Ruijie Reyee RG-EST100-E Wireless Bridge

Installation Guide

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.ruijie.com/support/caseportal

- Community: https://community.ruijie.com

- Technical Support Email: service_rj@ruijie.com

- Online Robot/Live Chat: https://reyee.ruijie.com/en-global/rita

Conventions

1. Signs

The signs used in this document are described as below:

> **⚡ Danger**
> An alert that calls attention to safety operation instructions that if not understood or followed when operating the device can result in physical injury.

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

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

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

> **✅ Specification**
> An alert that contains a description of product or version support.

2. Note

This manual provides the device installation steps, hardware troubleshooting, module technical specifications, and specifications and usage guidelines for cables and connectors. It is intended for the users who have some experience in installing and maintaining network hardware. At the same time, it is assumed that the users are already familiar with the related terms and concepts.

Contents

1 Product Overview

1.1 About the RG-EST100-E Wireless Bridge

The RG-EST100-E is a dual-stream wireless bridge launched by Ruijie Reyee for the scenario of surveillance video backhaul. Compliant with the IEEE 802.11n standard, the wireless bridge can work in the 2.4 GHz radio and delivers a maximum data rate of 300 Mbps.

1.2 Package Contents

Table 1-1   Package Contents

Item	Quantity
Device	2
Power adapter	2 Note: 12 V/1 A DC power adapter
PoE injector	2
Band clamp	4
Mounting Template	1
User Manual	1
Warranty Card	1

Note

The package contents generally contain the above items. The actual delivery is subject to the order contract. And please check your goods carefully against the order contract. If you have any questions, please contact the distributor.

1.3 Appearance

1.3.1 Appearance

Figure 1-1   Appearance of a RG-EST100-E Wireless Bridge

Instruction

The label is located on the back of the device.

1.3.2 Ports and WPS Hole
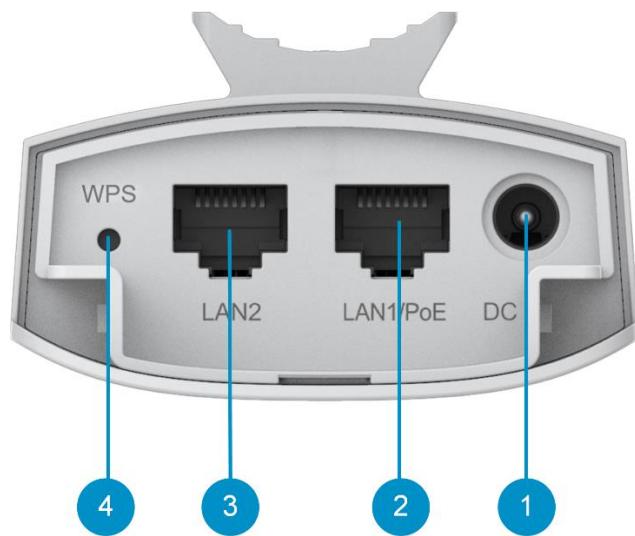
Table 1-2   Ports & WPS Hole

No.	Ports and WPS Hole	Description
1	12 V DC Connector	12 V/1 A DC power supply
2	LAN1/PoE	10/100BASE-T Ethernet port, supporting 12 V passive PoE power supply
3	LAN2	10/100BASE-T Ethernet port
4	WPS Hole	● Press and hold the pin to the WPS hole for less than 10 seconds: No action is triggered. ● Press and hold the pin to the WPS hole for at least 10 seconds: Restore the wireless bridge to factory settings.

Table 1-3 LED

No,	LED	Status	Description
1	Signal status LEDs	STR1 on	−78 dBm < RSSI < −72 dBm
		STR1 and STR2 on	−72 dBm < RSSI < −65 dBm

No,	LED	Status	Description
		STR1, STR2, and STR3 on	RSSI > –65 dBm
		Blinking	RSSI < –78 dBm
		Off	The device is not bridged.
2	LAN1/LAN2 Ethernet port LEDs	Solid on	The LAN port is connected and not receiving or transmitting data.
		Blinking	The LAN port is connected and receiving or transmitting data.
3	System Status LED	Off	The device is not powered on.
		Fast blinking	Possible cases: (1) Restoring the wireless bridge to factory settings. (2) Upgrading the firmware. (3) Handling alarms automatically. (4) Starting up the wireless bridge.
		Solid on	The device is working properly.

