Ruijie Cybrey
RG-CAP72Pro-IE Access Point

Installation 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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- Online support center: https://www.ruijie.com/support
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- Documentation feedback: doc@ruijie.com.cn

Conventions

1. GUI Symbols

GUI Symbol	Description	Example
Boldface	1. Button names 2. Window names, tab name, field name and menu items 3. Link	1. Click **OK**. 2. Select Config Wizard. 3. Click the **Download File** link.
>	Multi-level menu items	Choose System > Time.

2. Signs

The signs used in this document are described as follows:

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.

3. Note

This document provides the installation steps, troubleshooting, technical specifications, as well as the specifications and use guidelines of cables and connectors. It is intended for users who want to understand the above contents, and are familiar with the installation and maintenance of networking hardware. Users are assumed to have reasonable knowledge of relevant terms and concepts.

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1 Overview

1.1 About the RG-CAP72Pro-IE

The RG-CAP72Pro-IE is a tri-radio Wi-Fi 7 access point (AP) for indoor scenarios across various sectors, covering office, warehouse, university, gymnasium, and luxury hotels. In compliance with IEEE 802.11be, IEEE 802.11ax, IEEE 802.11ac Wave2, IEEE 802.11ac Wave1, and IEEE 802.11n standards, the RG-CAP72Pro-IE delivers a combined peak data rate of 6.453 Gbps.

The RG-CAP72Pro-IE integrates AI radio design. The additional intelligent radio enables real-time full-band scanning, ensuring high security and superior user experience in the Wi-Fi environment. The RG-CAP72Pro-IE is equipped with a built-in 2-position directional adjustable antenna and supports external antennas. With its flexible installation features, it is suitable for installation environments with different heights ranging from 3 to 15 meters.

The RG-CAP72Pro-IE is designed considering factors such as wireless network security, radio control, access control, QoS, and seamless roaming. The RG-CAP72Pro-IE can be used together with the RG-CNC series access controller (ACs) and Ruijie Cybrey Cloud to implement wireless user data forwarding, security, and access control. The RG-CAP72Pro-IE supports local power supply and Power over Ethernet (PoE), which can be selected based on power supply conditions. In addition, the RG-CAP72Pro-IE can be mounted on a wall or ceiling, making it ideal for different scenarios.

1.2 Hardware Features

Figure 1-1 Appearance of the RG-CAP72Pro-IE

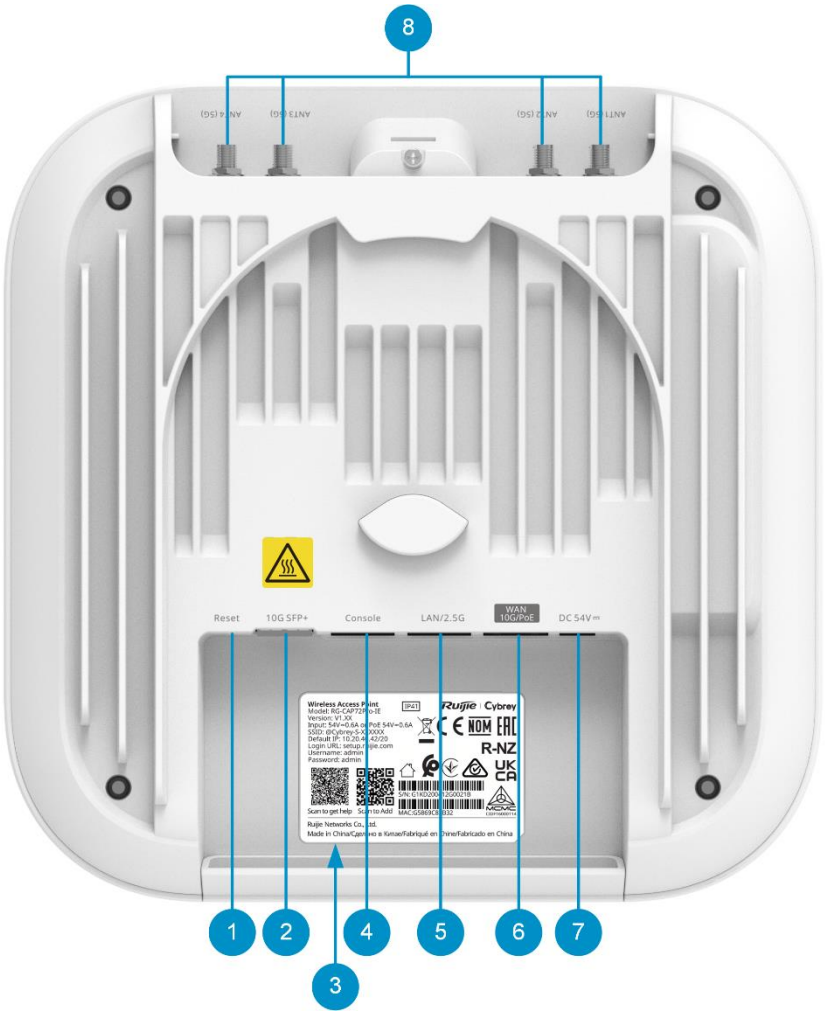


Note

Figure 1-1 is for illustrative purposes only. The actual product may vary.

1.2.1 Rear Panel

Figure 1-2 Rear View



Warning

is a hot surface sign: **Caution Hot Surface**. Do not touch the equipment surface while it is operating.

Table 1-1 Components on the Rear Panel

No.	Silkscreen	Component	Description
1	Reset	Reset button	● Press and hold the button for less than 2 seconds: Restart the AP. ● Press and hold the button for more than 5 seconds: Restore the AP to factory settings.

No.	Silkscreen	Component	Description
2	10G SFP+	SFP+ port	10GE SFP+ port connected to an optical transceiver for data transmission. It is paired with one 10GE RJ45 port as a combo port.
3	-	Nameplate	Located at the rear panel of the AP. The model, power supply, and other information are provided.
4	Console	Console port	Connected to a serial cable for AP management.
5	LAN/2.5G	RJ45 port	10/100/1000/2.5GBASE-T downlink port
6	WAN 10G/PoE	RJ45 port	10/100/1000/2.5G/5G/10GBASE-T port, supporting IEEE 802.3af/at/bt-compliant PoE input. It is paired with one 10GE SFP+ port as a combo port.
7	DC 54V⎓	DC power connector	Connected to a 54 V DC power adapter to source power to the AP.
8	ANT1(5G) ANT2(5G) ANT3(5G) ANT4(5G)	External antenna connectors	5 GHz SMA connectors. External antennas must be installed by professionals.

1.2.2 Side Panel

Figure 1-3 Side View

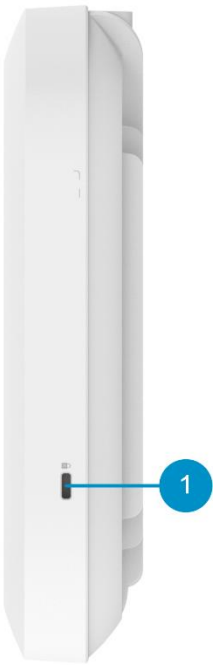


Table 1-2 Components on the Side Panel

No.	Silkscreen	Component	Description
1	-	Kensington lock slot	Connected to a customer-supplied Kensington lock.

1.2.3 LED

Figure 1-4 Front Panel



Table 1-3 LED

No.	Silkscreen	LED	Description	Frequency	AP Mode
1	-	System LED	Off: ● The AP is not powered on. ● The AP is powered on, but the LED is turned off through the software function.	-	FIT AP Cloud AP
			Blinking green quickly ● The software system is initializing. ● The AP is being restored to factory settings.	On for 0.1s Off for 0.1s	FIT AP Cloud AP
			Solid red: The software system is operating normally but the uplink service port of the AP is Down.	-	FIT AP Cloud AP
			Slow blinking red: CAPWAP tunnel establishment between the AP and the AC has timed out.	On for 3s Off for 1s	FIT AP

No.	Silkscreen	LED	Description	Frequency	AP Mode
			Fast blinking blue: The software system of the AP is being updated. During this process, the AP cannot be powered off.	On for 0.1s Off for 0.1s	FIT AP
			Solid blue: The AP is working properly, and the CAPWAP status is normal.	-	FIT AP Cloud AP
			Fast blinking red: The LED locating function is enabled on the AP to discover a specific AP.	On for 0.1s Off for 0.1s	FIT AP
			Blinking green for reset protection: When the reset protection function is enabled, pressing and holding the Reset button to restore factory settings makes the LED blink to indicate the reset protection alert.	On for 1.2s Off for 1.2s On for 1.2s Off for 4.4s	FIT AP Cloud AP

1.3 Technical Specifications

Table 1-1 Technical Specifications

Category	Item	RG-CAP72Pro-IE
Wi-Fi radio	Data rates	Combined peak data rate: 6453 Mbps ● Radio 1: 2.4 GHz, 688 Mbps ● Radio 2: 5 GHz, 5765 Mbps
	Radio design	Tri-radio 8 spatial streams ● Radio 1: 2.4 GHz, 2x2, MU-MIMO ● Radio 2: 5 GHz, 4x4, MU-MIMO ● Radio 3 (AI radio): 2.4 GHz & 5 GHz, 2x2, MIMO
	Operating frequency bands	● Radio 1: 802.11b/g/n/ax/be, 2.400 GHz to 2.4835 GHz, EHT20/EHT40 ● Radio 2: 802.11a/n/ac/ax/be, 5.150 GHz to 5.350 GHz, 5.470 GHz to 5.725 GHz, 5.725 GHz to 5.850 GHz, EHT20/EHT40/EHT80/EHT160 Note: Country-specific restrictions apply. To use the preceding frequency bands, ensure that they are supported in your country or region.

