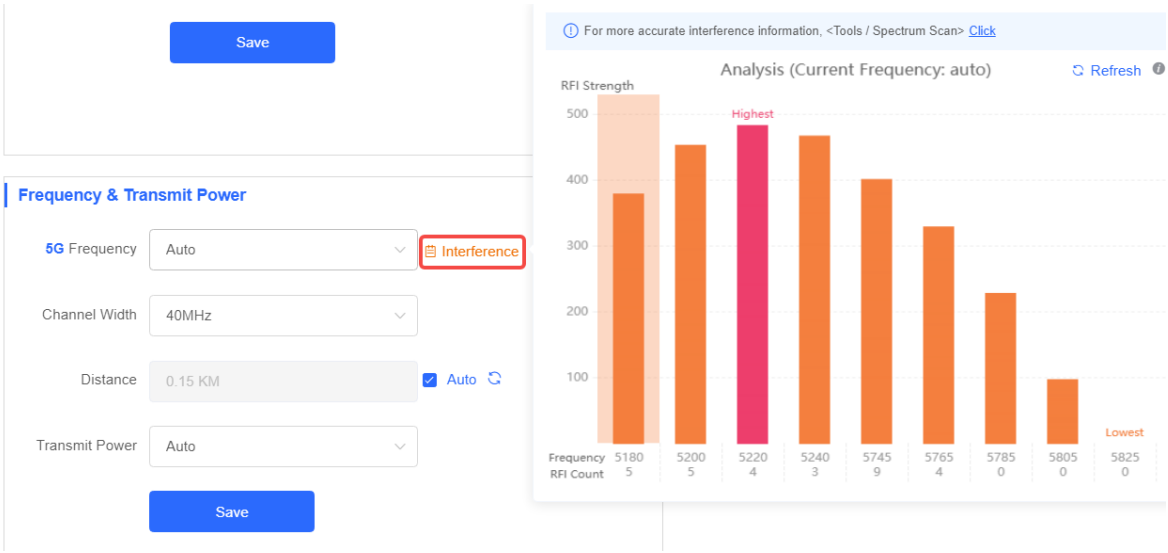
- Method 1: Choose **One-Device** > **Config** > **Wireless** > **Frequency & Transmit Power**.
- Method 2: Choose **One-Device** > **Monitor** > **WDS Group Info** > **BaseStation** or **CPE** > **WDS** > **Frequency & Transmit Power**.



Before configuration, you can check the interference in the current environment in the following way to find the optimal frequency.

Click **Interference** to view the interference of each frequency. The frequency with the smallest interference is the optimal frequency.

To view the interference details of each frequency, go to the **Spectrum Scan** page. For details, see 5.2 Spectrum Scan.



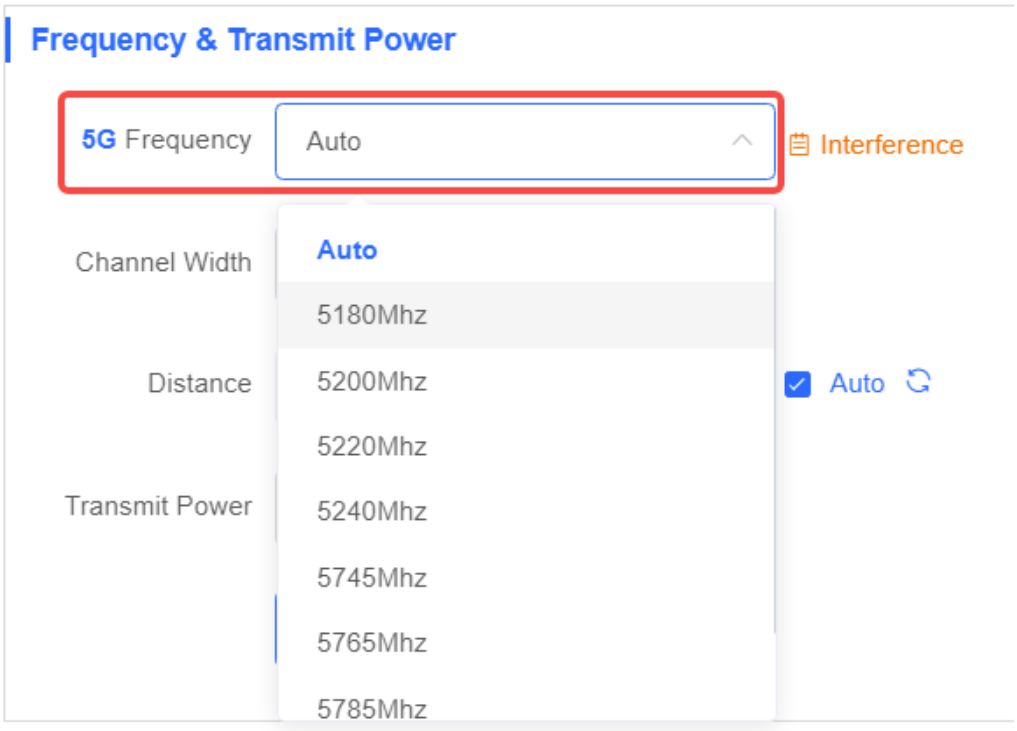
3.13.3 Configuration Steps

1. Configuring the Frequency

(1) Frequency Settings

Automatic frequency selection is enabled by default, that is, the device automatically selects a frequency based on the surrounding environment when it is powered on.

Excessive wireless clients connected to a frequency can cause strong wireless interference. Choose the optimal frequency identified through the proceeding analysis. Click **Save** to make the configuration take effect immediately.



Once the frequency is adjusted at the NVR end, the CPE end will follow the frequency configuration of the NVR end automatically. Independent frequency settings are not supported on the CPE end.

Note

- The available frequencies are subject to the country/region code. Select the country or region where the device will be used.
- The preceding figure shows the frequency configuration for 5 GHz, and that for 2.4 GHz is the same.
- The bridge that supports only the 2.4 GHz frequency band does not support the 5 GHz frequency configuration.

Caution

Changing the frequency will cause the BaseStation to disconnect and then reconnect to the CPE. Exercise caution when performing this operation.

2. Configuring the Channel Width

If the interference is severe in the wireless environment, choose a narrower channel width to avoid network stalling.

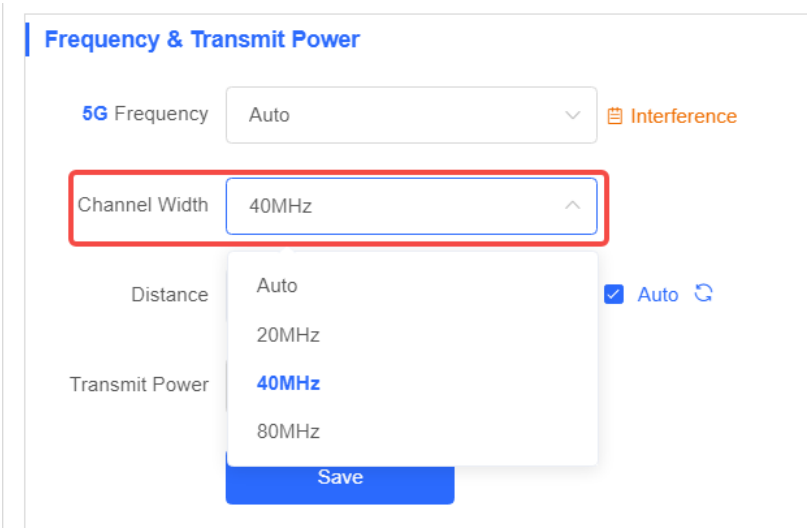
The 5 GHz bridge supports 20 MHz, 40 MHz, and 80 MHz, while the 2.4 GHz bridge supports 20 MHz and 40 MHz.

A narrower channel width indicates a more stable network with a smaller bandwidth. Conversely, a wider channel width indicates a less stable network but with a larger bandwidth. The default value is 20 MHz for 2.4 GHz and 40 MHz for 5 GHz. The default settings are recommended.

After setting the channel width, click **Save** to make the configuration take effect immediately.

Caution

Changing the channel will cause the BaseStation to disconnect and then reconnect to the CPE. Exercise caution when performing this operation.

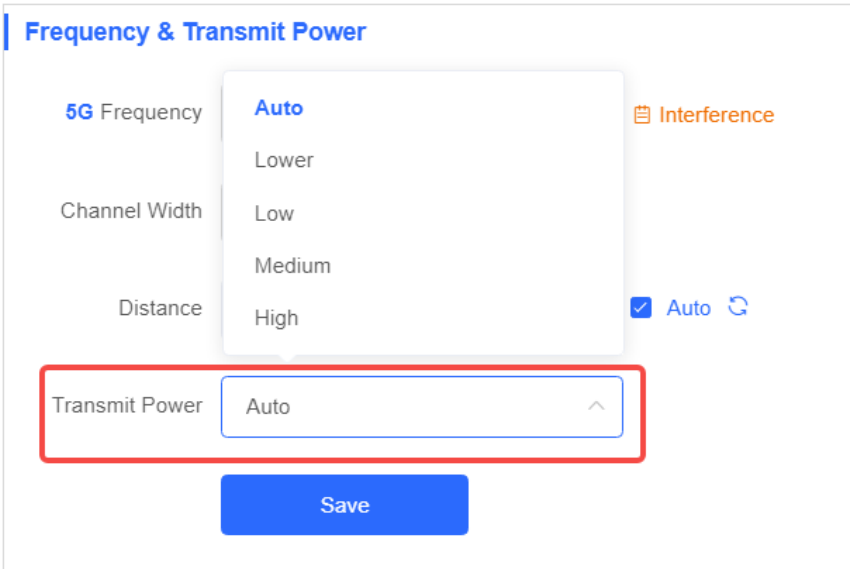


3. Configuring the Transmit Power

Higher transmit power provides greater coverage but may introduce stronger interference to surrounding wireless devices.

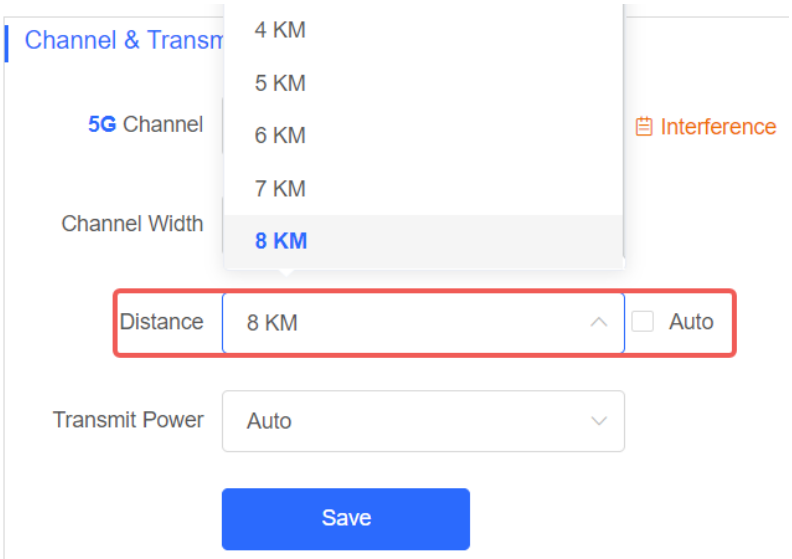
The default value is **Auto**, indicating that the transmit power is automatically adjusted. In scenarios where wireless devices are densely deployed, lower power is recommended.

Lower, **Low**, **Medium**, and **High** correspond to 25%, 50%, 75%, and 100% of the transmit power.



4. Configuring the Distance

The default setting automatically measures the distance between the NVR end and the camera end after they are bridged. In manual mode, you are advised to set the distance slightly greater than the actual distance. Setting a small distance may degrade wireless performance and lead to bridging failure.



Specification

The maximum distance vary with the devices: 5 km for the RG-EST350G, 3 km for the RG-EST450G, and RG-EST330F-P.

3.14 Configuring TDMA Mode

Specification

This function is supported only in the BaseStation mode.

3.14.1 Overview

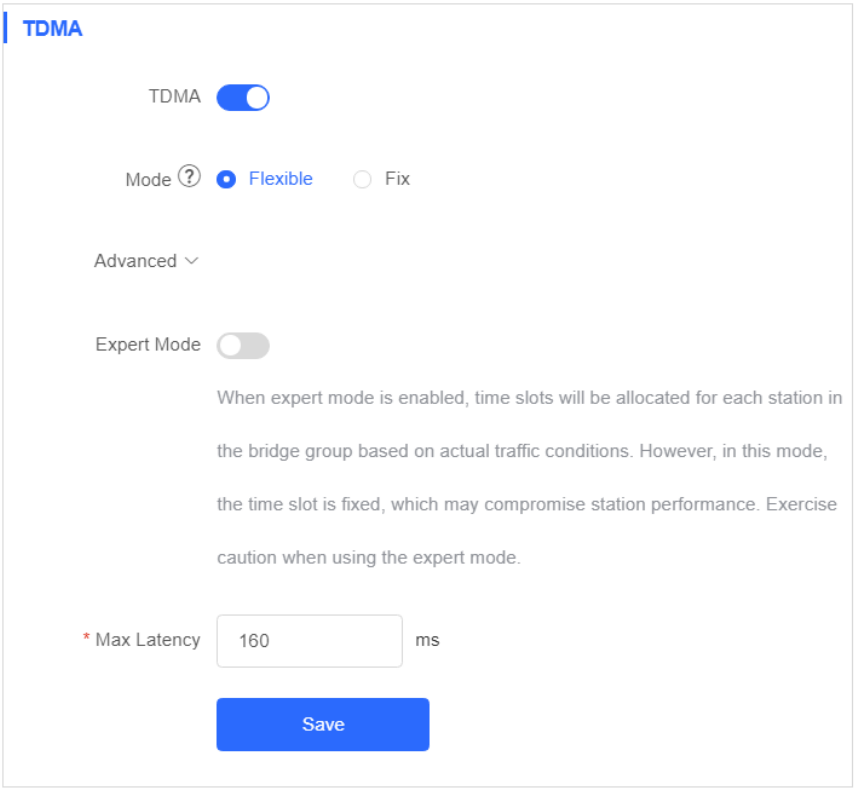
Time Division Multiple Access (TDMA) is specifically designed to address the challenge of CPE nodes being hidden from each other over long distances. In the traditional Wi-Fi mechanism utilizing Carrier Sense Multiple Access with Collision Detection (CSMA/CD), the nodes are unable to listen to each other, leading to significant performance degradation. With the TDMA mode enabled, the traffic of each node remains unaffected by long distances, ensuring high performance.

3.14.2 Selecting the TDMA Mode

Choose **One-Device** > **Config** > **Wireless** > **TDMA**.

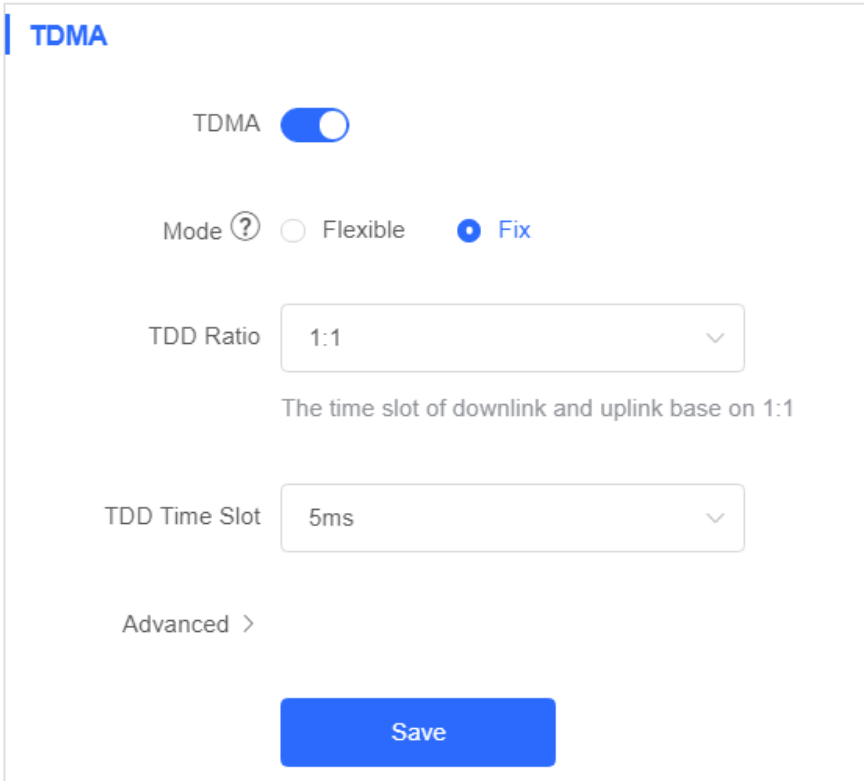
1. Flexible mode

The flexible mode is the default TDMA mode. When enabled, it employs an algorithm to automatically calculate the necessary time slots for each CPE or BaseStation. Additionally, the ratio between BaseStation and CPE is dynamically adjusted to optimize uplink and downlink traffic for maximum efficiency.



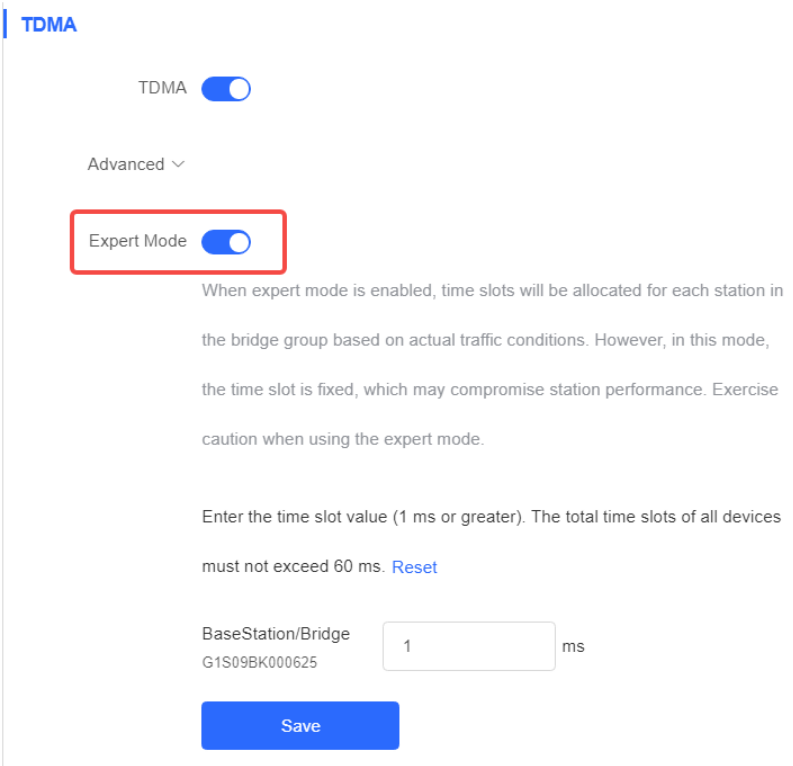
2. Fixed mode

The fixed mode is designed for scenarios that require traffic balance, consistent latency, and consistent uplink and downlink throughput for each node. By utilizing fix intervals (such as 5 ms, 8 ms, and 10 ms), the duration of each frame can be fixed to achieve a consistent latency. In terms of the uplink and downlink throughput, you can set the uplink and downlink ratio accordingly. Currently, there are five ratios available: 1:1, 1:2, 1:3, 2:1, and 3:1, which can be selected from the provided drop-down menu.



3. Expert mode

Expand **Advanced** and toggle on **Expert Mode**.



Caution

The expert mode is designed for situations where a specific node requires a dedicated and fixed time slot, unaffected by algorithm adjustments. In this mode, the desired time slot can be set by the customer. However, it is important to note that the expert mode is not recommended for general customers and should only be configured by individuals with relevant professional knowledge. Incorrect configuration in this mode may result in the device failing to go online.

4 Advanced Settings

4.1 Rate Limiting

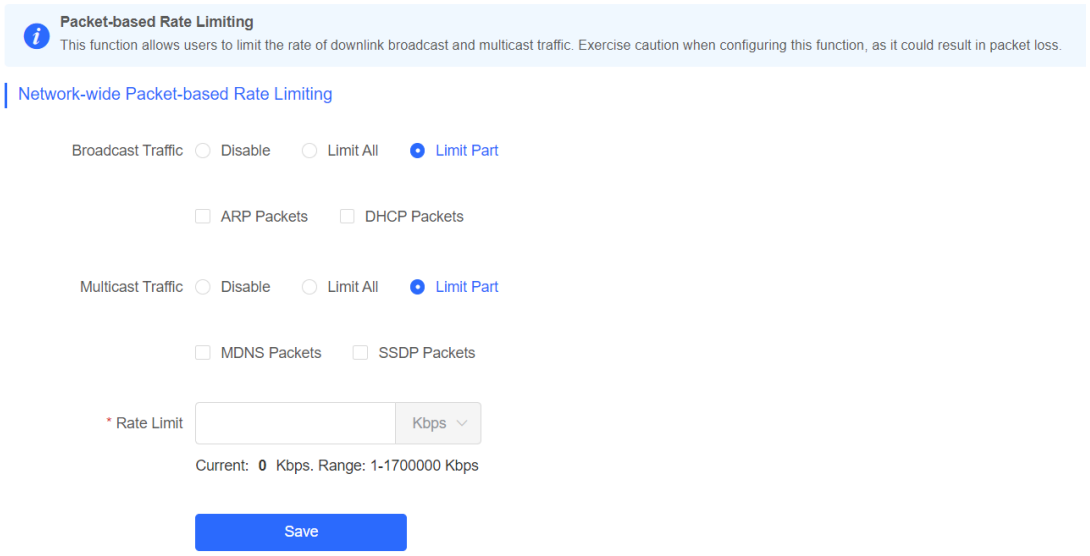
Enable rate limiting on broadcast or multicast packets to avoid congestion on the air interface.

The device supports rate limiting on specified broadcast packets (ARP and DHCP), specified multicast packets (MDNS and SSDP), or all broadcast and multicast packets.

Caution

Rate limiting takes effect on all devices over the network, that is, all bridges capable of rate limiting on the homepage.

Choose **One-Device** > **Config** > **Advanced** > **Rate Limiting**.



4.2 Configuring One-Touch Pairing

4.2.1 Overview

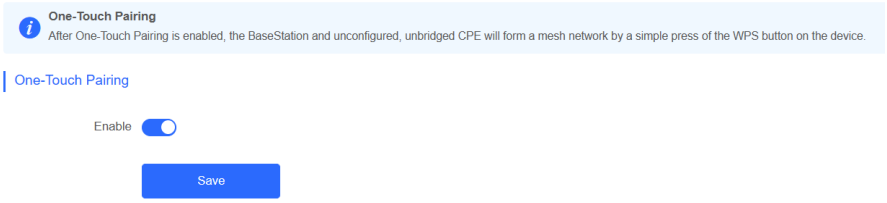
When the One-Touch Pairing feature is enabled, a simple press of the One-Touch Pairing button on the device triggers the mesh operation. During the mesh process, the BaseStation promptly forms a mesh connection with the factory-configured and unbridged CPE, streamlining the networking process.

4.2.2 Configuration Steps

Choose **One-Device** > **Config** > **Advanced** > **One-Touch Pairing**

Toggle on **Enable** and click **Save**.

Check whether the bridge is in BaseStation mode or CPE mode. If the bridge is currently in BaseStation mode, pressing the One-Touch Pairing button on the wireless bridge will bridge it to all nearby devices operating in CPE mode. If the device is currently in CPE mode, pressing the **One-Touch Pairing** button will switch it to BaseStation mode and continue bridging with all nearby devices operating in CPE mode.