1.4 Device Specification

Table 1-3   Specification

System Specifications	Flash memory	8 MB
	RAM	64 MB DDR2
Wi-Fi Radio	Radio design	Single-radio 2 spatial streams ● Radio 1: 2.4 GHz, 2 spatial streams: 2 x 2, MIMO
	2.4 GHz channel width	Auto/20/40 MHz
	Wi-Fi standard	Wi-Fi 4 (IEEE 802.11n) standard, compatible with IEEE 802.11b/g standards
	Receive sensitivity	802.11b: -91 dBm (1 Mbps), -88 dBm (5 Mbps), -85 dBm (11 Mbps) 802.11g: -89 dBm (6 Mbps), -80 dBm (24 Mbps), -76 dBm (36 Mbps), -71 dBm (54 Mbps)

		802.11n: -83 dBm@MCS0, -65 dBm@MCS7, -83 dBm@MCS8, -65 dBm@MCS15
	Modulation	802.11b: BPSK, QPSK, CCK 802.11g/n: BPSK, QPSK, 16-QAM, 64-QAM
	2.4 GHz Wi-Fi	Wi-Fi 4 (IEEE 802.11b/g/n)
	Transmission rate	Maximum wireless data rate: 300 Mbps ● Radio 1: 2.4 GHz, 300 Mbps
	Operating band	IEEE 802.11b/g/n: 2.400 GHz to 2.483 GHz Note: Available bands vary with countries and regions. To use the preceding frequency bands, ensure that your country or region supports these frequency bands. For details, see Channels for Countries & Regions (official website link to be added).
	Maximum transmit power	2.4 GHz: 23 dBm (single-stream power: 20 dBm) Note: The transmit power varies according to regulations in different countries and regions.
	Maximum transmit power (2.4 GHz)	Combined power: 23 dBm (single stream power: 20 dBm) Note: The transmit power varies according to regulations in different countries and regions.
	Highest QAM order	64
Antenna	Antenna horizontal orientation	70°
	Antenna vertical orientation	70°
	Antenna	2.4 GHz: 2 x 2 Built-in directional antenna, horizontal: 70°, vertical: 70°
	Antenna gain (2.4 GHz)	8 dBi
WLAN	Maximum bridge distance	0.5 km (0.31 miles)
Port Specifications	Number of fixed LAN ports	2
	Number of 10/100BASE-T ports	2
	Reset button	1
	LEDs	1 x system status LED 2 x Ethernet port LEDs 3 x signal status LEDs

Power Supply and Consumption	Power supply	Power supply options: ● DC power adapter ● Passive PoE injector
	Power input	DC power adapter: ● Rated input voltage: 100 V AC to 240 V AC, 50 Hz to 60 Hz ● Rated input current: 0.3 A Output： ● Rated output voltage: 12 V DC ● Maximum output current: 1 A Passive PoE injector: ● Rated input voltage: 12 V DC ● Rated input current: 1 A Output： ● Rated output voltage: 12 V DC ● Maximum output current: 1 A
	Local power supply	Yes, one DC power connector (12 V, 1 A)
	Number of PoE In ports	1
	Dimensions of the DC connector	Outer Diameter: 5.50 mm ± 0.05 mm (0.22 in. ± 0.002 in.) Inner Diameter: 2.10 mm ± 0.05 mm (0.08 in. ± 0.002 in.) Depth: 9 mm (0.35 in.)
	Maximum power consumption	5 W
Dimensions and Weight	Product dimensions (W x D x H)	165.5 mm x 68.7 mm x 42 mm (6.52 in. x 2.70 in. x 1.65 in.)
	Color	Elegant white
	Weight	0.14 kg (0.31 lbs) (without packaging materials)
	Package dimensions (W x D x H)	224 mm x 208 mm x 92 mm (8.82 in. x 8.19 in. x 3.62 in.)
	Shipping weight	0.3 kg (0.66 lbs)
Environment and Reliability	Surge protection	Service port: ±6 kV for common mode Power connector: ±4 kV for common mode and ±2 kV differential mode
	Cooling	Natural cooling

