Ruijie RG-AP820-L(V2) Access Point

Hardware Installation and Reference Guide

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Preface

Intended Audience

This document is intended for:

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

Technical Support

- Ruijie Networks website: https://www.ruijie.com

- Online support center: https://ruijie.com/support

- Case portal: https://caseportal.ruijie.com

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

- Email support: service_rj@ruijie.com

- Live chat: https://www.ruijie.com/rita

- Documentation feedback: doc@ruijie.com.cn

Conventions

1. Signs

The signs used in this document are described as follows:

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

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

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

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

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

2. Note

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

Contents

1 Product Overview

Featuring leading 802.11ax, Ruijie RG-AP820-L(V2) delivers up to 575Mbps@2.4G and 1.2Gbps@5G. The overall dual-radio, dual-band performance speeds up to 1.775Gbps per device, totally eliminating Gigabit wireless bottlenecks.

1.1 Technical Specifications

1.1.1 Dimensions and Weight

Dimensions and Weight	RG-AP820-L(V2)
Unit dimensions (W x D x H)	153 mm x 193 mm x 26 mm (6.02 in. x 7.60 in. x 1.02 in.)
Shipping dimensions (W x D x H)	377 mm x 322 mm x 228 mm (14.84 in. x 12.68 in. x 8.98 in.)
Unit weight	Main unit: 0.42 kg (0.93 lbs) Mounting bracket: 0.07 kg (0.15 lbs)
Shipping weight	5.75 kg (12.68 lbs)
Mounting	Wall/Ceiling-mount (a mounting bracket is delivered with the main unit.)
Color	White
Lock option	Securing latch and Kensington lock

1.1.2 Wi-Fi Radio

Wi-Fi Radio	RG-AP820-L(V2)
Radio design	Dual-radio design and four spatial streams ● Radio 1: 2.4 GHz/5 GHz, two spatial streams, 2x2, MU-MIMO ● Radio 2: 5 GHz, two spatial streams, 2x2, MU-MIMO
Operating frequency bands	Radio 1: 802.11b/g/n/ax: ● 2.400 GHz to 2.4835 GHz ISM, channels 1 to 13 802.11a/n/ac/ax: ● 5.150 GHz to 5.250 GHz, U-NII-1, channels 36, 40, 44, and 48 ● 5.250 GHz to 5.350 GHz, U-NII-2A, channels 52, 56, 60, and 64 ● 5.470 GHz to 5.725 GHz, U-NII-2C, channels 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, and 140 ● 5.725 GHz to 5.850 GHz, U-NII-3/ISM, channels 149, 153, 157, 161, and 165 Radio 2, 802.11a/n/ac/ax: ● 5.150 GHz to 5.250 GHz, U-NII-1, channels 36, 40, 44, and 48 ● 5.250 GHz to 5.350 GHz, U-NII-2A, channels 52, 56, 60, and 64 ● 5.470 GHz to 5.725 GHz, U-NII-2C, channels 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, and 140 ● 5.725 GHz to 5.850 GHz, U-NII-3/ISM, channels 149, 153, 157, 161, and 165

Wi-Fi Radio	RG-AP820-L(V2)
	Note: Available frequency bands may vary with countries or regions. To use the above-mentioned frequency bands, ensure that they are supported in your country or region. For details, see For details, see *WLAN Country or Region Codes and Channel Compliance*.
Data rates	Combined peak data rate: 2.4 GHz + 5 GHz, 1.775 Gbps 5 GHz + 5 GHz, 2.402 Gbps Radio 1: 2.4 GHz, 574 Mbps ● Two spatial stream Single User (SU) MIMO for up to 574 Mbps wireless data rate to individual 2SS HE40 802.11ax client devices (maximum) ● Two spatial stream Single User (SU) MIMO for up to 287 Mbps wireless data rate to individual 2SS HE20 802.11ax client devices (typical) 5 GHz, 1.201 Gbps ● Two spatial stream Single User (SU) MIMO for up to 1.201 Gbps wireless data rate to individual 2SS HE80 802.11ax client device (maximum) ● Two spatial stream Single User (SU) MIMO for up to 574 Mbps wireless data rate to individual 2SS HE40 802.11ax client device (typical) ● Two spatial stream Multi-User (MU) MIMO for up to 1.201 Gbps wireless data rate to up to two 1SS HE80 802.11ax DL-MU-MIMO capable client devices simultaneously (maximum) ● Two spatial stream Multi-User (MU) MIMO for up to 574 Mbps wireless data rate to up to two 1SS HE40 802.11ax DL-MU-MIMO capable client devices simultaneously (typical) Radio 2: 5 GHz, 1.201 Gbps ● Two spatial stream Single User (SU) MIMO for up to 1.201 Gbps wireless data rate to individual 2SS HE80 802.11ax client device (maximum) ● Two spatial stream Single User (SU) MIMO for up to 574 Mbps wireless data rate to individual 2SS HE40 802.11ax client device (typical) ● Two spatial stream Multi-User (MU) MIMO for up to 1.201 Gbps wireless data rate to up to two 1SS HE80 802.11ax DL-MU-MIMO capable client devices simultaneously (maximum) ● Two spatial stream Multi-User (MU) MIMO for up to 574 Mbps wireless data rate to up to two 1SS HE40 802.11ax DL-MU-MIMO capable client devices simultaneously (typical)
Data rate set	The following 802.11-compliant data rates in Mbps are supported: 2.4 GHz radio ● 802.11b: 1, 2, 5.5, 11 ● 802.11g: 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54 ● 802.11n: 6.5 to 300 (MCS0 to MCS15, HT20 to HT40) ● 802.11ac: 6.5 to 400 (MCS0 to MCS9, NSS = 1 to 2, VHT20 to VHT40) ● 802.11ax: 8.6 to 574 (MCS0 to MCS11, NSS = 1 to 2, HE20 to HE40) 5 GHz radio ● 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 ● 802.11n: 6.5 to 300 (MCS0 to MCS15, HT20 to HT40) ● 802.11ac: 6.5 to 867 (MCS0 to MCS9, NSS = 1 to 2, VHT20 to VHT80) ● 802.11ax: 8.6 to 1,201 (MCS0 to MCS11, NSS = 1 to 2, HE20 to HE80)
Packet aggregation	802.11n/ac/ax: A-MPDU and A-MSDU
Antenna type	Built-in omnidirectional antennas ● 2 x 2.4 GHz antennas (Radio 1)