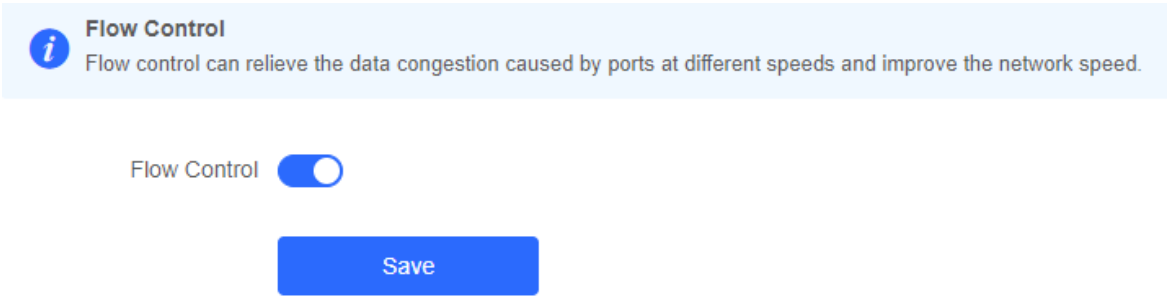
Specification

The One-Touch Pairing feature is enabled by default.

4.3 Port-based Flow Control

Choose **One-Device** > **Config** > **Advanced** > **Flow Control**.

Flow control can relieve the data congestion caused by ports at different speeds and improve the network speed. This function is enabled by default and can be manually disabled.



4.4 Wi-Fi Protection

Specification

This feature protects the network against de-authentication attacks. It is successfully enabled only when enabled on both the BaseStation and the CPE devices.

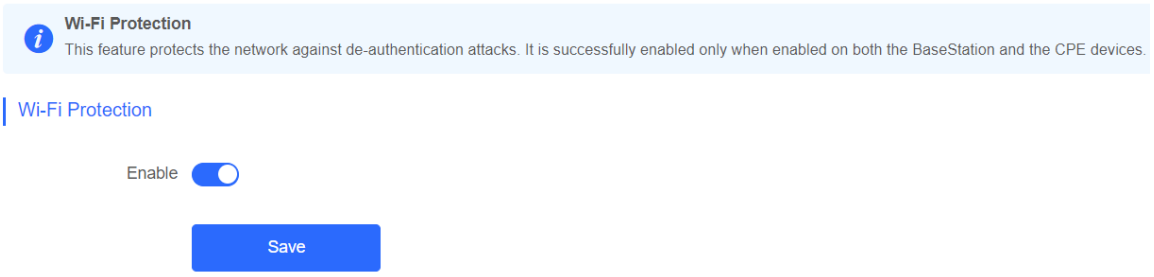
4.4.1 Overview

When there is any attacker in the operational environment of the bridge, the attacker will transmit authentication attack packets to the bridge, resulting in abnormal disconnection of the bridge. Enabling **Wi-Fi Protection** can safeguard the bridge from authentication attacks.

4.4.2 Configuration Steps

Choose **One-Device** > **Config** > **Advanced** > **Wi-Fi Protection**.

This function is enabled by default. You can manually disable the Wi-Fi protection function. Click **Save**.



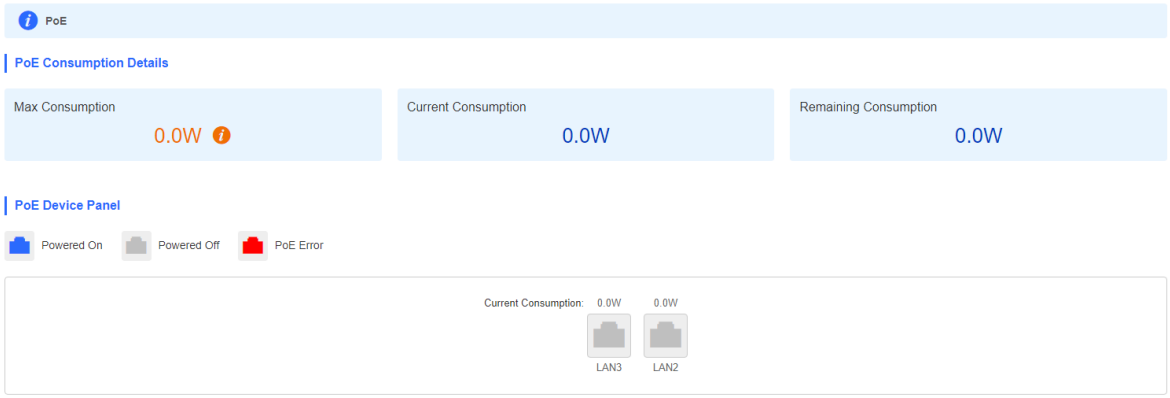
4.5 PoE Settings

Specification

PoE setting is only supported on the RG-EST330F-P.

Choose **One-Device** > **Config** > **Advanced** > **PoE**.

You can view the maximum power consumption, current power consumption, remaining power consumption and PoE status. Hover the cursor over  to display the PoE switch  .



4.6 Rebooting the Camera

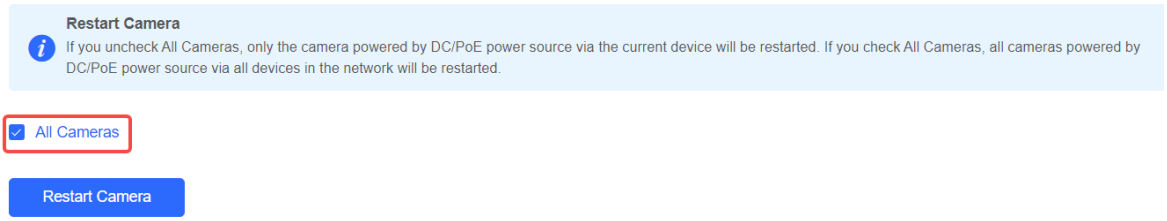
Specification

Camera restart is only supported on the RG-EST330F-P.

4.6.1 Rebooting All Cameras

Choose **Advanced** > **Restart Camera**.

You can reboot all cameras by check **All Cameras** and then clicking **Restart Camera**.



Caution

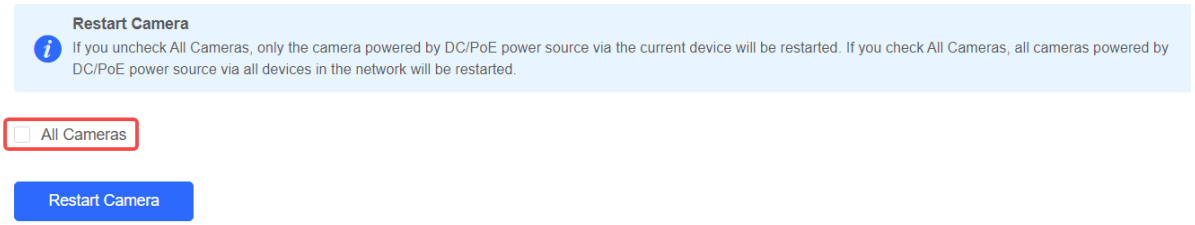
Only the cameras connected to the online devices supporting this function will be restarted.

Please keep the device powered on during reboot. Otherwise, the device may be damaged.

4.6.2 Rebooting the Camera Connected to the Current Device

Choose **Advanced** > **Restart Camera**.

Uncheck **All Cameras** and click **Restart Camera**.



5 Tools

5.1 Antenna Alignment

Specification

If the current device is in the BaseStation mode, you can view information about all devices in the CPE mode. If the current device is in the CPE mode, you can only view information about the current device and the device in the BaseStation mode.

5.1.1 Overview

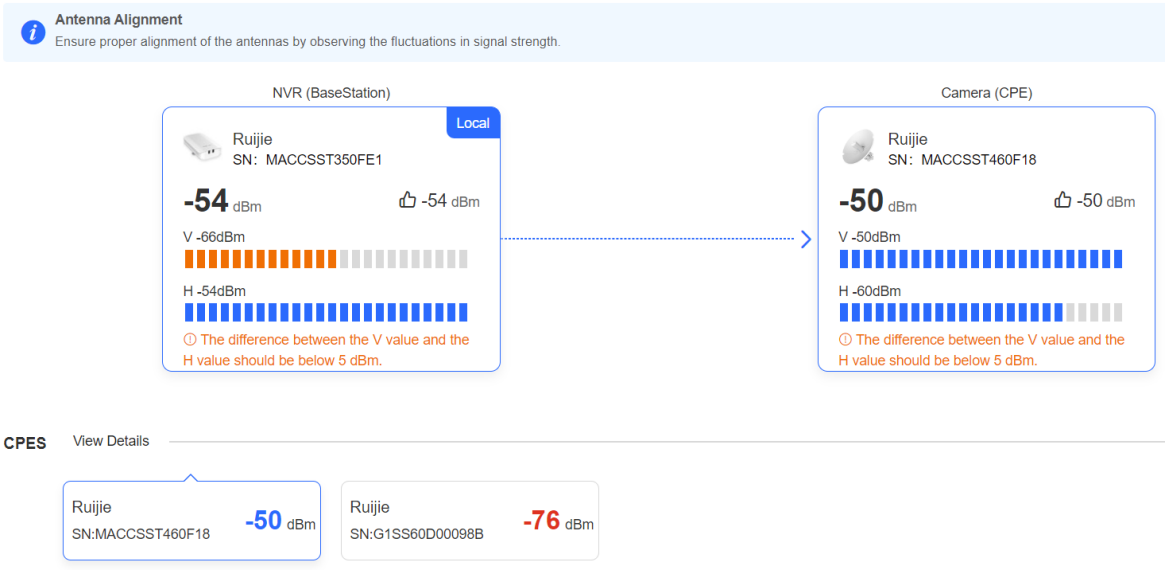
The **Antenna Alignment** tool can be used only when the device is in normal bridging state. Proper alignment can help you achieve the best bridging signal. When the device moves in the horizontal and vertical directions, the RSSI changes in real time.

5.1.2 Configuration Steps

Go to the configuration page:

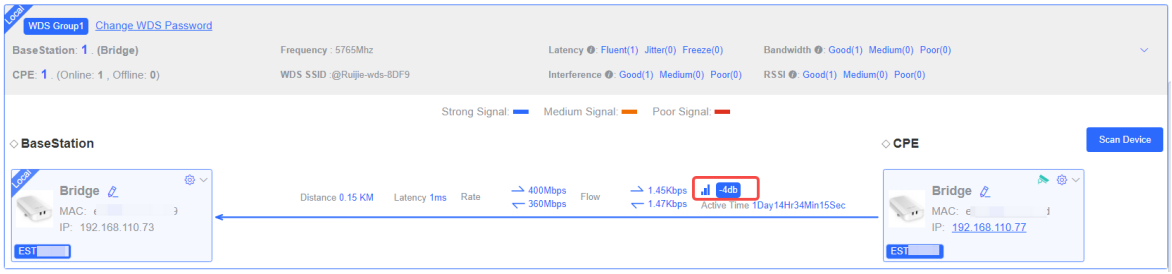
- Method 1: Choose **One-Device** > **Config** > **Tools** > **Antenna Alignment**.

Click **Antenna Alignment**. The RSSI of all CPEs in the bridge group will be displayed. Click any CPE to display the details of the bridging link.

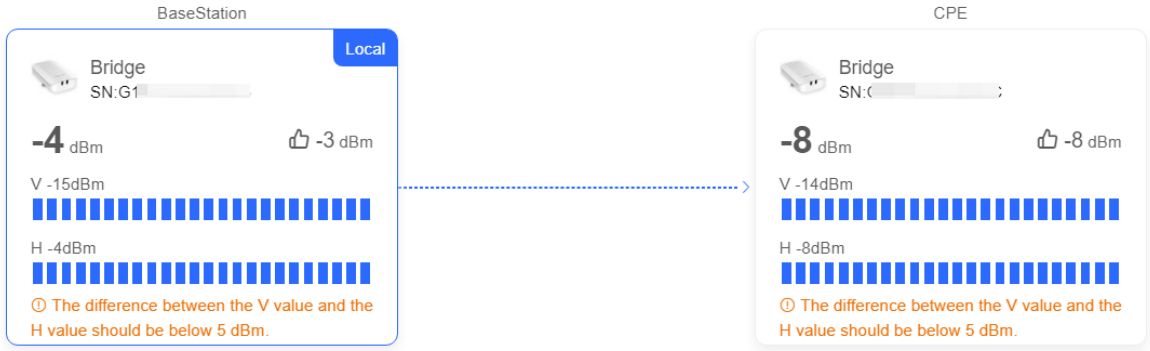


- Method 2: Choose **One-Device** > **Monitor** > **WDS Group Info**.

Click an RSSI value on the **WDS Group Info** page.



The bridge group information that can be viewed includes the maximum vertical and horizontal values of the BaseStation and camera in the bridge group, the optimal historical RSSI, and the real-time vertical and horizontal RSSIs.



Caution

The left pane displays details about the BaseStation device, while the right pane shows information about the CPE device.

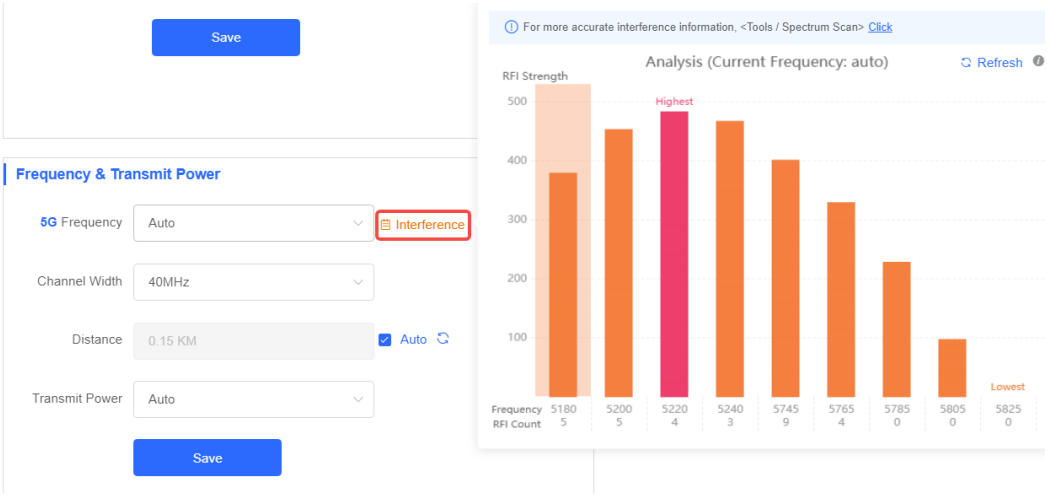
5.2 Spectrum Scan

Specification

- This function is supported only in the BaseStation mode.
- Bridges will be disconnected during spectrum scanning. Exercise caution when performing this operation.

Caution

The spectrum scan cannot be used together with the fast scan on the Frequency & Transmit Power configuration page. For quick scan configurations, see Section 3.13.2 Getting Started.



After the spectrum scan is complete, if the color of certain channels is gray, it indicates that they are unavailable. Use a channel with a different color.

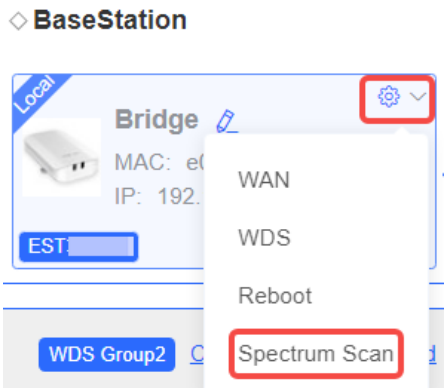
5.2.1 Overview

When a bridge is installed outdoors, outdoor base stations from other networks may cause wireless interference that will impact the bridge's performance. Spectrum scan provides details on interference across all frequencies. A higher interference score indicates severer interference on that frequency.

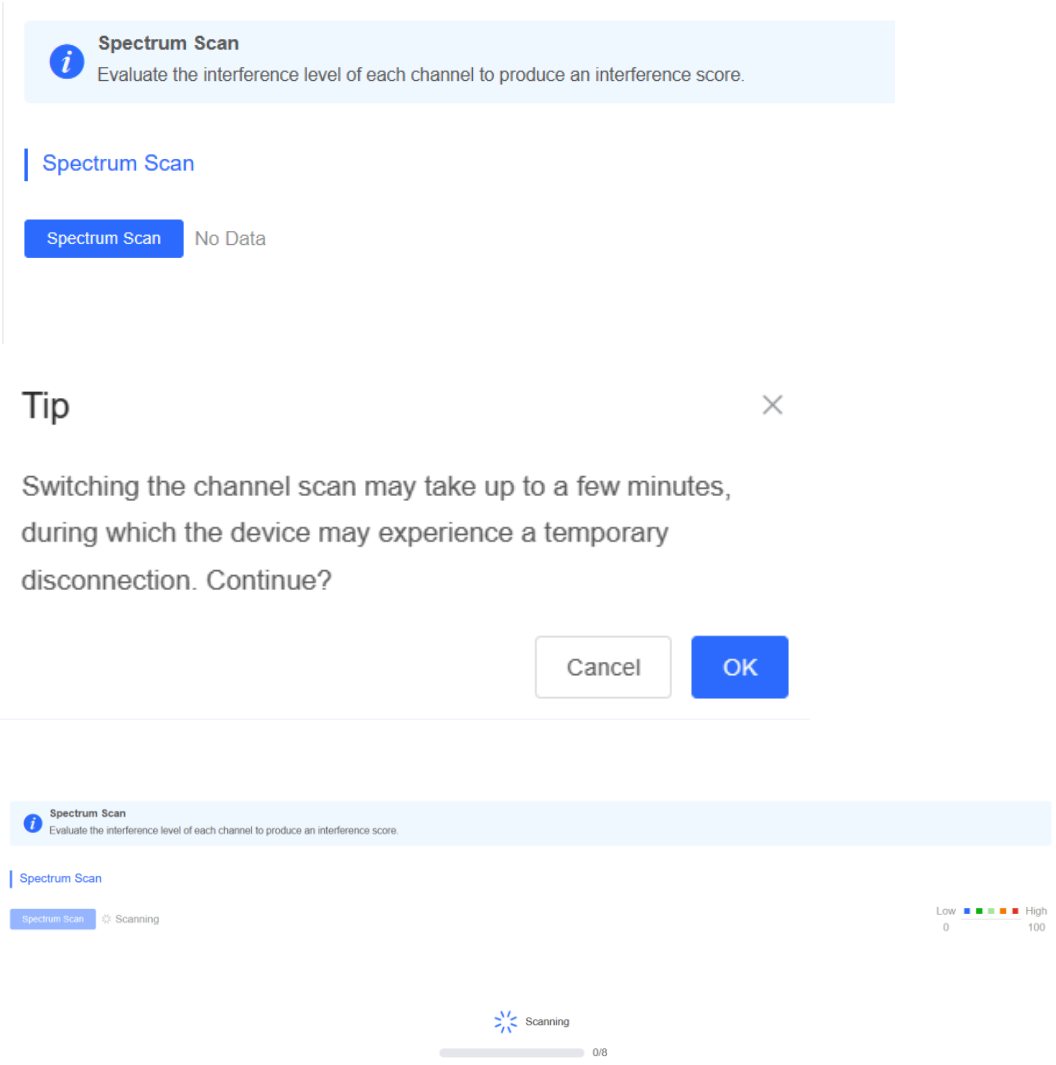
5.2.2 Configuration Steps

Go to the configuration page:

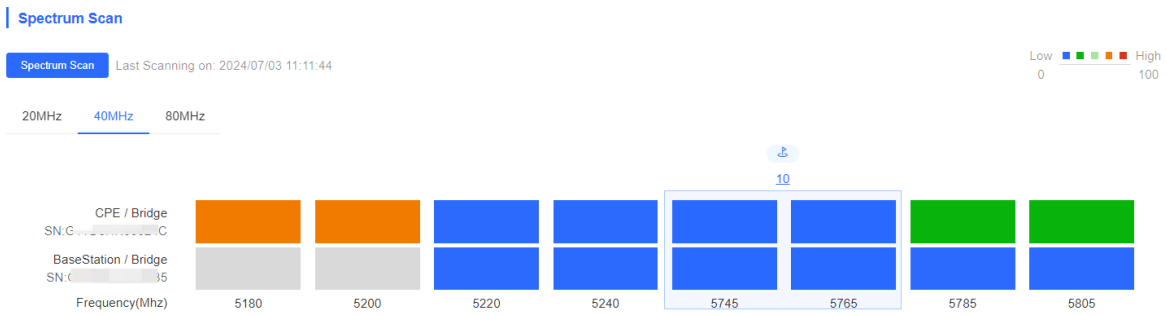
- Method 1: Choose **One-Device** > **Config** > **Tools > Spectrum Scan**.
- Method 2: Choose **One-Device** > **Monitor** > **WDS Group Info** > **BaseStation** > **Spectrum Scan**.



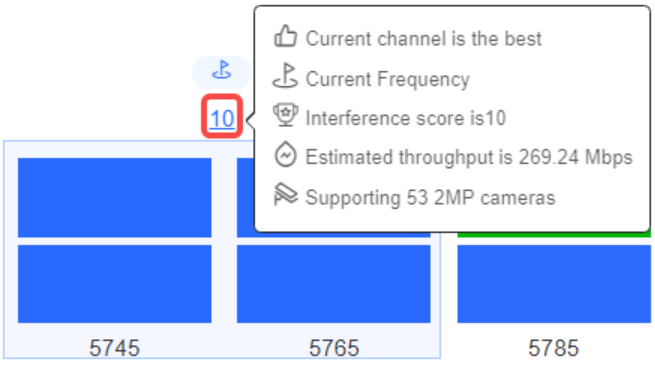
Click **Spectrum Scan**, and then click **OK** on the pop-up window. The **Spectrum Scan** page is displayed.



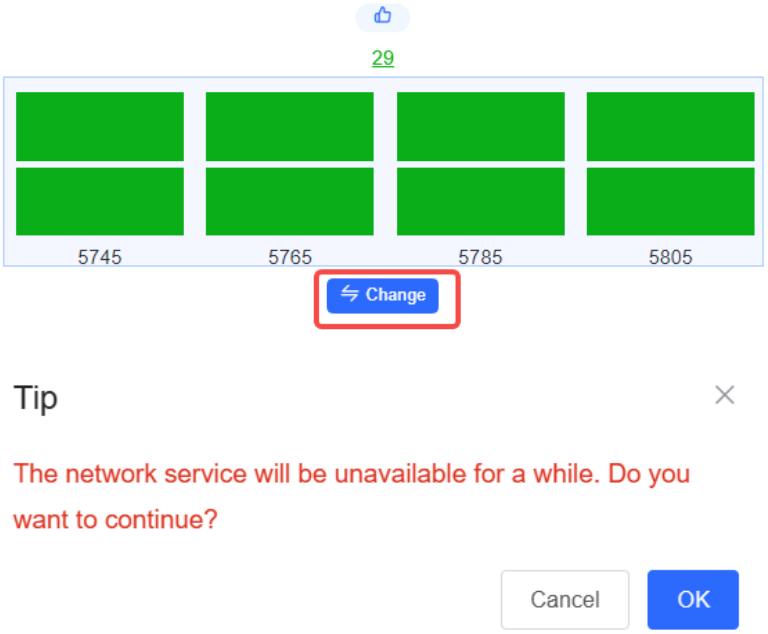
You can click the **20 MHz**, **40 MHz**, or **80 MHz** tabs to view the frequency interference. The color gradient from left to right indicates the level of interference, ranging from low to high. Each row represents the frequencies used by a device.



Hovering the mouse over it will display detailed information about the current frequency, including throughput and estimated number of cameras that can be supported.



To change frequencies, click on the target frequencies, and then click **Change**. A pop-up window is displayed. Click **OK**.