	Altitude	Operating altitude: -500 m to +5,000 m (-1,640.42 ft. to +16,404.20 ft.) Storage altitude: -500 m to +5,000 m (-1,640.42 ft. to +16,404.20 ft.)
	IP rating	IP55
	Operating temperature	−30°C to +60°C (−22ºF to +140ºF)
	Storage temperature	−40°C to +70°C (−40°F to +158°F)
	Operating humidity	5% RH to 95% RH (non-condensing)
	Storage humidity	5% RH to 95% RH (non-condensing)
	MTBF	400,000 hours (about 45 years)
	ESD protection	Standard test: contact discharge=8 kV, air discharge=15 kV, Class B
	Mounting options	Wall/Pole
Certification and Regulatory Compliance	EMC	EN 55032 EN 55035 EN 61000-3-3 EN 61000-3-2 EN 301489-1 EN 301489-3 EN 301489-17
	Safety compliance	EN62368-1
	Certification	CE, FCC, CB, ISED, cTUVus

⚠️ **Warning**

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

1.5 Power Specification

The wireless bridge is delivered with a 12 V/1 A DC power adapter and a 12 V/1 A PoE injector (not waterproof).

Inner Diameter	Outer Diameter	Depth	Polarity Symbol
2.10 mm ± 0.05 mm (0.08 in. ± 0.002 in.)	5.50 mm ± 0.05 mm (0.22 in. ± 0.002 in.)	9 mm (0.35 in.)	Center (tip) of the output plug: Positive (+)

Inner Diameter	Outer Diameter	Depth	Polarity Symbol
		8	Barrel (ring) of the output: Negative (-) Reverse polarity symbol is not allowed.

Caution

For PoE power supply, please use the PoE adapter provided with the product. Do not use a switch or a PoE adapter of another model for power supply. Otherwise, the device may be damaged.

1.6 Heat Dissipation

The RG-EST100-E adopts a fanless design. Maintain a sufficient clearance around the wireless bridge for proper ventilation.

2 Safety Precautions

2.1 Safety Precautions

Note
- To prevent device damage and physical injury, please read carefully the safety recommendations described in this chapter.
- The following safety suggestions 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 methods described in the installation guide to install and remove the device.

2.1.2 Handling Safety

- Prevent the device from being frequently handled.
- Cut off all the power supplies and unplug all power cords before moving or handling the device.

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 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 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, 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 Requirements

- 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 Lightning Protection Requirements

- 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 6 kV 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/ Humidity Requirements

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 +60°C (–22⁰F to +140⁰F)	5% RH to 95% RH (non-condensing)

2.2.4 Anti-interference Requirements

- Take interference prevention measures for the power supply system.

- Keep the device far away from the grounding or lightning protection devices of power device.

- 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
Special Tools	Anti-static glove, stripping plier, crimping plier, wire cutter, waterproof tape
Meter	Multimeter, network cable tester
Related devices	PC, screen, keyboard

Note

The installation tools are not included in the scope of delivery and should be purchased separately.

2.4 Checking before Installation

Please check your goods carefully against the Package Contents. If you have any questions or there are any errors, please contact your distributor.

