

Ruijie RG-AP840-I(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

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Conventions

1. Signs

The signs used in this document are described 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.

Caution

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

Note

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

Specification

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

2. **Note**

The manual offers information (including model, port type and command line interface) for indicative purpose only. In case of any discrepancy or inconsistency between the manual and the actual version, the actual version prevails.

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1 Product Overview

1.1 Overview

RG-AP840-I(V2) is an 802.11ax-compliant wireless access point product developed for indoor scenarios such as higher education, government, general education, finance, and business. It uses dual-radio technology, of which the 2.4 GHz frequency can provide up to 575 Mbps access rate and 5 GHz can provide up to 4.804 Gbps access rate. The whole machine can provide the maximum wireless access rate of 5.378 Gbps. The ultra-fast wireless access rate takes performance out of the equation.

The important factors such as wireless network security, RF control, mobile access, service quality assurance, and seamless roaming are fully considered in the design of RG-AP840-I(V2). It works with a wireless controller to guarantee data forwarding, security and access control of wireless users.

RG-AP840-I(V2) can be operated in 802.11ax, 802.11ac, and 802.11n modes concurrently. The product supports ceiling and wall-mounted installation modes, and can be safely and conveniently installed on ceiling and walls. RG-AP840-I(V2) supports local power feeding or power feeding over Ethernet (PoE). You can flexibly select appropriate power feeding methods according to the on-site power feeding environment. The product is especially suitable for large campus, enterprise offices, and operating hotspots.

1.2 Appearance

RG-AP840-I(V2) provides 2 radio frequency ports, 2 Ethernet copper ports (LAN1 supports PoE in compliance with IEEE 802.3af, 802.3at and 802.3bt, and LAN2/IoT port supports power feeding to IoT units (48 V/0.27 A, MAX: 12.95 W), 1 5G SFP, 1 RJ45 Console port, 1 DC power connector, 1 USB port, and 1 reset key. The appearance is as follows:

Caution

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with minimum distance 30cm between the radiator and your body.

ISED Compliance Statements

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 30cm between the radiator and your body.

the device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes :

- (1) L'appareil ne doit pas produire de brouillage;
- (2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet équipement est conforme aux limites d'exposition aux radiations IC CNR-102 établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance minimale de 30cm entre le radiateur et votre corps.

le dispositif utilisé dans la bande 5150-5250 MHz est réservé à une utilisation en intérieur afin de réduire le risque de brouillage préjudiciable aux systèmes mobiles par satellite dans le même canal.

Figure 1-1 Top view**Figure 1-2 Bottom view**

Figure 1-3 Front view



Table 1-1 Front view description

No.	Button and Port	Function Description
1	Indicator	Indicates the system working status.

Figure 1-4 Side view

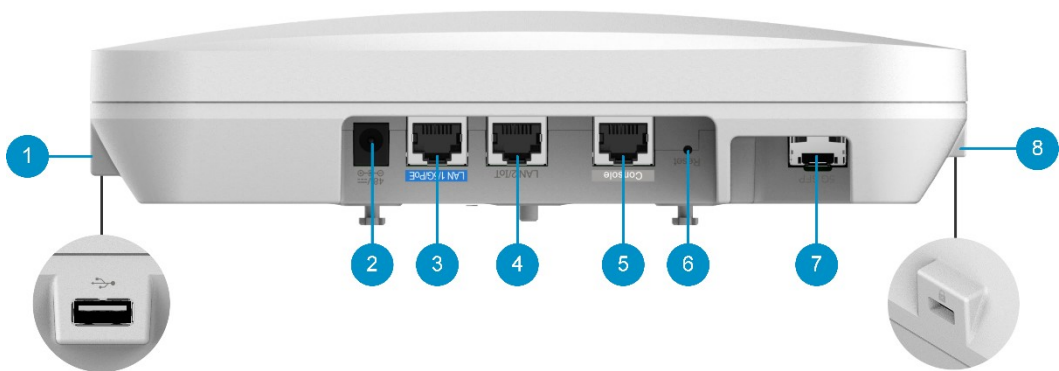


Table 1-2 Button and port description

No.	Button and Port	Function Description
1	USB port	Connected to USB flash drive.
2	DC power port	54 V DC power supply to source power to the AP.
3	LAN1/PoE copper port	Uplinked to service port for wired Ethernet connection and service data transmission, supporting PoE in compliance with IEEE 802.3af, 802.3at and 802.3bt.
4	LAN2/loT copper port	Downlinked to service port for wired Ethernet connection and service data transmission, providing power to IoT units (48 V/12.95 W).
5	Console port	Connected to serial port cable management device.
6	Reset key	Restarts the device or restores the factory settings.
7	5G SFP	Uplinked to service port for service data transmission.
8	Security lock hole	Connected to security lock.

Note

The nameplate is at the bottom of the access point.

1.3 Package Contents

Table 1-3 Package contents

Name	Quantity
Master AP	1
Mounting plate	1
Wall anchor	4
Phillips pan head tapping screw 4.2*20	4
Hardware Installation and Reference Guide	1

1.4 Product Technical Specifications

1.4.1 Dimensions and Weight

Table 1-4 Dimensions and weight description

Parameter Name	Value
Product dimensions (W x D x H)	230 mm x 230 mm x 51 mm (9.06 in. x 9.06 in. x 2.01 in.)
Weight	Master AP: 1.0 kg (2.20 lbs) Mounting plate: 0.1 kg (0.22 lbs)
Mounting mode	Ceiling and wall-mounted
Security lock	Dormant lock, hanging lock
Mounting plate dimensions (W x D x H)	120 mm x 120 mm x 8 mm (4.72 in. x 4.72 in. x 0.31 in.)
Mounting plate hole interval	53 mm x 53 mm (2.09 in. x 2.09 in.). For the diagram of mounting plate, see 3.2 Installation Preparation .
Mounting plate hole diameter	6.5 mm (0.26 in.)

1.4.2 RF Specifications

Table 1-5 RF specifications description

Parameter Name	Value
RF design	Dual-radio. A whole machine supports 6 spatial streams. Radio1: 2.4 GHz, 2 streams: 2x2, MU-MIMO Radio2: 5 GHz, 4 streams: 4x4, MU-MIMO
Working frequency band	802.11b/g/n/ax: 2.400 GHz to 2.4835 GHz 802.11a/n/ac/ax: 5.150 GHz to 5.350 GHz, 5.500 GHz to 5.700 GHz, 5.725 GHz to 5.850 GHz Note: The working frequency band varies according to the configuration of different countries.

Parameter Name	Value
Transmit power	2.4 GHz ● Max. transmit power: 27 dBm (500 mW) ● Minimum transmit power: 7 dBm (5.01 mW) 5 GHz ● Max. transmit power: 30 dBm (1000 mW) ● Minimum transmit power: 9 dBm (7.94 mW) Note: ● Adjusting the transmit power by percentage (recommended) and in 1dBm increments. ● The transmit power is limited by local regulatory requirements.
Antenna	Wi-Fi ● 2.4 GHz: two built-in omnidirectional antennas, the max. antenna gain is 5.9 dBi. ● 5 GHz: four built-in omnidirectional antennas, the max. antenna gain is 6.25 dBi. Bluetooth ● One integrated vertically polarized omnidirectional antenna, the max. antenna gain is 4.6 dBi.
Maximum transmit power	20 dBm Note: The actual transmit power varies according to country and region regulations.
Power adjustment step	1 dBm
Modulation type	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

Parameter Name	Value
Receiving sensitivity	11b: -96 dBm (1 Mbps), -93 dBm (5 Mbps), and -89 dBm (11 Mbps) 11a/g: -91 dBm (6 Mbps), -85 dBm (24 Mbps), -80 dBm (36 Mbps), and -74 dBm (54 Mbps) 11n: -90 dBm@MCS0, -70 dBm@MCS7, -89 dBm @MCS8, and -68 dBm@MCS15 11ac: HT20: -88 dBm (MCS0) and -63 dBm (MCS9) 11ac: HT40: -85 dBm (MCS0) and -60 dBm (MCS9) 11ac: HT80: -82 dBm (MCS0) and -57 dBm (MCS9) 11ax: HE80: -82 dBm (MCS0), -57 dBm (MCS9), and -52 dBm (MCS11) 11ax: HE160: -79 dBm (MCS0), -53 dBm (MCS9), and -50 dBm (MCS11)