Category	Item	RG-CAP72Pro-IE
	Maximum transmit power (2.4 GHz)	Combined power: 26 dBm (single-stream power: 23 dBm) Note: The transmit power is limited by local regulatory requirements.
	Maximum transmit power (5 GHz)	Combined power: 29 dBm (single-stream power: 23 dBm) Note: The transmit power is limited by local regulatory requirements.
	Maximum transmit power	Frequency bands and maximum Effective Isotropic Radiated Power (EIRP): Note: The transmit power is limited by local regulatory requirements. European Union & United Kingdom: 2400–2483.5 MHz, EIRP ≤ 20 dBm 5150–5350 MHz, EIRP ≤ 23 dBm 5470–5725 MHz, EIRP ≤ 30 dBm Myanmar: 2400–2483.5 MHz, EIRP ≤ 23 dBm 5725–5825 MHz, EIRP ≤ 30 dBm Thailand: 2400–2483.5 MHz, EIRP ≤ 20 dBm 5150–5350 MHz, EIRP ≤ 23 dBm 5470–5725 MHz, EIRP ≤ 30 dBm 5725–5825 MHz, EIRP ≤ 30 dBm Indonesia: 2400–2483.5 MHz, EIRP ≤ 27 dBm 5150–5350 MHz, EIRP ≤ 23 dBm 5725–5825 MHz, EIRP ≤ 23 dBm Egypt: 2400–2483.5 MHz, EIRP ≤ 20 dBm 5150–5350 MHz, EIRP ≤ 23 dBm Vietnam: 2400–2483.5 MHz, EIRP ≤ 23 dBm 5150–5350 MHz, EIRP ≤ 23 dBm 5470–5725 MHz, EIRP ≤ 30 dBm 5725–5850 MHz, EIRP ≤ 30 dBm
	Power increment	1 dBm

Category	Item	RG-CAP72Pro-IE
	Receive sensitivity	802.11a: –91 dBm (6 Mbps), –85 dBm (24 Mbps), –72 dBm (54 Mbps) 802.11b: –94 dBm (1 Mbps), –90 dBm (5.5 Mbps), –86 dBm (11 Mbps) 802.11g: –91 dBm (6 Mbps), –85 dBm (24 Mbps), –80 dBm (36 Mbps), –74 dBm (54 Mbps) 802.11n HT20: –88 dBm (MCS0), –70 dBm (MCS7) 802.11n HT40: –85 dBm (MCS0), –67 dBm (MCS7) 802.11ac VHT20: –88 dBm (MCS0), –65 dBm (MCS8) 802.11ac VHT40: –85 dBm (MCS0), –60 dBm (MCS9) 802.11ac VHT80: –82 dBm (MCS0), –57 dBm (MCS9) 802.11ac VHT160: –79 dBm (MCS0), –54 dBm (MCS9) 802.11ax HE20: –88 dBm (MCS0), –63 dBm (MCS9), –58 dBm (MCS11) 802.11ax HE40: –85 dBm (MCS0), –60 dBm (MCS9), –55 dBm (MCS11) 802.11ax HE80: –82 dBm (MCS0), –57 dBm (MCS9), –52 dBm (MCS11) 802.11ax HE160: –79 dBm (MCS0), –54 dBm (MCS9), –49 dBm (MCS11) 802.11be EHT20: –88 dBm (MCS0), –63 dBm (MCS9), –58 dBm (MCS11), –52 dBm (MCS13) 802.11be EHT40: –85 dBm (MCS0), –60 dBm (MCS9), –55 dBm (MCS11), –49 dBm (MCS13) 802.11be EHT80: –82 dBm (MCS0), –57 dBm (MCS9), –52 dBm (MCS11), –46 dBm (MCS13) 802.11be EHT160: –79 dBm (MCS0), –54 dBm (MCS9), –49 dBm (MCS11), –43 dBm (MCS13)
	Wi-Fi standards	IEEE 802.11be (Wi-Fi 7), compatible with IEEE 802.11a/b/g/n/ac/ax
	Modulation types	802.11b: BPSK, QPSK, CCK 802.11a/g/n: BPSK, QPSK, 16-QAM, 64-QAM 802.11ac: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM 802.11ax: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM 802.11be: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM, 4096-QAM

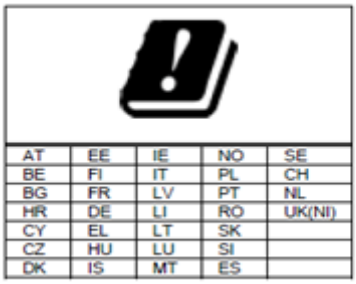
Category	Item	RG-CAP72Pro-IE
Bluetooth radio	Bluetooth	Bluetooth 5.3, supporting remote maintenance through a Bluetooth serial port
	Maximum Bluetooth transmit power	10 dBm
	Bluetooth operating frequency bands	2.400 GHz to 2.4835 GHz
	Bluetooth modulation type	GFSK
	Bluetooth receive sensitivity	–92 dBm
Antenna	Antenna type	● 2.4 GHz: 2 x built-in directional antennas with a 75° beamwidth ● 5 GHz: 4 x built-in directional antennas with a 75° beamwidth ● 5 GHz: 4 x built-in directional antennas with a 35° beamwidth ● Bluetooth: 1 x built-in omnidirectional antenna Note: 1. Radio 2 supports switching between two sets of built-in antennas and switching to external antennas. When external antennas are used, the access point uses four external RP-SMA female antenna connectors. The external antenna connectors are labeled ANT1(5G), ANT2(5G), ANT3(5G), and ANT4(5G). 2. The version of this device for the Indonesian market does not support external antennas.
	Antenna gain	● 2.4 GHz: 6.60 dBi ● 5 GHz: 9.40 dBi (default mode for built-in antennas) ● 5 GHz: 10.20 dBi (enhanced mode for built-in antennas) ● Bluetooth: 3.70 dBi
Dimensions and weight	Unit dimensions (W x D x H)	220 mm x 220 mm x 46.3 mm (8.66 in. x 8.66 in. x 1.82 in., without the mounting bracket)
	Packaging dimensions (W x D x H)	247.5 mm x 242 mm x 78 mm (9.74 in. x 9.53 in. x 3.07 in.)
	Unit weight	Main unit: 1.10 kg (2.43 lbs) Mounting bracket: 0.12 kg (0.26 lbs)
	Packaging weight	1.59 kg (3.51 lbs)
	Color	White

Category	Item	RG-CAP72Pro-IE
Port specifications	LED	1 x system LED
	Reset button	1
	Fixed service port	● 1 x 10/100/1000/2.5G/5G/10GBASE-T port, supporting 802.3af/at/bt-compliant PoE input. It is paired with one 10GE SFP+ port as a combo port. ● 1 x 10GE SFP+ port, compatible with 2.5GE and 1GE optical transceivers. It is paired with one 10GE RJ45 port as a combo port. ● 1 x 10/100/1000/2.5GBASE-T port
	Fixed management port	1 x RJ45 console port
Power supply and consumption	DC power supply	● DC power adapter: 54 V, 0.7 A ● DC connector dimensions: o Outer diameter: 5.5 mm (0.22 in.) o Inner diameter: 2.1 mm (0.08 in.) o Depth: 10 mm (0.39 in.) Note: If both DC power and PoE are available, DC power is preferred.
	PoE power supply	● IEEE 802.3af (PoE) ● IEEE 802.3at (PoE+) ● IEEE 802.3bt (PoE++) Note: If both DC power and PoE are available, DC power is preferred.
	IEEE 802.3af power input	● Port restrictions: The downlink LAN port is unavailable. ● Radio restrictions: The 2.4 GHz and 5 GHz radios are limited to 1T1R, with the transmit power of both radios limited to 50%. In addition, independent RF scanning by AI Radio is not supported. ● Other feature restrictions: N/A
	IEEE 802.3at power input	● Port restrictions: N/A ● Radio restrictions: N/A ● Other feature restrictions: N/A
	IEEE 802.3bt power input	● Port restrictions: N/A ● Radio restrictions: N/A ● Other feature restrictions: N/A
	DC power input	● Port restrictions: N/A ● Radio restrictions: N/A ● Other feature restrictions: N/A
	Maximum power consumption	26.2 W
Environment and reliability	Mounting options	Ceiling-mount, wall-mount, and junction box-mount
	Operating temperature	–10°C to +50°C (14°F to 122°F)

Category	Item	RG-CAP72Pro-IE
		Note: At altitudes ranging from 1,800 m (5,905.51 ft.) to 5,000 m (16,404.20 ft.), the maximum temperature decreases by 1°C (1.8°F) for every 220 m (721.78 ft.) increase in elevation.
	Storage temperature	–40°C to +70°C (–40°F to +158°F) Note: At altitudes ranging from 1,800 m (5,905.51 ft.) to 5,000 m (16,404.20 ft.), the maximum temperature decreases by 1°C (1.8°F) for every 220 m (721.78 ft.) increase in elevation.
	Operating humidity	5% RH to 95% RH (non-condensing)
	Storage humidity	0% RH to 95% RH (non-condensing)
	Lock option	Kensington lock slot and securing latch
	MTBF	400,000 hours
Certification and regulatory compliance	EMC compliance	EN 55032 EN 61000-3-3 EN IEC 61000-3-2 EN 55035 EN 301 489-1 EN 301 489-3 EN 301 489-17
	Safety compliance	IEC 62368-1
	Radio	EN 300 328 EN 301 893 EN 300 440
	RF exposure	EN IEC 62311
	Certification	CE, CB, Wi-Fi Alliance