Wi-Fi Radio	RG-AP820-L(V2)
	• 4 x 5 GHz antennas (Radio 1 & Radio 2)
Antenna gain	2.4 GHz: 5 dBi 5 GHz: 5 dBi
Maximum transmit power	2.4 GHz radio: 20 dBm (17 dBm per chain) 5 GHz radio: 20 dBm (17 dBm per chain) Note: The transmit power is limited by local regulatory requirements. For details, see For details, see _WLAN Country or Region Codes and Channel Compliance_.
Power increment	Configurable in increments of 1 dBm
Radio technologies	802.11b: Direct-Sequence Spread-Spectrum (DSSS) 802.11a/g/n/ac: Orthogonal Frequency-Division Multiplexing (OFDM) 802.11ax: OFDMA
Modulation types	802.11b: BPSK, QPSK, and CCK 802.11a/g/n: BPSK, QPSK, 16-QAM, and 64-QAM 802.11ac: BPSK, QPSK, 16-QAM, 64-QAM, and 256-QAM 802.11ax: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, and 1024-QAM

The following table lists the radio frequency performance of Wi-Fi including different frequency bands, protocols, and date rates. It is country-specific, and Ruijie Networks reserves the right of interpretation.

Wi-Fi Radio Performance	RG-AP820-L(V2)		
Frequency Band and Protocol	Data Rate	Maximum Transmit Power per Transmit Chain	Maximum Receive Sensitivity per Receive Chain
2.4 GHz, 802.11b	1 Mbps	23 dBm	–93 dBm
	2 Mbps	23 dBm	–93 dBm
	5.5 Mbps	23 dBm	–92 dBm
	11 Mbps	21 dBm	–89 dBm
2.4 GHz, 802.11g	6 Mbps	23 dBm	–91 dBm
	24 Mbps	22 dBm	–87 dBm
	36 Mbps	22 dBm	–80 dBm
	54 Mbps	20 dBm	–74 dBm
2.4 GHz, 802.11n (HT20)	MCS0	23 dBm	–87 dBm
	MCS7	19 dBm	–69 dBm
2.4 GHz, 802.11n (HT40)	MCS0	23 dBm	–84 dBm
	MCS7	19 dBm	–66 dBm
2.4 GHz, 802.11ax (HE20)	MCS0	23 dBm	–87 dBm
	MCS11	15 dBm	–60 dBm
2.4 GHz, 802.11ax (HE40)	MCS0	23 dBm	–84 dBm
	MCS11	15 dBm	–56 dBm
5 GHz, 802.11a	6 Mbps	21 dBm	–91dBm

Wi-Fi Radio Performance	RG-AP820-L(V2)		
	24 Mbps	21 dBm	–85 dBm
	36 Mbps	20 dBm	–78dBm
	54 Mbps	19 dBm	–74 dBm
5 GHz, 802.11n (HT20)	MCS0	21 dBm	–87 dBm
	MCS7	18 dBm	–69 dBm
5 GHz, 802.11n (HT40)	MCS0	21 dBm	–84 dBm
	MCS7	18 dBm	–66 dBm
5 GHz, 802.11ac (VHT20)	MCS0	21 dBm	–87 dBm
	MCS9	17 dBm	–64 dBm
5 GHz, 802.11ac (VHT40)	MCS0	21 dBm	–84 dBm
	MCS9	17 dBm	–59 dBm
5 GHz, 802.11ac (VHT80)	MCS0	21 dBm	–81 dBm
	MCS9	17 dBm	–55 dBm
5 GHz 802.11ax (HE20)	MCS0	21 dBm	–87 dBm
	MCS11	15 dBm	–60 dBm
5 GHz, 802.11ax (HE40)	MCS0	21 dBm	–84 dBm
	MCS11	15 dBm	–56 dBm
5 GHz, 802.11ax (HE80)	MCS0	21 dBm	–81 dBm
	MCS11	15 dBm	–54 dBm

1.1.3 Bluetooth Radio

Bluetooth Radio	RG-AP820-L(V2)
Bluetooth	Bluetooth 5.0
Antenna type	Integrated omnidirectional antenna
Maximum antenna gain	4.5 dBi, with a downtilt angle of roughly 30 degrees
Maximum transmit power	10 dBm
Receive sensitivity	–88 dBm (@BLE)

1.1.4 Port Specifications

Port Specifications	RG-AP820-L(V2)
Fixed service port	1 x 10/100/1000BASE-T port ● In compliance with IEEE 802.3af standard (PoE) ● Auto MDI/MDIX crossover ● PoE-PD: 54 V DC (nominal) 802.3af/at/bt (Class 3 or higher) ● 802.3az Energy Efficient Ethernet (EEE)
Fixed management port	1 x RJ45 console port (serial console port)

Port Specifications	RG-AP820-L(V2)
Status LED	1 x multi-color system status LED
Button	1 x Reset button ● Press the button for less than two seconds to restart the device. ● Press the button for more than five seconds to restore the device to factory settings.