1.4.3 Port Specifications

Table 1-6 Port specifications description

Parameter Name	Value
Bluetooth	Bluetooth 5.1
USB	USB3.0
Fixed service ports	Uplink: One 100/1000/2500/5000Base-T adaptive Ethernet port, supporting IEEE 802.3af/802.3at/802.3bt-compliant PoE One 5G SFP port ,conformity to 1 GHz and 2.5 GHz SFP ports, a combo port Downlink: One 10/100/1000Base-T adaptive Ethernet port, providing power to IoT units (48 V/12.95 W)
Fixed management port	One RJ45 Console port
LED	One system LED
Key	One reset key

1.4.4 Power and Power Consumption

Parameter Name	Value
----------------	-------

Powered type	(1) 54 V DC/1.1 A power supply (2) PoE/PoE+/PoE++ (comply with 802.3af/at/bt Ethernet powering standards) The 802.3bt standard is recommended, in which the device can provide the best performance.
Powering external devices	Supported. Expand IoT units through the Ethernet ports.
Maximum power consumption of the whole machine	40 W

Caution

- The power adapter is an optional device. If you need to use a DC power adapter, purchase a matching power adapter that meets the requirements of the corresponding safety standards.
- When the device provides PoE powering, it is necessary to ensure that the other end of the Ethernet has 802.3af-compliant power feeding capability.
- This product uses a fanless design. When placing the AP, ensure that there is enough space around to facilitate air circulation.
- By default, the AP works in the 802.3at power feeding mode. To enable bt-related functions, run commands.
- If 802.3af is used for power feeding, when the AP starts, the 2.4 GHz and 5 GHz frequencies can only work in 1-stream mode, and the LAN2 port and USB port cannot supply power to external devices.
- If 802.3at is used for power feeding, when the AP starts, the LAN2 port and USB port cannot supply power to external devices.

1.4.5 Environment and Reliability

Table 1-7 Standards Compliance

Parameter Name	Value
Temperature	Working temperature: -10°C to +50°C Storage temperature: -40°C to +70°C Note: Within the altitude of 3000-5000 m, for every 166 m (546 ft.) increase in altitude, the maximum temperature specification

	decreases by 1°C.
Humidity	Working humidity: 5%RH to 95%RH (non-condensing) Storage humidity: 5%RH to 95%RH (non-condensing)
Regulatory compliance	EN 55032, EN 55035, EN 61000-3-3, EN IEC 61000-3-2, EN 301 489-1, EN 301 489-3, EN 301 489-17, EN 300 328, EN 301 893, EN 300 440, FCC Part 15, EN IEC 62311, IEC 62368-1, and EN 62368-1

1.5 Indicator and Button Description

Note

In the description of the indicator status, unless otherwise specified, the indicator status description applies to both Fit AP and Fat AP.

Table 1-8 System indicator status description

Indicator Color	Blinking Frequency	Description
Off	None	The AP is not powered on, or has been powered on but the indicator is turned off by software.
Steady green	None	The AP is performing software system initialization.
Steady red	None	The system is running normally, but the uplink service port of the AP is Link Down.
Slow blink in red	On for 3s Off for 1s	In Fit AP mode, the establishment of a CAPWAP tunnel between the AP and the AC times out.
Fast blink in blue	On for 0.2s Off for 0.2s	In Fit AP or MACC AP mode, the AP is updating software system.
Steady blue	None	The software system is running normally, and the AP is working normally but no wireless users are online.

Indicator Color	Blinking Frequency	Description
Blinking blue	On for 1s Off for 1s	The software system is running normally. The AP is working normally and wireless users are online.
Fast blink in red	On for 0.2s Off for 0.2s	In Fit AP mode, the AP enables the indicator positioning function to find a specific AP.

Table 1-9 Reset key description

Button Type	Action	Result
Reset key	Press and hold for less than 2s	The device restarts.
	Press and hold for more than 3s	Restore the factory settings.

1.6 SFP Module Description

The peer device that is directly connected to the 5G SFP port of the AP supports fiber ports and copper ports. However, the negotiated rates are different when the devices at both ends use different port rates or use different SFP modules. For details, see [Table 1-10](#) and [Table 1-11](#).

Table 1-10 Rate negotiation result when the peer is fiber port (unit: bps)

AP SFP Port Rate	SFP Module Rate	Negotiation Rate Supported by Peer Port		
		1G	1G/10G/auto	1G/2.5G/5G/10G/auto
1G	3G	1G	1G	1G
1G	1G	1G	1G	1G

AP SFP Port Rate	SFP Module Rate	Negotiation Rate Supported by Peer Port		
		1G	1G/10G/auto	1G/2.5G/5G/10G/auto
2.5G	3G	Not supported	Not supported	2.5G
2.5G	1G	1G	1G	1G
5G	6G	Not supported	Not supported	5G
5G	1G	1G	1G	1G

Table 1-11 Rate negotiation result when the peer is copper port (unit: bps)

AP SFP Port Rate	O/E Converter Rate	Negotiation Rate Supported by Peer Port		
		1G	1G/10G/auto	1G/2.5G/5G/10G/auto
1G	2.5G	Not supported	Not supported	Not supported
1G	1G	1G	1G	1G
2.5G	2.5G	Not supported	Not supported	2.5G
2.5G	1G	Not supported	Not supported	Not supported
5G	5G	Not supported	Not supported	5G
5G	1G	Not supported	Not supported	Not supported

Caution

1. The 2.5G SFP port of the AP does not support rate negotiation. When the O/E converter is used, ensure that the rates of AP, O/E converter, and peer port are the same.
2. The device supports the combo ports. If both the uplink fiber port and the uplink copper port are connected to cables, the AP will preferentially select the fiber port as the data transmission port (automatically disables the copper port). When the cable is removed from uplink fiber port, the copper port is automatically enabled.

2 Installation Preparation

2.1 Safety Recommendations

Note

- To avoid injury to human body and equipment, read the safety recommendations in this manual carefully before installation.
 - The following safety recommendations may not cover all possible hazardous situations.
-

2.1.1 Universal Safety Recommendations

- High temperature, dust, harmful gas, flammable and explosive factors, electromagnetic interference (large radar stations, transmitting stations, or substations) and the environment with unstable voltage, large vibration or strong noise may affect the operating of AP. Do not install the device in such environment.
- It is strictly forbidden to install the device in places prone to water accumulation, seepage, dripping, or condensation. When performing engineering design, comprehensively consider the factors such as climate, hydrology, geology, earthquake, electricity, transportation, and select the address that meets the requirements of communication device engineering environment design according to the communication network planning and technical requirements.
- The installation site should be dry, and it is not recommended to install the device in a place very close to the sea. The distance between the device and the sea should be greater than 500 meters, and it is not recommended to place the device on the windward side of the sea.
- Do not place the device in walking areas.
- During installation and maintenance, do not wear loose clothing, jewelry, or other items that may be hooked by the chassis.
- Keep tools and device away from walking areas.

2.1.2 Moving Safety

- Do not move the device frequently.
- Turn off all power sources and unplug all power sources and cables before moving or handling the device.

2.1.3 Electrical Safety

⚠ Warning

- Irregular and improper electrical operations may cause accidents such as fire or electric shock, and cause serious or fatal injury to human body and device.
 - Do not directly contact high voltage and mains or contact them through wet objects; otherwise, it may bring fatal danger.
-
- When performing electrical operations, comply with local regulations and rules. The relevant staff must have the corresponding qualifications.
 - Check carefully whether there are potential dangers in the work area, such as whether the ground is wet.
 - Before installation, you need to know the location of the emergency power switch in the room. When an accident occurs, the power switch must be turned off.
 - Check carefully before turning off the power.
 - Do not place the device in moist places and prevent liquid from entering the device.
 - It is not recommended to use the AP working ground together with the ground device of electrical equipment or lightning protection ground device, and separate them as far as possible.
 - Keep the device far away from wireless transmitters, radar transmitters, high-frequency high-current devices, microwave ovens and other high-power wireless devices.

2.1.4 Storage Safety

To ensure the normal operating of the device, see the storage temperature/humidity requirements in the specifications for the storage environment of the device.