Note

- EU simplified DoC: Hereby, [**Ruijie Networks Co., Ltd.**] declares that the radio equipment type [**RG-CAP72Pro-IE**] 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-CAP72Pro-IE**] 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)





1.4 Radio Performance

Note

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

Table 1-2 Radio Performance

Wi-Fi Radio Performance	RG-CAP72Pro-IE		
Frequency Band and Protocol	**Data Rate**	**Maximum Transmit Power per Transmit Chain**	**Receive Sensitivity per Receive Chain**
2.4 GHz 802.11b	1 Mbps	23 dBm	–96 dBm
	2 Mbps	23 dBm	–94 dBm
	5.5 Mbps	23 dBm	–93 dBm
	11 Mbps	23 dBm	–89 dBm
2.4 GHz 802.11g	6 Mbps	23 dBm	–91 dBm
	24 Mbps	22 dBm	–85 dBm
	36 Mbps	22 dBm	–80 dBm
	54 Mbps	20 dBm	–74 dBm
2.4 GHz 802.11n (HT20)	MCS0	23 dBm	–88 dBm
	MCS7	21 dBm	–70 dBm
2.4 GHz 802.11n (HT40)	MCS0	23 dBm	–85 dBm
	MCS7	21 dBm	–67 dBm
2.4 GHz 802.11ax (HE20)	MCS0	23 dBm	–88 dBm
	MCS11	18 dBm	–58 dBm

Wi-Fi Radio Performance	RG-CAP72Pro-IE		
Frequency Band and Protocol	**Data Rate**	**Maximum Transmit Power per Transmit Chain**	**Receive Sensitivity per Receive Chain**
2.4 GHz 802.11ax (HE40)	MCS0	23 dBm	–85 dBm
	MCS11	18 dBm	–55 dBm
2.4 GHz 802.11be (EHT20)	MCS0	23 dBm	–88 dBm
	MCS11	18 dBm	–58 dBm
	MCS13	16 dBm	–52 dBm
2.4 GHz 802.11be (EHT40)	MCS0	23 dBm	–85 dBm
	MCS11	18 dBm	–55 dBm
	MCS13	16 dBm	–49 dBm
5 GHz 802.11a	6 Mbps	23 dBm	–91 dBm
	24 Mbps	22 dBm	–85 dBm
	36 Mbps	22 dBm	–80 dBm
	54 Mbps	20 dBm	–74 dBm
5 GHz 802.11n (HT20)	MCS0	23 dBm	–88 dBm
	MCS7	20 dBm	–70 dBm
5 GHz 802.11n (HT40)	MCS0	23 dBm	–85 dBm
	MCS7	20 dBm	–67 dBm
5 GHz 802.11ac (VHT20)	MCS0	23 dBm	–88 dBm
	MCS8	19 dBm	–65 dBm
5 GHz 802.11ac (VHT40)	MCS0	23 dBm	–85 dBm
	MCS9	19 dBm	–60 dBm
5 GHz 802.11ac (VHT80)	MCS0	23 dBm	–82 dBm
	MCS9	19 dBm	–57 dBm
5 GHz 802.11ac (VHT160)	MCS0	23 dBm	–79 dBm
	MCS9	19 dBm	–54 dBm
5 GHz 802.11ax (HE20)	MCS0	23 dBm	–88 dBm
	MCS11	18 dBm	–58 dBm
5 GHz 802.11ax (HE40)	MCS0	23 dBm	–85 dBm

Wi-Fi Radio Performance	RG-CAP72Pro-IE		
Frequency Band and Protocol	**Data Rate**	**Maximum Transmit Power per Transmit Chain**	**Receive Sensitivity per Receive Chain**
	MCS11	18 dBm	–55 dBm
5 GHz 802.11ax (HE80)	MCS0	23 dBm	–82 dBm
	MCS9	19 dBm	–57 dBm
	MCS11	18 dBm	–52 dBm
5 GHz 802.11ax (HE160)	MCS0	23 dBm	–79 dBm
	MCS9	19 dBm	–54 dBm
	MCS11	18 dBm	–49 dBm
5 GHz 802.11be (EHT80)	MCS0	23 dBm	–82 dBm
	MCS9	19 dBm	–57 dBm
	MCS11	18 dBm	–52 dBm
	MCS13	16 dBm	–46 dBm
5 GHz 802.11be (EHT160)	MCS0	23 dBm	–79 dBm
	MCS9	19 dBm	–54 dBm
	MCS11	18 dBm	–49 dBm
	MCS13	16 dBm	–43 dBm

2 Preparing for Installation

2.1 Package Contents

Table 1-4 Package Contents

No.	Item	Quantity
1	RG-CAP72Pro-IE access point	1
2	ST4.2 x 25 mm Phillips tapping screw	4
3	φ6.3 x 25 mm plastic expansion anchor	4
4	Mounting bracket	1
5	Key to security lock	1
6	Alignment sticker	1
7	*Warranty Card*	1
8	*User Manual*	1

Note

The package contents are subject to the purchase contract, and actual delivery may vary. Please check the items carefully against the package contents or purchase contract. If you have any questions, please contact the distributor.

2.2 Safety Guidelines

Note

- To avoid personal injury and equipment damage, review the safety guidelines in this chapter before you begin the installation.
- The following safety recommendations may not cover all possible hazardous situations.

2.2.1 General Precautions

- Do not expose the equipment to high temperatures, dust, or harmful gases. Do not install the equipment in flammable or explosive environments. Keep the equipment away from sources of electromagnetic interference (EMI), such as large radar stations, radio stations, and substations. Do not subject the equipment to unstable voltage, vibration, or excessive noise.
- The installation site should be free from water flooding, seepage, dripping, or condensation. The installation site should be selected according to communication network planning and technical requirements for communication equipment, and considerations such as climate, hydrology, geology, earthquake, electrical

power, and transportation.

- The installation site should be dry. Do not install the equipment in a place near the sea. The distance between the device and the sea should be greater than 500 m, and it is not recommended to place the device on the windward side of the sea.
- Keep the equipment away from walking areas.
- During installation and maintenance, do not wear loose clothing or ornament that may get caught in the chassis.
- Keep tools and components away from walking areas.

2.2.2 Chassis-Lifting Guidelines

- Avoid moving the equipment frequently.
- Turn off all power supplies and disconnect all power cords before lifting or moving the equipment.

2.2.3 Electric Safety

Warning

- Any deviation from standard or improper electrical operations can result in accidents such as fires or electric shocks, potentially causing severe or even fatal harm to both individuals and equipment.
- Direct or indirect touch through a wet object on high-voltage and mains supply can bring a fatal danger.

- Always observe the local regulations and standards. Only trained and qualified personnel should be allowed to operate the device.
- Carefully check the work area for possible hazards, including ungrounded power system, absent safety grounds, and damp floors.
- Locate the emergency power-off switch in the room. In the case of an electrical accident, cut off the power supply immediately.
- Be sure to make a careful check before shutting down the power supply.
- Never operate the equipment in a wet environment, and avoid any liquids inside it.
- Keep the equipment far away from grounding or surge protection facility for power equipment.
- Keep the equipment away from radio stations, radar stations, high-frequency and high-current devices, microwave ovens, and other high-power wireless devices.

2.2.4 Storage Guidelines

To ensure normal operation, plan for your installation site according to the temperature and humidity requirement.

Caution

If the equipment has been powered off for more than 18 months, power it on and operate it continuously for 24 hours to reactivate the equipment.

2.3 Site Requirements

The equipment must be installed and used indoors for normal operation and prolonged service life of the equipment.

The installation site must meet the following requirements.

2.3.1 Floor Loading

Assess the combined weight of the equipment and its accessories, such as the mounting bracket and power modules, and verify that the installation site can bear the weight.

2.3.2 Airflow

The equipment dissipates heat naturally. Therefore, certain space needs to be reserved around the equipment for heat dissipation.

2.3.3 Space

Maintain a minimum clearance of 0.4 m around the device for heat dissipation and device maintenance.

2.3.4 Temperature and Humidity

To ensure the normal operation and prolonged service life of the equipment, maintain appropriate temperature and humidity conditions in the equipment room.

Prolonged exposure to inappropriate temperature and humidity conditions can cause damage to the equipment.

- In an environment with a high relative humidity, insulating materials are prone to poor insulation or even electricity leakage.
- In an environment with a low relative humidity, insulating gaskets may shrink, resulting in screw loosening.
- In a dry environment, static electricity is more likely to occur, posing a risk to the internal circuits of equipment.
- A high temperature can accelerate the aging process of insulation materials, greatly reducing the availability of the equipment and severely affecting its service life.

Note

The operating temperature and humidity are measured at 1.5 m (4.92 ft.) above the floor and 0.4 m (1.31 ft.) before the rack when there is no protective plate in front or on the rear of the rack.

2.3.5 Cleanliness

Dust poses a significant hazard to the equipment. The indoor dust takes on a positive or negative static electric charge when falling on the equipment, causing poor contact of the metallic joint. Such electrostatic adhesion may occur more easily when the relative humidity is low, not only affecting the service life of the equipment, but also causing communication faults. The following table lists the requirements for dust concentration and particle size in the equipment room.

Table 2-1 Requirements for Dust

Dust	Unit	Concentration
Dust particles (diameter ≤ 0.5 μm)	Particles/m^3	≤ 1.4 x 10^7
Dust particles (0.5 μm < diameter ≤ 1 μm)	Particles/m^3	≤ 7 x 10^5
Dust particles (1 μm < diameter ≤ 3 μm)	Particles/m^3	≤ 2.4 x 10^5
Dust particles (3 μm < diameter ≤ 5 μm)	Particles/m^3	≤ 1.3 x 10^5

Apart from dust, there are also requirements on the salt, acid, and sulfide in the air of the equipment room. These harmful substances will accelerate metal corrosion and component aging. Therefore, the machine room should be properly protected against the intrusion of harmful gases, such as sulfur dioxide, hydrogen sulfide, nitrogen dioxide, and chlorine gas. The following table lists limit values for harmful gases.