1.1.5 Power Supply and Consumption

Power Supply and Consumption	RG-AP820-L(V2)
Input power supply	The AP supports the following two power supply modes: ● 48 V DC/0.3 A power input over DC connector: The DC connector accepts 2.1 mm/5.5 mm center-positive circular plug. A DC power adapter needs to be purchased independently. ● PoE input over LAN/PoE: The power sourcing equipment (PSE) complies with IEEE 802.3af standard (PoE). Note: If both DC power and PoE are available, DC power is preferred.
Overall power consumption	Maximum power consumption: 12.95 W ● DC powered: 12.95 W ● PoE powered (802.3af): 12.95 W ● PoE+ powered (802.3at): 12.95 W ● PoE++ powered (802.3bt): 12.95 W ● Idle mode: < 8 W

1.1.6 Environment and Reliability

Environment and Reliability	RG-AP820-L(V2)
Temperature	Operating temperature: −10°C to +50°C (14°F to 122°F) Storage temperature: −40°C to +70°C (−40°F to +158°F) Note: At an altitude in the range of 3,000–5,000 m (9,842.52–16,404.20 ft.), every time the altitude increases by 166 m (544.62 ft.), the maximum temperature decreases by 1°C (1.8°F).
Humidity	Operating humidity: 5% RH to 95% RH (non-condensing) Storage humidity: 5% RH to 95% RH (non-condensing)
Mean Time Between Failure (MTBF)	200,000 hours (22 years) at the operating temperature of 25°C (77°F)

1.1.7 Regulatory Compliance

Regulatory Compliance	RG-AP810-L
Regulatory compliance	IEC 62368-1,EN 62368-1, EN 60950-22, EN 55032, EN 55035, EN 301 489-1, EN 301 489-3, EN 301 489-17, EN 300328, EN 301 893, EN 300 440, EN 62311, EN IEC 62311, EN 50665, FCC Part 15, EN 18031-1, and EN

Regulatory Compliance	RG-AP810-L
	18031-2

ℹ **Note**

For more country-specific regulatory information and approvals, contact your local sale agency.

ℹ **Note：**

● EU simplified DoC: Hereby, [**Ruijie Networks Co., Ltd.**] declares that the radio equipment type [**RG-AP820-L(V2)**] is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: https://www.ruijie.com/.

● UK simplified DoC: Hereby, [**Ruijie Networks Co., Ltd.**] declares that the radio equipment type [**RG-AP820-L(V2)**] is in compliance with UK Radio Equipment Regulation 2017. The full text of the UK declaration of conformity is available at the following internet address: https://www.ruijie.com/.

● The functions of Wireless Access Systems including Radio Local Area Networks(WAS/RLANs) within the band 5150-5350 MHz for this device are restricted to indoor use only within all European Union countries (BE/BG/CZ/DK/DE/EE/IE/EL/ES/FR/HR/IT/CY/LV/LT/LU/HU/MT/NL/AT/PL/PT/RO/SI/SK/FI/SE/TR/NO/CH/IS/LI/UK(NI)
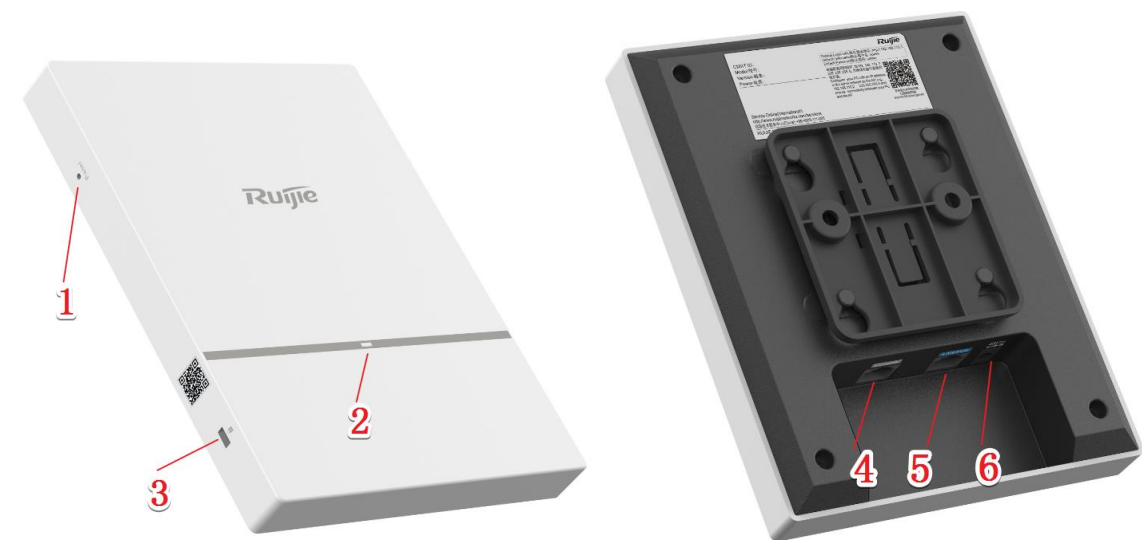

1.2 Product Image

The AP provides one Ethernet ports (PoE-capable), one Console port, and one power port for external power supply.

Figure 1-1   Appearance of RG-AP820-L(V2)

Note	
1. Reset button	4. RJ45 Console port
2. LED indicator	5. LAN/PoE port
3. Anti-Theft lock hole	6. 48V DC power port

1.3 LED Indicators

Fit AP

State	Frequency	Meaning
Off	N/A	The AP is NOT receiving power. Or the AP is in Do Not Disturb mode, which can be disabled by software.
Blinking green	3Hz	uBoot program initialization in progress
Solid green	N/A	Main program initialization in progress
Blinking red	3Hz	Initialization is complete, but no Ethernet activity.
	2Hz	Locates the AP.
Solid orange	N/A	Initialization is complete, and the AP is establishing a CAPWAP connection with an AC.
Blinking orange	3Hz	Firmware upgrade in progress. Do not power off.
Solid blue	N/A	Normal operation, but no wireless clients are associated with the AP.
Blinking blue	3Hz	Normal operation, at least one wireless client is associated with the AP.

State	Frequency	Meaning
Reset button	Pressed for less than 2s	Reboots the device.
	Pressed for more than 3s	Restores default settings.

Fat AP

State	Frequency	Meaning
Off	N/A	The AP is NOT receiving power. Or the AP is in Do Not Disturb mode, which can be disabled by software.
Blinking green	3Hz	uBoot program initialization in progress
Solid green	N/A	Main program initialization in progress
Blinking red	3Hz	Initialization is complete, but no Ethernet activity.
Solid blue	N/A	Normal operation, but no wireless clients are associated with the AP.
Blinking blue	3Hz	Normal operation, at least one wireless client is associated with the AP.
Reset button	Pressed for less than 2s	Reboots the device.
	Pressed for more than 3s	Restores default settings.

1.4 Power Sources

The AP can be powered either with a DC power adapter or through Power over Ethernet (PoE).