3 Installing the Device

Caution

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

3.1 Installation Procedure
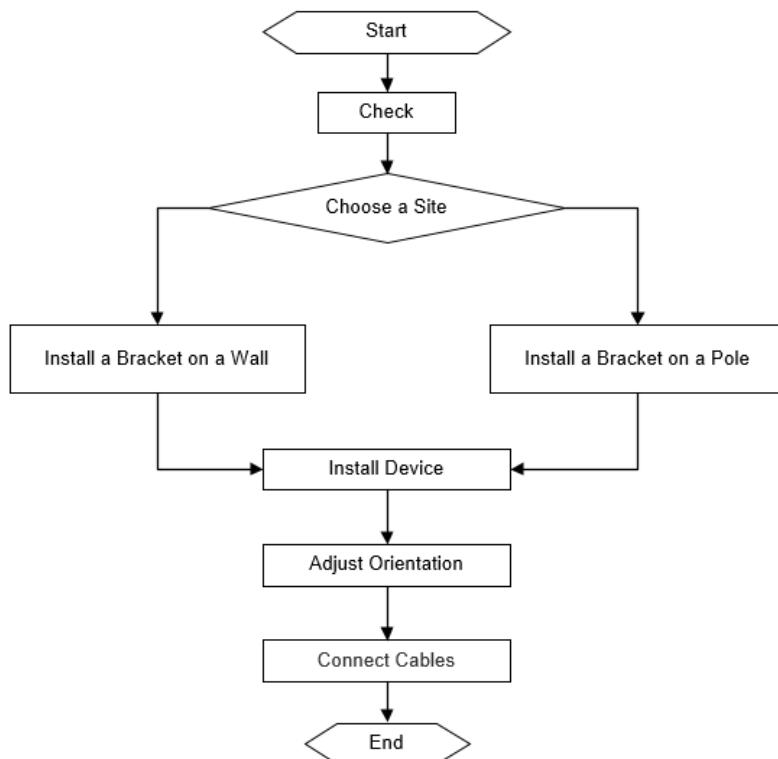
3.2 Preparing

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

- The installation position provides sufficient space for heat dissipation.
- The installation position 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 Precautions

The device can be mounted on a wall and a pole (diameter: 35 mm to 89 mm/1.38 in. to 3.50 in.). If the diameter of the pole is out of the range, the hose clamp is customer-supplied. 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 could fall down and cause injuries.

Please make full preparations as described in Chapter 2 and observe the following precautions before installing the device.

● Use the 12 V/1 A DC power adapter or 12 V/1 A PoE injector provided or a power adapter of the same specification. When using the PoE injector, make sure that Pin 4 and 5 are connected to the positive posts, and Pin 7 and 8 are connected to the negative posts. Noted that a power adapter of different specifications is not allowed.

● Make sure that the connector of the power module is fully seated.

3.4 Mounting the Device

Caution
● It is recommended to install the device where you can get the optimal coverage.
● The image shown here is for indicative purpose only. The actual product may differ.

3.4.1 Wall Mounting

Use the mounting template to mark where the holes need to be drilled. Then, drill the holes and insert screws into each hole. Mount the device onto the screws to securely hang it in place.

Note

To mount the device on a wall, prepare two screws (M4 × 25 mm screws are recommended) by yourself. Make sure the nuts are 8-9 mm away from the wall.

Figure 3-1   Wall Mounting
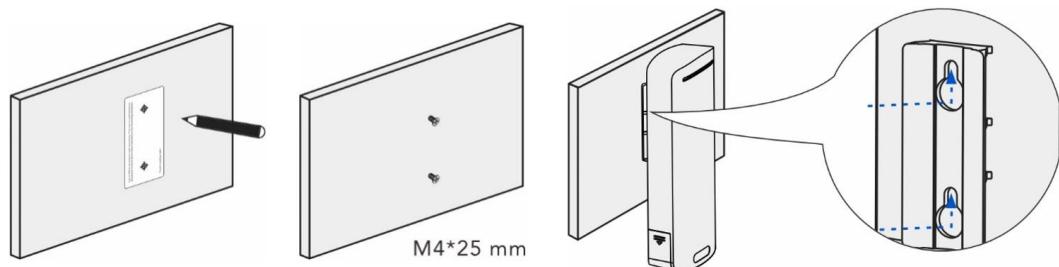
3.4.2 Pole Mounting

Thread the band clamps through the bracket at the back of the device, and pull the band clamps tight to secure the device to the pole.