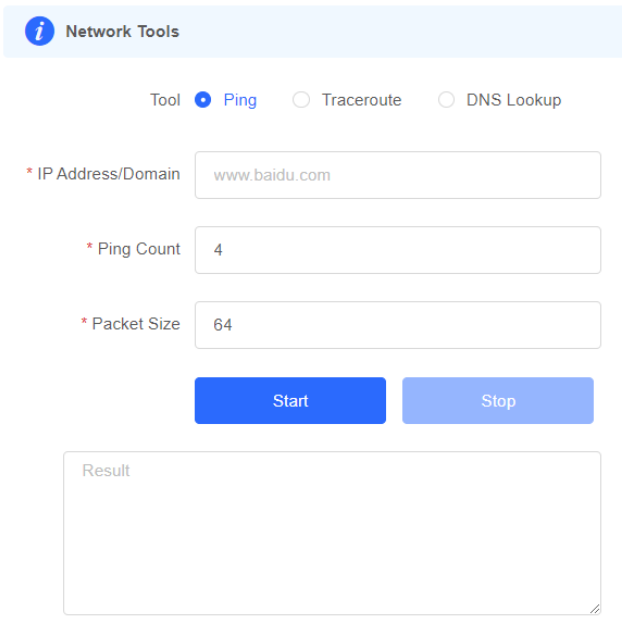
5.3 Network Test Tool

Choose **One-Device** > **Config** > **Tools** > **Network Tools**.

When you select the ping tool, you can enter the IP address or URL and click **Start** to test the connectivity between the bridge and the IP address or URL. The message "Ping failed" indicates that the bridge cannot reach the IP address or URL.

The Traceroute tool displays the network path to a specific IP address or URL.

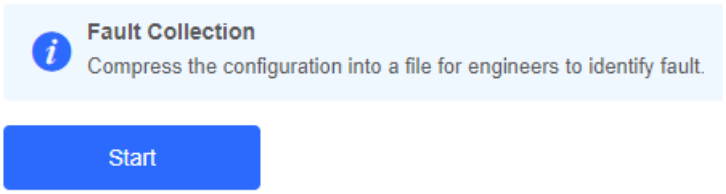
The DNS Lookup tool displays the DNS server address used to resolve a URL.



5.4 Collecting Fault Info

Choose **One-Device** > **Config** > **Tools** > **Fault Collection**.

Click **Start** to collect fault information and compress it into a file for engineers to identify fault.



Caution

If the issue persists despite following the troubleshooting methods provided in this section, you may require remote support from a technician who will enable developer mode to resolve the issue. We will ensure your data is protected during this process.

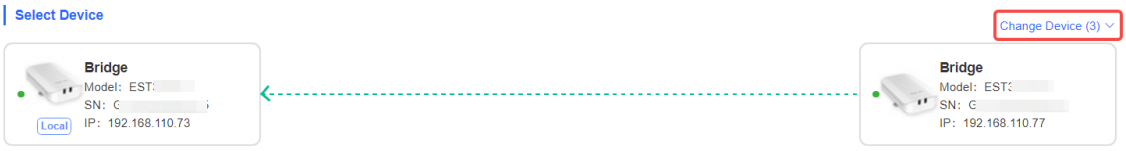
5.5 Bridge Speed Test

Specification

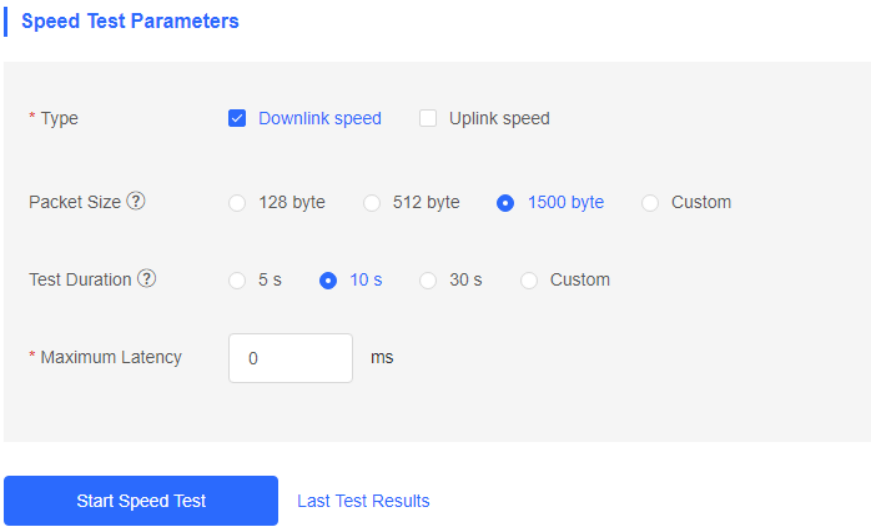
- The speed test is only supported on paired bridges.
- Before the speed test, ensure that the peer device is online. Otherwise, speed test cannot be performed.

Choose **One-Device** > **Config** > **Tools** > **Bridge Speed Test**.

(1) Select a test device and click **Change Device**. You can select the peer device that has been bridged.



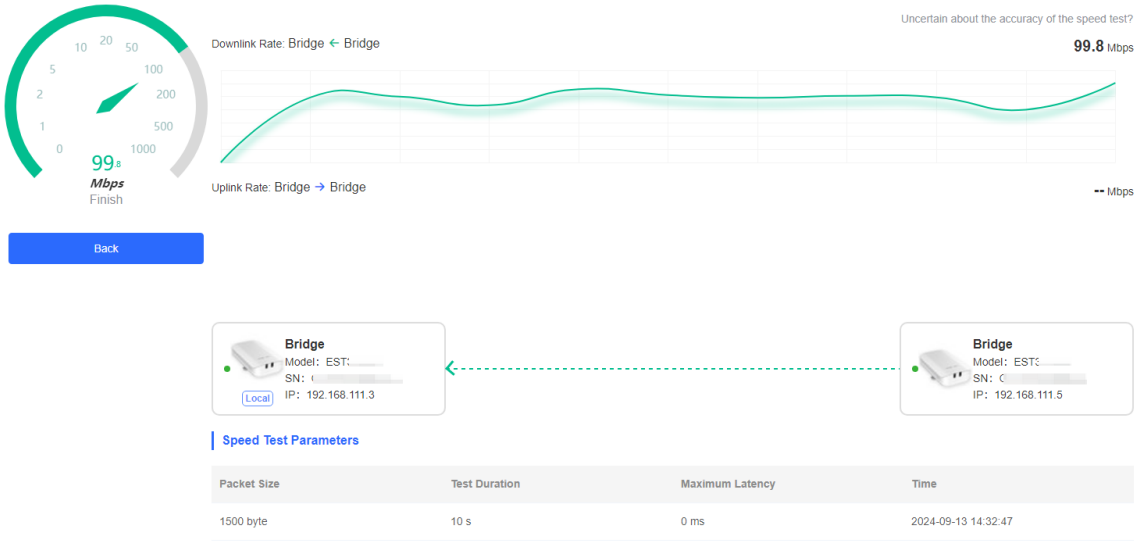
(2) Set speed test parameters.



- **Type**: Select the downlink or uplink rates for the test (multiple selections are supported):
  - **Downlink speed**: Data transmission rate from the peer device to the local device (indicated by the green arrow).
  - **Uplink speed**: Data transmission rate from the local device to the peer device (indicated by the blue arrow).
- **Packet Size**: Using smaller packets is more suited for evaluating network latency and connectivity, whereas larger packets help test bandwidth utilization and the capacity of network devices.
- **Test Duration**: A short duration reflects the peak rate, while a long duration reflects the stable rate.
- **Maximum Latency**: The maximum acceptable network latency during the speed test. A lower acceptable latency indicates a higher requirement for the network environment. The default value is 0 ms.

(3) Click **Start Speed Test**.

(4) After the speed test is complete, the test results will be displayed on the page. Click **Back** to return to the speed test page.


Uncertain about the accuracy of the speed test?
Downlink Rate: Bridge ← Bridge
99.8 Mbps
Uplink Rate: Bridge → Bridge
-- Mbps
99.8
Mbps
Finish
Back
Bridge
Model: EST
SN:
IP: 192.168.111.3
Local
Bridge
Model: EST
SN:
IP: 192.168.111.5
Speed Test Parameters
Packet Size
Test Duration
Maximum Latency
Time
1500 byte
10 s
0 ms
2024-09-13 14:32:47

6 Network Settings

6.1 Network Modes

6.1.1 Configuring the Network Mode

The device supports two network modes: bridge mode and router mode. The system menu and functions vary with the network mode. A bridge is in bridge mode by default.

1. Bridge Mode

The device performs Layer 2 forwarding, and does not support the DHCP address pool function. In bridge mode, it is used in combination with a routing device for networking. The downlink devices' IP addresses are uniformly allocated and managed by the uplink device (with a DHCP address pool). The bridge only performs transparent transmission.

If the network is already connected to the Internet, you are advised to select the bridge mode.

2. Router Mode

The device has the routing function, and supports NAT routing and forwarding. The IP address of the downlink device can be allocated by the bridge. Data is forwarded by the bridge and NAT is supported.

In router mode, the device supports DHCP and static IP for Internet connection, and can directly connect to the uplink device.

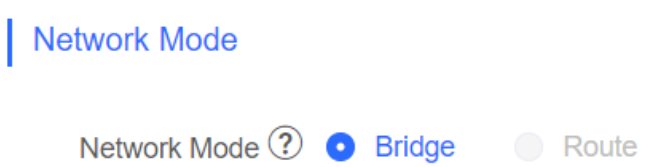
Caution

After the device is switched to the router mode, its network settings will be changed. The IP address of the LAN port will be changed to 192.168.130.1, and the DHCP server will be enabled. You are advised to set the PC to automatically obtain an IP address, and to log in to 10.44.77.254 to configure the device in router mode. Router mode is supported only when the bridge acts as a CPE.

6.1.2 Configuration Steps

Choose **One-Device** > **Config** > **Network** > **Network Mode**.

Select the required network mode. Hover the mouse over the icon to view the help information.



6.2 Configuring the IPv4 Address of the WAN Port

In bridge mode, the IPv4 address of the WAN port is only used for accessing the web interface, and does not affect the service network.

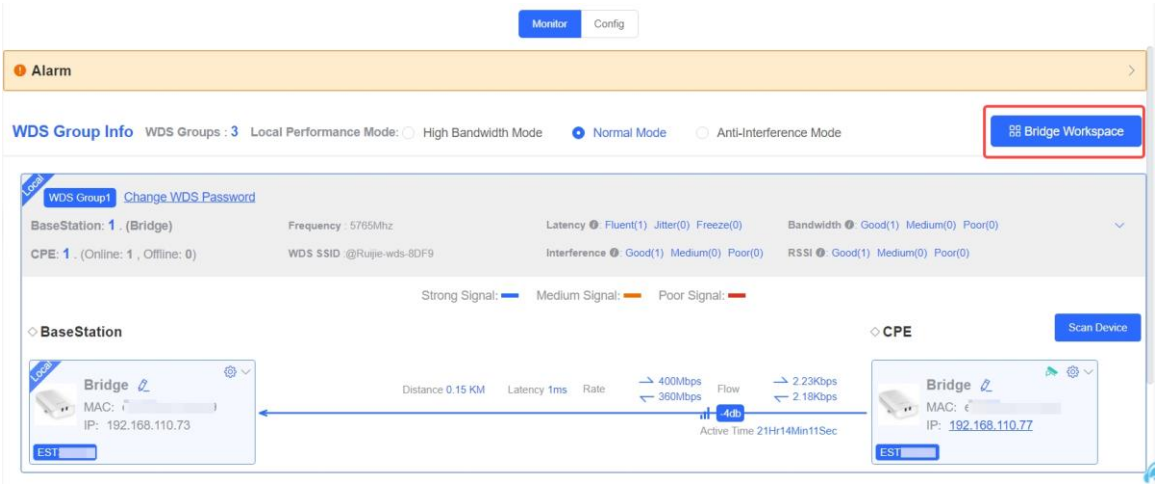
6.2.1 Allocating IPv4 Addresses to Bridges on the Network

1. Static IP Address

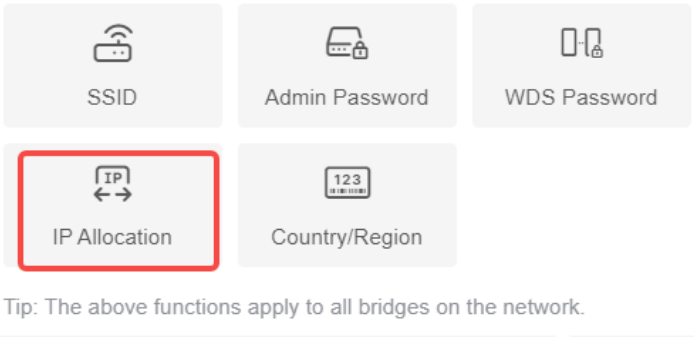
Choose **One-Device** > **Monitor** > **WDS Group Info**.

When a large number of devices on the network need to be configured with static IP addresses, you can use the IP Allocation feature to automatically allocate a static IP address to each device.

(1) Click **Bridge Workspace**.

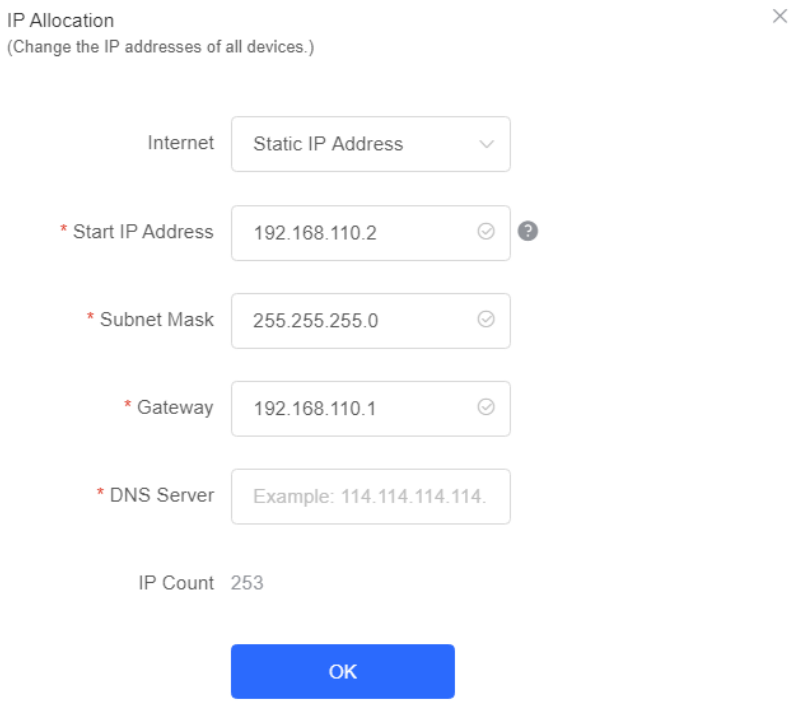


(2) Click **IP Allocation**.



(3) In the dialog box that appears, select **Static IP Address** from the **Internet** drop-down list, enter the start IP address, subnet mask, gateway IP address, and DNS server IP address. Then, click **OK**.

Hover the mouse over the icon to view the help information.



Caution

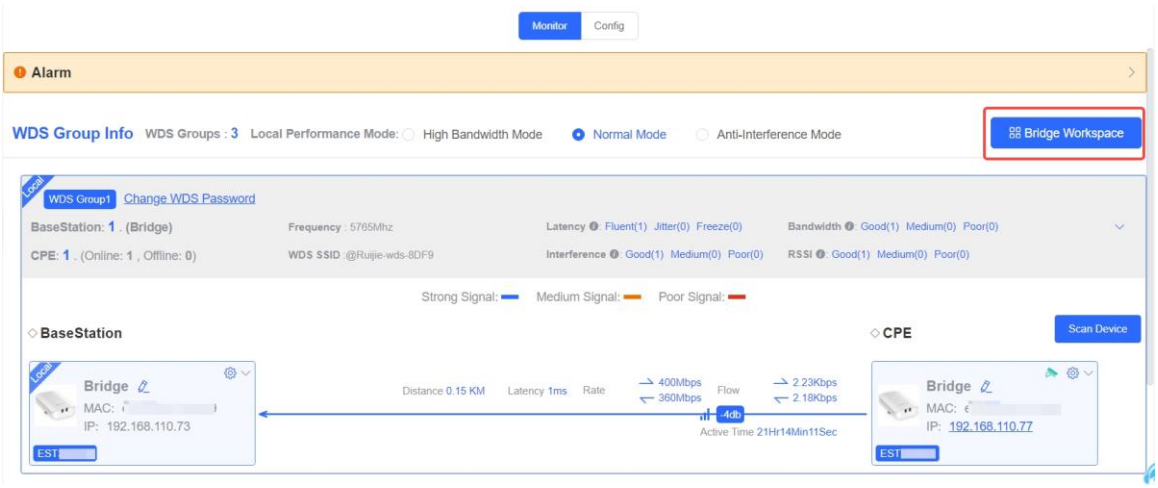
- The start IP address cannot be on the same network segment as the current IP address. Otherwise, the configuration will fail.
- After the configuration is saved, the device IP address will change, and you may fail to access the device's web interface. In this case, you need to enter the new IP address in the browser's address bar for login. Ensure that the IP addresses of the management PC and the device are on the same network segment. If they are not on the same network segment, change the management PC's IP address. For details, see 2.3.2 Configuring the IP Address of the Management PC. Therefore, exercise caution when performing this operation.

2. DHCP

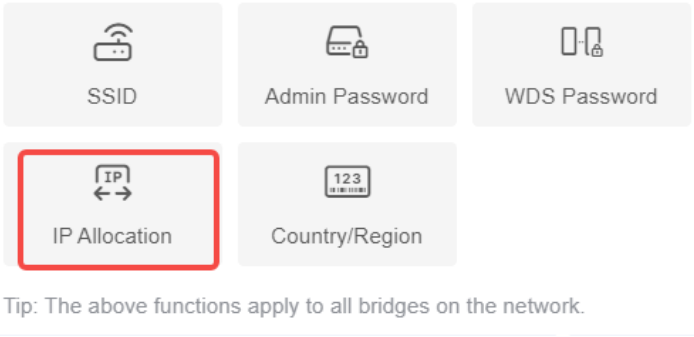
Choose **One-Device** > **Monitor** > **WDS Group Info**.

When a large number of devices on the network require dynamic IP addresses, you can configure dynamic IP addresses for all devices on the network, so that each device can dynamically obtain an IP address.

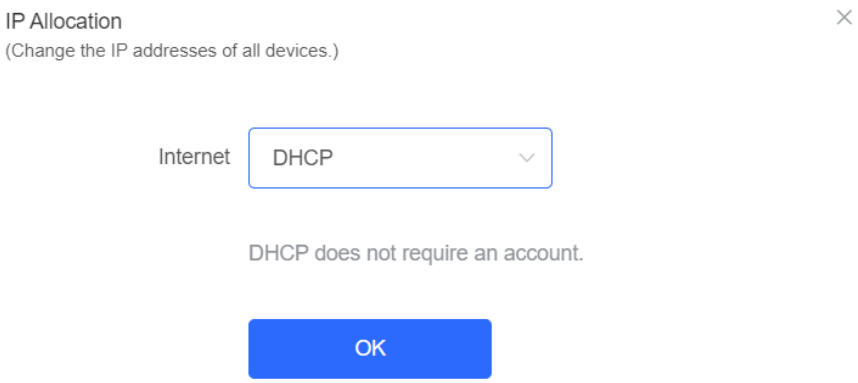
(1) Click **Bridge Workspace**.



(2) Click **IP Allocation**.



(3) Select **DHCP** from the **Internet** drop-down list. Then, click **OK**.

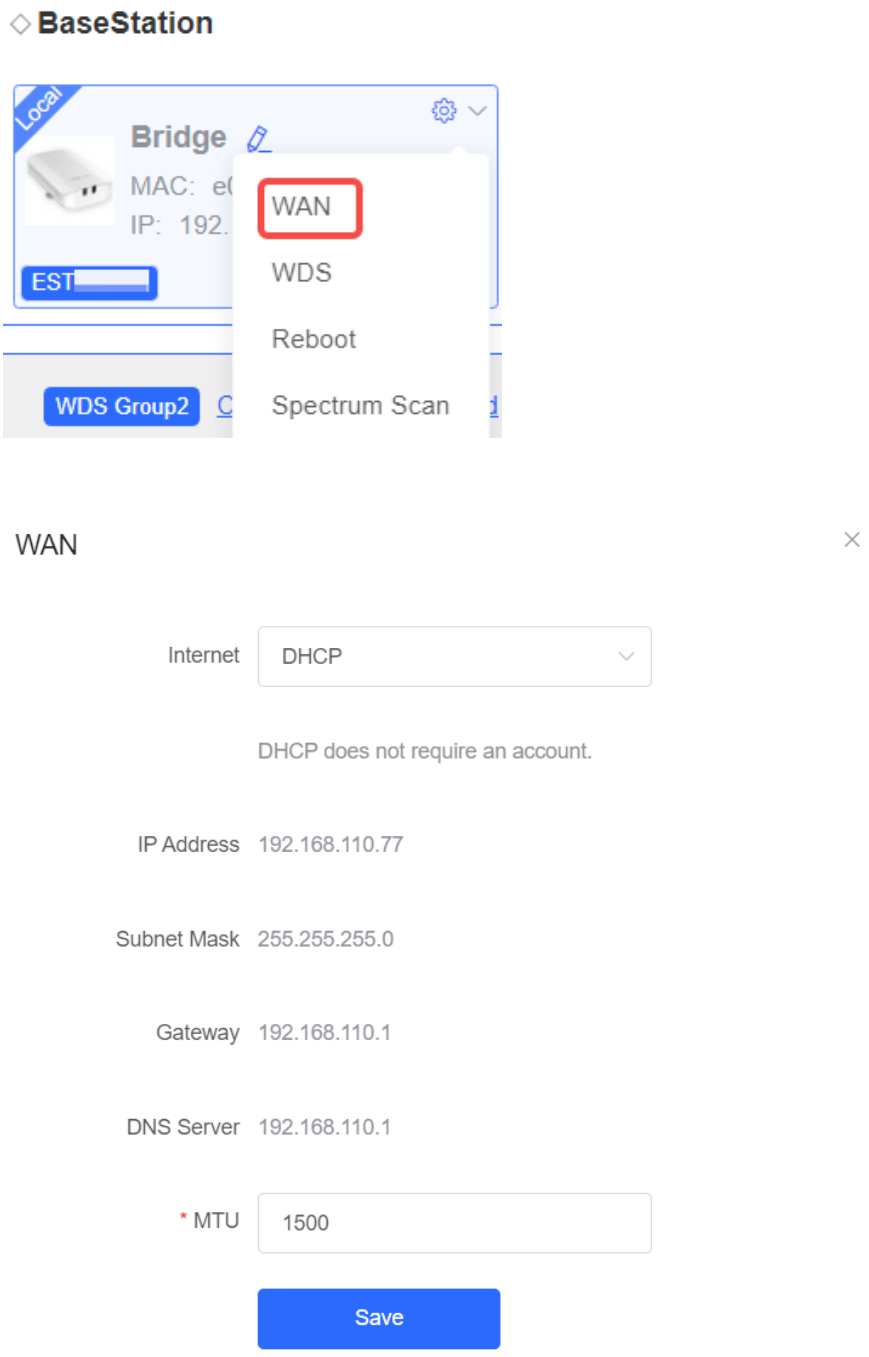


6.2.2 Set the WAN Port IP Address for a Single Online Bridge

Choose **One-Device** > **Monitor** > **WDS Group Info** > **BaseStation** or **CPE**.

You can set an IP address for a single device using the **Network-wide Management** menu.

Click . Select **WAN** from the drop-down list. For details, see6.2.1 Allocating IPv4 Addresses to Bridges.