- The AP requires Ruijie power adapters (If needed, you can buy them from Ruijie).
- To use a PoE device, make sure it supports the IEEE 802.3af PoE standard.

1.5 Cooling Solution

The AP adopts fanless design.

- Leave sufficient space at the surrounding of the AP when place the AP to permit airflow for proper ventilation.

2 Preparing for Installation

ⓘ   To prevent device damage and bodily injury, please read carefully the safety recommendations described in this chapter.

ⓘ   The recommendations do not cover all possible hazardous situations.

2.1 Installation

The AP must be installed indoors. To ensure its normal operation, the installation site must meet the following requirements.

● Install the AP 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 AP and its accessories.

● Make sure the site has enough space for installing the AP and leave sufficient room around the AP for ventilation. Also, to avoid mutual interference, ensure the site is at least 2 meters away from a base station antenna.

● Do not expose the AP to high temperature, dusts, or harmful gases.

● Do not install the AP in an inflammable or explosive environment.

● Keep the AP away from EMI sources such as large radar stations, radio stations, and substations.

● Do not subject the AP to unstable voltage, vibration, and noises.

● Keep the AP 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 equipment, and considerations such as climate, hydrology, geology, earthquake, electric power, and transportation.

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

2.2 Movement

● Avoid moving the device frequently.

● Turn off all power supplies and unplug all power cables before you remove the device.

2.3 EMI

● Please observe local regulations and specifications when performing electrical operations. Relevant operators must be qualified.

● Please carefully check for any potential danger in the working area, for example, damp/wet ground or floor.

● 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 chassis

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

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

⚠ Any nonstandard and inaccurate electrical operation can cause an accident such as fire or electric shock, thus causing severe even fatal damages to human bodies and device.

⚠ Direct or indirect touch through a wet object on high voltage and power line can bring a fatal danger.

2.4 Ventilation

For proper ventilation, leave sufficient space around the AP.

2.5 Temperature and Humidity

To ensure normal operation and service life of the device, maintain appropriate temperature and humidity levels in your equipment room. See Table 2-1. Improper room temperature and humidity can cause damages to the device.

- High relative humidity may affect insulation materials, resulting in poor insulation and even electrical leakage, and sometimes may lead to change of mechanical properties of materials and corrosion of metal parts.

- Low relative humidity may dry and shrink insulation sheets and cause static electricity that can damage the circuitry inside the device.

- High temperature greatly reduces reliability of the device and shortens its service life.

Table 2-1   Required Temperature and Humidity for the RG-AP820-L(V2)

Temperature	Relative Humidity
-10°C to 50°C (14°F to 122°F)	5% to 95%

2.6 Cleanness

Dust poses a serious threat to device operation. Dust that falls onto the surface of the device can be absorbed onto metal contact points by static electricity, resulting in poor contact. Electrostatic absorption of dust occurs more easily when the relative humidity is low, which may shorten the service life of the device and cause communication failures. Table 2-2 shows the maximum concentration and diameter of dust allowed in the equipment room.

Table 2-2

Maximum diameter (μm)	0.5	1	3	5
Maximum concentration (Particles/m³)	$1.4×10^7$	$7×10^5$	$2.4×10^5$	$1.3×10^5$

Besides, the contents of salts, acids and sulfides in the air are also strictly limited for the equipment room. These substances can accelerate metal corrosion and the aging of some parts. Table 2-3 describes the limit of some hazardous gases such as SO_2, H_2S, NO_2 and Cl_2 in the equipment room.
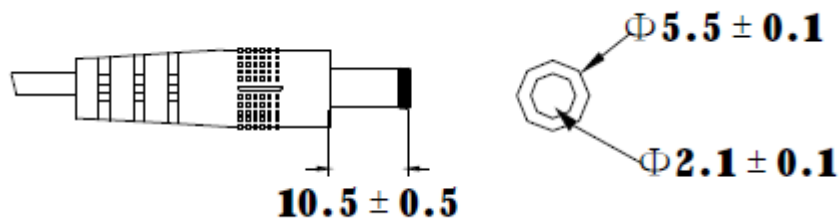
Table 2-3

Gas	Average (mg/m^3)	Maximum (mg/m^3)
SO_2	0.2	1.5
H_2S	0.006	0.03
NO_2	0.04	0.15
NH_3	0.05	0.15
Cl_2	0.01	0.3

2.7 Power Supply

● DC power adapter: 48V/0.3A

Specifications of Connector

Internal Diameter	External Diameter	Depth	Polarity	
2.1mm	5.5mm	10mm	Internal: positive	External: negative

2.8 Installation Tools

Common Tools	Phillips screwdriver, related copper and fiber cables, bolts, diagonal pliers, cable ties
Special Tools	Wire stripper, crimping pliers, RJ-45 crimping pliers, punch down tool
Meter	Multimeter, bit error rate tester (BERT)

ⓘ   The listed tools are customer supplied.

2.9   Unpacking the Access Point

Package Contents

Items	Verify that all parts are installed and debugged. Screws Mounting brackets Product quick installation guide Packing list

ⓘ The above listed items are for general situations, which may vary in the actual shipment. The purchase order shall prevail in any case. Please check each item carefully according to the packing list or purchase order. If any item is damaged or missing, notify the sales person.

3 Installing the Access Point

The RG-AP820-L(V2) series must be fixed and installed indoors.

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

3.1 Installation Flowchart

```
┌─────────────────────────────────┐
│   Install the Mounting Bracket  │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│          Install the AP         │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│     Install Ethernet Cables     │
└─────────────────────────────────┘
```
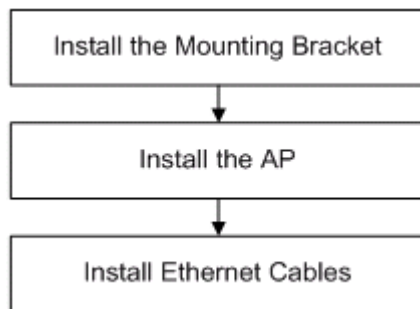
3.2 Before You Begin

Before you install the AP, verify that:

● The installation site provides sufficient ventilation for the AP.