Figure 3-2   Pole Mounting

35 mm-89 mm
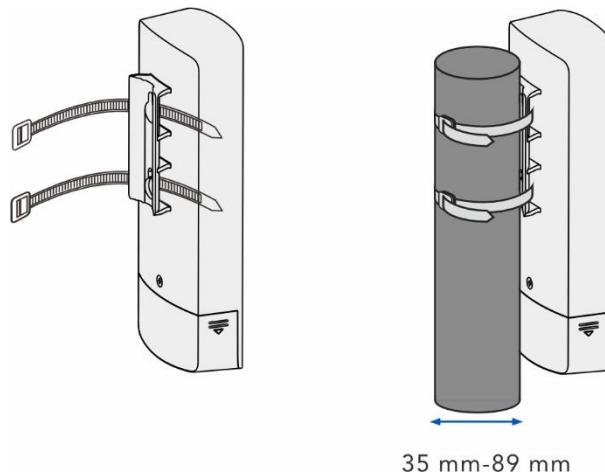
3.5 Connecting Cables

Note

The bridge must be installed outdoors, while the DC power adapter or the PoE injector must be installed indoors.

(1) Use or make a network cable of suitable length based on the distance between RG-EST100-E and the Power Sourcing Equipment (PSE), server, or camera. Please note that the device supports PoE power supply through a network cable of up to 100 meters (CAT5e or higher).

(2) Plug one end of the cable into the PoE port of the PoE injector and plug the other end into the LAN1/PoE port of the device. Connect the LAN port of the PoE injector to the server or camera.

Or you can connect the DC port of the device to the 12 V/1 A DC power adapter, and connect the LAN port of the device to the server or camera.

Figure 3-3   Connecting Cables
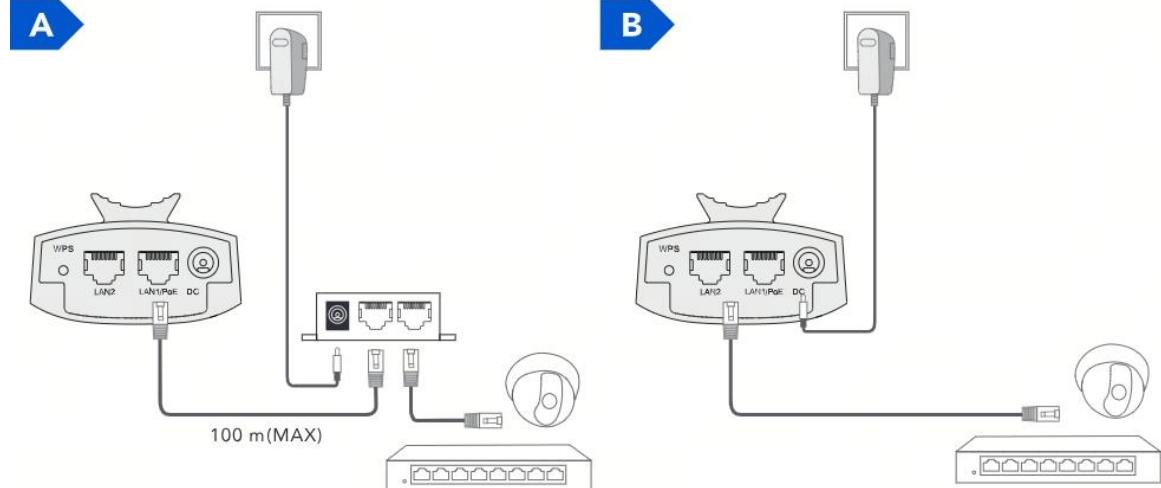
⚠ **Warning**

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

3.6 Verifying Installation

(1) Checking the Device

- Verify if the external power supply matches the specification.
- Verify that the device has been fastened and will not move or tilt.

(2) Checking the Power Supply

- Make sure all power cables are properly connected.
- Make sure the device is operational after power-on.

4 Verifying Operating Status

4.1 Setting up Configuration Environment

Power on the device through 12 V/1 A DC power adapter or 12 V/1 A PoE injector. Make sure all power cables are properly connected and meet the safety requirement.

4.2 Checking Environment before/after Power-on

(1) Before power-on, check the following items:

- Verify that the power supply is properly connected.

- Verify that the input voltage matches the specification.