Caution

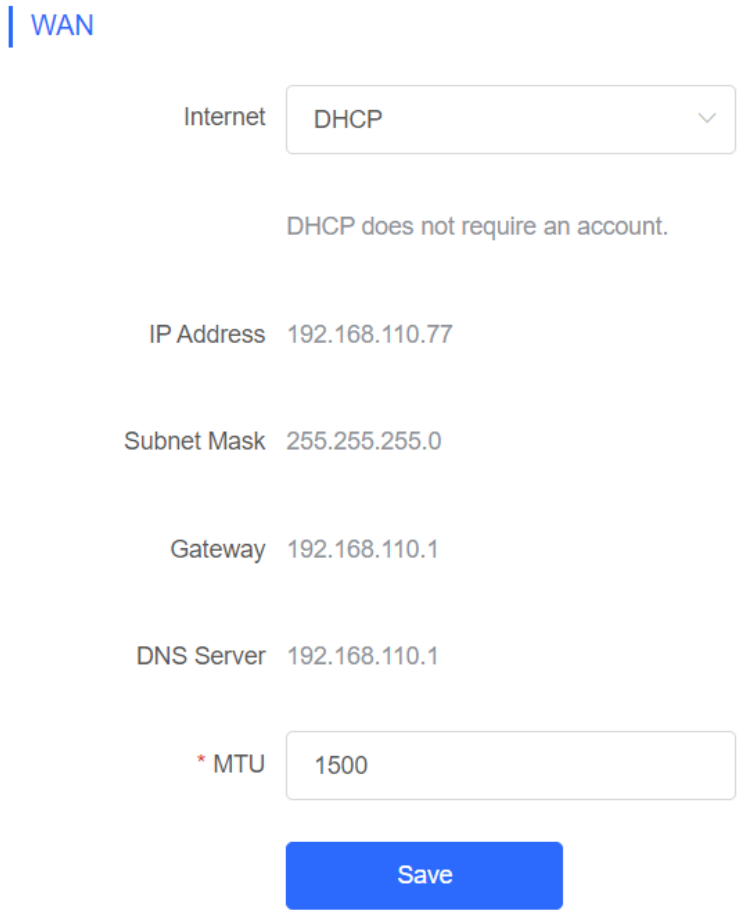
After the IP address and subnet mask are changed, you may fail to access the device's web interface. In this case, you need to enter the new IP address in the browser's address bar for login. Ensure that the IP addresses of the management PC and the device are on the same network segment. If they are not on the same network segment, change the management PC's IP address. For details, see 2.3.2 Configuring the IP Address of the Management PC. Therefore, exercise caution when performing this operation.

6.2.3 Configuring an IP Address for the WAN Port

Choose **One-Device** > **Config** > **Network > WAN**.

Select the Internet connection type. You are advised to select **DHCP** for networks with a DHCP server, or **Static IP** for networks without a DHCP server.

If **Static IP** is selected, enter the IP address, subnet mask, gateway IP address, and DNS server address. Click **Save**.



Caution

After the IP address and subnet mask are changed, you may fail to access the device's web interface. In this case, you need to enter the new IP address in the browser's address bar for login. Ensure that the IP addresses of the management PC and the device are on the same network segment. If they are not on the same network segment, change the management PC's IP address. For details, see 2.3.2 Configuring the IP Address of the Management PC. Therefore, exercise caution when performing this operation.

6.3 Changing the IP Address of a LAN Port

Specification

This function is supported only when the network mode of the device is set to router mode.

Choose **One-Device** > **Config** > **Network** > **Base Configuration** > **LAN**.

Enter the IP address and subnet mask, and click **Save**. After changing the IP address of the LAN port, enter the new IP address in the browser to access the web interface of the device for configuration and management.

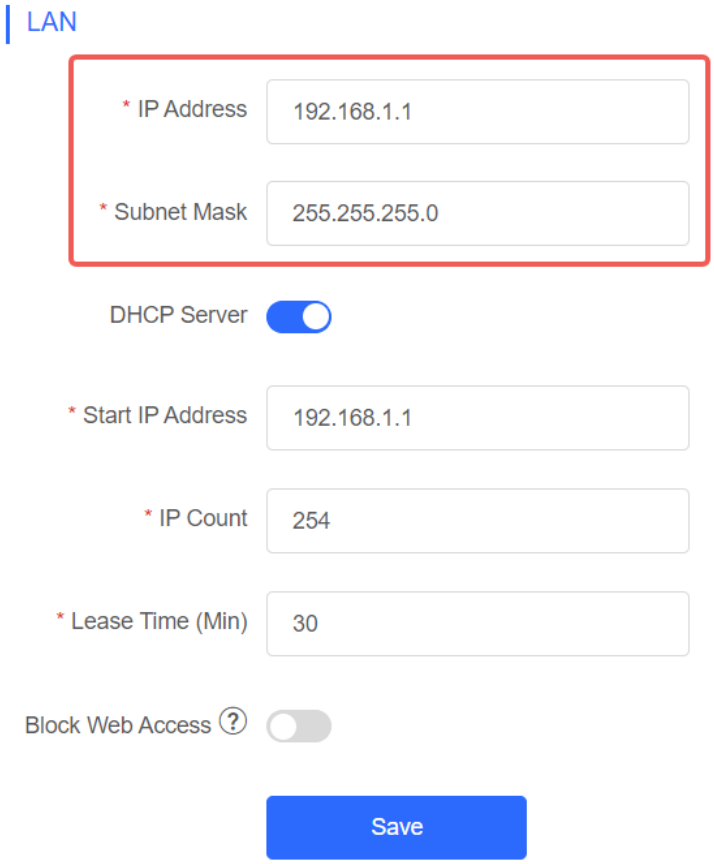


Table 6-1 LAN Configuration Parameters

Parameter	Description
IP Address	This IP address is the default gateway IP address for devices connected to the internet through this LAN.
Subnet Mask	Subnet mask of devices on the LAN.
DHCP Server	After this function is enabled, devices on the LAN can automatically obtain IP addresses. You need to configure the start IP address to be assigned, number of IP addresses to be assigned, and address lease time for the DHCP server, as well as other DHCP server options. For details, see 6.5 Configuring the DHCP Server.
Start IP Address	Start IP address of the IP address range automatically allocated by the DHCP server. The start address should be on the network segment calculated based on the IP address and the subnet mask.

Parameter	Description
IP Count	The number of assignable IP addresses, which is determined by the LAN segment and the start IP address.
Lease Time (Min)	Lease time of the automatically assigned IP addresses. When the lease time expires, devices on the LAN will obtain IP addresses again.
Block Web Access	After this function is enabled, you cannot log in to the web interface of the CPE through the LAN port. You can only log in to the web interface of the CPE by connecting to the SSID or connecting to the NVR (BaseStation) to access the web interface of the CPE.

6.4 Changing the MTU

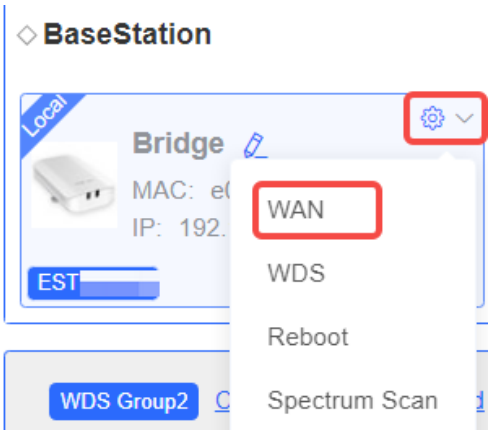
WAN port MTU indicates the maximum transmission unit (MTU) allowed by the WAN port. The default value is 1500 bytes. However, at times, ISP networks may limit the speed of large data packets or block their transmission. This can lead to slow network speeds or even disconnections. In such cases, you are advised to set a smaller MTU value.

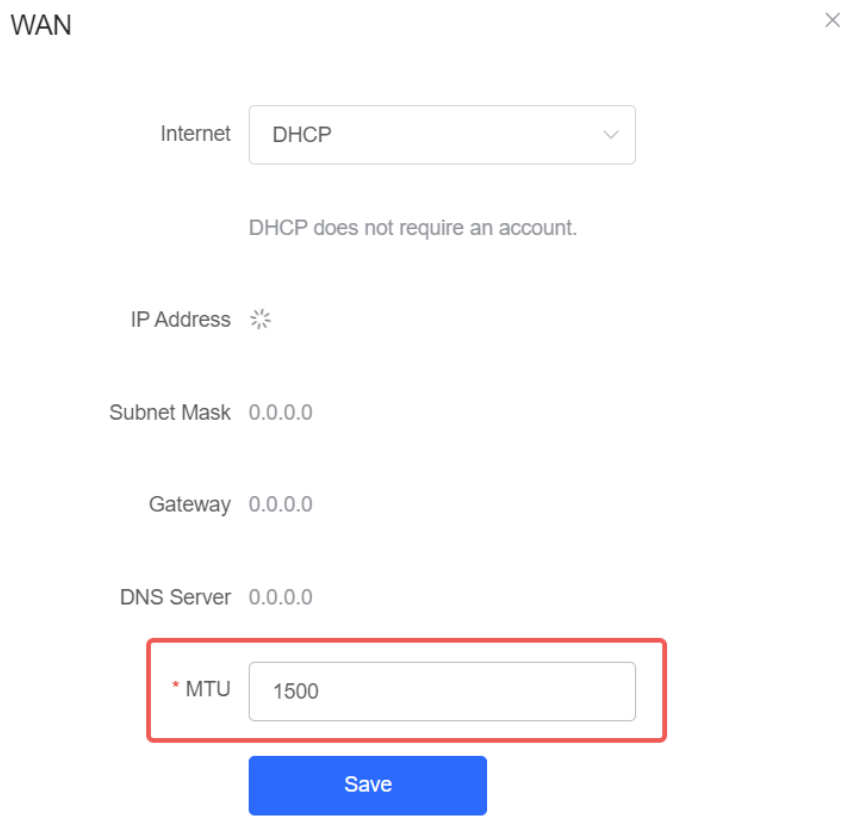
6.4.1 Changing the MTU of a Single Online Bridge

Choose **One-Device** > **Monitor** > **WDS Group Info** > **BaseStation** or **CPE**.

The MTU of a single device can be configured using the **Network-wide Management** menu.

Click . Select **WAN** from the drop-down menu. On the page that is displayed, enter the MTU value, and click **Save**.

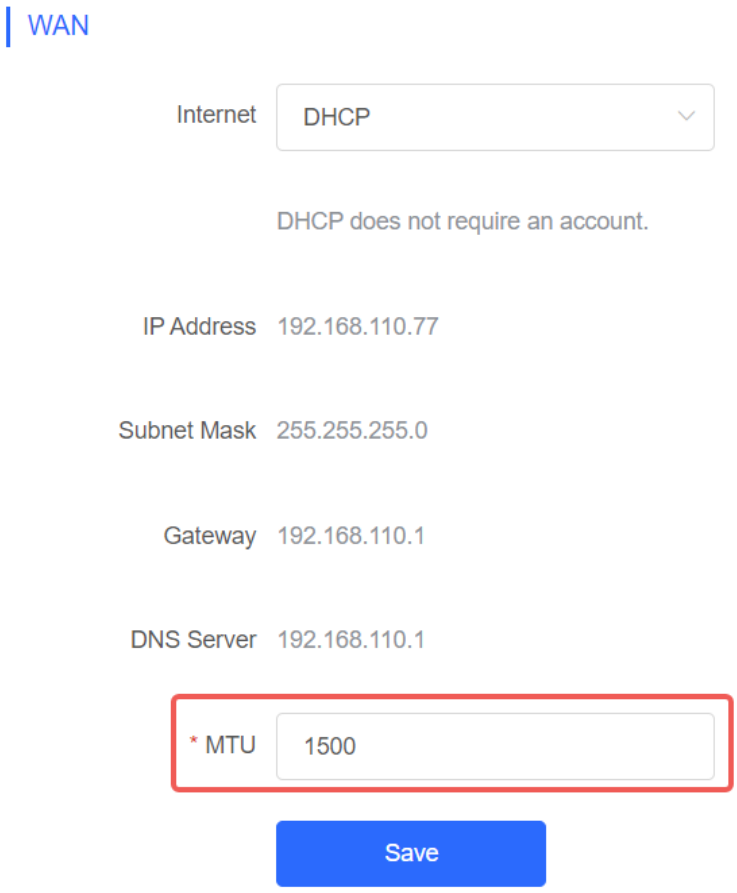




6.4.2 Modifying the MTU of the Current Device

Choose **One-Device** > **Config** > **Network** > **WAN**.

On the **WAN** page, enter the MTU value and click **Save**.



6.5 Configuring the DHCP Server

Specification

This function is supported only when the network mode of the device is set to router mode.

6.5.1 Overview

In router mode, the DHCP server function can be enabled on the device to automatically assign IP addresses to clients, so that clients connected to the LAN ports of the device can obtain IP addresses for Internet access.

6.5.2 Configuring the DHCP Server

Choose **One-Device** > **Config** > **Network** > **LAN**.

DHCP Server: This function is enabled by default when the network mode of the device is set to router mode. When the device is used as the only routing device on the network, you are advised to keep this function enabled. When multiple routing devices are connected to the uplink device through the LAN port, you are advised to disable this function.

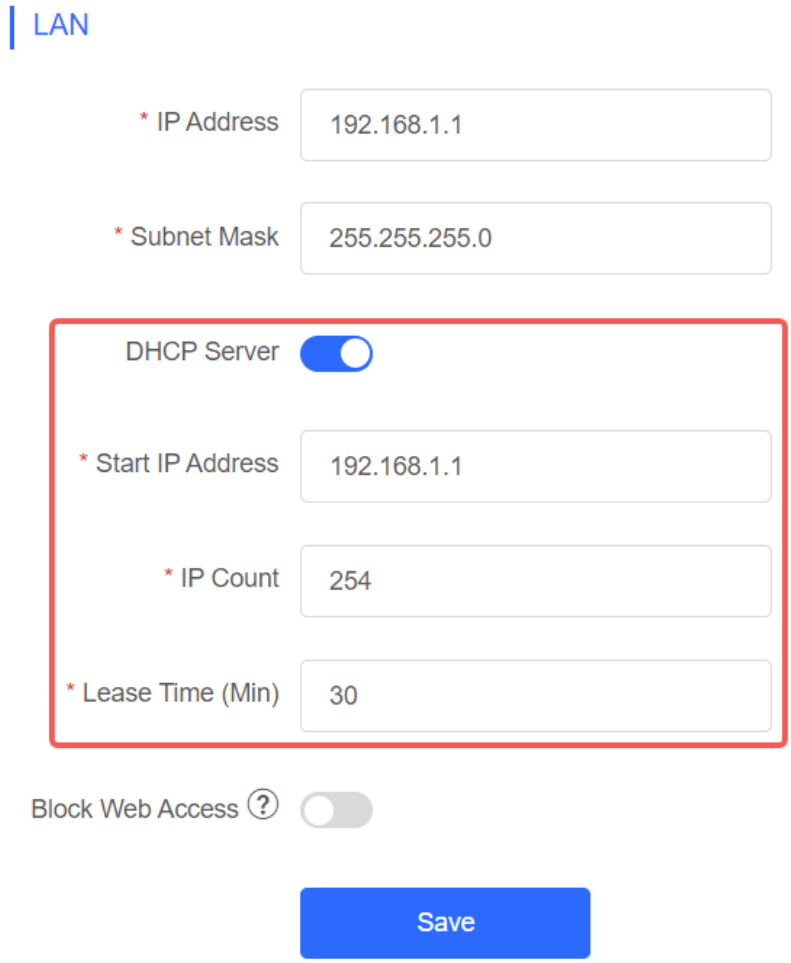
Caution

If the DHCP Server function is disabled on all devices on the network, clients cannot automatically obtain IP addresses. You need to enable the DHCP Server function on one device or manually configure a static IP address for each client for Internet access.

Start IP Address: Start IP address of the DHCP address pool. A client obtains an IP address from the address pool. If all the addresses in the address pool are used up, no IP address will be assigned to the clients.

IP Count: Number of IP addresses in the address pool.

Lease Time (Min): Lease time of IP addresses. When a client is connected, the leased IP address is automatically renewed. If a leased IP address is not renewed due to client disconnection or network instability, the IP address will be reclaimed after the lease time expires. After the client connection is restored, the client can request for an IP address again. The default lease time is 30 minutes.



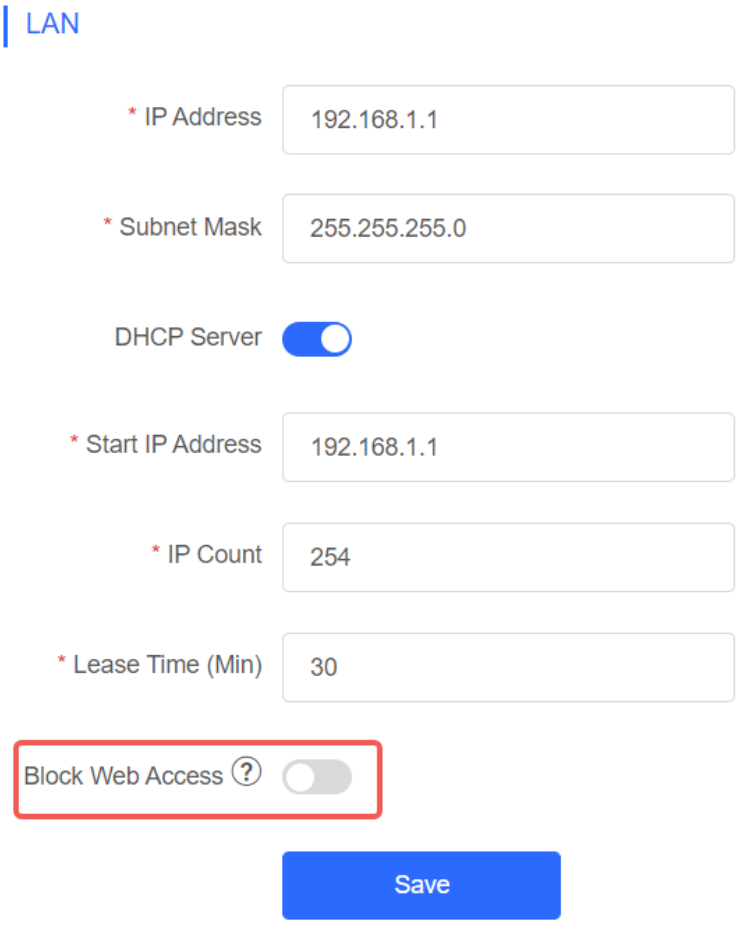
6.6 Blocking Web Access

Specification

This function is supported only when the network mode of the device is set to router mode.

Choose **One-Device** > **Config** > **Network** > **LAN**.

After this function is enabled, you cannot log in to the web interface of the camera through the LAN port of the PC. You can only access the web interface of the camera through the SSID or by connecting to the BaseStation.

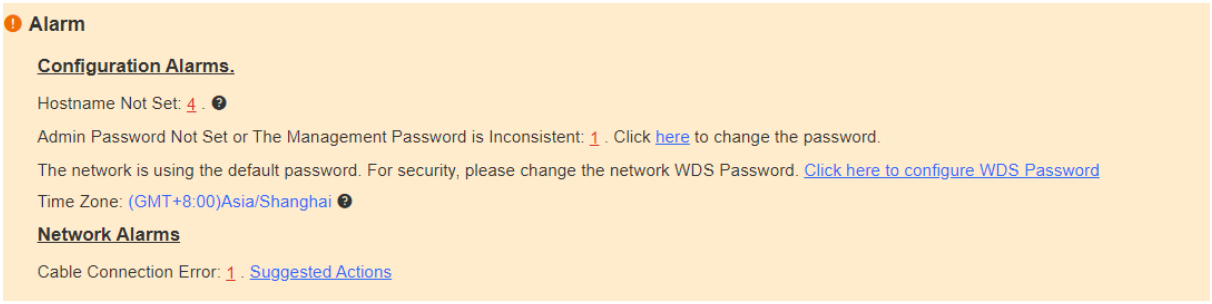


7 Alarm and Fault Diagnosis

7.1 Alarm Information and Suggested Action

When bridges fail or lack some necessary security configuration, the system prompts key alarms about the bridges on the homepage, so that users can handle the exceptions promptly.

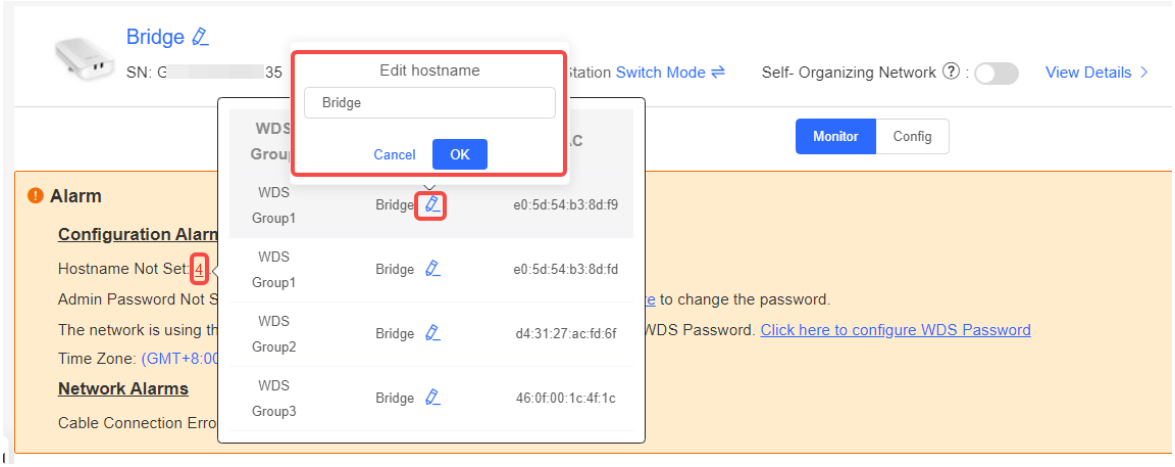
Choose **One-Device** > **Monitor** > **Alarm**.



7.1.1 Default Device Name Is Not Modified

Modifying device names can help you better distinguish each bridge. Unless otherwise specified, you are advised to modify default device names.

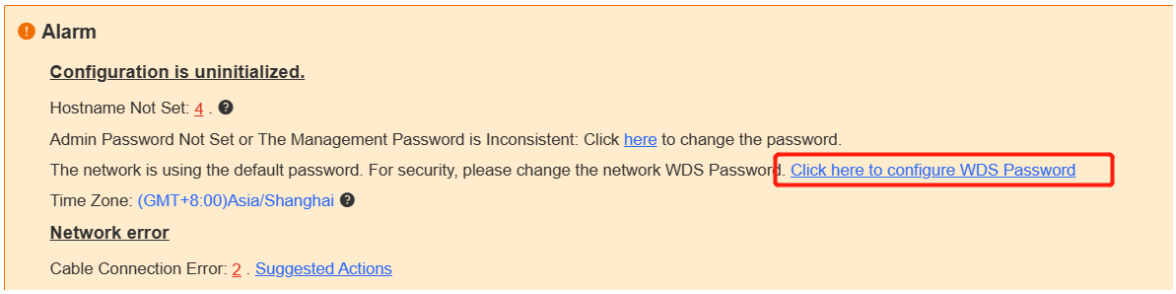
When viewing the alarm, hover the cursor over the orange number of the prompt and click  in the displayed dialog box to modify the name of each device. (The orange number, 2 in the figure, indicates the number of devices that still use the default name in the network.) Enter the new device name and click **OK** to make the change take effect immediately.



7.1.2 Default WDS Password Is Still Used by All Devices

The default WDS password of devices of the same model is the same. Changing the WDS password can prevent others from illegally accessing the network by using a device of the same model.

Click **Click here to configure WDS Password**, enter the new password, and click **Save** to change the WDS password for the entire network.