● The installation site meets temperature and humidity requirements.

● The installation site is equipped with proper power supply.

● Network cables are in place.

● The installation site meets all described requirements.

● The custom AP meets the customers' requirements.

3.3 Precautions

To avoid damages to the AP, observe the following safety precautions:

● Do not power the device during installation.

● Install the device in a well-ventilated location.

● Do not subject the device to high temperatures.

● Keep away from high voltage cables.

● Install the device indoors.

● Do not expose the device in a thunderstorm or strong electric field.

● Keep the device clean and dust-free.

● Disconnect the device before cleaning it.

● Do not wipe the device with a damp cloth.

● Do not wash the device with liquid.

- Do not open the enclosure when the AP is working.

- Fasten the device tightly.

3.4 Installing the Access Point

- Ceiling Mount

(1) Drill two 6 mm diameter holes (53 mm apart) on the ceiling. Tap wall anchors into the holes, and drive screws through the mounting bracket into the anchors to fix the bracket. See Figure 3-1.

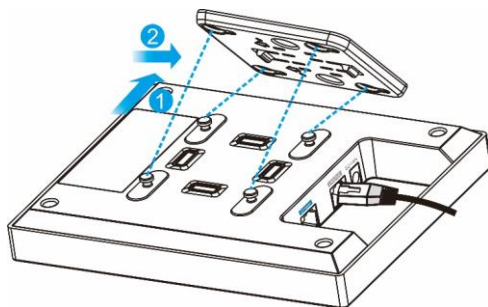**Figure 3-1   Attaching the Mounting Bracket on the Ceiling**
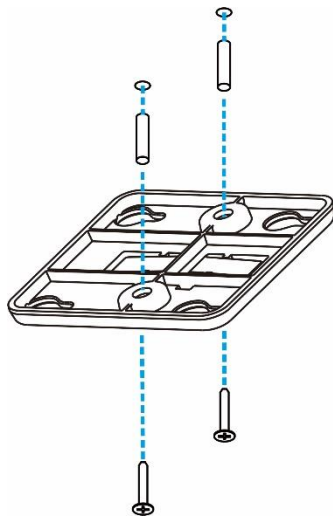
(2) Align the square feet on the rear of the AP over the mounting holes on the bracket. See Figure 3-2.

Figure 3-2   Aligning the Square Feet with the Mounting Holes
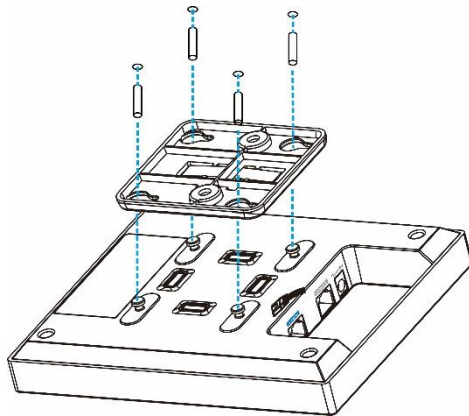
⚠️ Before mounting the AP on the bracket, you must first install the Ethernet cables.

(3) Slide the AP onto the bracket in the reverse direction against the arrow on the mounting bracket until it clicks into place. See Figure 3-3.

Figure 3-3   Mounting the AP on the Bracket

⚠️ The AP can be installed in any of four directions on the mounting bracket depending on how you route your Ethernet cable.

⚠️ The square feet should fit easily into the mounting slots. Do not forcibly push the AP into the slots.

⚠️ After installation, verify that the AP is securely fastened.

●   Wall Mount

(1) Drill four 6 mm diameter holes (53 mm apart) on the wall with the arrow on the mounting bracket facing up. Tap wall anchors into the holes, and drive screws through the mounting bracket into the anchors to fix the bracket. See Figure 3-4.

Figure 3-4   Attaching the Mounting Bracket on the Wall

(2) Align the square feet on the rear of the AP over the mounting holes on the bracket. See Figure 3-5.

Figure 3-5   Aligning the Square Feet with the Mounting Holes

⚠ Before mounting the AP on the bracket, you must first install the Ethernet cables.

(3) Slide the AP into the holes in the reverse direction against the arrow on the mounting bracket until it clicks into place. See Figure 3-6.
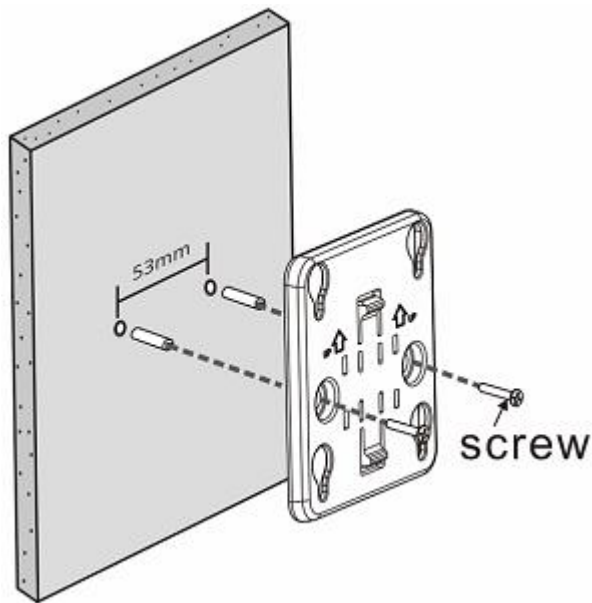
Figure 3-6   Mounting the AP on the Bracket

⚠ When mounting the AP on wall, keep the "Ruijie" logo upright during the installation.

⚠ The square feet should fit easily into the mounting slots. Do not forcibly push the AP into the slots.