(2) After power-on, check the following item (Recommended):

- Check the indicator status.

4.3 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.

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5 Monitoring and Maintenance

5.1 Monitoring

When the RG-EST100-E 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

```
┌─────────────────────────────────────┐
│  The device is not working properly. │
└─────────────────────────────────────┘
                   │
                   ▼
┌─────────────────────────────────────┐
│       Check device installation.    │
└─────────────────────────────────────┘
                   │
                   ▼
┌─────────────────────────────────────┐
│       Check power installation.     │
└─────────────────────────────────────┘
                   │
                   ▼
┌─────────────────────────────────────┐
│             Check LED.              │
└─────────────────────────────────────┘
                   │
                   ▼
┌─────────────────────────────────────┐
│        Check cable connection.      │
└─────────────────────────────────────┘
                   │
                   ▼
┌─────────────────────────────────────┐
│        Contact technical support.   │
└─────────────────────────────────────┘
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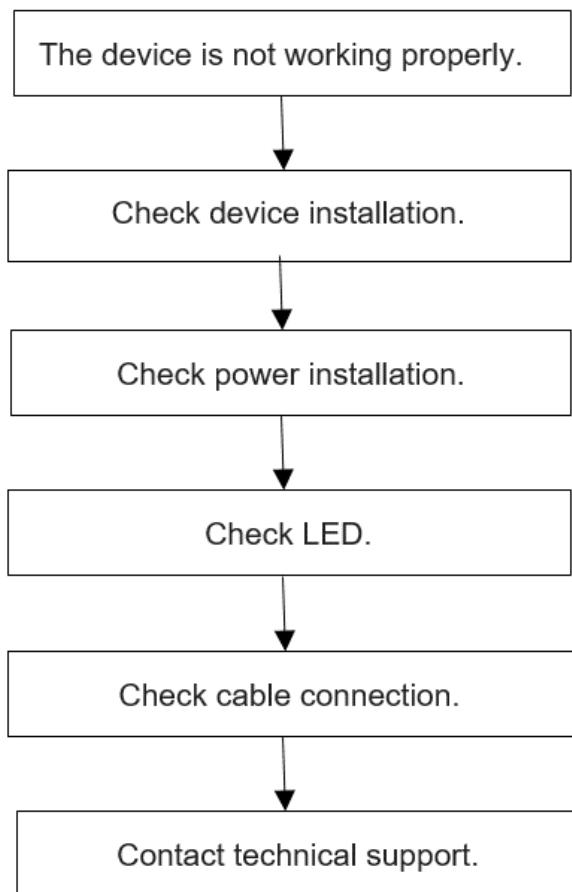
7 Appendix A Connectors and Media Description

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

Straight-Through		Crossover	
Switch	Switch	Switch	Switch
1 TP0+ ⟷ 1 TP0+		1 TP0+ ⤫ 1 TP0+	
2 TP0- ⟷ 2 TP0-		2 TP0- ⤫ 2 TP0-	
3 TP1+ ⟷ 3 TP1+		3 TP1+ ⤫ 3 TP1+	
6 TP1- ⟷ 6 TP1-		6 TP1- ⤫ 6 TP1-	
4 TP2+ ⟷ 4 TP2+		4 TP2+ ⤫ 4 TP2+	
5 TP2- ⟷ 5 TP2-		5 TP2- ⤫ 5 TP2-	
7 TP3+ ⟷ 7 TP3+		7 TP3+ ⤫ 7 TP3+	
8 TP3- ⟷ 8 TP3-		8 TP3- ⤫ 8 TP3-	

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 shows 100BASE-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

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

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

Straight-Through		Crossover	
Switch	Adapter	Switch	Switch
1 IRD+ ⟷ 1 OTD+		1 IRD+ ⤸ 1 IRD+	
2 IRD- ⟷ 2 OTD-		2 IRD- ⤸ 2 IRD-	
3 OTD+ ⟷ 3 IRD+		3 OTD+ ⤸ 3 OTD+	
6 OTD- ⟷ 6 IRD-		6 OTD- ⤸ 6 OTD-	