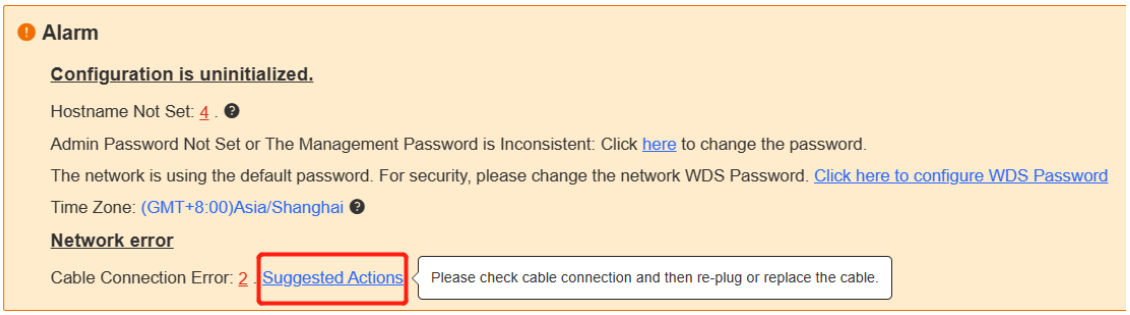
Caution

- When configuring the WDS password for the entire network, ensure that all devices are online. Otherwise, WDS passwords of the devices will be inconsistent.
- Configuring the WDS password for the entire network will reconnect all devices in the network. Therefore, exercise caution when performing this operation.
- If there is an unbridged device in the network, the function of configuring the WDS password for the entire network will be disabled.

7.1.3 Network Cable Is Disconnected or Incorrectly Connected

Hover the cursor over the orange number of the prompt to display the alarm details.

Click the suggested action to check the solution.



7.1.4 Latency Is High or Bandwidth Is Insufficient

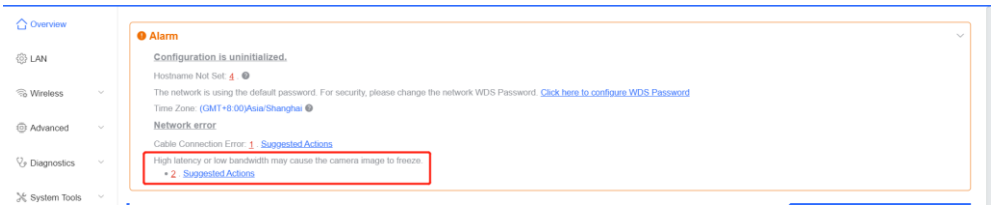
First, check whether the device latency is too high. If yes, the interference in the environment may be severe. Then, you are advised to change to a frequency with smaller interference.

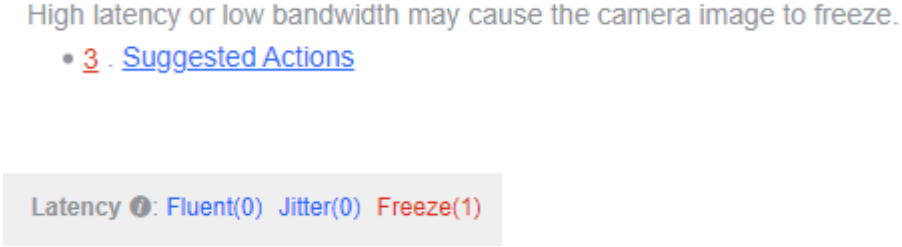
If not, increase the channel width. For frequency settings, see 3.13.3 1. Configuring the Frequency. For channel width settings, see 3.13.3 2. Configuring the Channel Width.

To check whether the latency is too high, perform as follows:

Hover the cursor over the orange number of the prompt to display all WDS groups, and click a group to display the details.

On the **Overview** page, check whether **Latency** is **Freeze**. If so, the latency is too high. Otherwise, the latency is normal.



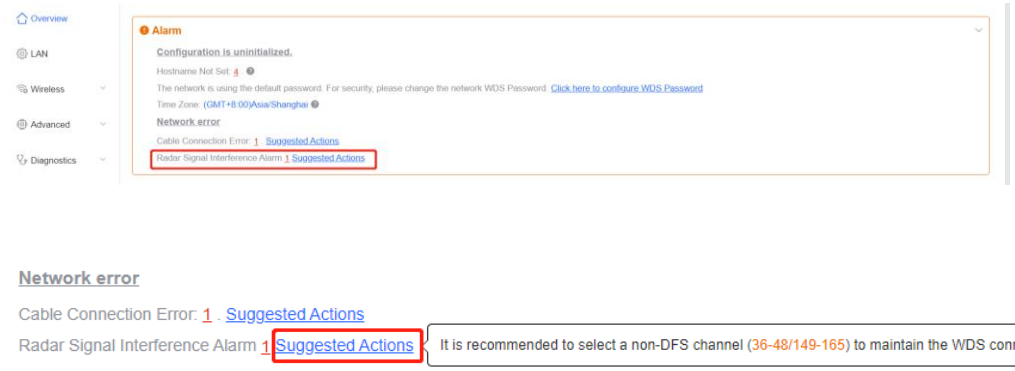


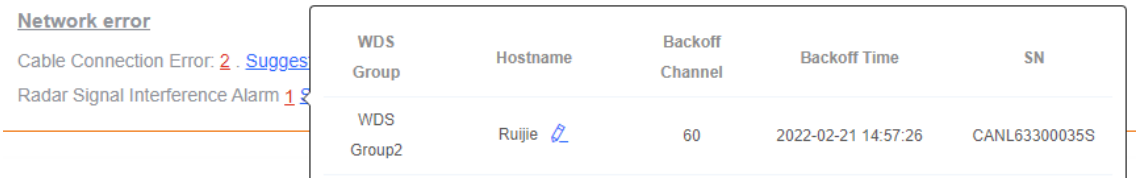
Caution

Frequency and channel width settings described in this section are performed on the local device. You can click the IP address of a device to open the management page of the device and set the frequency and channel width.

7.1.5 Radar Signal Interference

When the device detects a radar signal in a channel, it generates an alarm. Hover the cursor over the orange number of the prompt to display alarm details.





According to the information about the WDS group and back-off channel in the alarm record, check whether the current working frequency in the WDS group (group 2 in the example) is consistent with that of back-off channels. (See 3.9 Displaying WDS Group Information.) If so, manually switch the frequency to a non-dynamic frequency selection (DFS) channel. For details, see 3.13.3 1. Configuring the Frequency.

Note

- Non-DFS channels include channels 36–48 and 149–165, corresponding to 5180 MHz to 5260 MHz and 5745 MHz to 5825 MHz.
- Automatic frequency switching upon detection of radar signals is supported on RG-EST350G, EST450G, EST330F-P.

Caution

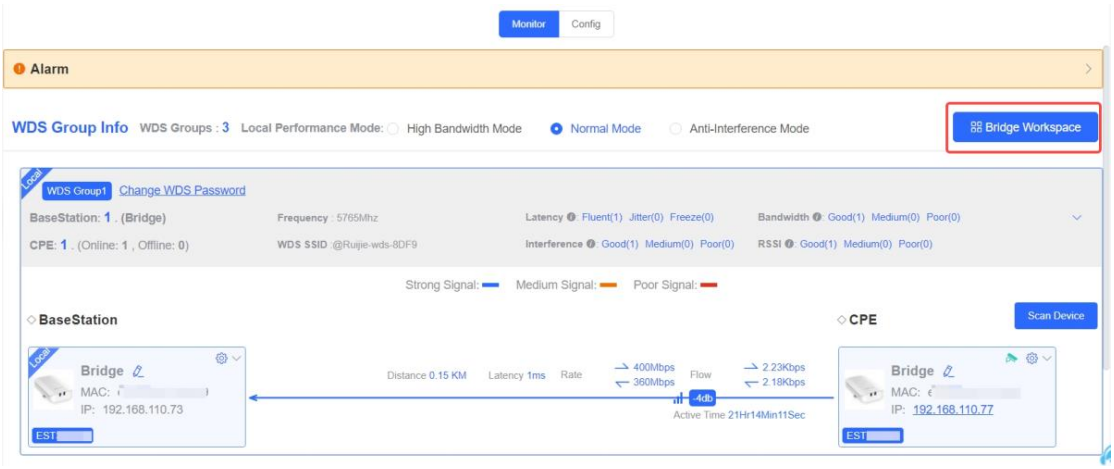
If the preceding troubleshooting steps fail to resolve the issue, and remote assistance from technical support is needed, you can contact them to assist in enabling the developer mode. The technical support team can then perform diagnostics to identify and address the issue effectively.

8 System Settings

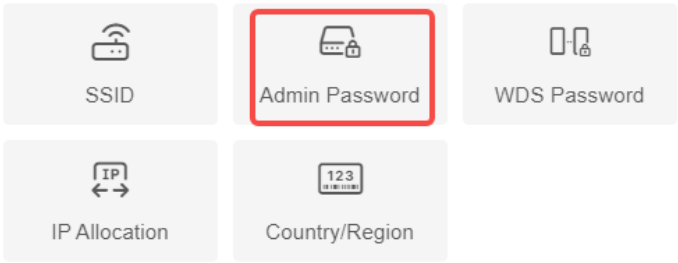
8.1 Configuring Management Password

Choose **One-Device** > **Monitor** > **WDS Group Info**.

(1) Click **Bridge Workspace**.

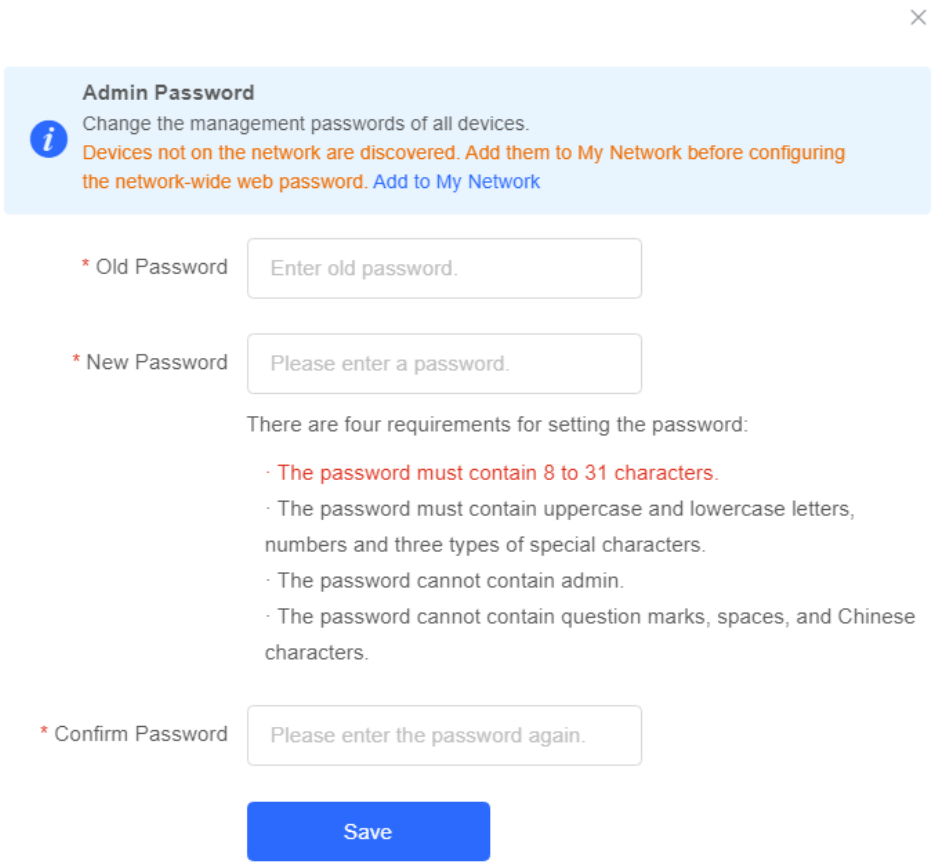


(2) Click **Admin Password** to change the login password for all devices.



Tip: The above functions apply to all bridges on the network.

If there is an unbridged device in the network, the link will be unavailable.



Caution

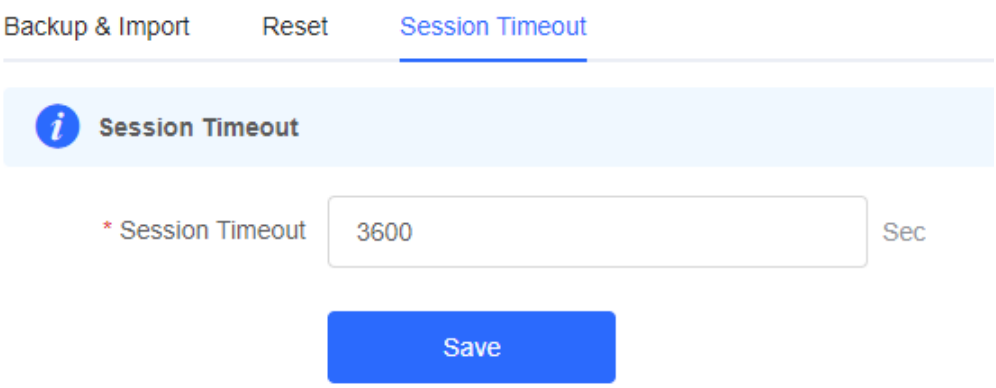
This password is used to log in to web interface of any device in the network.

If there is an unbridged network in the network, the function of configuring the admin password will be disabled.

8.2 Configuring Session Timeout Duration

Choose **One-Device** > **Config** > **System** > **Management** > **Session Timeout**.

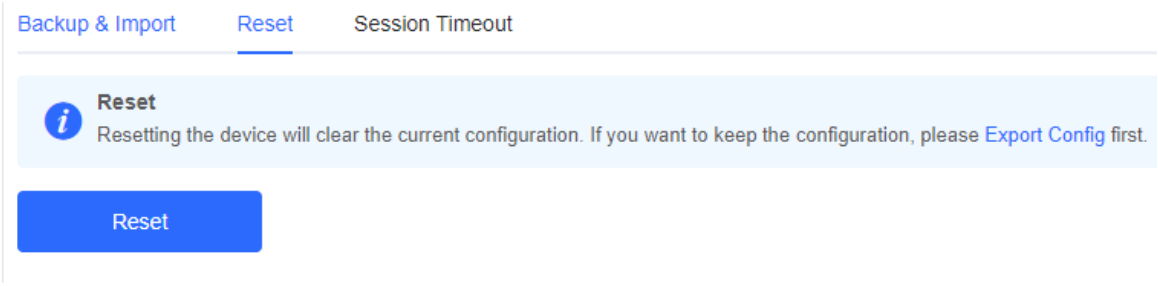
If no operation is performed on the page within a period of time, the session will be down. When you need to perform operations again, enter the password to open the configuration page. The default timeout duration is 3600 seconds, that is, 1 hour.



8.3 Resetting Factory Settings

Choose **One-Device** > **Config** > **System** > **Management** > **Reset**

Click **Reset** to restore factory settings.



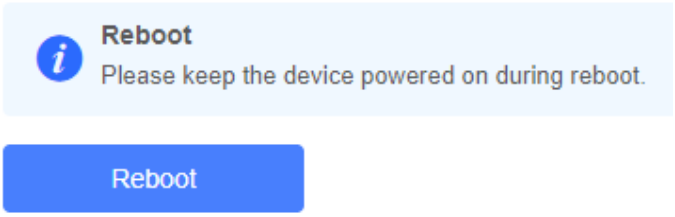
Caution

This operation will clear existing settings and restart the device. Therefore, exercise caution when performing this operation. If there is any configuration in the current system, please export the configuration before resetting the device.

8.4 Rebooting the Device

Choose **One-Device** > **Config** > **System** > **Reboot**.

Click **Reboot** to reboot the device immediately.



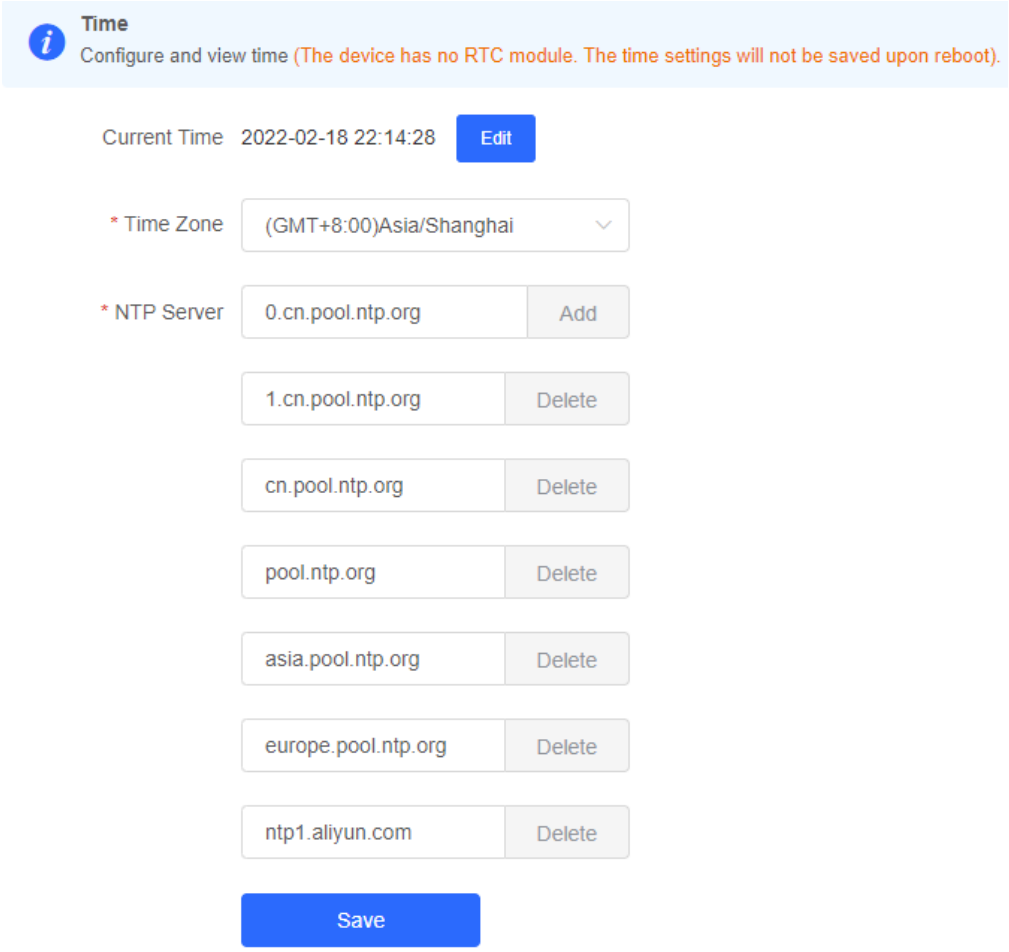
Caution

Please keep the device powered on during reboot. Otherwise, the device may be damaged.

8.5 Configuring System Time

Choose **Network-Wide > System** > **Time**.

You can view the current system time. If the time is incorrect, check and select the local time zone. If the time zone is correct but time is still incorrect, click **Edit** to manually set the time. In addition, the bridge supports Network Time Protocol (NTP) servers. By default, multiple servers serve as the backup of each other. You can add or delete local servers as required.

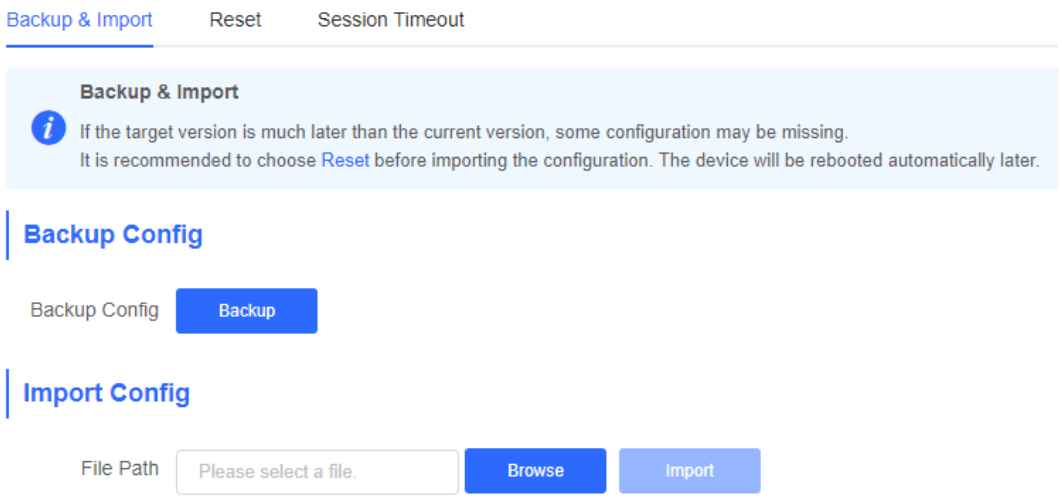


8.6 Configuring Config Backup and Import

Choose **One-Device** > **Config** > **System** > **Management** > **Backup & Import**.

Configure backup: Click **Backup** to download a configuration file locally.

Configure import: Click **Browse**, select a configuration file backup on the local PC, and click **Import** to import the configuration file. The device will restart.



8.7 Performing Update and Displaying the System Version

8.7.1 Online Update

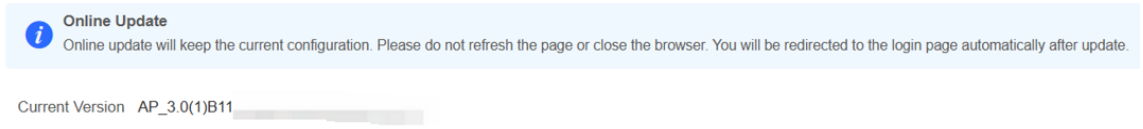
Choose **One-Device** > **Config** > **System** > **Update** > **Online Update**.

If there a new version available, you can click it for an update.

Caution

After being updated, the device will reboot. Therefore, exercise caution when performing this operation.

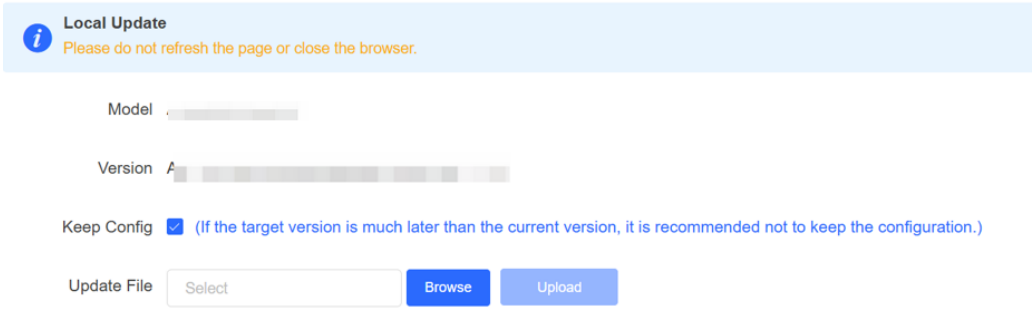
If no version update is detected or online update cannot be performed, check whether the bridge is connected to the Internet.



8.7.2 Local Update

Choose **One-Device** > **Config** > **System** > **Update** > **Local Update**.

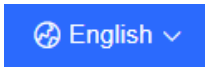
You can view the current software version, hardware version and device model. If you want to update the device with the configuration retained, check **Keep Config**. Click **Browse**, select an update package on the local PC, and click **Upload** to upload the file. The device will be updated.



Caution

After being updated, the device will reboot. Therefore, exercise caution when performing this operation.

8.8 Switching System Language

Click 

in the upper right corner of the page.

Select the target language from the drop-down list.

Note

Only Chinese and English are available.

8.9 Configuring SNMP

Specification

SNMP is supported on RG-EST350G and RG-EST450G only.

8.9.1 Overview

The Simple Network Management Protocol (SNMP) is a protocol for managing network devices. Based on the client/server model, it can achieve remote monitoring and control of network devices.

SNMP uses a manager and agent architecture. The manager communicates with agents through the SNMP protocol to retrieve information such as device status, configuration details, and performance data. It can also be used to configure and manage devices.

SNMP can be used to manage various network devices, including routers, switches, servers, firewalls, etc. You can achieve user management through the SNMP configuration interface and monitor and control devices through the third-party software.

8.9.2 Global Configuration

1. Overview

The purpose of global configuration is to enable the SNMP service and make the SNMP protocol version (v1/v2c/v3) take effect, so as to achieve basic configuration of local port, device location, and contact information.

SNMP v1: As the earliest version of SNMP, SNMP v1 has poor security, and only supports simple community string authentication. SNMP v1 has certain flaws, such as plaintext transmission of community strings and vulnerability to attacks. Therefore, SNMP v1 is not recommended for modern networks.