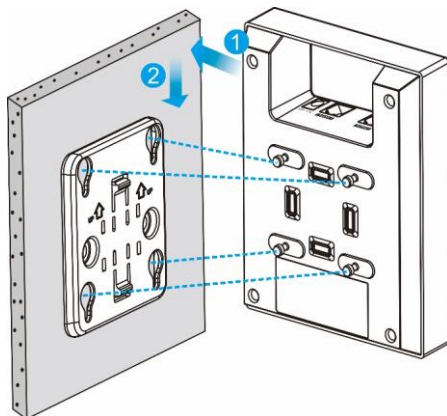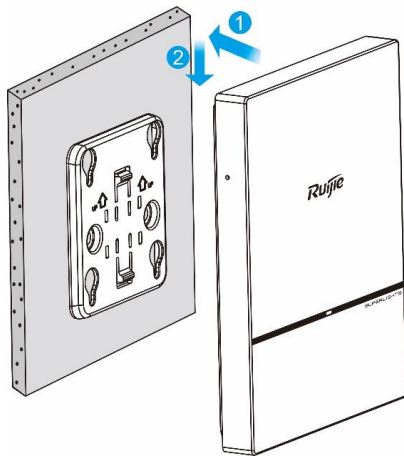⚠ After installation, verify that the AP is securely fastened.

3.5 Removing the Access Point

(1) If the AP is installed on the wall, hold the AP in your hands and push it upward and away from the bracket in the LAN port direction.

Figure 3-7   Removing the Wall-Mount AP
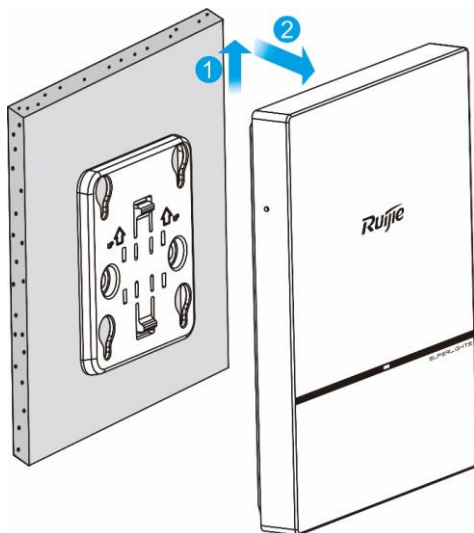
(2) If the AP is installed on the ceiling, hold the AP in your hands and push it sideward. And attempt to push it along the direction of the LAN port.

Figure 3-8   Removing the Ceiling-Mount AP

3.6 Connecting Cables

Connect UTP/STP to the LAN/PoE port on the AP. See Appendix A for supported wiring of twisted pairs.

⚠ By default, baud rate is set to 9600, data bit 8, parity none, stop bits 1 and flow control none on the console port of the AP. The console port is used only when you want to configure the AP manually.
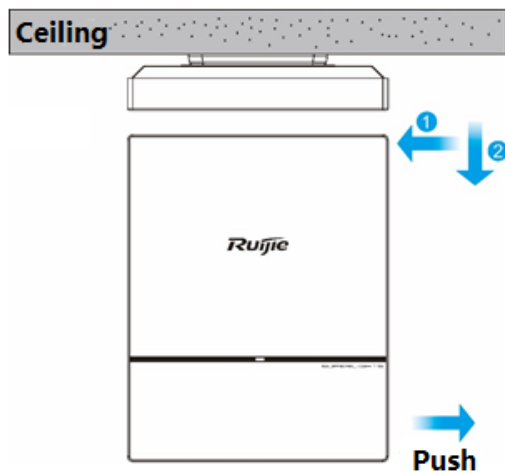
3.7 Bundling Cables

Precautions

- Make sure the cable bundles are neat and orderly.

- Bend twisted pairs naturally or to a large radius close to the connector.

- Do not over tighten cable bundle as it may reduce the cable life and performance.

Bundling Steps

(1) Bundle the drop UTP/STP cables and route them to the LAN/PoE port.

(2) Attach the cables in the cable tray of the rack.

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

3.8 Checking after Installation

Checking the Cabinet

- Make sure the external power supply matches the specifications of the patch panel in the cabinet.

- After installation, make sure you can close the front and rear cabinet doors.

- Make sure the cabinet is stable and level.

- Make sure the device and all cables are securely fastened in the rack.

Checking Cable Connection

- Make sure the UTP/STP cable matches the interface type.

- Make sure cables are properly bundled.

Checking the Power Supply

- Make sure all power cables are properly connected and safe.

- Make sure the AP is operational after power-on.

4 System Debugging

4.1 Setting up a Debugging Environment

Use a power adapter or PoE to power the AP.

Setting up the Environment

- Verify that the AP is properly connected to the power source.

- Connect the AP to an AC through a twisted pair cable.

- When the AP is connected to a PC for debugging, verify that the PC and PoE switch are properly grounded.

4.2 Powering up the AP

4.2.1 Checking before power-up

- Verify that the power supply is properly connected.

- Verify that the input voltage matches the specification of the AP.

4.2.2 Checking after power-up (recommended)

After powering up, it is recommended that you check the following to ensure normal operation of the AP.

- Check if any message is printed on the Web-based configuration interface of the AC.

- Check if the LED works normally.

5 Monitoring and Maintenance

5.1 Monitoring

LED

You can observe the LED to monitor the AP in operation.

CLI Commands

You can run related commands on the command line interface (CLI) on the AC to remotely monitor the configurations and status of the AP.

> You can log in to the AP via Telnet and use monitoring related commands to maintain the AP.

5.1.1 Remote Maintenance

● If the AP operates as a Fat AP, you can log in to the AP remotely for maintenance.

● If the AP operates as a Fit AP, you can use AC to centrally manage and maintain the AP.

5.1.2 Hardware Maintenance

If the hardware is faulty, please contact our Technical Assistance Center (TAC) for help.