⚠ Caution

If the storage time exceeds 18 months, the device needs to be powered on and run for 24 hours without interruption for device activation.

2.2 Installation Environment Requirements

The device must be used indoors to ensure normal operating and prolong its service life.

The installation site should meet the following requirements.

2.2.1 Load-bearing Requirements

Evaluate the floor load-bearing requirements according to the actual weight of the installed device and its accessories (such as mounting plate and power supplies), and ensure that the load-bearing capacity of the installation site meets the requirements.

2.2.2 Ventilation Requirements

Reserve the position for vent to ensure heat dissipation. After connecting all cables, arrange them into bundles or place them on the cable distribution frame to avoid blocking the air inlet.

2.2.3 Space Requirements

To facilitate heat dissipation and maintenance of the device, do not install the device against the wall. Leave a certain space (not less than 0.4 m) for the left and right panels to facilitate heat dissipation.

2.2.4 Temperature and Humidity Requirements

To ensure the normal operating of the device and prolong its service life, maintain certain temperature and humidity in the equipment room.

If the equipment room is in the environment that does not meet the temperature/humidity requirements for a long time, the device may be damaged.

- When the relative humidity is too high, it is easy to cause poor insulation of insulating materials and even mechanical properties such as leakage.
- When the relative humidity is too low, the insulating washer may dry out and cause loosening of the fastening screws.
- In dry environment, it is easy to generate static electricity and harm the internal circuit of the device.
- In the high-temperature environment, the aging process of insulating materials will be accelerated, the reliability of the device will be greatly reduced, and its service life will be seriously affected.

Note

The temperature and humidity of the working environment of the device are measured at 1.5 m above the floor and 0.4 m in front of the device rack when there is no protective plate before and after the rack.

2.2.5 Cleanliness Requirements

Dust is a major hazard to device operating. Indoor dust falling on the device body will cause electrostatic adsorption and poor contact of metal contacts. Especially when the indoor relative humidity is low, it is more likely to cause electrostatic adsorption, which will not only affect the

service life of the device, but also cause communication failures. The dust content and granule size requirements in the equipment room are as follows:

Table 1-12 Dust requirements

Dust	Unit	Content
Dust granule (diameter $\leq 0.5 \mu\text{m}$)	Number of granules/ m^3	$\leq 1.4 \times 10^7$
Dust granule ($0.5 \mu\text{m} < \text{diameter} \leq 1 \mu\text{m}$)	Number of granules/ m^3	$\leq 7 \times 10^5$
Dust granule ($1 \mu\text{m} < \text{diameter} \leq 3 \mu\text{m}$)	Number of granules/ m^3	$\leq 2.4 \times 10^5$
Dust granule ($3 \mu\text{m} < \text{diameter} \leq 5 \mu\text{m}$)	Number of granules/ m^3	$\leq 1.3 \times 10^5$

In addition to dust, the equipment room must strictly meet the requirements on the salt, acid and sulfide contained in the air. These harmful substances can accelerate metal corrosion and component aging. The equipment room should prevent the intrusion of harmful gases (such as sulfur dioxide, hydrogen sulfide, nitrogen dioxide, and chlorine), and the specific limits are as follows:

Table 1-13 Gas requirements

Gas	Average (mg/m^3)	Maximum (mg/m^3)
Sulfur dioxide	0.2	1.5
Hydrogen sulfide	0.006	0.03
Nitrogen dioxide	0.04	0.15
Ammonia gas	0.05	0.15
Chlorine	0.01	0.3

Note

The average is the average value within a week. The maximum value is the upper limit within a week, which does not exceed 30 minutes per day.

2.2.6 Anti-interference Requirements

- Take effective measures to prevent grid interference to the power feeding system.
- It is not recommended to use the device working ground together with the ground device of electrical equipment or lightning protection ground device, and separate them as far as possible.
- Keep away from high-frequency current devices such as high-power radio transmitters and radar transmitters.
- Take electromagnetic shielding measures if necessary.

2.2.7 Lightning Protection Requirements

Lightning protection has been designed on the device, but as an electrical device, excessive lightning strike may still cause damage. The following lightning protection measures need to be taken:

- Ensure that the neutral point of the AC power socket is in good contact with the ground.
- To enhance the lightning protection effect of the power supply, consider adding a power lightning arrester to the input end of the power supply.

2.2.8 Checking the Installation Conditions

The following conditions must be met no matter whether the device is installed on the wall or ceiling:

- Ensure that there is space reserved at the air inlets and vents of the device to facilitate the heat dissipation of the device chassis.
- Ensure that the installation site has good ventilation and heat dissipation systems.
- Ensure that the installation position is strong enough to support the device and its mounting accessories.

2.3 Installation Tools

Table 1-14 Tool list

Common tools	Phillips screwdriver, related cables, network cables, mounting bolts, diagonal pliers, and strapping straps
Dedicated tools	Anti-static gloves, wire strippers, crimping pliers, crystal head crimping pliers, and wire cutters
Meters	Multimeter, bit error tester
Related devices	PC, display, keyboard

** Note**

RG-AP840-I(V2) does not come with a tool kit, so the tools on the tool list need to be prepared by users.

3 Installation

RG-AP840-I(V2) must be used indoors and must be fixed.

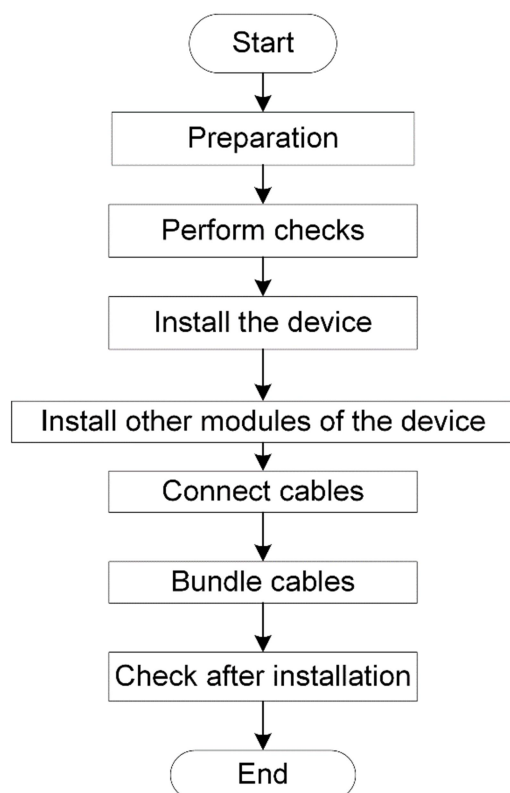
⚠ Caution

Ensure that you have carefully read the contents of Chapter 2, and the requirements described in Chapter 2 have been met.

3.1 Installation Process

The installation process is as shown in the following figure.