Table 2-2 Requirements for Gases

Gas	Average (mg/m^3)	Maximum (mg/m^3)
Sulfur dioxide (SO_2)	0.2	1.5
Hydrogen sulfide (H_2S)	0.006	0.03
Nitrogen dioxide (NO_2)	0.04	0.15
Ammonia gas (NH_3)	0.05	0.15
Chlorine gas (Cl_2)	0.01	0.3

Note

Average refers to the average value of harmful gases measured in a week. **Maximum** refers to the upper limit of harmful gases measured in one week, and the maximum value cannot last for more than 30 minutes every day.

2.3.6 Preventing Electromagnetic Interference

- Take interference prevention measures for the power supply system.
- Keep the equipment far away from the grounding system or lightning protection grounding system of the power facility.
- Keep the equipment far away from high-frequency current equipment such as a high-power radio transmitting stations and radar launchers.
- Take electromagnetic shielding measures when necessary.

2.3.7 Surge Protection

Although the equipment can guard against lightning strikes, strong lightning strikes may still damage the equipment. Take the following surge protection measures:

- Ensure that the neutral point of the AC power socket is in good contact with the ground.
- Install a power arrester in front of the power input end to enhance surge protection for the power supply.

2.3.8 Installation Site

Regardless of whether the device is installed on a wall or an 86-mm junction box, the following requirements must be met:

- Sufficient space is reserved at the air inlet and air vents of the device, to facilitate heat dissipation of the device.
- Ensure that the installation site has a good cooling and ventilation system.
- Ensure that the installation site is sturdy enough to support the weight of the chassis and its accessories.

2.4 Tools

Table 2-3 Tools

Common Tools	Phillips screwdriver, power cords, Ethernet cables, fastening bolts, diagonal plier, and cable ties
Dedicated Tools	ESD-preventive glove, wire stripper, crimper, RJ45 connector crimping plier, and wire cutter
Meters	Multimeter and bit error rate tester (BERT)
Relevant Equipment	PC, display, and keyboard

Note

The RG-CAP72Pro-IE is delivered without a tool kit. The tool kit is customer-supplied.

3 Installing the Access Point

The RG-CAP72Pro-IE must be fixed and used indoors. Connect cables (such as Ethernet cable and console cable) after the system LED is on.

Caution

Before installing the equipment, ensure that guidelines and requirements in Chapter 2 have been met.

3.1 Before You Begin

Carefully plan and arrange the installation position, networking mode, power supply, and cabling before installation. Before installation, ensure that:

- The installation site meets the temperature and humidity requirements.
- The power supply is available at the installation site, and its current meets the requirements.
- The power supply meets the requirements.
- The Ethernet cables have been deployed at the installation site.
- The installation site meets the site requirements of the equipment.
- The dedicated device for a specific customer meets special requirements of the customer.

3.2 Precautions

To ensure the normal operation and prolonged service life of the equipment, observe the following safety precautions:

- Do not power on the equipment during installation.
- Place the equipment in a well-ventilated environment.
- Do not place the equipment in high temperature environment.
- Keep the equipment far away from high-voltage cables.
- Install the equipment indoors.
- Keep the equipment far away from strong thunderstorms and strong electric fields.
- Keep the equipment clean and protect it against dust.
- Disconnect the power of device before cleaning it.
- Do not wipe the equipment with a wet cloth.
- Do not clean the equipment with liquids.
- Do not open the enclosure while the equipment is working.
- Secure the equipment properly.

3.3 Mounting the Access Point

Caution

- The installation diagrams in this chapter are for reference only. The actual product may vary.
- When installing or handling the AP, ensure that the power supply is cut off.
- Ensure that the installation position of the AP allows for LED status observation.
- Maintain a minimum clearance of 100 mm (3.94 in.) around the AP. Ensure that there are no obstacles around the ports when connecting cables.
- The deployment of the AP is subject to the actual environment. For areas with severe environmental interference, you are advised to reduce the distance between two APs to improve the signal coverage in the edge area.

3.3.1 Connecting Cables

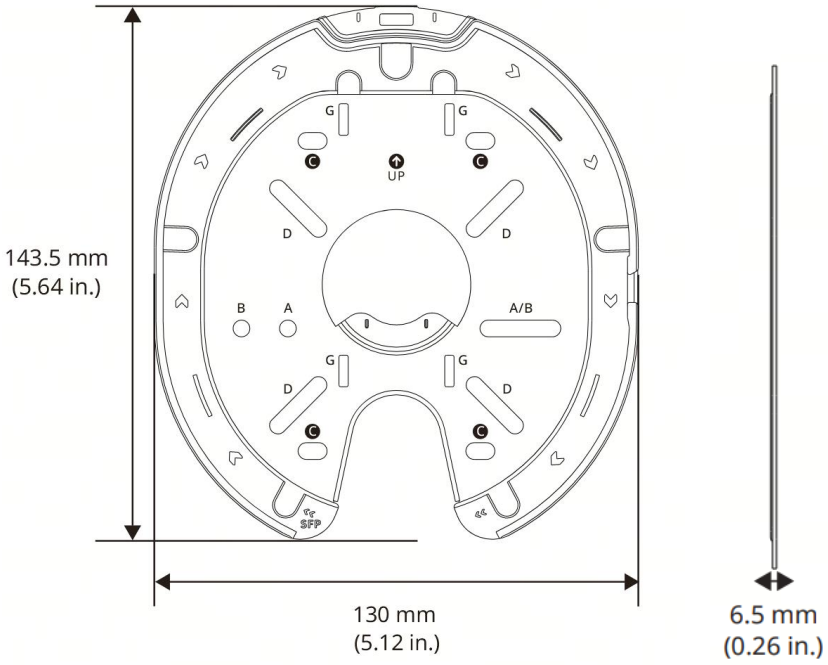
Connect cables based on your actual networking requirements. The recommended cable connection methods for different power supply modes are listed as follows.

Table 3-1 Recommended Cable Connection

Connection Method	Power Input Port (Silkscreen)	Uplink Port (Silkscreen)	Downlink Port (Silkscreen)
Method 1: PoE + Ethernet uplink port	WAN/10G/PoE (PoE input + uplink data transmission)		LAN/2.5G (optional)
Method 2: DC power adapter + Ethernet uplink port	DC 54V ⎓	WAN/10G/PoE	LAN/2.5G (optional)
Method 3: DC power adapter + Optical uplink port	DC 54V ⎓	10G SFP+	LAN/2.5G (optional)

3.3.2 Mounting Bracket

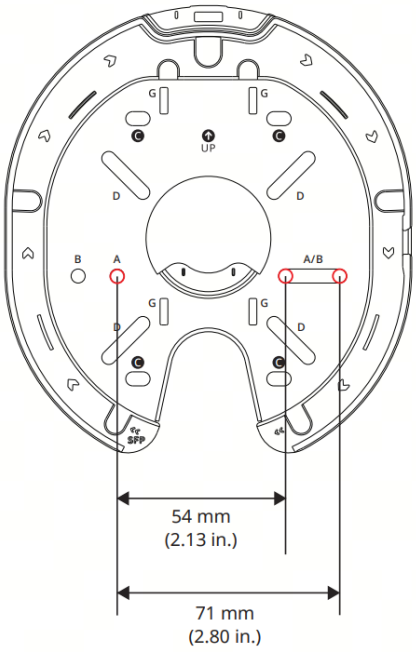
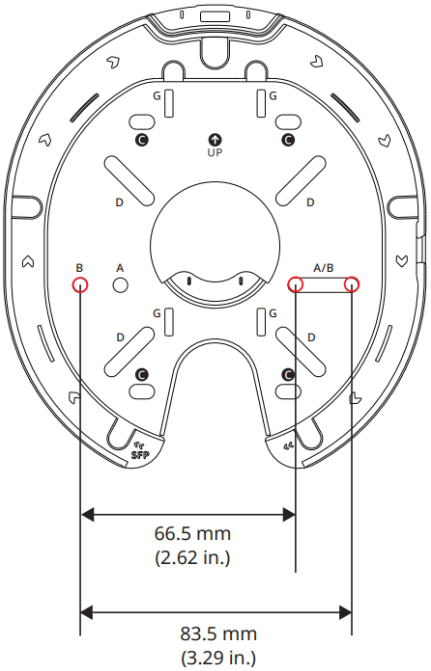
Figure 3-1 Mounting Bracket Dimensions