6 Troubleshooting

6.1 Troubleshooting Flowchart
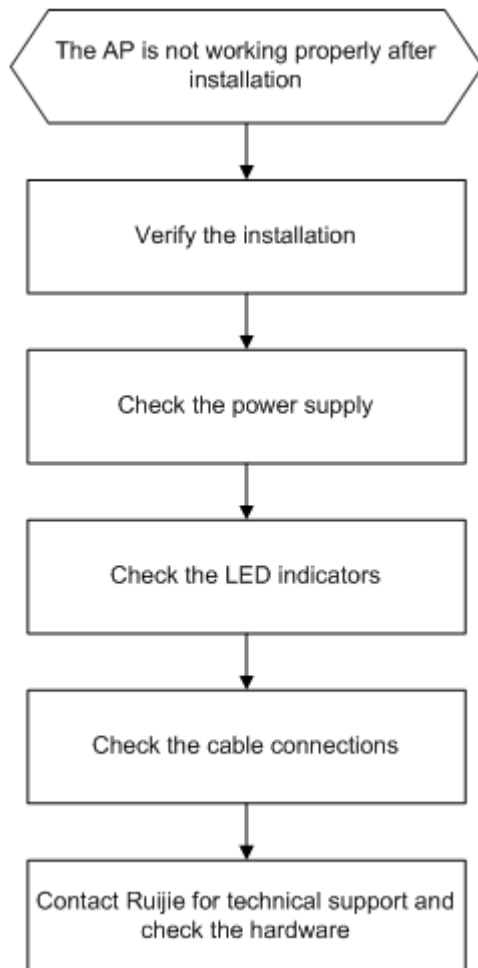
6.2 Troubleshooting

LED does not light up after the AP is powered on

- If you use PoE power supply, verify that the power source is IEEE 802.11af compliant, and then verify that the cable is connected properly.

- If you use a power adapter, verify that the power adapter is connected to an active power outlet, and then verify that the power adapter works properly.

Ethernet port is not working after the Ethernet port is connected

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

Wireless client cannot find the AP

Follow the above-mentioned two steps.

(1) Verify that the AP is configured correctly.

(2) Adjust the angle of antennas.

(3) Move the client device to adjust the distance between the client and the AP.

LED keeps blinking red

The LED stays blinking red for a long time, indicating the Ethernet port is not connected. Verify the Ethernet connection.

LED keeps blinking green

The AP performs initialization after power on. During this period, the LED keeps blinking green and does not turn solid until the initialization is completed. **Note**: If the blinking persists for an hour, it indicates the device initialization fails and the device is faulty.

LED keeps blinking orange (Fit AP mode)

Sometimes the AP performs firmware upgrade after power on. During this period, the LED keeps blinking orange and does not turn solid until the upgrade is completed. **Note**: Do not plug or unplug the power cord when the Status LED is blinking as firmware update takes time. If the blinking persists for ten minutes, it indicates the device fails to complete firmware upgrade and is faulty.

LED does not turn solid blue or blinking blue

After the system starts and the LED does not turn solid blue or blinking blue, probably because the AP has not established a proper CAPWAP connection with the AC. Verify the AC is operational and configured properly.

7 Appendix

7.1 Connectors and Media

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

Table 7-1   100BASE-TX/10BASE-T Pin Assignments

Pin	Socket	Plug
1	Input Receive Data+	Output Transmit Data+
2	Input Receive Data-	Output Transmit Data-
3	Output Transmit Data+	Input Receive Data+
6	Output Transmit Data-	Input Receive Data-
4,5,7,8	Not used	Not used

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

Figure 7-2   100BASE-TX/10BASE-T Connection

Straight-Through		Crossover	
Switch	Switch	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+	
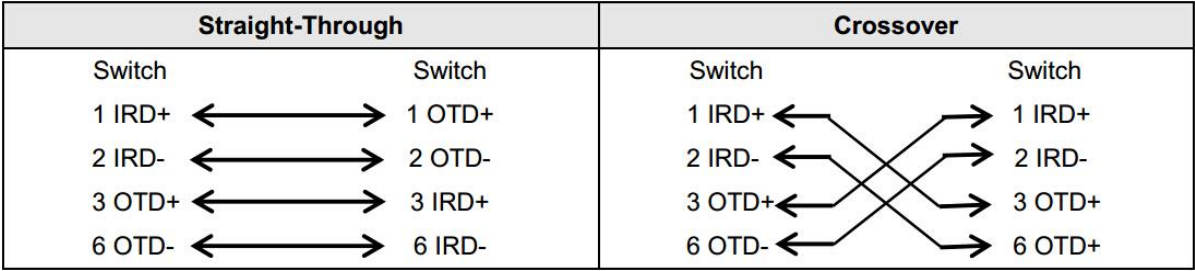
7.2 Cabling Recommendations

During installation, route cable bundles upward or downward along the sides of the rack depending on the actual situation in the equipment room. All cable connectors should be placed at the bottom of the cabinet rather than be exposed outside of the cabinet. Power cords should be routed upward or downward beside the cabinet close to the location of the DC power distribution cabinet, AC power outlet, or lightning protection box.

Required Minimum Cable Bend Radius

● The minimum bend radius of a power, communication or flat cable should be 5 times the overall diameter of the cable. If the cable is constantly bent, plugged or unplugged, the bend radius should be 7 times the overall diameter.

● The minimum bend radius of a coaxial cable should be 7 times the overall diameter of the cable. If the cable is constantly bent, plugged or unplugged, the bend radius should be 10 times the overall diameter.

● The minimum bend radius of a high-speed cable, such as an SFP+ cable should be 5 times the overall diameter of the cable. If the cable is constantly bent, plugged or unplugged, the bend radius should be 10 times the overall diameter.

Precautions for Cable Bundling

● Before bundling cables, correctly mark labels and stick the labels to cables where appropriate.

● Cables should be neatly and properly bundled, as shown in Figure 7-3.

Figure 7-3   Bundling Cables
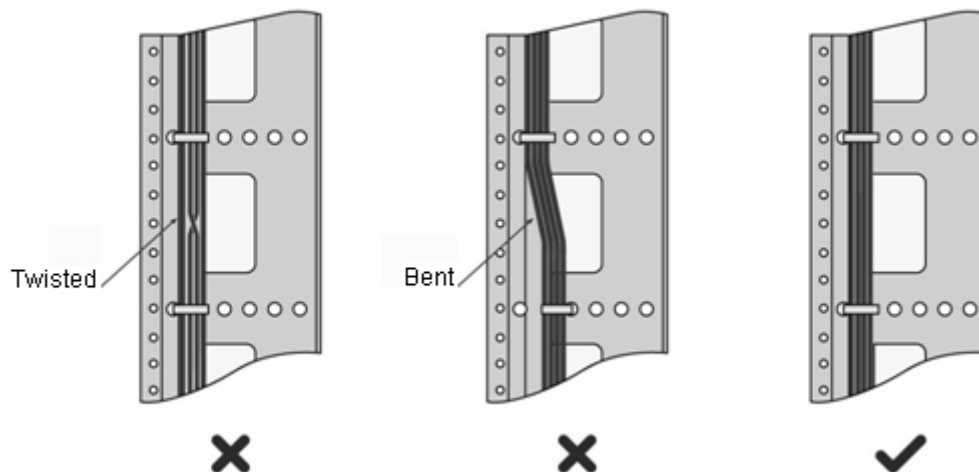
● Route and bundle power, signal, ground cables separately. When the cables are close to each other, cross them. When power cables run parallel to signal cables, the distance between them must be greater than 30 mm.