Figure 1-5 Installation Flowchart



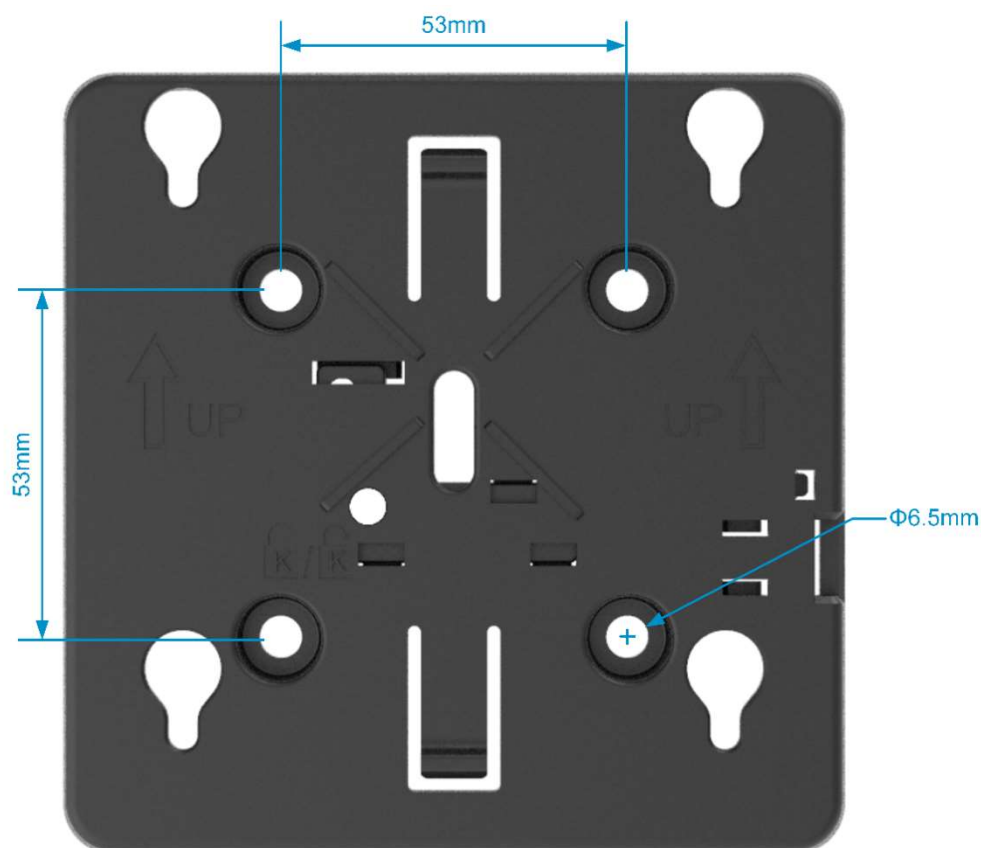
3.2 Installation Preparation

Before the device is installed, carefully plan and arrange the installation position, networking method, power feeding and wiring.

Before the installation, ensure that:

- The installation site can provide enough space to meet the heat dissipation requirements.
- The installation site meets the temperature and humidity requirements of the device.

- The power supply is ready at the installation site and meets the current requirements.
- The relevant network cables have been arranged at the installation site.
- The selected power supply can meet the system power requirements.
- The location of the emergency power switch in the room is confirmed. When an accident occurs, turn off the power switch immediately.
- For wireless products that support ceiling-mounted or wall-mounted installation, the size of the mounting plate and the spacing between the holes of the mounting plate must meet the parameter value requirements in [Table 1-4 Dimensions and weight description](#). An example of the spacing between the holes of the mounting plate is as follows:



3.3 Precautions

To ensure the normal operating of the wireless AP and prolong its service life, observe the following rules:

- Do not power on the device before you finish the installation.
- Place the device in a ventilated place.
- Do not place the device in high temperature environment.
- Keep the device far away from high-voltage cables.

- Install the device indoors.
- Keep the device far away from strong thunderstorms and strong electric fields.
- Keep the device clean and protect it against dust.
- Disconnect the power of device before cleaning it.
- Do not wipe the device with a wet cloth.
- Do not clean the device with liquids.
- Do not open the shell while the device is working.
- Fix the device firmly.

3.4 Installing the Master AP

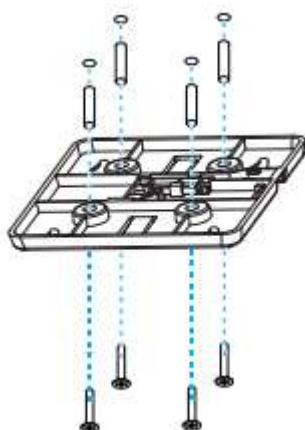
Note

- An area with large antenna radiation coverage is preferred to install the master AP.
 - In the indoor environment, the radiation coverage area of the ceiling-mounted antenna is larger than that of the wall-mounted antenna. Therefore, the ceiling-mounted mode is preferred.
-

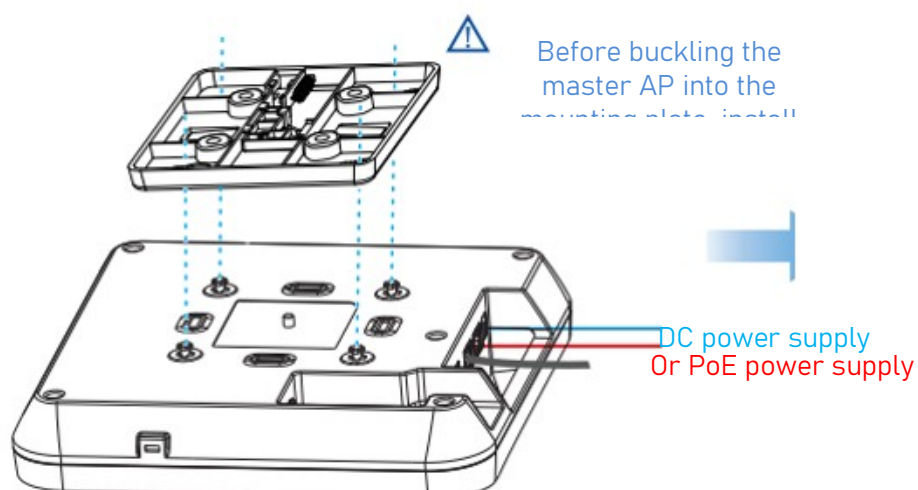
3.4.1 Ceiling-Mounted

- (2) Drill 4 mounting holes with a diameter of 6.5 mm on the ceiling, and the center distance of the mounting holes is 53 mm. After tapping the anchors into the mounting holes, screw the mounting plate in and fix it.

Figure 1-6 Ceiling-mounted mounting plate

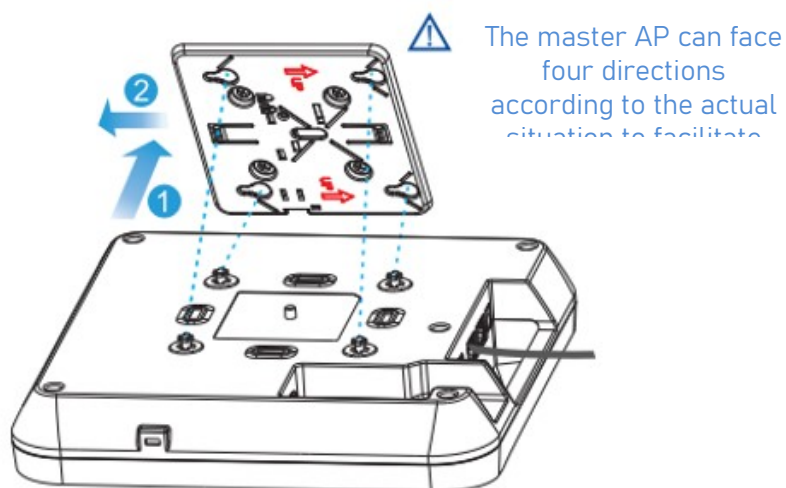


- (3) Align the buckle on the back of the master AP with the hole on the mounting plate.

Figure 1-7 Aligning the AP with the mounting plate**⚠ Caution**

Before buckling the master AP into the mounting plate, install the network cable first.

- (4) Push the master AP into the buckle in the opposite direction of the arrow on the mounting plate to fasten it.

Figure 1-8 Buckling AP into mounting plate**⚠ Caution**

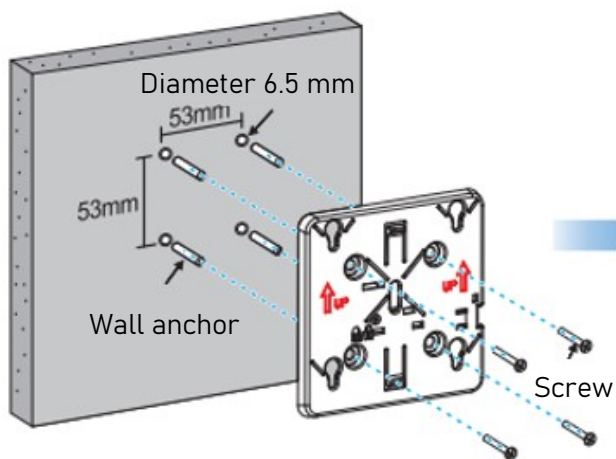
- The mounting plate of this master AP supports four installation directions. When installing the master AP in the mounting plate, you can choose one of the directions to install the master AP according to the network cable wiring.