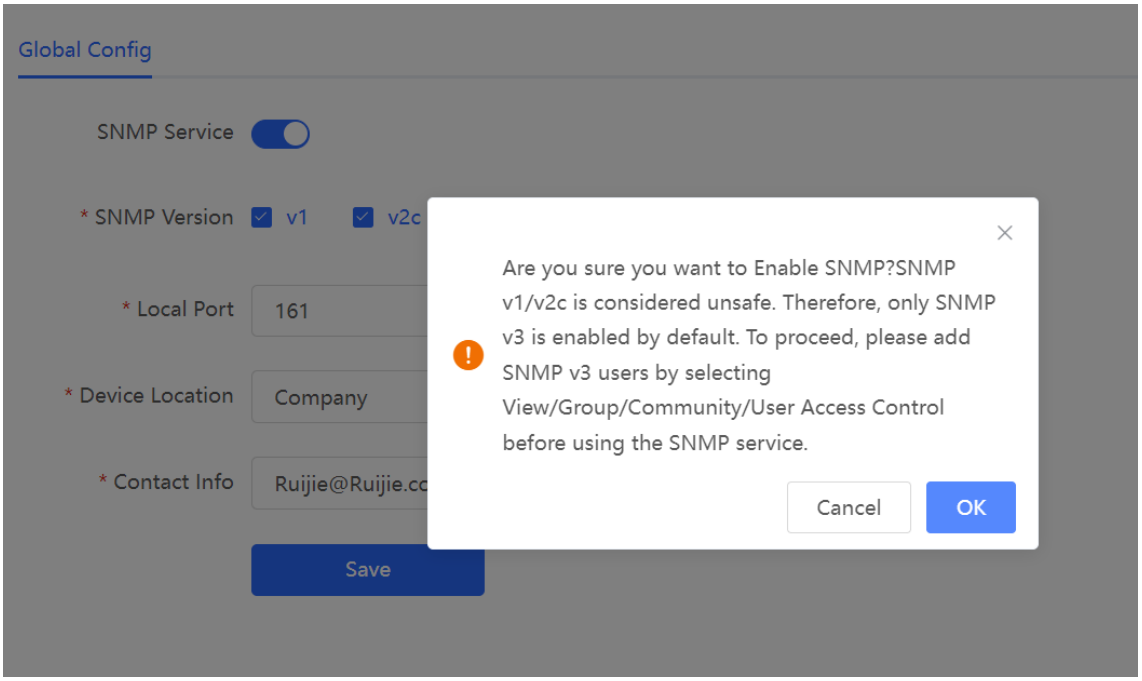
SNMP v2c: As an improved version of SNMP v1, SNMP v2c supports richer functions and more complex data types, with enhanced security. SNMP v2c performs better than SNMP v1 in terms of security and functionality, and is more flexible. It can be configured according to different needs.

SNMP v3: As the newest version, SNMP v3 supports security mechanisms such as message authentication and encryption compared to SNMP v1 and SNMP v2c. SNMP v3 has achieved significant improvements in security and access control.

2. Configuration Steps

Choose **Network-Wide** > **System** > **SNMP** > **Global Config**

(1) Enable the SNMP service.



When it is enabled for the first time, SNMP v3 is enabled by default. Click **OK**.

(2) Set SNMP service global configuration parameters.

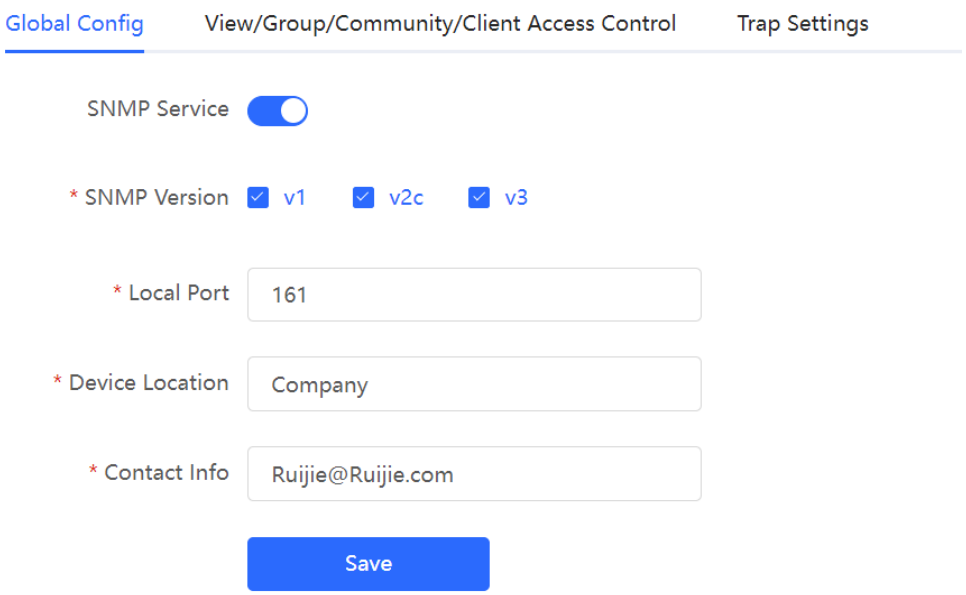


Table 8-1 Global Configuration Parameters

Parameter	Description
SNMP Server	Indicates whether SNMP service is enabled.
SNMP Version	Indicates the SNMP protocol version, including v1, v2c, and v3 versions.
Local Port	The port range is 1 to 65535.
Device Location	1~64 characters. Chinese characters, full-width characters, question marks, and spaces are not allowed.
Contact Info	1~64 characters. Chinese characters, full-width characters, question marks, and spaces are not allowed.

(3) After the SNMP service is enabled, click **Save** to make basic configurations such as the SNMP protocol version number take effect.

8.9.3 View, Group, Community, User Access Control

1. Configuring Views

- Overview

Management Information Base (MIB) can be regarded as a database storing the status information and performance data of network devices. It contains a large number of object identifiers (OIDs) to identify the status information and performance data of these network devices.

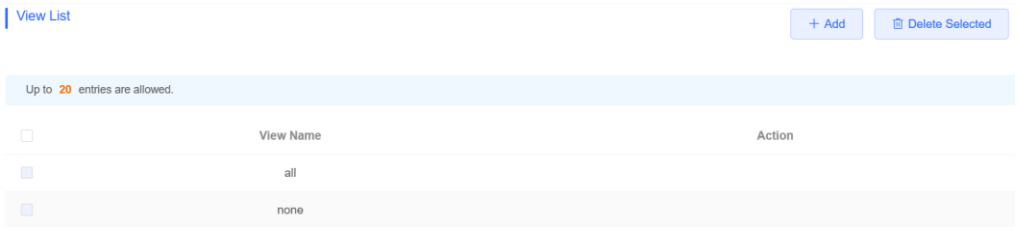
Views in SNMP can limit the range of MIB nodes that the management system can access, thereby improving the security and reliability of network management. Views are an indispensable part of SNMP and need to be configured or customized according to specific management requirements.

A view can have multiple subtrees. The management system can only access MIB nodes in these subtrees, and cannot access other unauthorized MIB nodes. This can prevent unauthorized system administrators from accessing sensitive MIB nodes, thereby protecting the security of network devices. Moreover, views can also improve the efficiency of network management and speed up the response from the management system.

- Configuration Steps

Choose **Network-Wide** > **System** > **SNMP** > **View/Group/Community/Client Access Control**.

(1) Click **Add** under the **View List** to add a view.



(2) Configure basic information of a view.

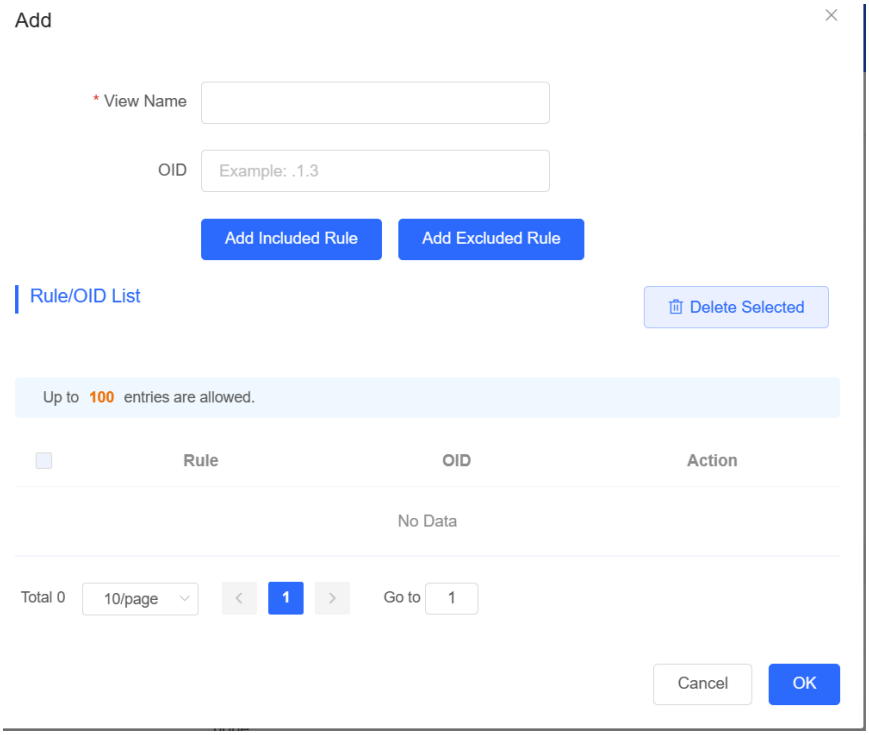


Table 8-2 View Configuration Parameters

Parameter	Description
View Name	Indicates the name of the view. 1~32 characters. Chinese or full width characters are not allowed.
OID	Indicates the range of OIDs included in the view, which can be a single OID or a subtree of OIDs.

Parameter	Description
Type	There are two types of rules: included and excluded rules. The included rule only allows access to OIDs within the OID range. Click Add Included Rule to set this type of view. Excluded rules allow access to all OIDs except those in the OID range. Click Add Excluded Rule to configure this type of view.

Note

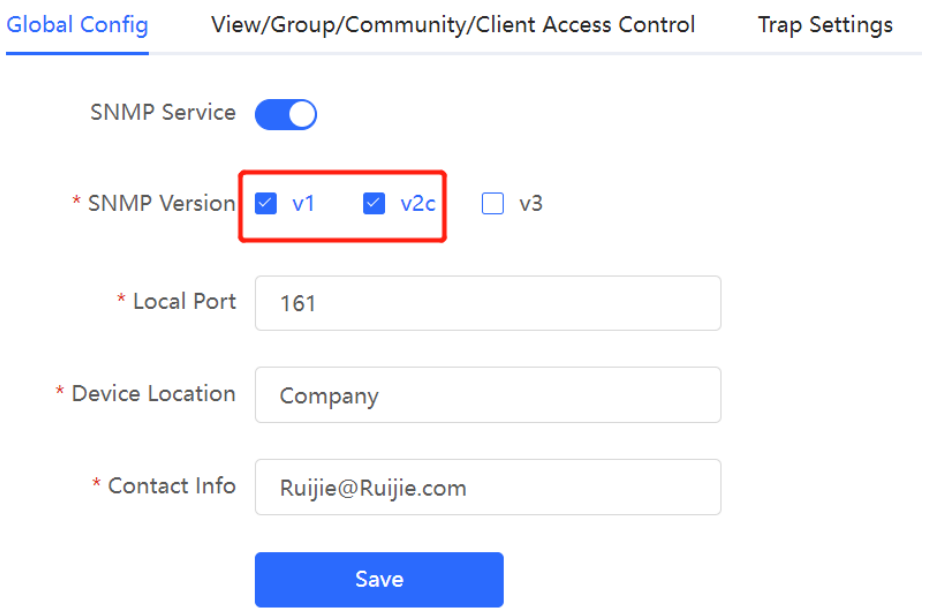
A least one OID rule must be configured for a view. Otherwise, an alarm message will appear.

(3) Click **OK**.

2. Configuring v1 and v2c Users

- Overview

When the SNMP version is set to v1/v2c, user configuration is required.



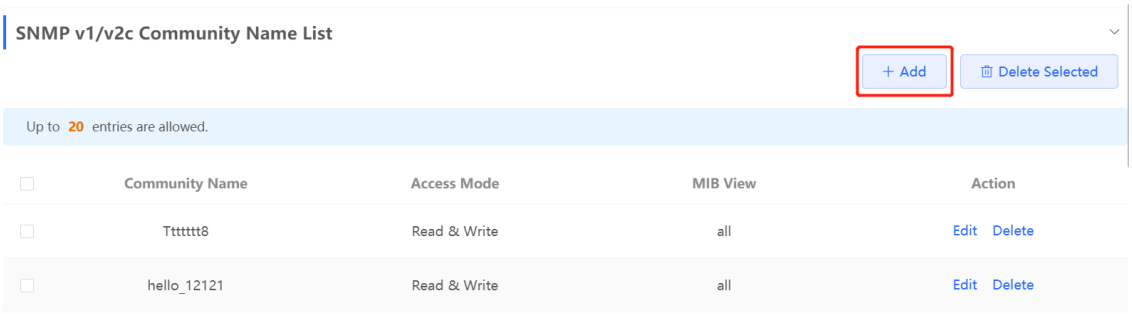
Note

Select the SNMP protocol version, and click **Save**. The corresponding configuration options will appear on the **View/Group/Community/User Access Control** page.

- Configuration Steps

Choose **Network-Wide** > **System** > **SNMP** > **View/Group/Community/Client Access Control**.

(1) Click Add in the SNMP v1/v2c Community Name List pane.



(2) Add a v1/v2c user.

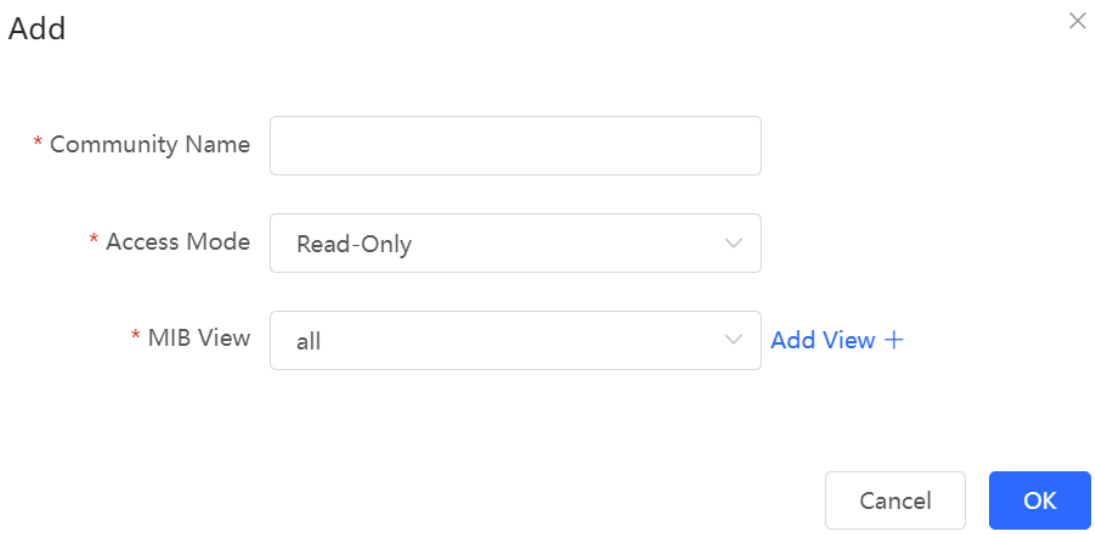


Table 8-3 v1/v2c User Configuration Parameters

Parameter	Description
Community Name	● 8~32 characters. ● It must contain at least three character categories, including uppercase and lowercase letters, digits, and special characters. ● Admin, public or private community names are not allowed. ● Question marks, spaces, and Chinese characters are not allowed.
Access Mode	Indicates the access permission (read-only or read & write) for the community name.
MIB View	The options under the drop-down box are configured views (default: all, none).

Note

- Community names cannot be the same among v1/v2c users.
- Click **Add View** to add a view.

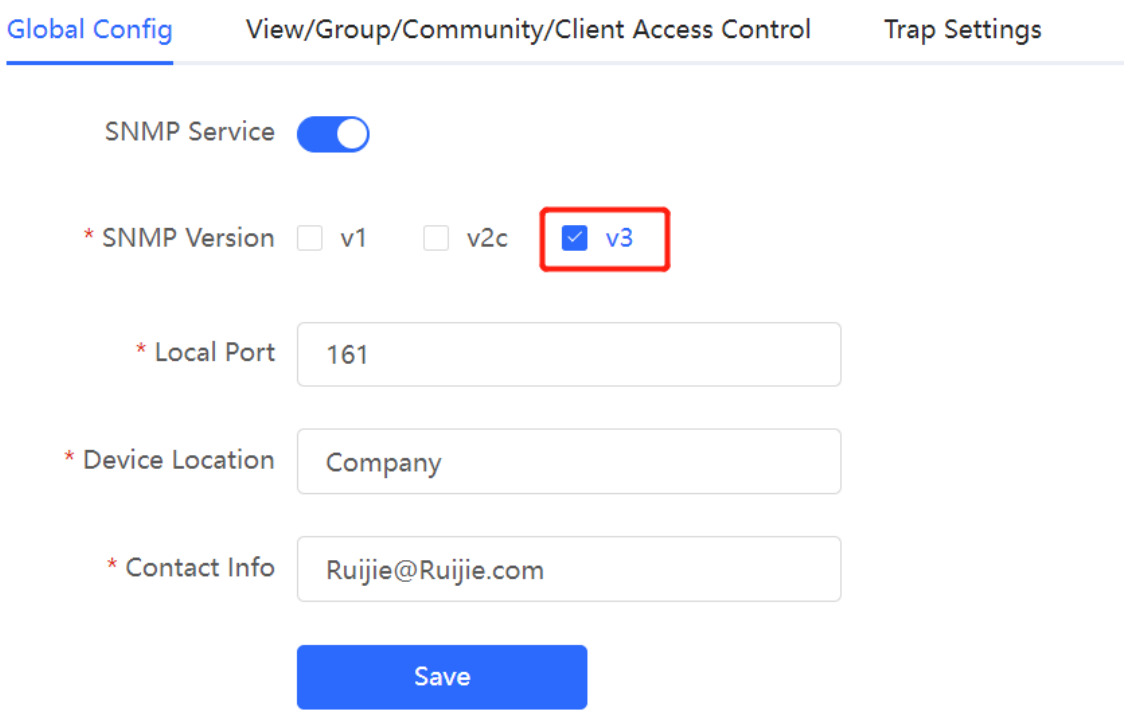
3. Configuring v3 Groups

- Overview

SNMP v3 introduces the concept of grouping to achieve better security and access control. A group is a group of SNMP users with the same security policies and access control settings. With SNMP v3, multiple groups can be configured, each with its own security policies and access control settings. Each group can have one or more users.

- Prerequisites

When the SNMP version is set to v3, the v3 group configuration is required.



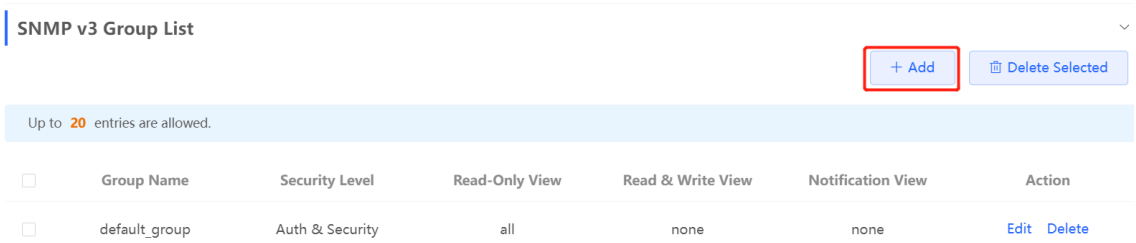
Note

Select the SNMP protocol version, and click **Save**. The corresponding configuration options will appear on the **View/Group/Community/User Access Control** page.

- Configuration Steps

Choose **Network-Wide** > **System** > **SNMP** > **View/Group/Community/Client Access Control**.

(1) Click **Add** in the **SNMP v3 Group List** pane to create a group.



(2) Configure v3 group parameters.

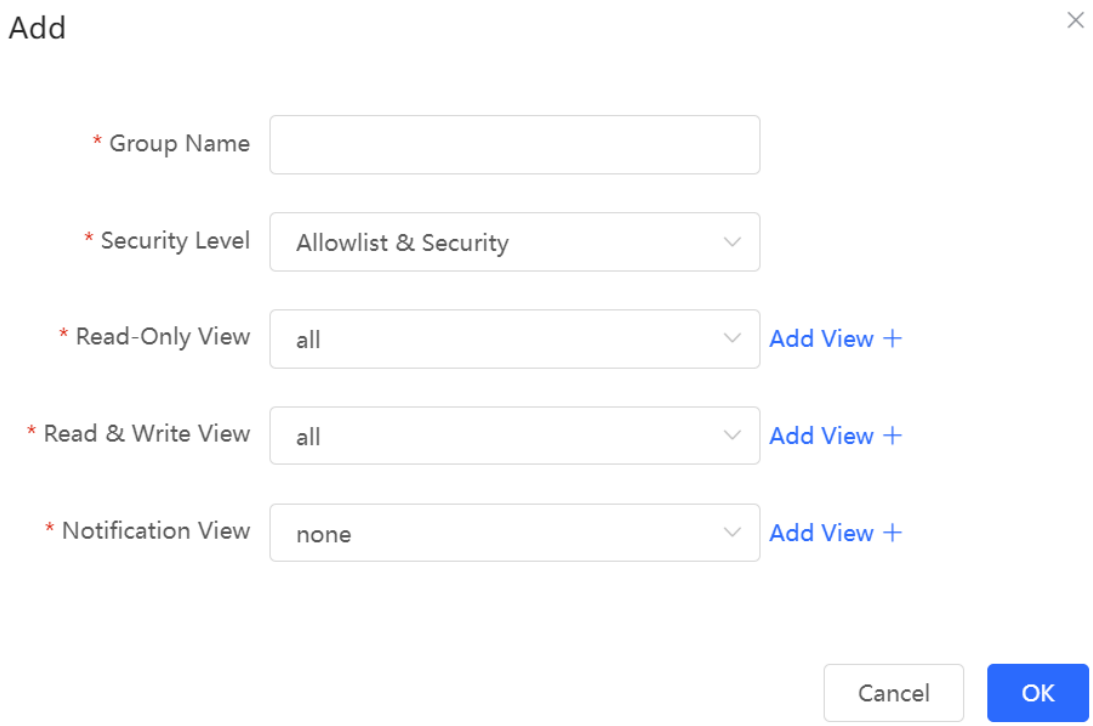


Table 8-4 v3 Group Configuration Parameters

Parameter	Description
Group Name	Indicates the name of the group. 1~32 characters. Chinese characters, full-width characters, question marks, and spaces are not allowed.
Security Level	Indicates the minimum security level (authentication and encryption, authentication but no encryption, no authentication and encryption) of the group.
Read-Only View	The options under the drop-down box are configured views (default: all, none).

Parameter	Description
Read & Write View	The options under the drop-down box are configured views (default: all, none).
Notify View	The options under the drop-down box are configured views (default: all, none).