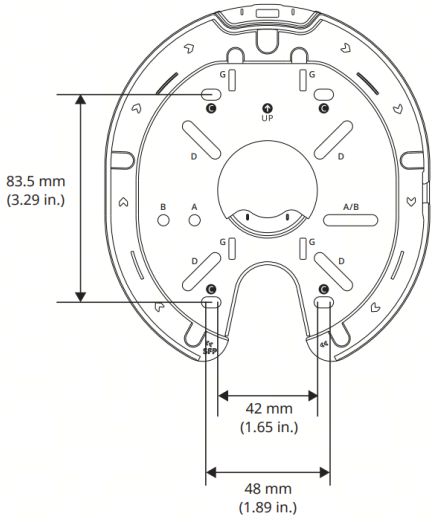
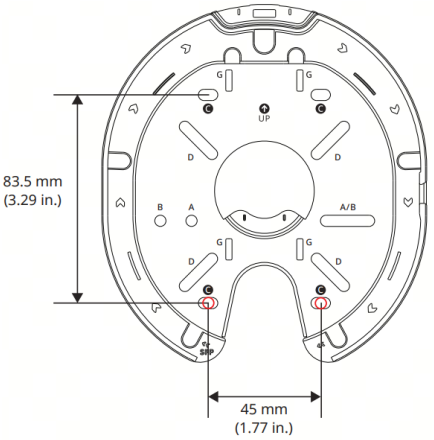
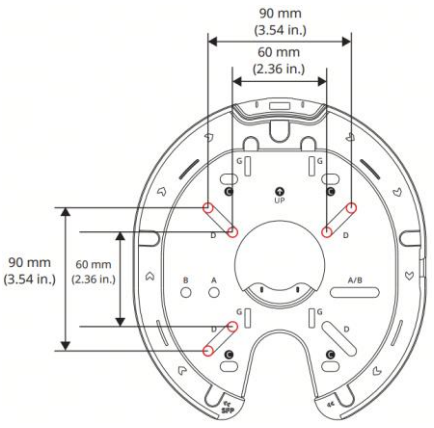


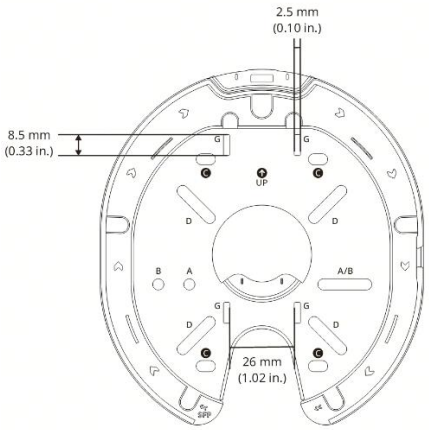
Note

The AP supports multiple mounting options. ST4.2 x 25 mm Phillips tapping screws and φ6.3 x 25 mm expansion anchors are delivered with the AP. If these screws do not match your mounting holes, use screws of the appropriate size instead.

Table 3-2 Mounting Holes and Scenarios

Mounting Hole	Diagram	Description	Scenarios
A		● 2 mounting holes ● Horizontal spacing range: 54–71 mm (2.13–2.80 in.)	Junction box-mount. The following junction boxes are recommended: ● Chinese-standard 86-mm junction box ● English-standard single-gang junction box ● German-standard single-gang junction box ● Japanese-standard octagonal junction box ● Argentine-standard single-gang junction box ● American-standard 3.25/3.50-inch round or octagonal junction box
B		● 2 mounting holes ● Horizontal spacing range: 66.5–83.5 mm (2.62–3.29 in.)	Junction box-mount. The following junction boxes are recommended: ● Chinese-standard single-gang 120 mm junction box ● Single-gang 118-mm junction box ● American-standard single-gang junction box ● Japanese-standard single-gang junction box ● Argentine-standard single-gang rectangle junction box

Mounting Hole	Diagram	Description	Scenarios
C		● 4 mounting holes ● Vertical center-to-center spacing: 83.5 mm (3.29 in.) ● Horizontal spacing range: 42–48 mm (1.65–1.89 in.)	Junction box-mount. The following junction boxes are recommended: ● Chinese-standard dual-gang 120-mm junction box ● American-standard dual-gang junction box ● Japanese-standard SM30M wall-mount box
C		● 4 mounting holes ● Vertical/Horizontal center-to-center spacing: 83.5 mm (3.29 in.) / 45 mm (1.77 in.) ● Ceiling/Wall -mount hole diameter: 6.35 mm (0.25 in.)	Ceiling/Wall-mount
D		● 4 mounting holes (supporting diagonal 2-hole installation) ● Vertical/Horizontal spacing range: 60–90 mm (2.36–3.54 in.)	Junction box-mount. The following junction boxes are recommended: ● Chinese-standard junction box ● American-standard 3.25/3.50/4-inch round or octagonal junction box ● Japanese-standard R36 round junction box ● R44 wall-mount box ● Japanese-standard octagonal junction box ● Hole A supports rotational mounting on the junction box.

Mounting Hole	Diagram	Description	Scenarios
G		● Hose clamp hole length: 8.5 mm (0.33 in.) ● Hose clamp hole width: 2.5 mm (0.10 in.) ● Hose clamp hole spacing: 26 mm (1.02 in.)	Hose clamp-mount

3.3.3 Ceiling/Wall Mount

Caution

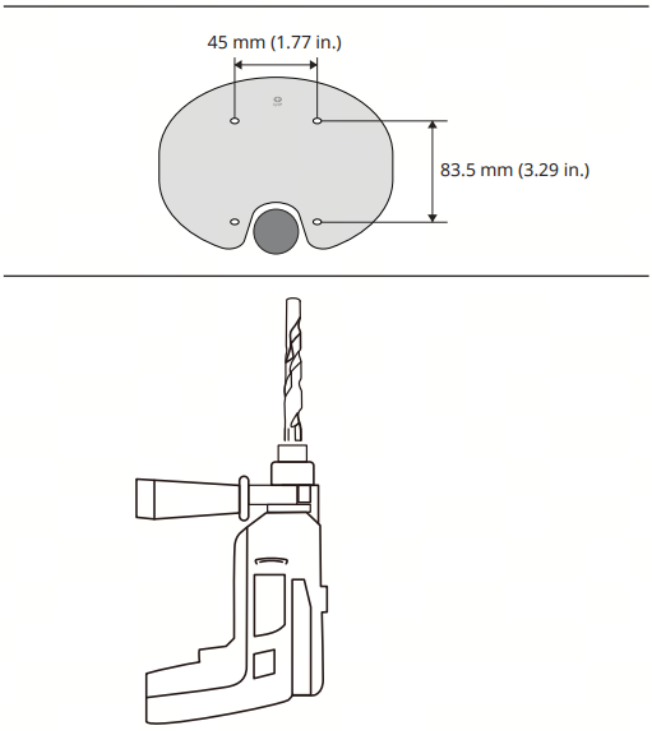
- The mounting bracket can be installed in four orientations. Install the AP in one orientation based on the cable routing.
- After installation, check whether the AP is secured properly in case it falls down.

(1) Drill four holes on the ceiling or wall using the alignment sticker.

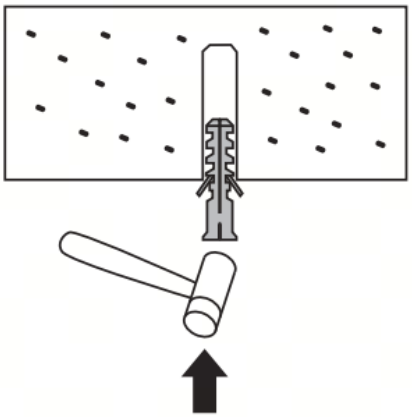
- Mounting holes: Center-to-center spacing of 45 mm (1.77 in.), hole diameter of 6.35 mm (0.25 in.).
- Cable threading holes: Hole diameter of 30 mm (1.18 in.).

Caution

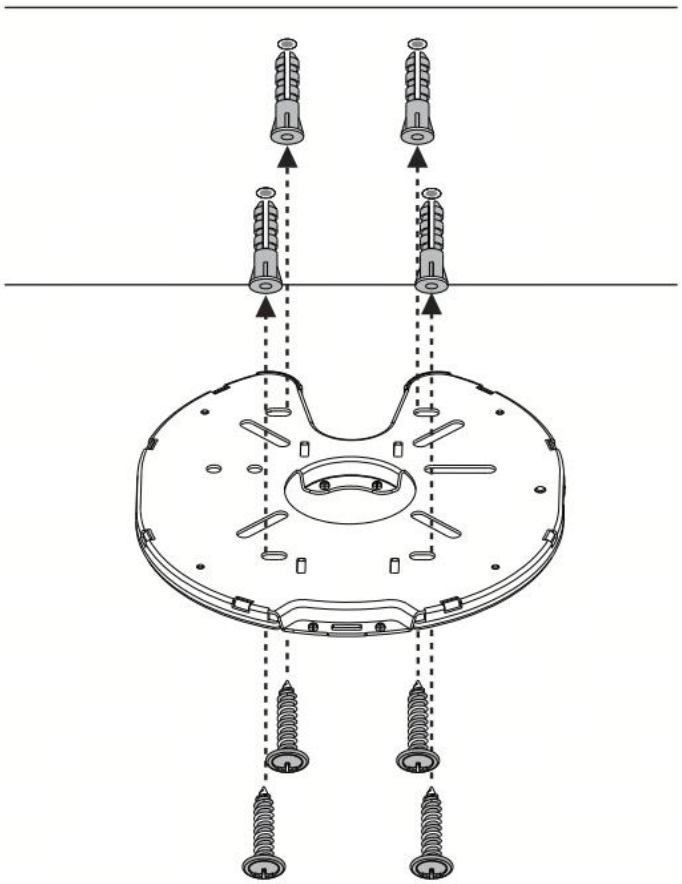
After the holes is drilled, peel the alignment sticker off the ceiling or wall.



(2) Tap four φ6.3 x 25 mm expansion anchors into the holes with a rubber hammer until the anchors are properly seated.