● All cable trays and their accessories shall be smooth and free from sharp edges.

● Holes in metal, through which cables pass shall have smooth, well-rounded surfaces or be protected with insulating bushings.

● Use proper cable ties to bind cables together. Do not tie two or more cable ties to bind cables.
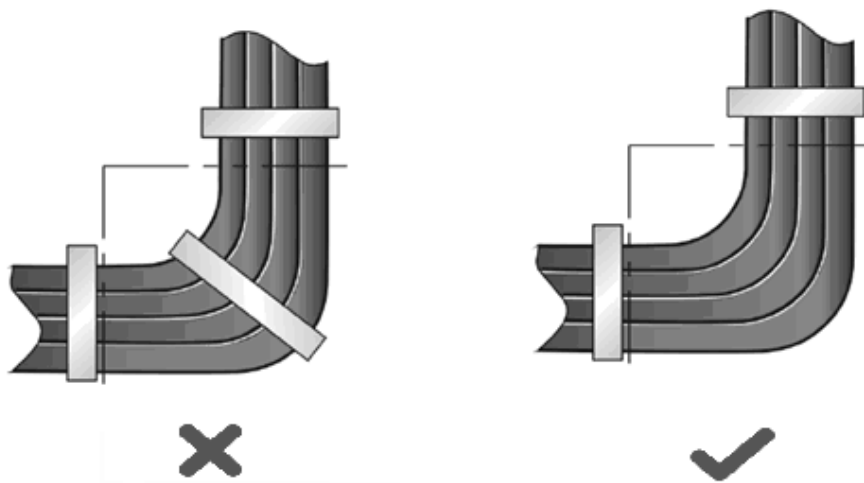
● Cut off excess cable tie cleanly with no sharp edges after bundling cables, as shown in Figure 7-4.

Figure 7-4   Cutting off Excess Cable Tie
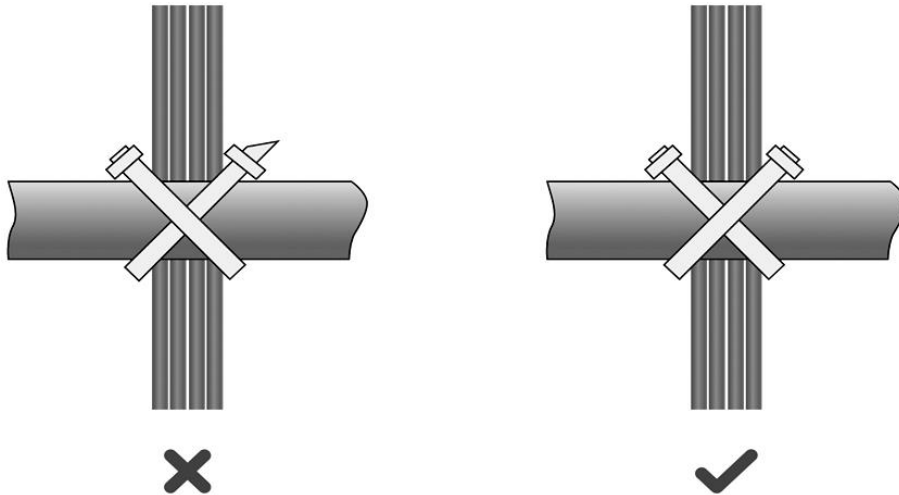
● If cables are to be bent, bind them first but do not tie cable ties within the bend to avoid stress on the cables, which may otherwise cause the wires inside to break, as shown in Figure 7-5.

Figure 7-5   Do Not Tie Cable Ties within the Bend

● Wrap up unnecessary or excess cables and bind them to the appropriate rack position, where device operation is not affected and no damages occur to the device and cables during debugging.

● Do not bind power cords to the rails for moving parts.

● Leave a certain length of the cable connecting moving parts, such as the ground wire of the cabinet door, to avoid stress on the cable; When moving parts are in place, ensure the excess cable length shall not contact heat sources, sharp corners or edges. If heat sources are unavoidable, use high-temperature cables instead.

● When using screws to fasten cable lugs, the bolts or nuts shall be tightened and prevented from loosening, as shown in Figure 7-6.

Figure 7-6   Fastening Cable Lugs
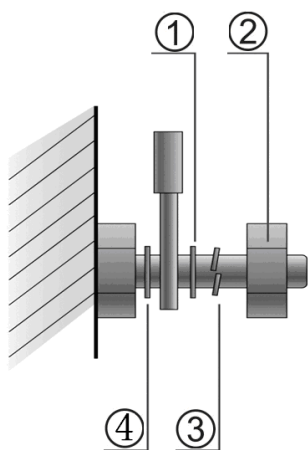
Note	1. Flat washer	3. Spring washer
	2. Nut	4. Flat washer

- When using a stiff cable, fix it near the cable lug to avoid stress on the lug and cable.

- Do not use self-tapping screws to fasten terminals.

- Bundle cables of the same type and running in the same direction into groups. Keep cables clean and straight.

- Cables shall be tied according to the following table.

Diameter of Cable Bundle (mm)	Space between Bundles (mm)
10	80 to 150
10 to 30	150 to 200
30	200 to 300

- Do not tie knots for cables or cable bundles.

- The metal parts of the cold-pressed terminal blocks, such as air circuit breakers, shall not be exposed outside of the blocks.