Note

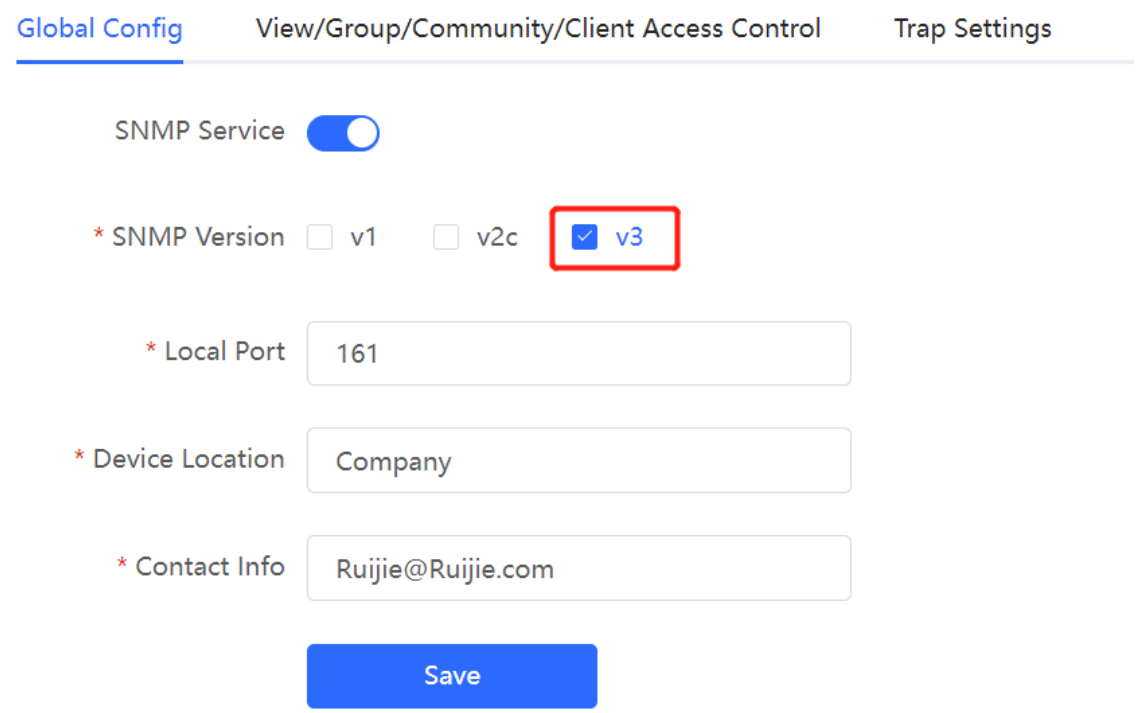
- A group defines the minimum security level, read and write permissions, and scope for users within the group.
- The group name must be unique. To add a view, click **Add View**.

(3) Click **OK**.

4. Configuring v3 Users

- Prerequisites

When the SNMP version is set to v3, the v3 group configuration is required.



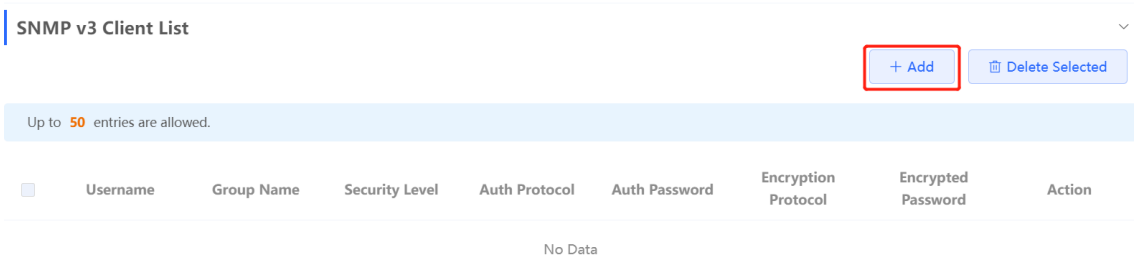
Note

Select the SNMP protocol version, and click **Save**. The corresponding configuration options will appear on the **View/Group/Community/User Access Control** page.

- Configuration Steps

Choose **Network-Wide** > **System** > **SNMP** > **View/Group/Community/Client Access Control**.

(1) Click **Add** in the **SNMP v3 Client List** pane to add a v3 user.



(2) Configure v3 user parameters.

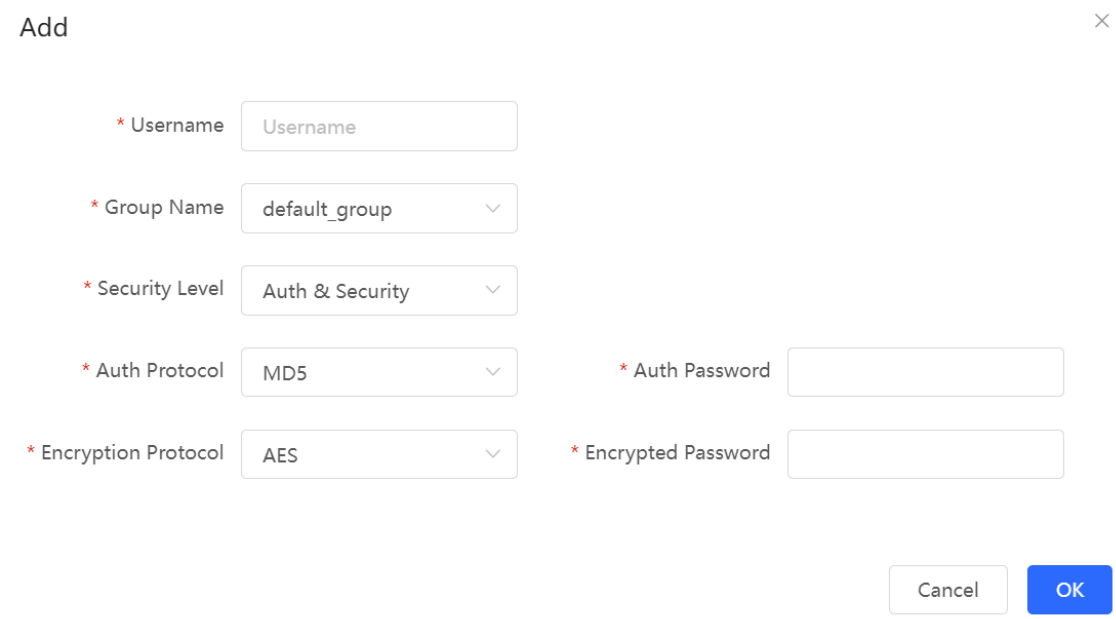


Table 8-5 v3 User Configuration Parameters

Parameter	Description
Username	Username ● 8~32 characters. ● It must contain at least three character categories, including uppercase and lowercase letters, digits, and special characters. ● Admin, public or private community names are not allowed. ● Question marks, spaces, and Chinese characters are not allowed.
Group Name	Indicates the group to which the user belongs.
Security Level	Indicates the security level (authentication and encryption, authentication but no encryption, and no authentication and encryption) of the user.

Parameter	Description
Auth Protocol, Auth Password	Authentication protocols supported: MD5/SHA/SHA224/SHA256/SHA384/SHA512. Authentication password: 8~31 characters. Chinese characters, full-width characters, question marks, and spaces are not allowed. It must contain at least three character categories, including uppercase and lowercase letters, digits, and special characters. Note: This parameter is mandatory when the security level is authentication and encryption, or authentication but no encryption.
Encryption Protocol, Encryption Password	Encryption protocols supported: DES/AES/AES192/AES256. Encryption password: 8~31 characters. Chinese characters, full-width characters, question marks, and spaces are not allowed. It must contain at least three character categories, including uppercase and lowercase letters, digits, and special characters. Note: This parameter is mandatory when the security level is authentication and encryption.

Note

- The security level of v3 users must be greater than or equal to that of the group.
- There are three security levels, among which authentication and encryption requires the configuration of authentication protocol, authentication password, encryption protocol, and encryption password. Authentication but no encryption only requires the configuration of authentication protocol and encryption protocol, while no authentication and encryption does not require any configuration.

8.9.4 SNMP Service Typical Configuration Examples

1. Configuring SNMP v2c

- Application Scenario

You only need to monitor the device information, but do not need to set and deliver it. A third-party software can be used to monitor the data of nodes like 1.3.6.1.2.1.1 if v2c version is configured.

- Configuration Specification

According to the user's application scenario, the requirements are shown in the following table:

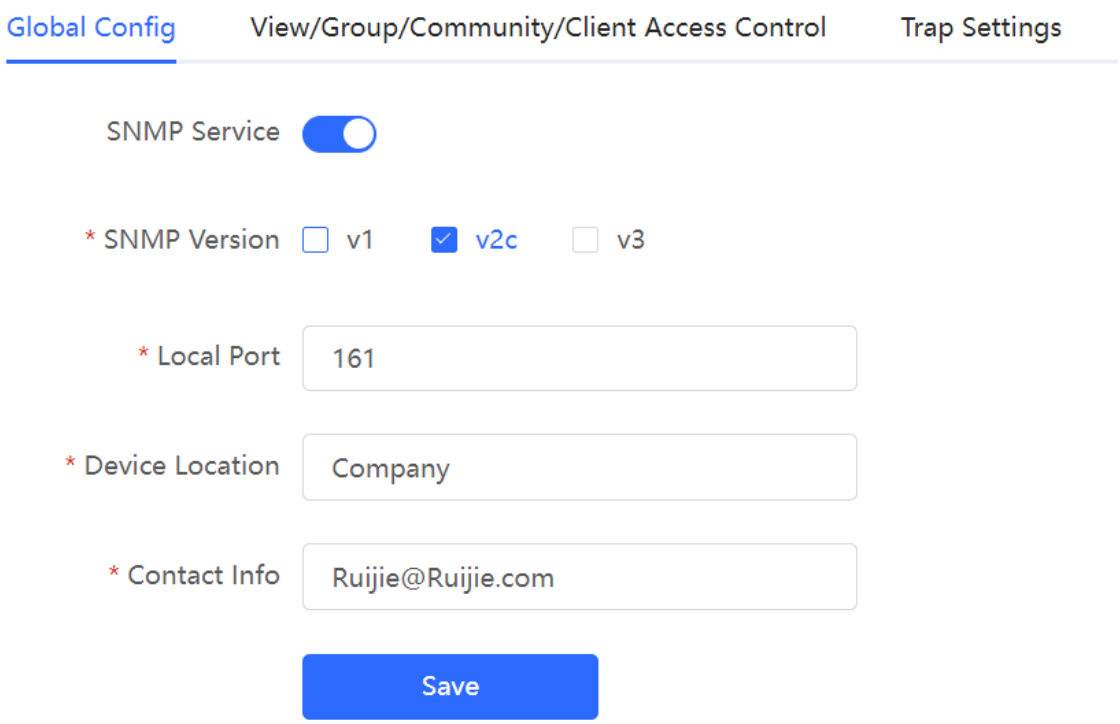
Table 8-6 User Requirement Specification

Item	Description
View range	Included rule: the OID is .1.3.6.1.2.1.1, and the custom view name is "system".
Version	For SNMP v2c, the custom community name is "public", and the default port number is 161.

Item	Description
Read & write permission	Read-only permission.

- Configuration Steps

(2) In the global configuration interface, select v2c and set other settings as default. Then, click **Save**.

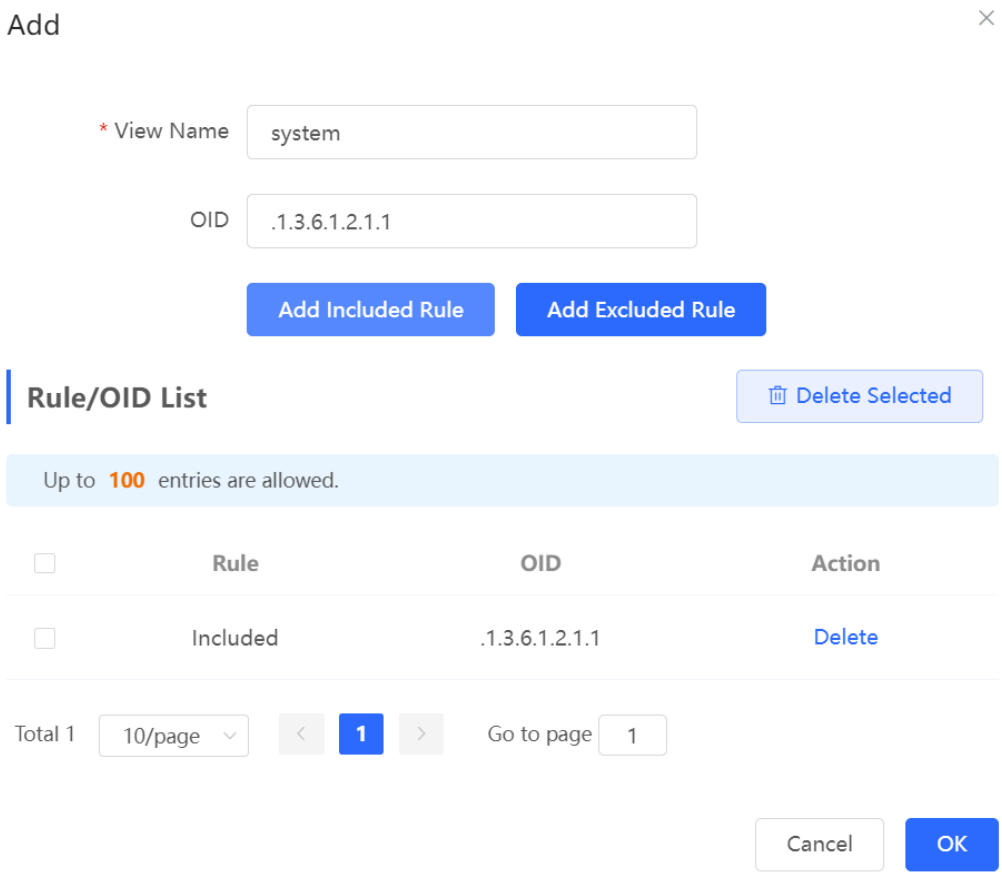


(3) Add a view on the View/Group/Community/Client Access Control interface.

a Click **Add** in the **View List** pane to add a view.

b Enter the view name and OID in the pop-up window, and click **Add Included Rule**.

c Click **OK**.

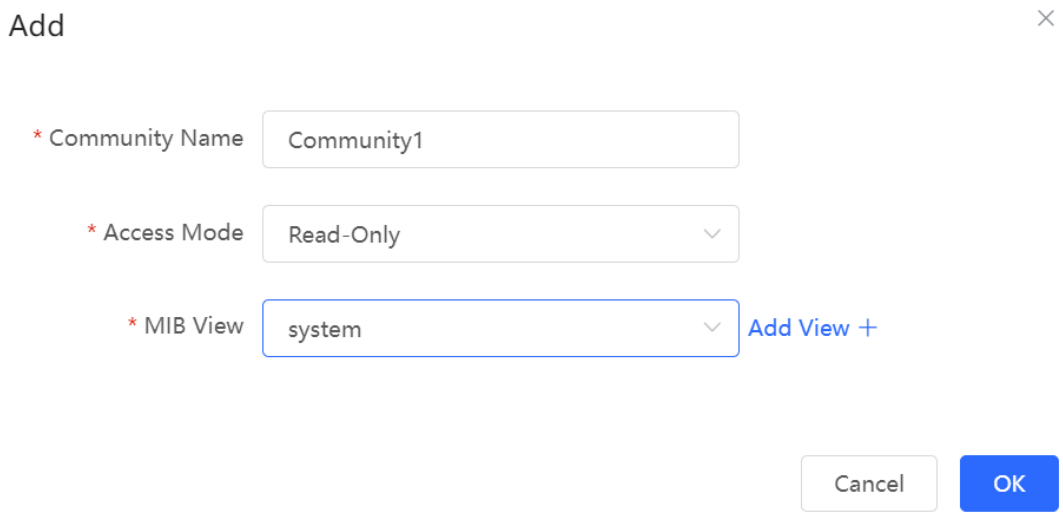


(4) On the View/Group/Community/Client Access Control interface, enter the SNMP v1/v2c community name.

a Click **Add** in the **SNMP v1/v2c Community Name List** pane.

b Enter the group name, access mode, and view in the pop-up window.

c Click **OK**.



2. Configuring SNMP v3

- Application Scenario

You need to monitor and control devices, and use the third-party software to monitor and deliver device information to public nodes (1.3.6.1.2.1). The security level of v3 is authentication and encryption.

- Configuration Specification

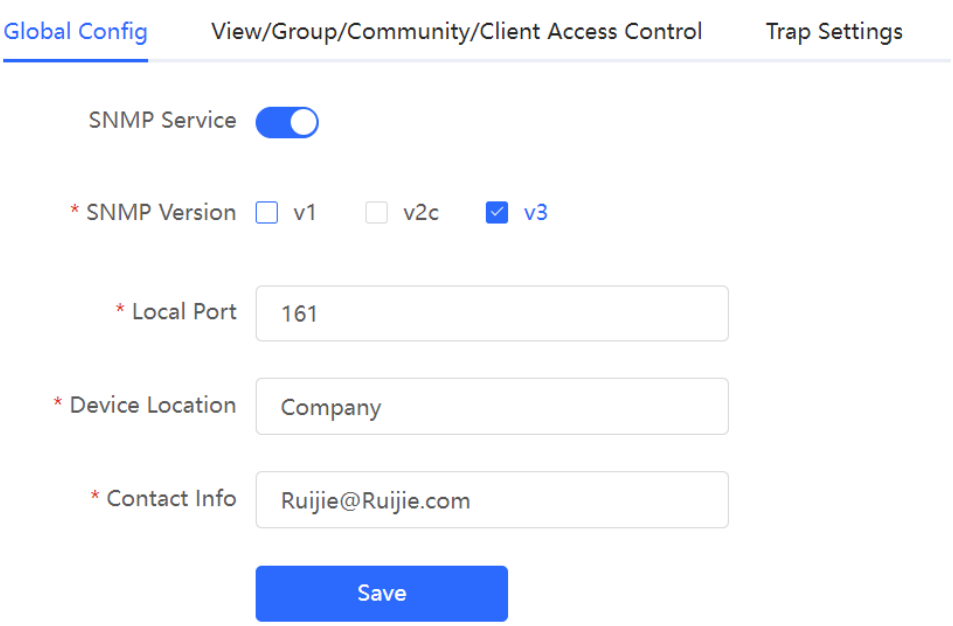
According to the user's application scenario, the requirements are shown in the following table:

Table 8-7 User Requirement Specification

Item	Description
View range	Included rule: the OID is .1.3.6.1.2.1, and the custom view name is "public_view".
Group configuration	Group name: group Security level: authentication and encryption Select public_view for a read-only view. Select public_view for a read & write view. Select none for a notify view.
Configuring v3 Users	User name: v3_user Group name: group Security level: authentication and encryption Authentication protocol/password: MD5/Ruijie123 Encryption protocol/password: AES/Ruijie123
Version	For SNMP v3, the default port number is 161.

- Configuration Steps

(2) On the global configuration interface, select v3, and change the port number to 161. Set other settings to defaults. Then, click **Save**.

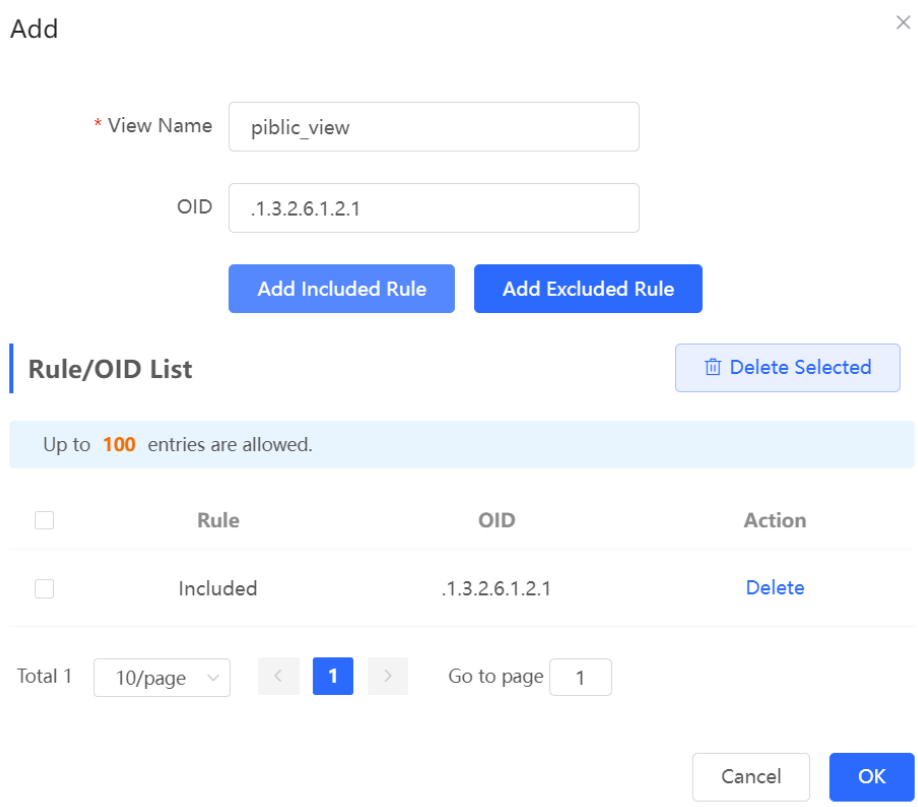


(3) Add a view on the View/Group/Community/Client Access Control interface.

a Click **Add** in the **View List** pane.

b Enter the view name and OID in the pop-up window, and click **Add Included Rule**.

c Click **OK**.

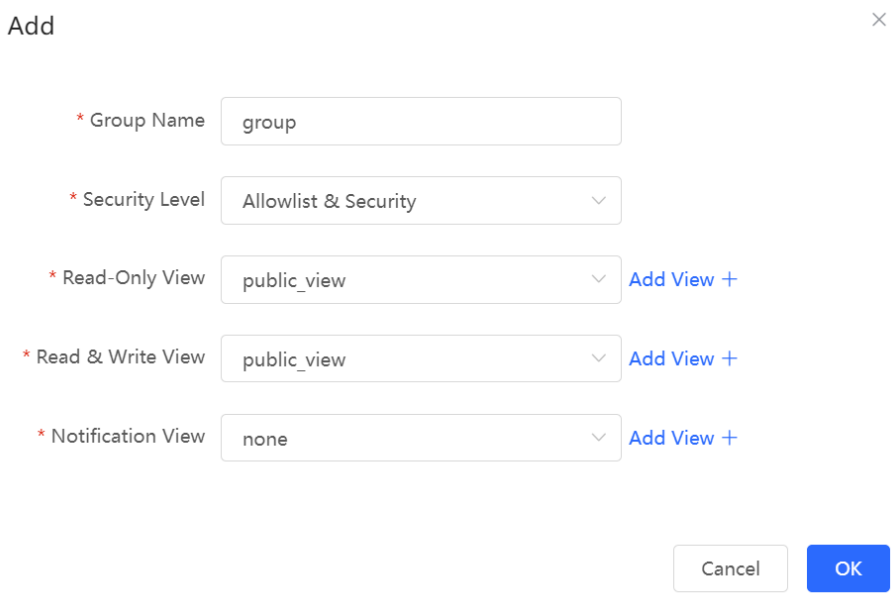


(4) On the View/Group/Community/Client Access Control interface, add an SNMP v3 group.

a Click **Add** in the **SNMP v3 Group List** pane.

b Enter the group name and security level on the pop-up window. As this user has read and write permissions, select public_view for read-only and read & write views, and select none for notify views.

c Click **OK**.