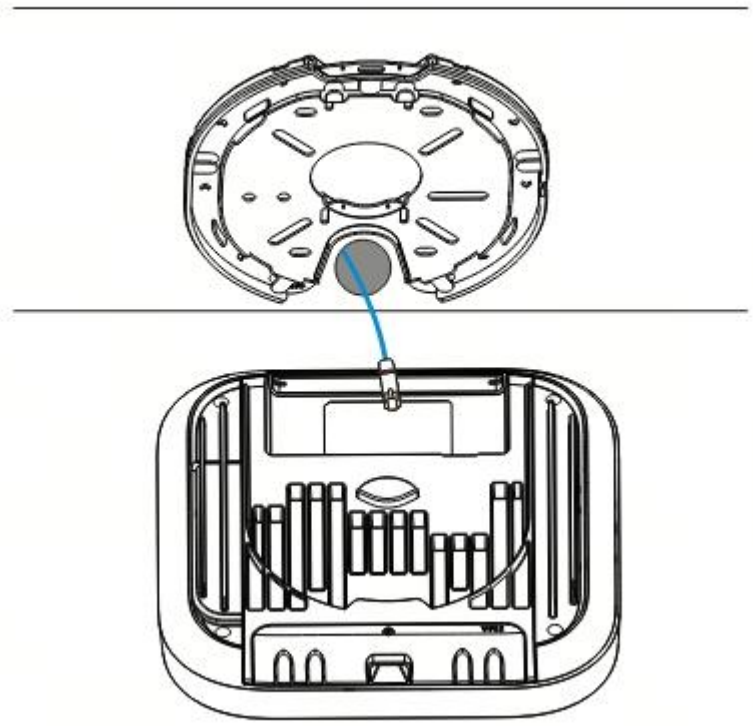


(3) Secure the mounting bracket to the ceiling or wall using ST4.2 x 25 mm Phillips taping screws and φ6.3 x 25 mm expansion anchors.

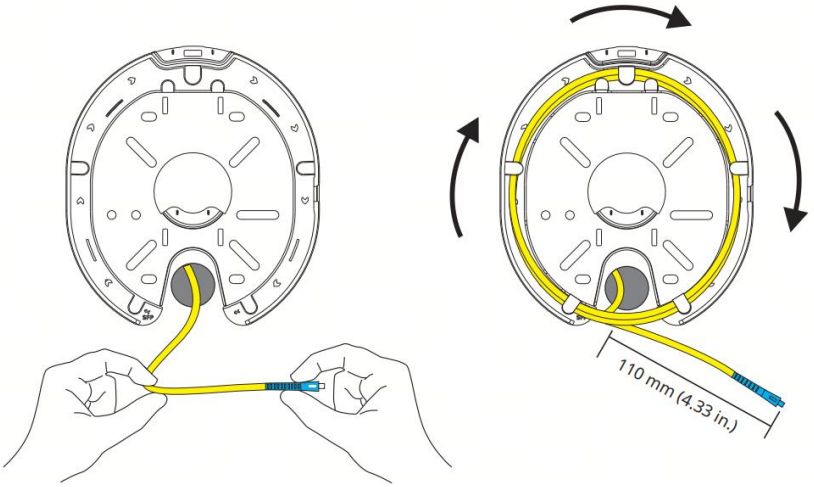


(4) Connect the cables to the ports on the AP based on your networking requirements.

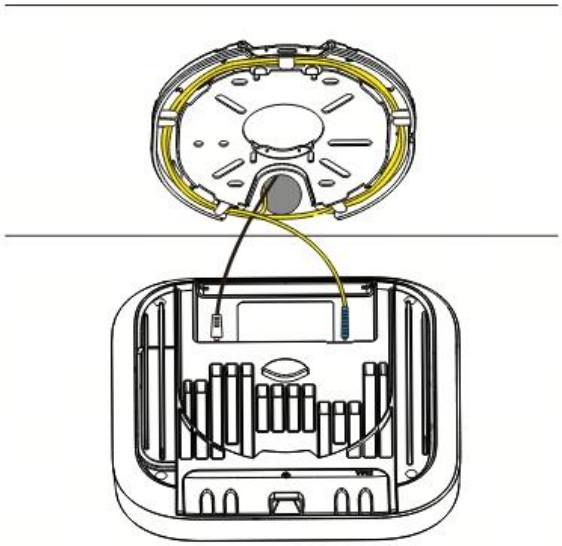
- Ethernet cable: Connect the Ethernet cable to the RJ45 port (WAN 10G/PoE or LAN/2.5G) on the rear of the AP. WAN 10G/PoE port supports PoE input.



- Optical fiber: Connect the optical fiber to the 10GE SFP+ port on the rear of the AP. Leave a 110-mm (4.33-in.) fiber slack at the fiber connector. Coil the optical fiber in the fiber management trough on the rear of the AP.



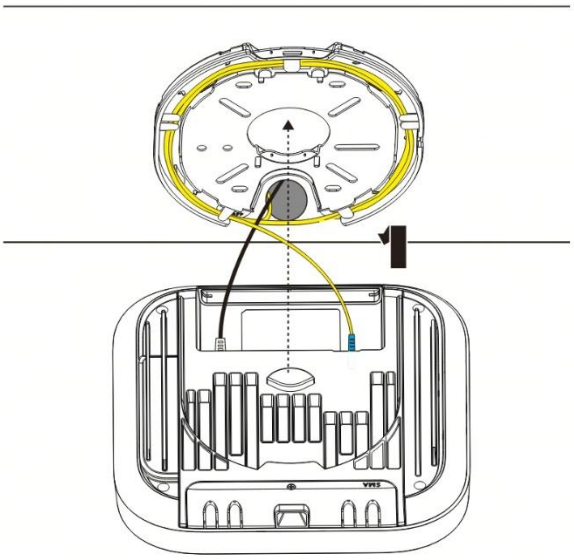
- DC power cord: Connect the DC power cord to the DC connector on the rear of the AP.



(5) Align the mounting posts on the bottom of the AP with the mounting holes on the mounting bracket. Slide the AP onto the mounting bracket until it clicks in place.

Caution

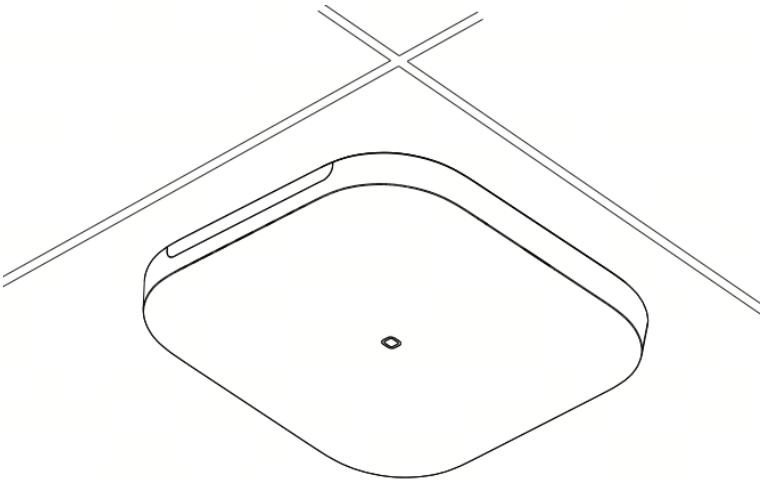
- Connect the Ethernet cables properly before sliding the AP onto the mounting bracket.
- The mounting posts on the bottom of the AP must be aligned with and slid into the mounting holes on the mounting bracket during installation. Do not press the mounting posts into the mounting holes by force.
- After installation, check whether the AP is secured properly in case it falls down.



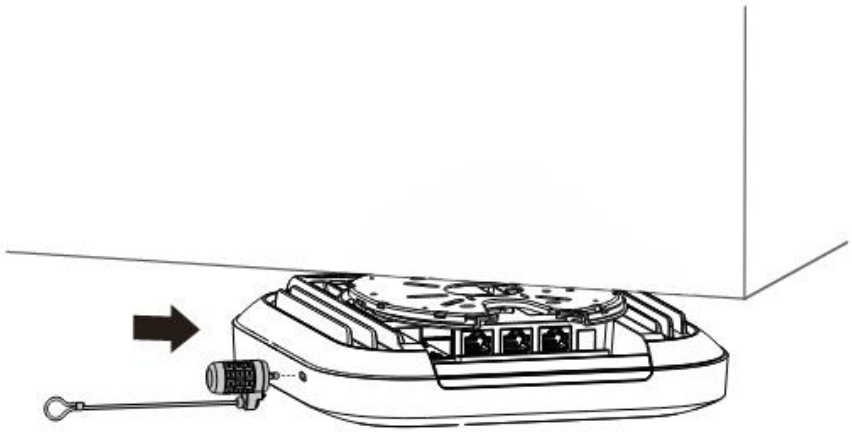
(6) The installation is complete.

Caution

After the AP is installed, remove the protective film from its surface to ensure proper heat dissipation.



(7) (Optional) Install a Kensington lock into the Kensington lock slot. The Kensington lock is customer-supplied.

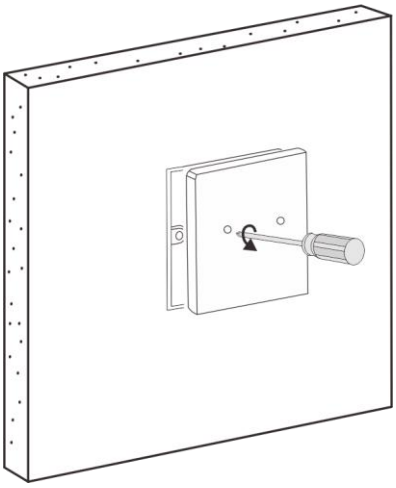


3.3.4 Junction Box Mount

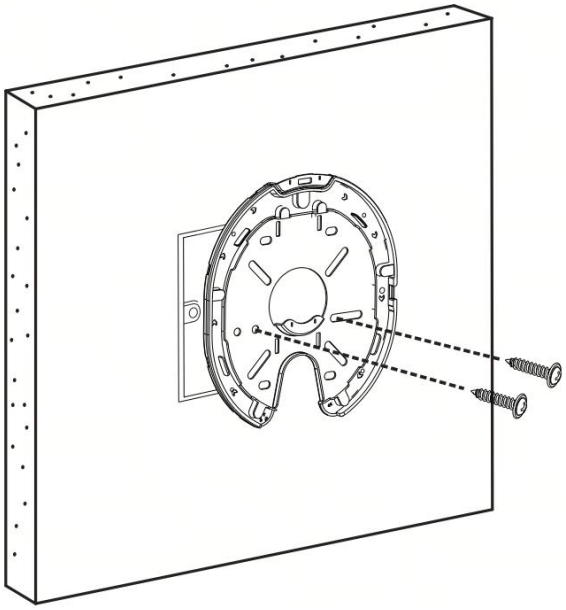
Note

- Take 86-mm junction box mount as an example. For details about other junction boxes, see Table 3-2 Mounting Holes and Scenarios.
- After installation, check whether the AP is secured properly in case it falls down.