- During installation, slide and fasten the master AP along the direction of the installation guide holes on the mounting plate. Do not forcibly push the master AP into the buckle of the mounting plate.
 - After installation, carefully check whether the master AP is fastened, so as to prevent the master AP from falling.
-

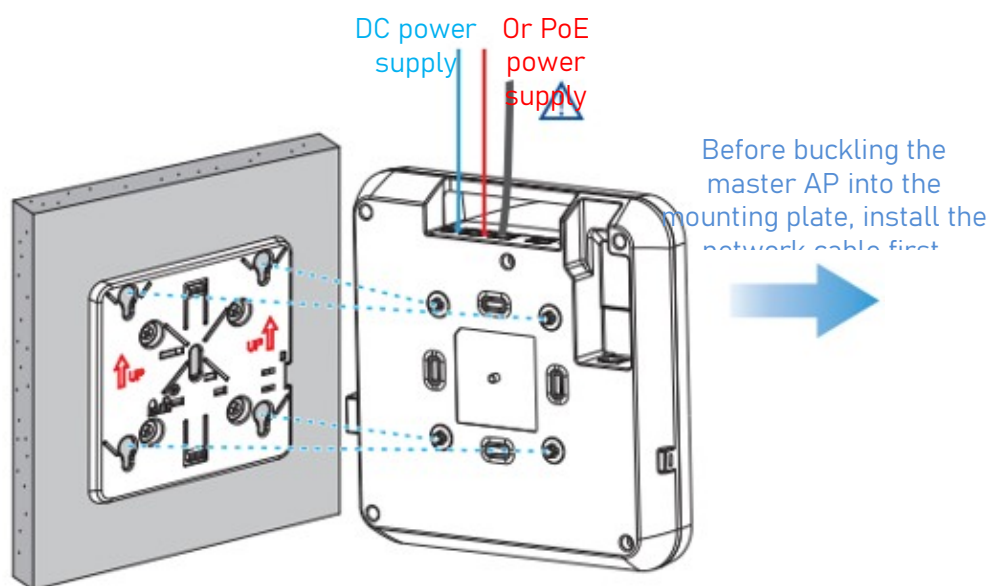
3.4.2 Wall-Mounted

- (5) Drill 4 mounting holes with a diameter of 6.5 mm on the wall, and the center distance of the mounting holes is 53 mm. The arrow direction on the mounting plate is upwards. After tapping the anchors into the mounting holes, screw the mounting plate in and fix it.

Figure 1-9 Wall-Mounted mounting plate

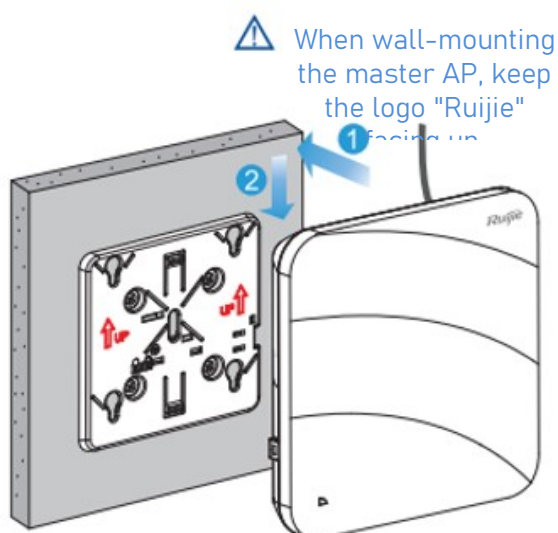


- (6) Align the buckle on the back of the master AP with the hole on the mounting plate.

Figure 1-10 Aligning the AP with the mounting plate**⚠ Caution**

Before buckling the master AP into the mounting plate, install the network cable first.

- (7) In the opposite direction of the arrow on the mounting plate, push the master AP buckle into the buckle hole from top to bottom to fasten it.

Figure 1-11 Buckling AP into mounting plate

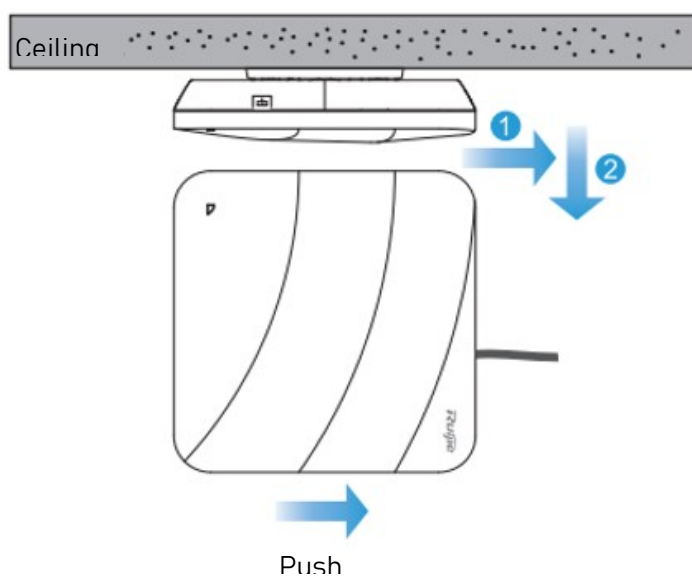
⚠ Caution

- When wall-mounting the master AP, keep the product logo on the master AP panel facing upwards.
- During installation, slide and fasten the master AP along the direction of the installation guide holes on the mounting plate. Do not forcibly push the master AP into the buckle of the mounting plate.
- After installation, carefully check whether the master AP is fastened, so as to prevent the master AP from falling.

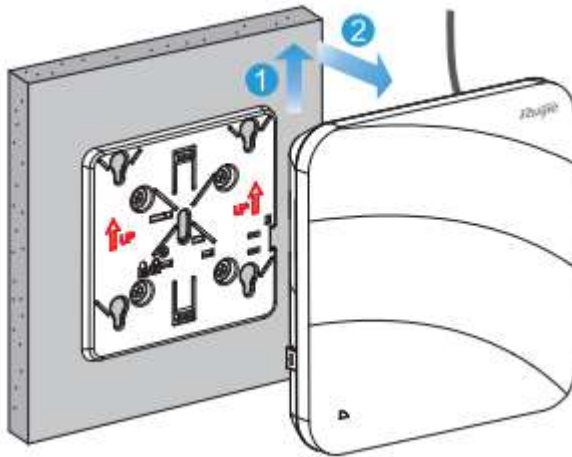
3.4.3 Disassembling Device

- (8) In the ceiling-mounted mode, you need to hold the two sides of the master AP with your hands and push it out along the direction of the network port.

Figure 1-12 Removing the AP



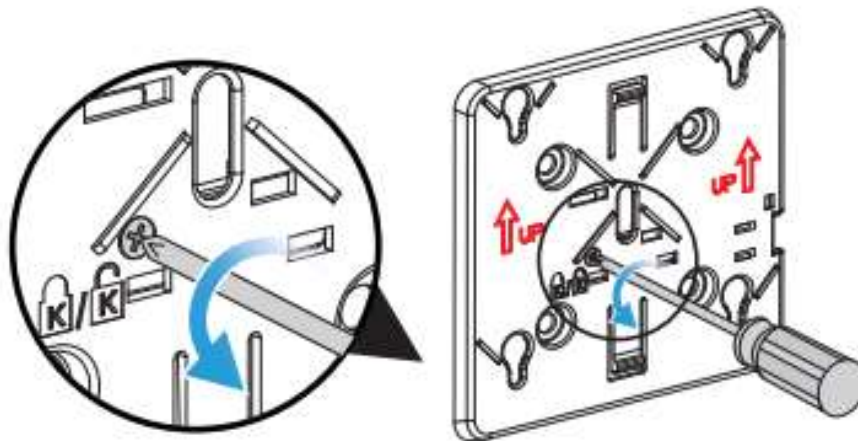
- (9) In the wall-mounted mode, you need to hold the two sides of the master AP with your hands and push it out along the direction of the network port.