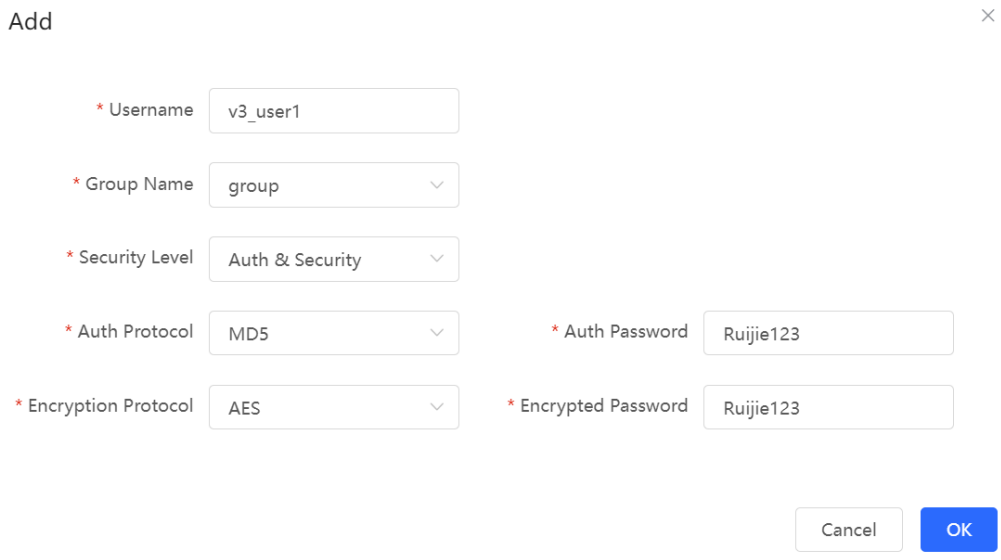


(5) On the View/Group/Community/Client Access Control interface, add an SNMP v3 user.

a Click **Add** in the **SNMP v3 Client List** pane.

b Enter the user name and group name in the pop-up window. As the user's security level is authentication and encryption, enter the authentication protocol, authentication password, encryption protocol, and encryption password.

c Click **OK**.



8.9.5 Configuring Trap Service

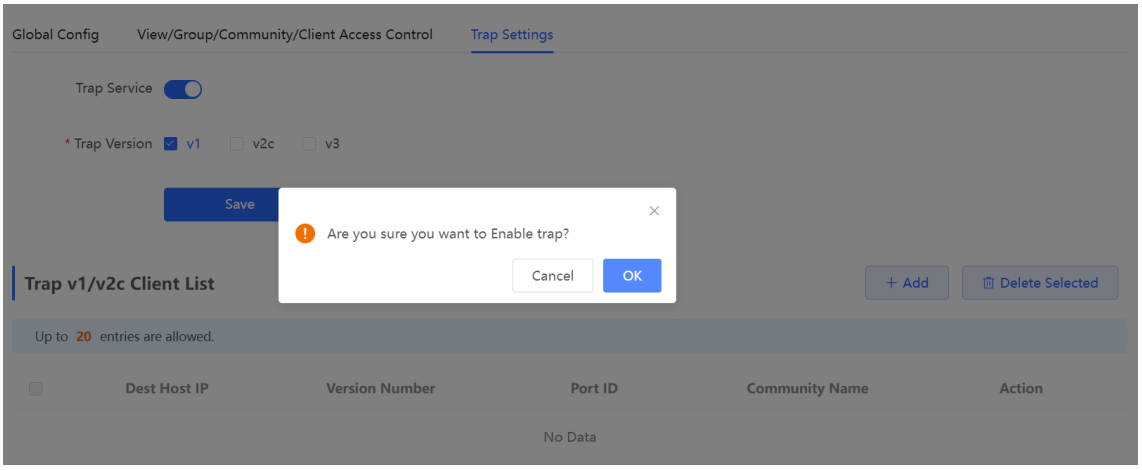
Trap is a notification mechanism of the Simple Network Management Protocol (SNMP) protocol. It is used to report the status and events of network devices to administrators, including device status, faults, performance, configuration, and security management. Trap provides real-time network monitoring and fault diagnosis services, helping administrators discover and solve network problems in a timely manner.

1. Enabling Trap Service

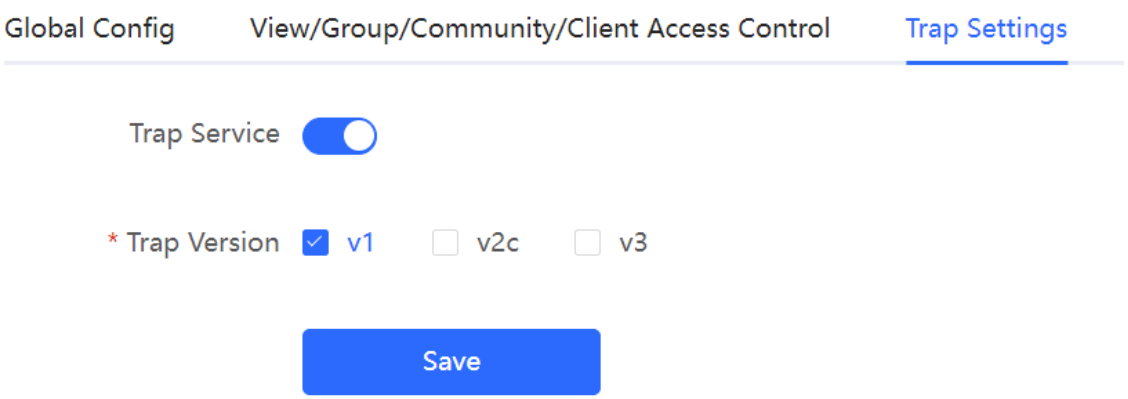
Enable the trap service and select the effective trap version, including v1, v2c, and v3 versions.

Choose **Network-Wide** > **System** > **SNMP** > **Trap Setting**.

(1) Enable the trap service.



When the trap service is enabled for the first time, the system will pop up a prompt message. Click **OK**.



(2) Set the trap version.

The trap versions include v1, v2c, and v3.

(3) Click **OK**.

After the trap service is enabled, click **Save** for the configuration to take effect.

2. Configuring Trap v1 and v2c Users

- Overview

Trap is a notification mechanism that is used to send alerts to administrators when important events or failures occur on devices or services. Trap v1/v2c are two versions in the SNMP protocol for network management and monitoring.

Trap v1 is the first version that supports basic alert notification functionality. Trap v2c is the second version, which supports more alert notification options and advanced security features.

By using trap v1/v2c, administrators can promptly understand problems on the network and take corresponding measures.

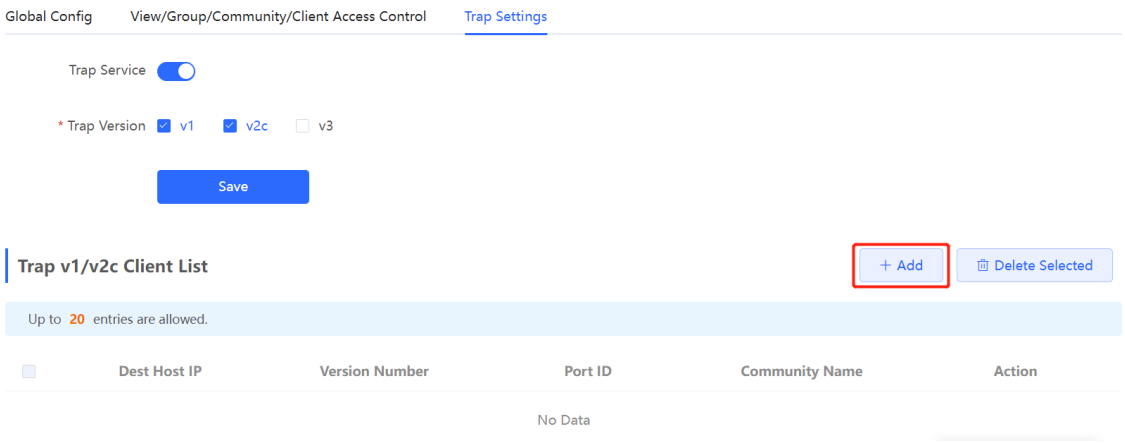
- Prerequisites

Once trap v1 and v2c versions are selected, it is necessary to add trap v1v2c users.

- Procedure

Choose **Network-Wide** > **System** > **SNMP** > **Trap Setting**.

(1) Click **Add** in the **Trap v1/v2c Client List** pane to add a trap v1/v2c user.



(2) Configure trap v1/v2c user parameters.

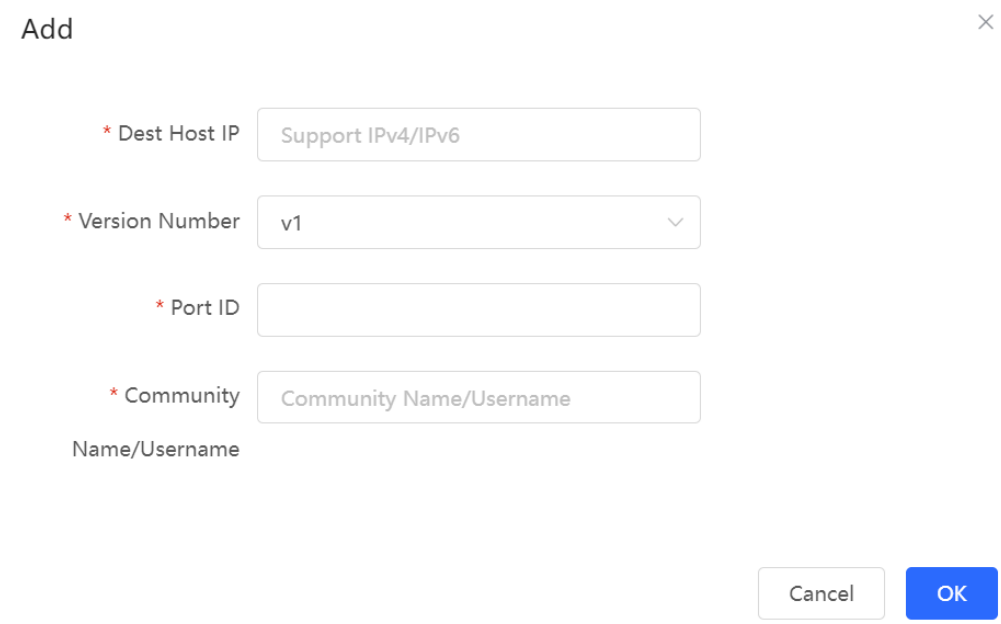


Table 8-8 Trap v1/v2c User Configuration Parameters

Parameter	Description
Dest Host IP	IP address of the trap peer device. An IPv4 or IPv6 address is supported.
Version Number	Trap version, including v1 and v2c.
Port ID	The port range of the trap peer device is 1 to 65535.
Community name/User name	Community name of the trap user. ● 8~32 characters. ● It must contain at least three character categories, including uppercase and lowercase letters, digits, and special characters. ● Admin, public or private community names are not allowed. ● Question marks, spaces, and Chinese characters are not allowed.

Note

- The destination host IP address of trap v1/ v1/v2c users cannot be the same.
- Community names of trap v1/ v1/v2c users cannot be the same.

(3) Click **OK**.

3. Configuring Trap v3 Users

- Overview

Trap v3 is a network management mechanism based on the SNMP protocol. It is used to send alert notifications to administrators. Unlike previous versions, trap v3 provides more secure and flexible configuration options, including authentication and encryption features.

Trap v3 offers custom conditions and methods for sending alerts, as well as the recipients and notification methods for receiving alerts. This enables administrators to have a more accurate understanding of the status of network devices and to take timely measures to ensure the security and reliability of the network.

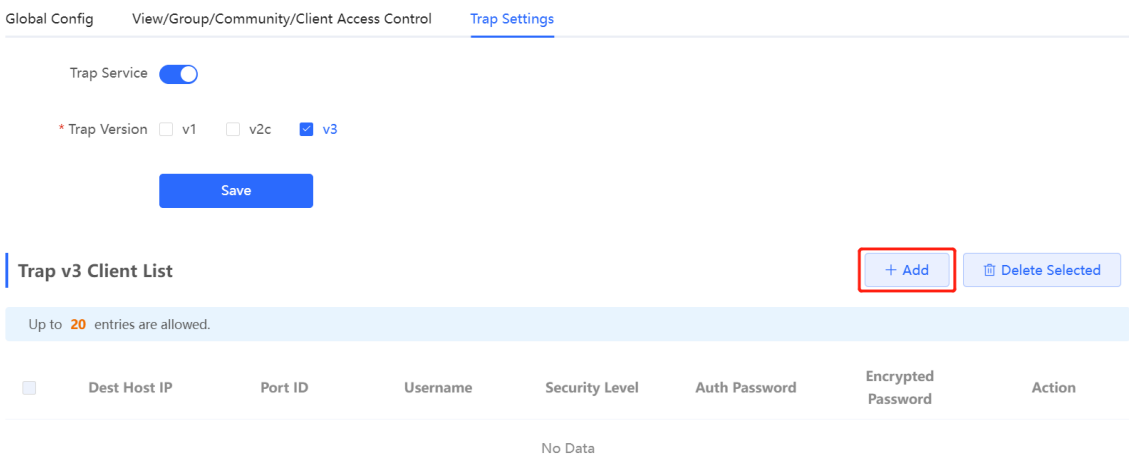
- Prerequisites

When the v3 version is selected for the trap service, it is necessary to add a trap v3 user.

- Configuration Steps

Choose **Network-Wide** > **System** > **SNMP** > **Trap Setting**.

(1) Click **Add** in the **Trap v3 Client List** pane to add a trap v3 user.



(2) Configure trap v3 user parameters.

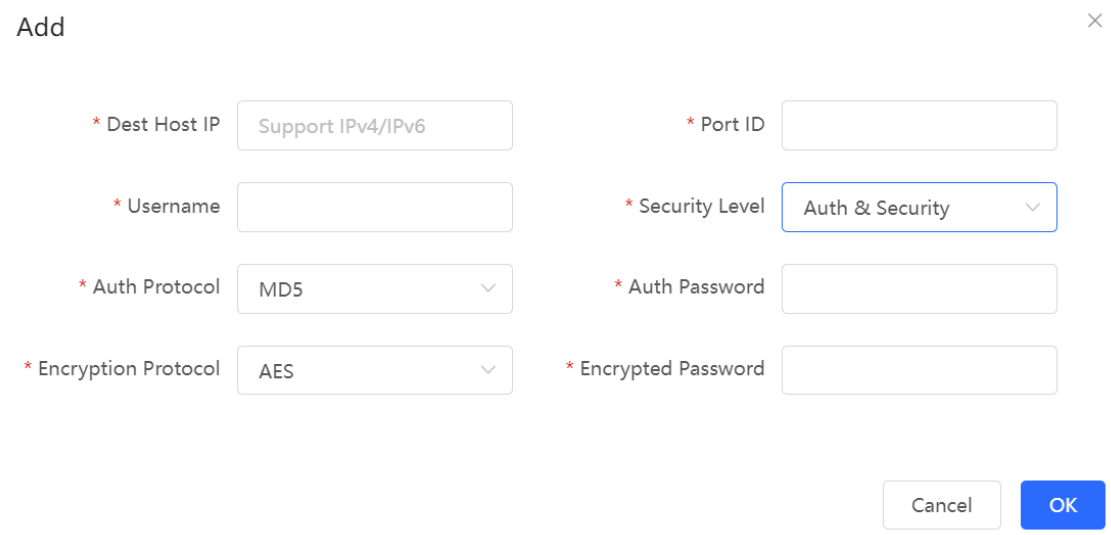


Table 8-9 Trap v3 User Configuration Parameters

Parameter	Description
Dest Host IP	IP address of the trap peer device. An IPv4 or IPv6 address is supported.
Port ID	The port range of the trap peer device is 1 to 65535.
Username	Name of the trap v3 user. ● 8~32 characters. ● It must contain at least three character categories, including uppercase and lowercase letters, digits, and special characters. ● Admin, public or private community names are not allowed. ● Question marks, spaces, and Chinese characters are not allowed.
Security Level	Indicates the security level of the trap v3 user. The security levels include authentication and encryption, authentication but no encryption, and no authentication and encryption.

Parameter	Description
Auth Protocol, Auth Password	Authentication protocols supported: MD5/SHA/SHA224/SHA256/SHA384/SHA512. Authentication password: 8~31 characters. Chinese characters, full-width characters, question marks, and spaces are not allowed. It must contain at least three character categories, including uppercase and lowercase letters, digits, and special characters. Note: This parameter is mandatory when the security level is authentication and encryption, or authentication but no encryption.
Encryption Protocol, Encryption Password	Encryption protocols supported: DES/AES/AES192/AES256. Encryption password: 8~31 characters. Chinese characters, full-width characters, question marks, and spaces are not allowed. It must contain at least three character categories, including uppercase and lowercase letters, digits, and special characters. Note: This parameter is mandatory when the security level is authentication and encryption.

Note

The destination host IP address of trap v1/ v1/v2c users cannot be the same.

8.9.6 Trap Service Typical Configuration Examples

1. Configuring Trap v2c

- Application Scenarios

During device monitoring, if the device is suddenly disconnected or encounters an abnormality, and the third-party monitoring software cannot detect and handle the abnormal situation in a timely manner, you can configure the device with a destination IP address of 192.168.110.85 and a port number of 166 to enable the device to send a v2c trap in case of an abnormality.

- Configuration Specification

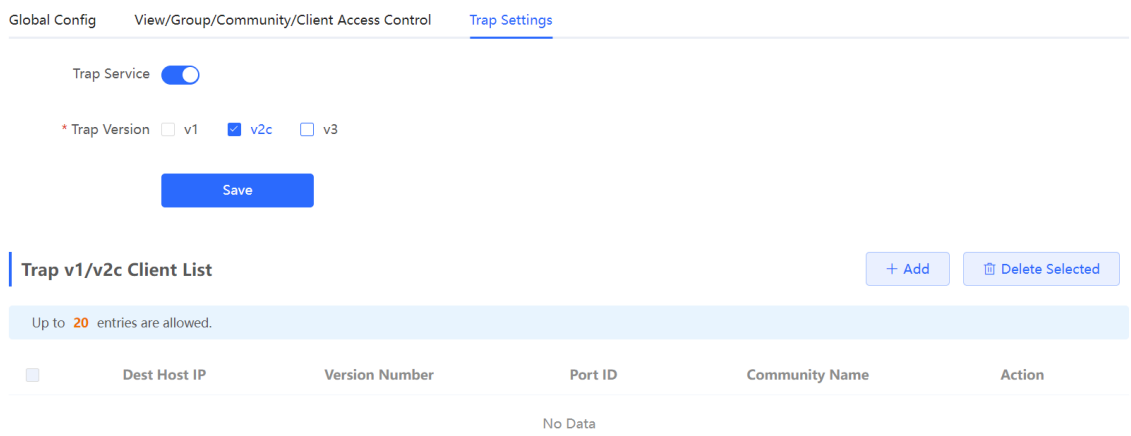
According to the user's application scenario, the requirements are shown in the following table:

Table 8-10 User Requirement Specification

Item	Description
IP address and port number	The destination host IP is 192.168.110.85, and the port number is 166.
Version	Select the v2 version.
Community name/User name	Trap_user

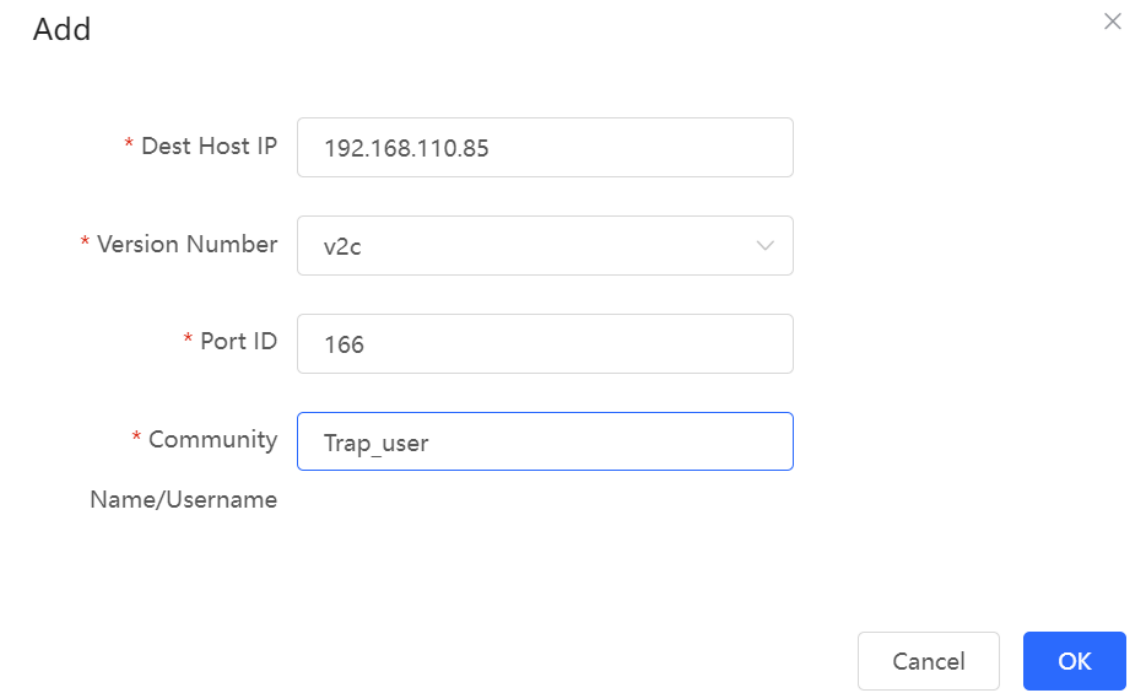
- Configuration Steps

(2) Select the v2c version in the **Trap Setting** interface and click **Save**.



(3) Click **Add** in the Trap v1/v2c Client List to add a trap v2c user.

(4) Enter the destination host IP address, version, port number, user name, and other information. Then, click **OK**.



2. Configuring Trap v3

- Application Scenarios

During device monitoring, if the device is suddenly disconnected or encounters an abnormality, and the third-party monitoring software cannot detect and handle the abnormal situation in a timely manner, you can configure the device with a destination IP address of 192.168.110.87 and a port number of 167 to enable the device to send a v3 trap, which is a safer trap compared with v1/v2c traps.

- Configuration Specification

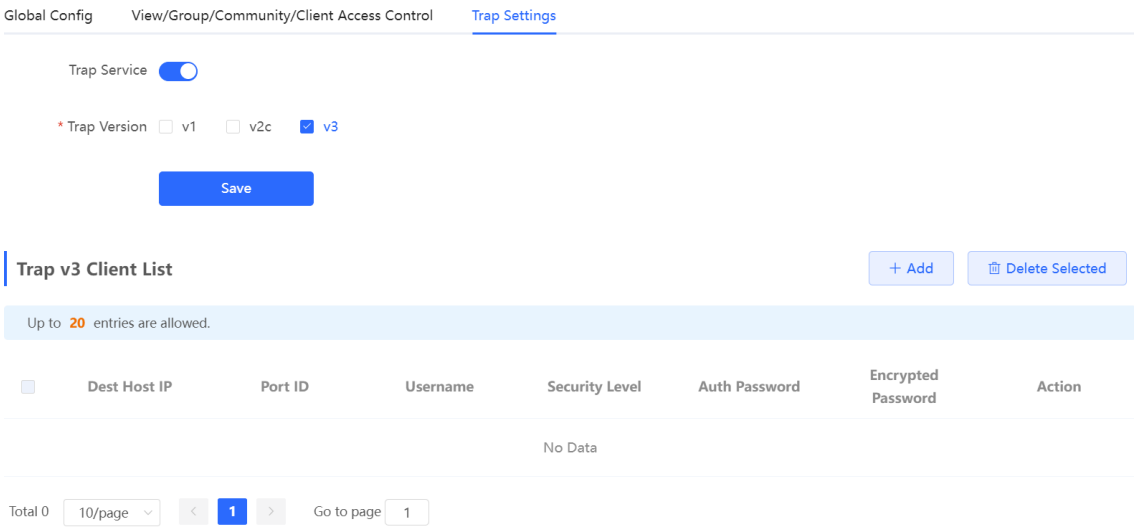
According to the user's application scenario, the requirements are shown in the following table:

Table 8-11 User Requirement Specification

Item	Description
IP address and port number	The destination host IP is 192.168.110.87, and the port number is 167.
Version and user name	Select the v3 version and trapv3_user for the user name.
Authentication protocol/authentication password Encryption protocol/encryption password	Authentication protocol/password: MD5/Ruijie123 Encryption protocol/password: AES/Ruijie123

- Configuration Steps

(2) Select the v3 version in the **Trap Setting** interface and click **Save**.



(3) Click **Add** in the Trap v3 Client List to add a trap v3 user.

(4) Enter the destination host IP address, port number, user name, and other information. Then, click **OK**.