(1) Remove the panel of the 86-mm junction box.

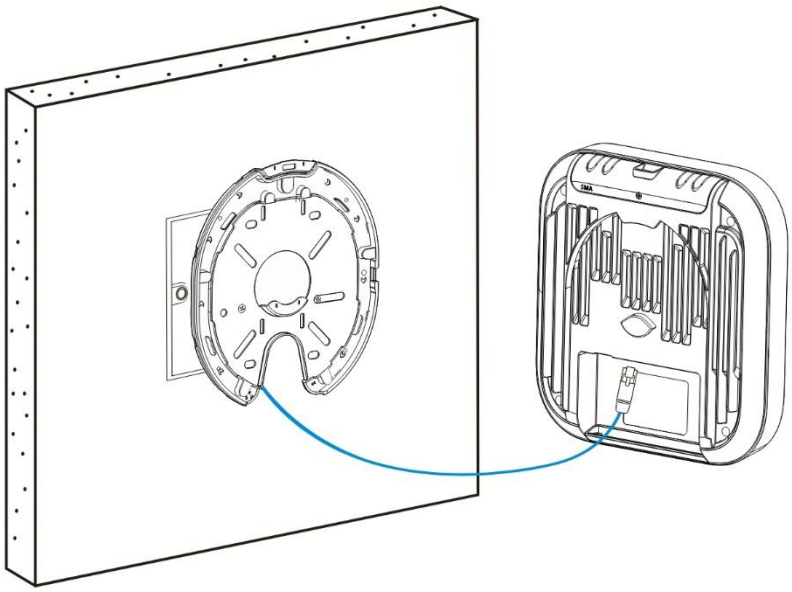


(2) Align the mounting holes on the mounting bracket over the screw holes on the 86-mm junction box. Secure the mounting bracket to the 86-mm junction box using ST4.2 x 25 mm Phillips tapping screws.

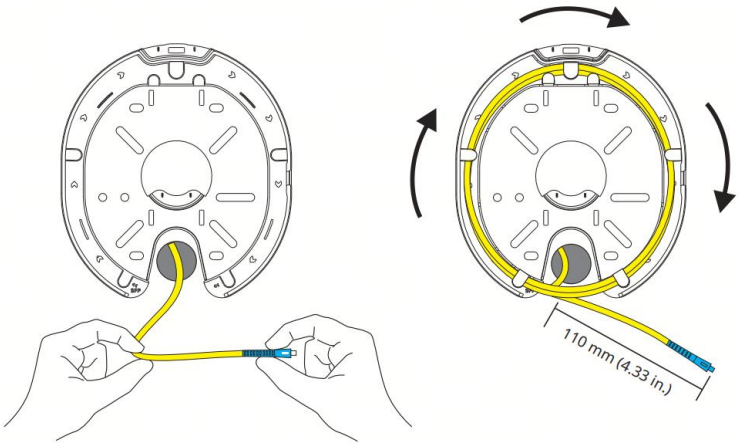


(3) Connect the cables to the ports on the AP based on your networking requirements.

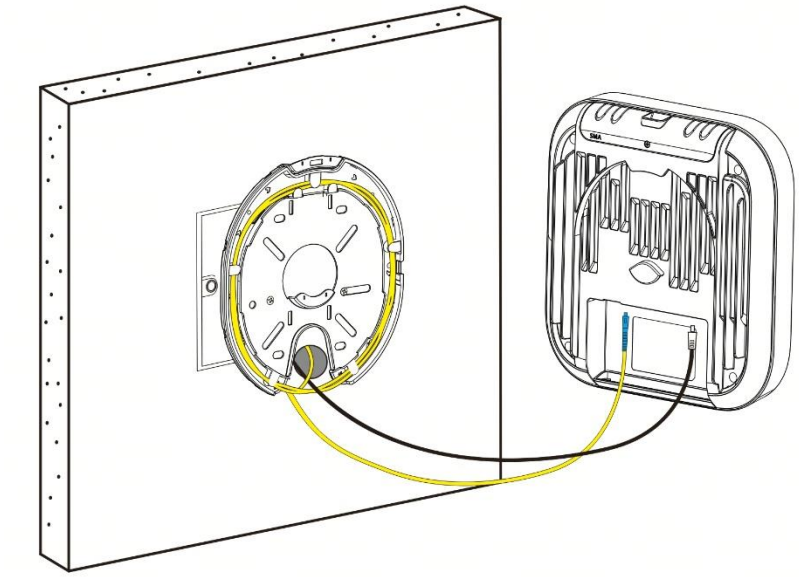
- Ethernet cable: Connect the Ethernet cable to the RJ45 port (WAN 10G/PoE or LAN/2.5G) on the rear of the AP. WAN 10G/PoE port supports PoE input.



- Optical cable: Connect the optical fiber to the 10GE SFP+ port on the rear of the AP. Leave a 110-mm (4.33-in.) fiber slack at the fiber connector. Coil the optical fiber in the fiber management trough on the rear of the AP.



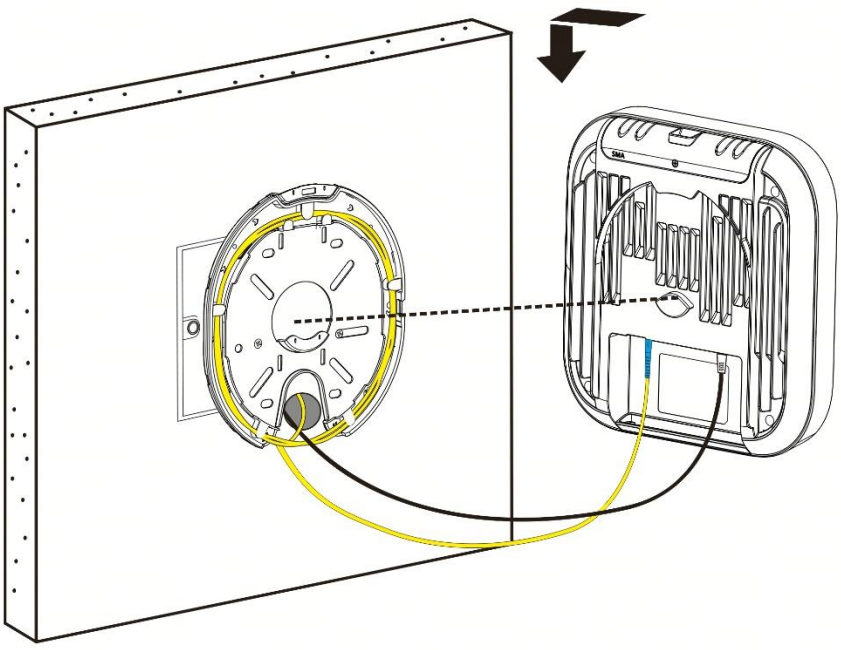
- DC power cord: Connect the DC power cord to the DC connector on the rear of the AP.



(4) Align the mounting posts on the bottom of the AP with the mounting holes on the mounting bracket. Slide the AP onto the mounting bracket until it clicks in place.

Caution

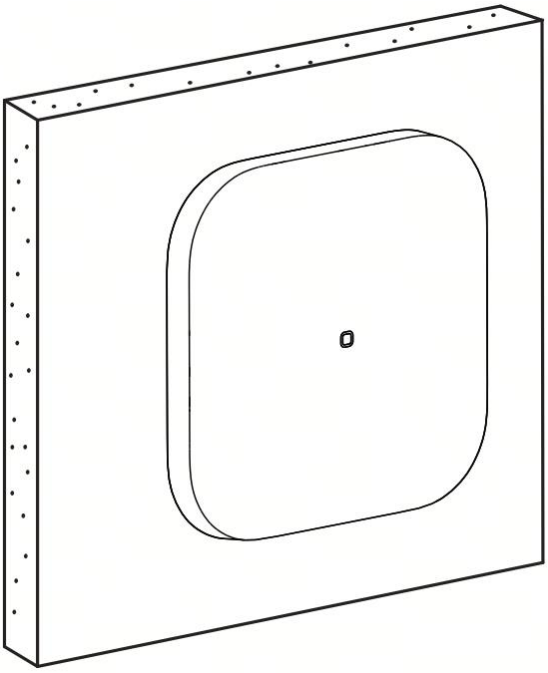
- Connect the Ethernet cables properly before sliding the AP onto the mounting bracket.
- The mounting posts on the bottom of the AP must be aligned with and slid into the mounting holes on the mounting bracket during installation. Do not press the mounting posts into the mounting holes by force.
- After installation, check whether the AP is secured properly in case it falls down.