Figure 1-13 Removing the AP

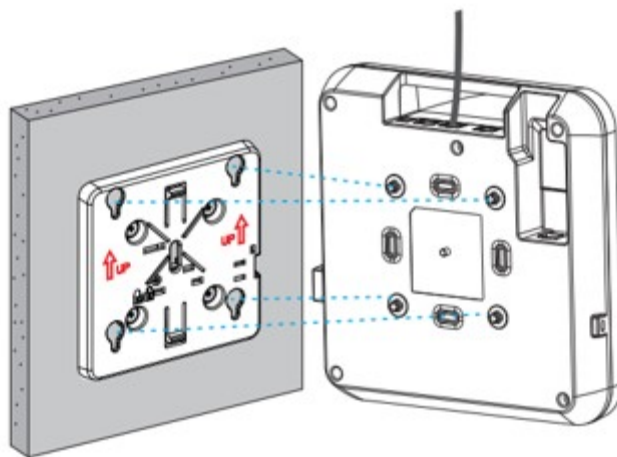
3.5 Installing Other Modules

3.5.1 Installing Security Lock

(10) Unscrew the screw on the mounting plate to open the security lock.

Figure 1-14 Opening dormant lock

(11) Align the buckle on the back of the master AP with the hole on the mounting plate. Fasten the master AP in the opposite direction of the arrow on the mounting plate.

Figure 1-15 Buckling AP into mounting plate

⚠ Before buckling the master AP into the mounting plate, install

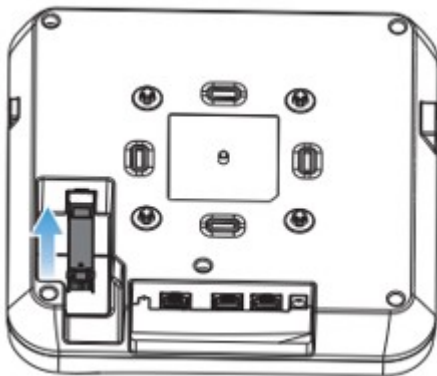
Align the buckle on the back of the master AP with the hole on the

⚠ Caution

- Before buckling the master AP into the mounting plate, install the network cable first.
 - You can decide whether to install a security lock according to your needs.
-

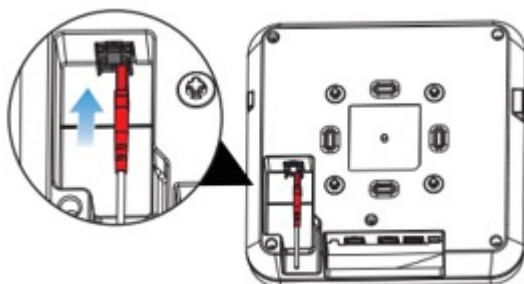
3.5.2 Installing SFP Module

(12) Insert the SFP module.



Insert the SFP module.

(13) Insert the fiber.



3.6 Connecting Cables

Connect a twisted pair to the LAN/PoE port of the AP. For the twisted pair line sequence supported by the AP, see [7.1 Connector and Connection Media Description](#).

Caution

The default baud rate of the master AP's console port is 9600, the data bits are 8, the parity check is none, the stop bit is 1, and the flow control is none. The parameters need to be set only when the AP needs to be manually configured.

3.7 Bundling Cables

3.7.1 Precautions

- The bundles of power cords and cables should be tidy and neat.
- When bundling twisted pairs, the twisted pairs at the plug should be in natural bending or large curvature.
- When bundling twisted pairs, do not tie them too tightly, avoiding too much stress on cables to affect the service life and transmission performance of the cables.

3.7.2 Simplified Steps of Cable Bundling

- 1) Bundle the drooping part of the twisted pairs and route them to the master AP's LAN/PoE port as convenient.
- 2) Secure the twisted pairs inside the cable management bracket of the mounting plate.
- 3) When twisted pairs are bundled, the bundle should extend close to the bottom of the master AP and should be as straight as possible.

3.8 Check After Installation

3.8.1 Master AP Check

- Check that the type of external power feeding matches the master AP.
- Check that the master AP is fully seated and will not move or fall.

3.8.2 Cable Connection Check

- Check that the twisted pairs match the ports.
- Check that the cables are bundled correctly.

3.8.3 Power Check

- Check that the power cord is in good contact and meets safety requirements.
- Turn on the power to supply power to the master AP, and check that the AP can work normally.

4 Commissioning

4.1 Setting Up Configuration Environment

Power on the AP by using DC power supply or PoE.

Keys to set up the environment:

- When the AP is powered by using DC power supply or PoE, ensure that the power supply is in good contact and meets safety requirements.
- Connect the AP connected to power supply to the AC through twisted pairs.
- When you commission the AP through a PC connected to the serial port, note that both the PC and the PoE switch must be well grounded.

4.2 Power-on

4.2.1 Check Before Power-on

- Check whether the power cord is correctly connected.
- Check whether the power feeding voltage meets the device requirements.

4.2.2 Check After Power-on

After the AP is powered on, it is recommended to perform the following checks to ensure that the subsequent configuration can be successful:

- After power-on, check whether there is printed information on the configuration interface of the device.
- Check whether the indicators of the device are normal.

5 Monitoring and Maintenance

5.1 Monitoring

5.1.1 Indicator

When the device is running, monitor the device status by observing the indicators.

5.1.2 CLI

The device can monitor various states of the system by running related commands of the CLI, including:

- Configuration information and status of ports
- Monitoring information in system log

 Note

- For monitoring commands, see Configuration Guide.
 - The device supports remote maintenance.
-

5.2 Remote Maintenance

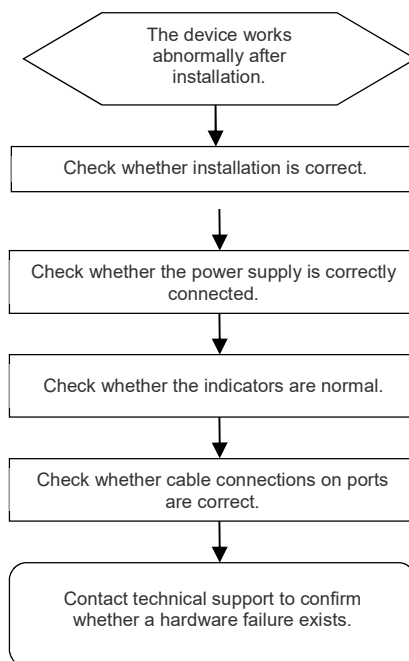
- When the AP works in the fat AP mode, log in directly to the AP for remote maintenance.
- When the AP works in the fit AP mode, manage the AP through AC for unified remote management and maintenance.

5.3 Hardware Maintenance

When a hardware failure occurs, contact the technical support of the customer service department, and the technicians will handle it.

6 Troubleshooting

6.1 Universal Troubleshooting Process



6.2 Typical Troubleshooting Cases

6.2.1 Ethernet Port Does Not Work After Being Connected to an Ethernet Cable

Check whether the device on the other end of the Ethernet is working normally, and then check whether the Ethernet cable matches the current working speed. In addition, check whether the cable is connected normally.

6.2.2 Indicator Is Off for a Long Time

- PoE power feeding: Check whether the other end of the PoE cable supports 802.11af or higher PoE standards, and then check whether the Ethernet cable is properly connected.
- Power adapter: Detect whether the adapter has received mains electricity, and then check whether the adapter works normally.

6.2.3 Indicator Remains Red for a Long Time

If the indicator stays red for a long time, it means that the Ethernet port cannot be connected. Check the connection on the Ethernet port.

6.2.4 Indicator Remains Green for a Long Time

The device needs to be initialized when it is powered on. During the initialization, the indicator is in steady green. When the initialization is finished, the indicator turns blue. Note: If the indicator is still green after 1 hour, the device initialization fails, and you can determine that the device is faulty.

6.2.5 Indicator Fast Blinks in Blue (Fit AP)

The software may be upgraded after the device is powered on. The indicator fast blinks in blue during software upgrade. When the software upgrade is finished, the indicator is steady blue.

Note: The software upgrade time is uncertain, so do not turn off the device when the indicator is blinking. If the indicator still blinks after 10 minutes, the software upgrade fails, and you can determine that the device is faulty.

6.2.6 Indicator Is Not Steady Blue or Does Not Blink in Blue

After the system is started, if the indicator is not steady blue or does not blink in blue, the AP and the AC may not establish CAPWAP communication. Ensure that the AC has been started and the network configuration is correct.

6.2.7 Users Cannot Find Wireless Signals

- (14) Check whether the power feeding to the device is normal.
- (15) Check whether the link on Ethernet port is normal.
- (16) Check whether the AP is correctly configured.
- (17) Move the users' terminals to adjust the distance between terminals and AP.

7 Appendix

7.1 Connector and Connection Media Description

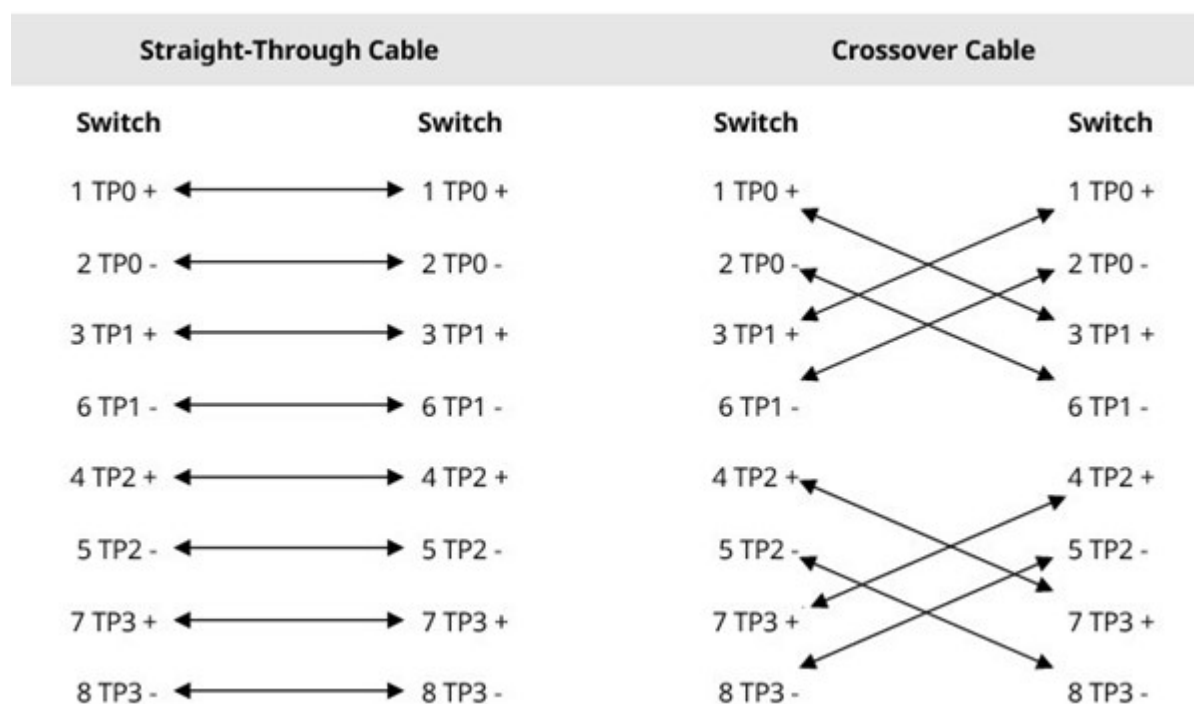
- 1000BASE-T/100BASE-TX/10BASE-T port

The 1000BASE-T/100BASE-TX/10BASE-T port is adaptive to three rates, and supports automatic MDI/MDIX Crossover functions at the three rates.

1000BASE-T complies with the IEEE 802.3ab standard, the connected cable is 100-ohm CAT5 or CAT 5e unshielded twisted pair UTP or shielded twisted pair STP. The maximum distance supported is 100 meters.

The 1000BASE-T port uses 4 pairs of wires for data transmission, and all 4 pairs of wires need to be connected. The connection of the twisted pair used by the 1000BASE-T port is shown in the following figure:

Figure 1-16 1000BASE-T 4 twisted pairs



In addition to the above cables, the 100BASE-TX/10BASE-T port can use 100-ohm CAT3/4/5 cables for 10 Mbps transmission and 100-ohm CAT5 cables for 100 Mbps transmission. All of them can support a maximum of 100 m distance. The following are the definitions of the pinouts of 100BASE-TX/10BASE-T:

Figure 1-17 Pinouts of 100BASE-TX/10BASE-T

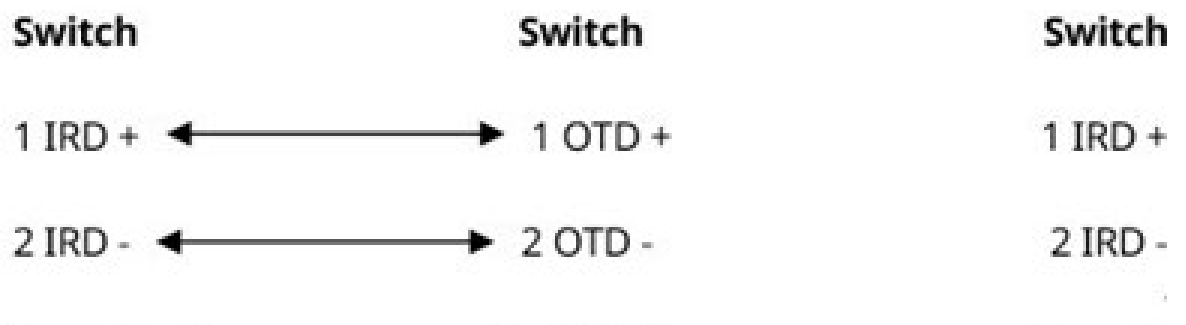
Pin	Socket	Connector
1	Input Receive Data+	Output Transmit Data+

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 are the possible connection methods of straight-through and cross twisted pairs for 100BASE-TX/10BASE-T:

Figure 1-18 Connections for 100BASE-TX/10BASE-T

Straight-Through Cable



7.2 SFP Module Type and Technical Specifications

The corresponding SFP modules are provided according to the port type of the controller module. You can choose the proper SFP module according to the actual requirements. This document provides the description of some SFP models and technical parameters for reference.

Table 1-15 SFP Module Technical Specifications

Wavelength (nm)	Fiber Type	DDM	Transmitted Intensity (dBm)		Received Intensity (dBm)	
			Min	Max	Min	Max
1310Tx/1550Rx	Single mode	Not supported	-9	-3	—	-18

Table 1-16 SFP module wiring layout

Port Type	Fiber Type	Core Specification (um)	Max. Wiring Distance
LC	Single mode	9/125	0.3 km

Caution

- For the SFP module of which wiring distances is more than 40 km (including 40 km), if a short-distance single-mode fiber is used, an in-line optical attenuator should be inserted into the link to avoid overloading the optical receiver.
- The SFP module is a laser transmitter. Do not look directly at the light source to protect eye safety.
- To protect the cleanliness of the SFP module, use a dust cover when the optical fiber cable is not connected.

Table 1-17 FP module wiring layout

Port Type	Fiber Type	Core Specification (um)	Max. Wiring Distance
LC	Single mode	9/125	0.3 km

⚠ Caution

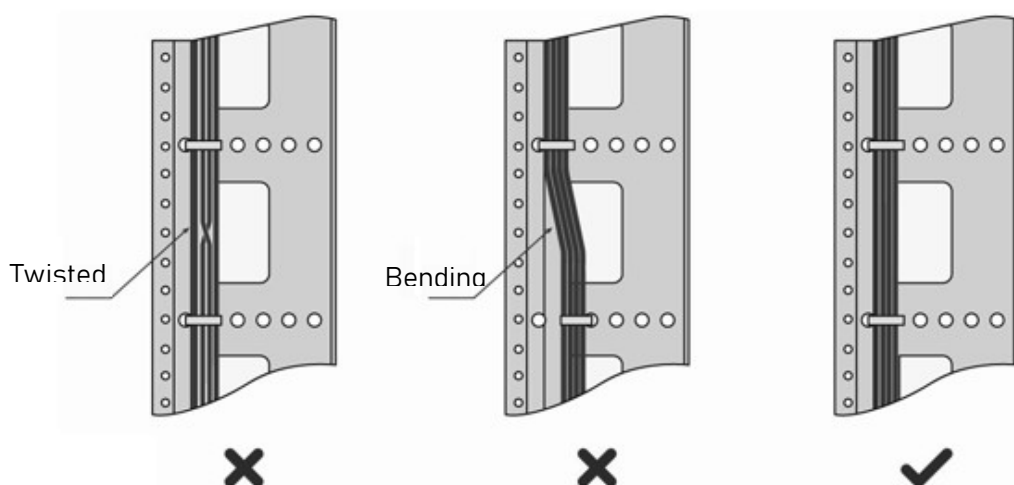
- For the SFP module of which wiring distances is more than 40 km (including 40 km), if a short-distance single-mode fiber is used, an in-line optical attenuator should be inserted into the link to avoid overloading the optical receiver.
 - The SFP module is a laser transmitter. Do not look directly at the light source to protect eye safety.
 - To protect the cleanliness of the SFP module, use a dust cover when the optical fiber cable is not connected.
-

7.3 Recommendations on Wiring During Installation

When the device is installed, the connected cables are bundled on the cable binding frame of the cabinet through the cable management bracket. Choose upper or lower wiring according to the actual situation of the equipment room. Arrange and place all cable connectors at the bottom of the cabinet (not outside the cabinet where it is easy to be touched). The power cables are routed from the side of the cabinet. Choose upper or lower wiring according to the actual situation of the equipment room (locations of DC power distribution box, AC socket, and lightning resistant box).

- Requirements for minimum bending radius of cables
 - After power cords, communication cables, and flat cables are laid and fixed, their bending radius should be more than 5 times the outer diameter of the cables. For the cables that are often bent and plugged, their bending radius should be more than 7 times the outer diameter of the cables.
 - After common coaxial cables are laid and fixed, their bending radius should be more than 7 times the outer diameter of the cables. For the cables that are often bent and plugged, their bending radius should be more than 10 times the outer diameter of the cables.
 - The bending radius of high-speed cables (such as SFP+ cables) should be more than 5 times the outer diameter of the cables. For the cables that are often bent and plugged, their bending radius should be more than 10 times the outer diameter of the cables.
- Precautions for Cable Bundling
 - Before bundling the cables, the labels need to be filled in correctly and affixed to the appropriate positions of the cables.
 - After the cables are bundled in the cabinet, they should be straight and neatly bundled without twisting or bending, as shown in [Figure 1-19](#).

Figure 1-19 Cable bundling diagram (1)

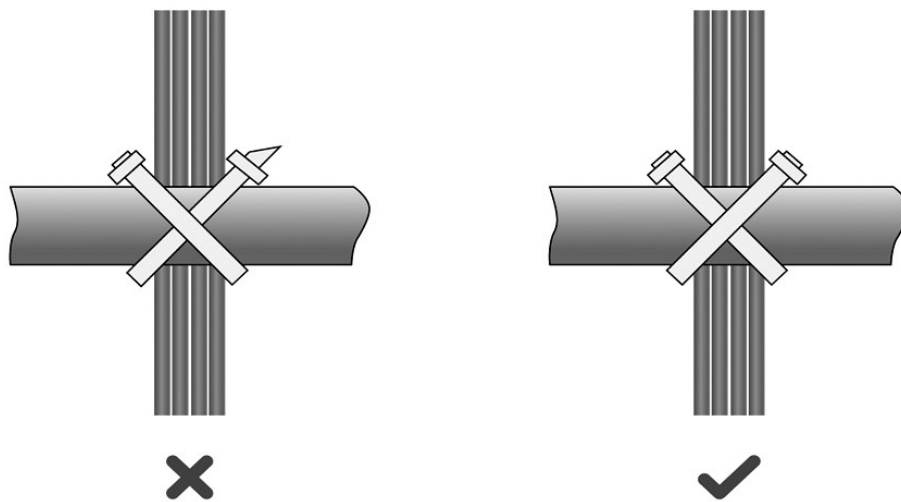


- Different types of cables (power cables, signal cables, such as ground cables) should be routed and bound separately in the cabinet. Do not mix them. When the distance is short,

cross wiring can be used. When deploying cables in parallel, the distance between the power cord and the signal cable should not be less than 30 mm.

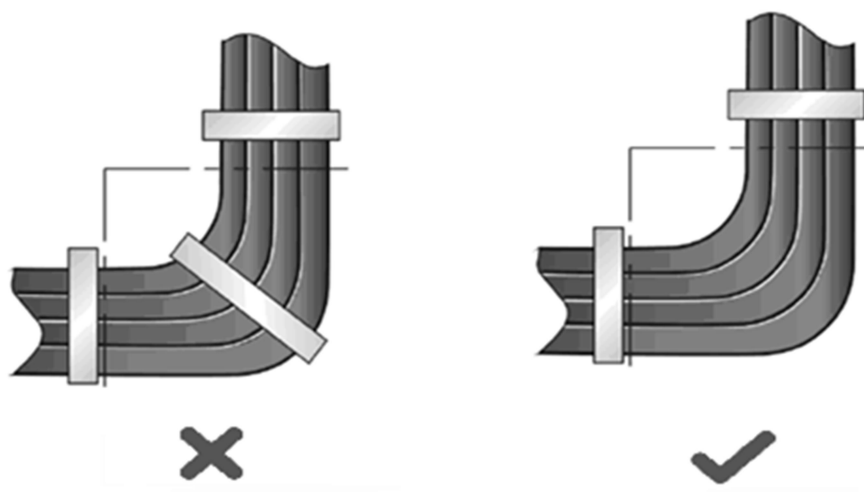
- The cable binding frames and cable troughs inside and outside the cabinet should be smooth without sharp edges and corners.
- Metal holes through which cables pass should have smooth, rounding surfaces, or have insulating bushings.
- Select the appropriate buckle to bind cables. Do not tie two or more buckles together for binding.
- After tying the cables with buckle, cut off the excess part. The incision should be smooth and neat, and no sharp corner exists, as shown in [Figure 1-20](#).

Figure 1-20 Cable bundling diagram (2)



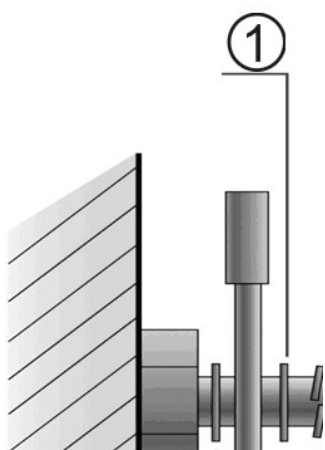
- When the cables need to be bent, bind the cables before bending. However, the buckle cannot be bound in the curved part; otherwise, a large stress is generated on the cables and breaks the cable core, as shown in [Figure 1-21](#).

Figure 1-21 Cable bundling diagram (3)



- For the cables that do not need to be assembled or are too long, fold and tie them at the appropriate position in the cabinet or cable trough. The proper position refers to the position that will not affect the operating of the device to cause device or cable damage during commissioning.
- The 220 V and -48 V power cords cannot be bound on the guide rails of moving parts.
- For the power cord connected to the movable parts, such as the door ground wire, an extra section should be reserved to avoid stress on the cable. When the moving parts arrive at the installation position, the extra section of cable will not touch heat sources, sharp corners, or sharp edges. If the heat sources cannot be avoided, heat-resisting cables must be used.
- If cable terminals are fixed with threads, the screws or nuts should be firmly fixed, and anti-loosening measures should be taken, as shown in [Figure 1-22](#).

Figure 1-22 Cable fixing diagram



Note:

① Flat washer

③ Spring washer

② Nut

④ Flat washer

- For stiff power cords, secure them near the connector to prevent stress on the connector and on the cable.
- Do not use self-tapping screws to fasten the terminals.
- Bind the power cords of the same type and same direction into a bundle, and the cords in the bundle should be clean and straight.
- Bind the cords with buckles according to the following table.

Cable Bundle Diameter (mm)	Bundle Interval (mm)
10	80-150
10-30	150-200

30	200-300
----	---------

- Cables or bundles cannot be knotted.
- When crimping the cord end terminals (for example, circuit breaker), the metal part of the terminal should not be exposed outside the terminal block.

7.4 DC Power Specifications

- Input voltage: 54 V DC; rate current: 1.1 A

Table 1-18 Specifications of DC power connector connector

Inner Diameter	Outer Diameter	Insert Depth	Polarity
2.1 mm	5.5 mm	9.5 mm	Inner positive, outer negative

Figure 1-23 DC power connector dimensions