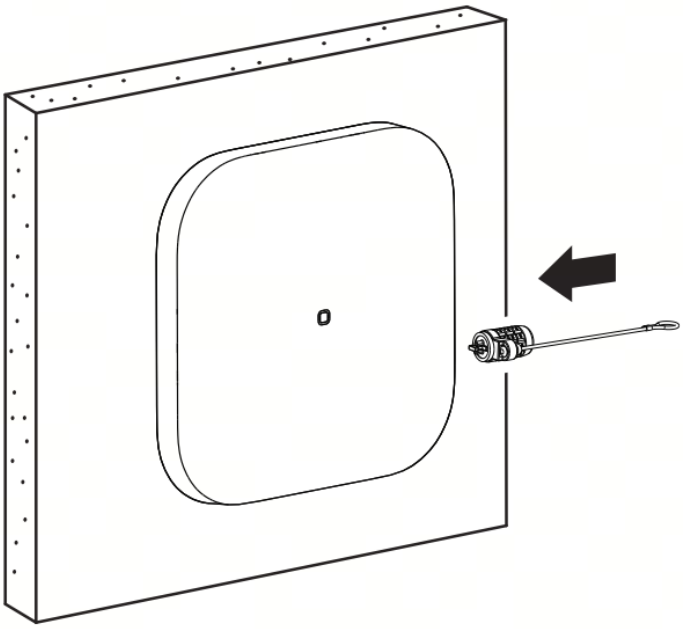
(5) The installation is complete.

Caution

After the AP is installed, remove the protective film from its surface to ensure proper heat dissipation.



(6) (Optional) Install a Kensington lock into the Kensington lock slot. The Kensington lock is customer-supplied.



3.3.5 (Optional) Rail Mount

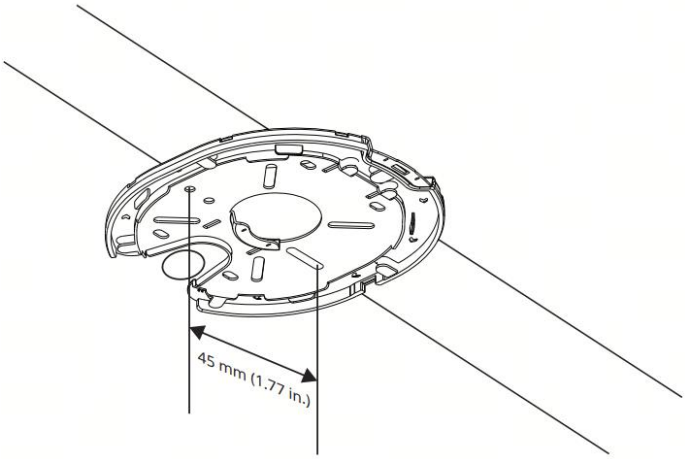
Caution

- The accessories for rail mount are customer-supplied.
- The mounting bracket can be installed in four orientations. Install the AP in one orientation based on the cable routing.

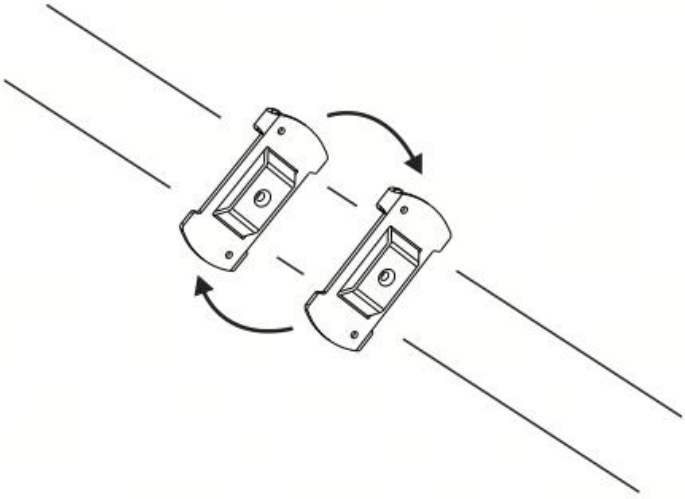
- After installation, check whether the AP is secured properly in case it falls down.

(1) Drill holes on the rail using the alignment sticker.

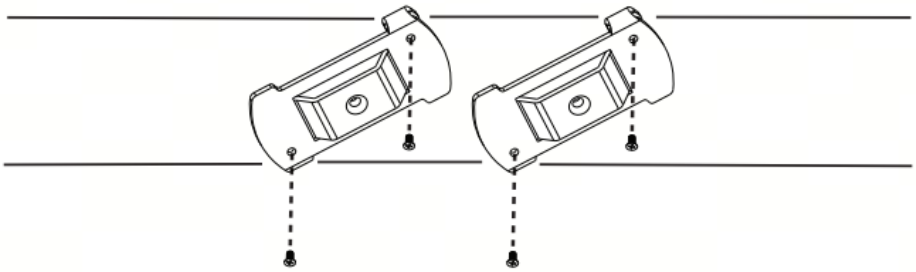
- Mounting holes: Center-to-center spacing of 45 mm (1.77 in.), hole diameter of 6.35 mm (0.25 in.).
- Cable threading holes: Hole diameter of 30 mm (1.18 in.).



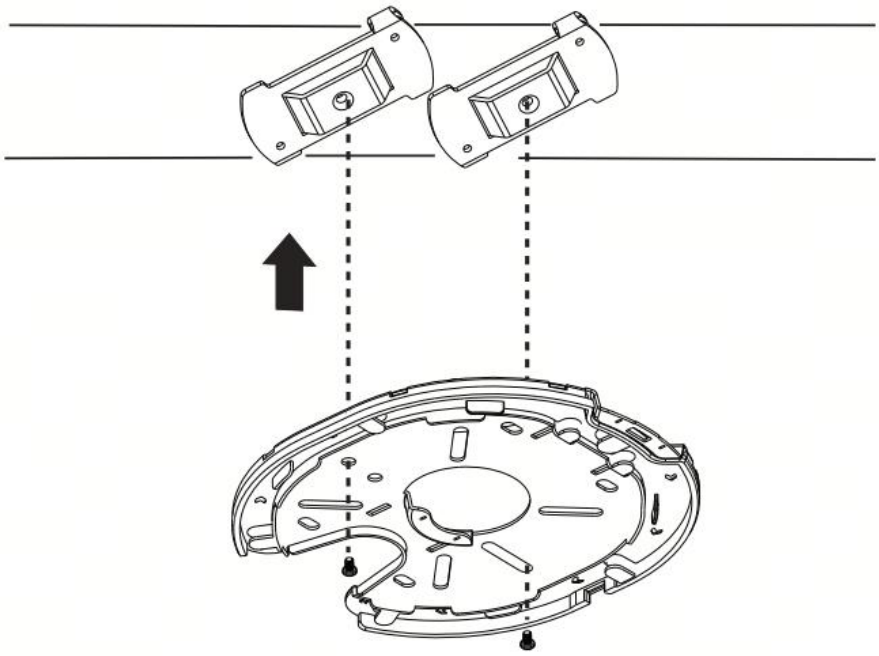
(2) Position two ceiling grid clips at 90° to the rail. Rotate the ceiling grid clips in the orientation shown until they are properly attached to the rail.



(3) Secure the ceiling grid clips to the rail using the screws.

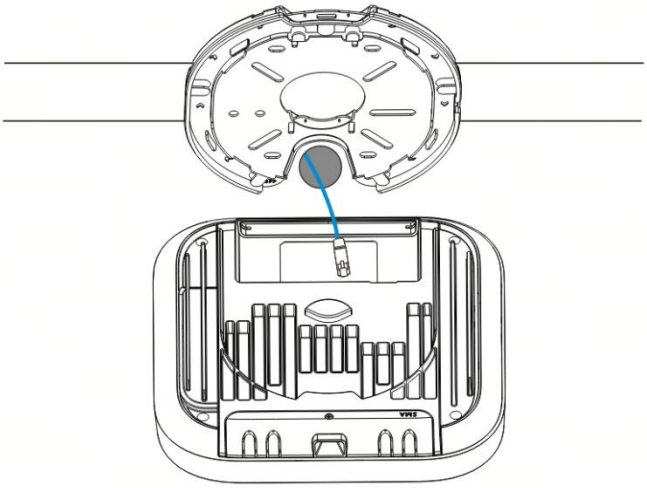


(4) Secure the mounting bracket to the ceiling grid clips using M4 x 6 mm machine screws.

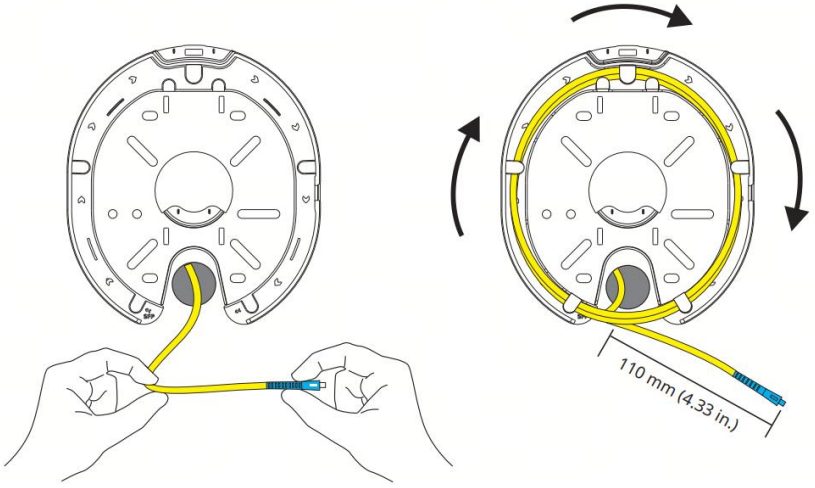


(5) Connect the cables to the ports on the AP based on your networking requirements.

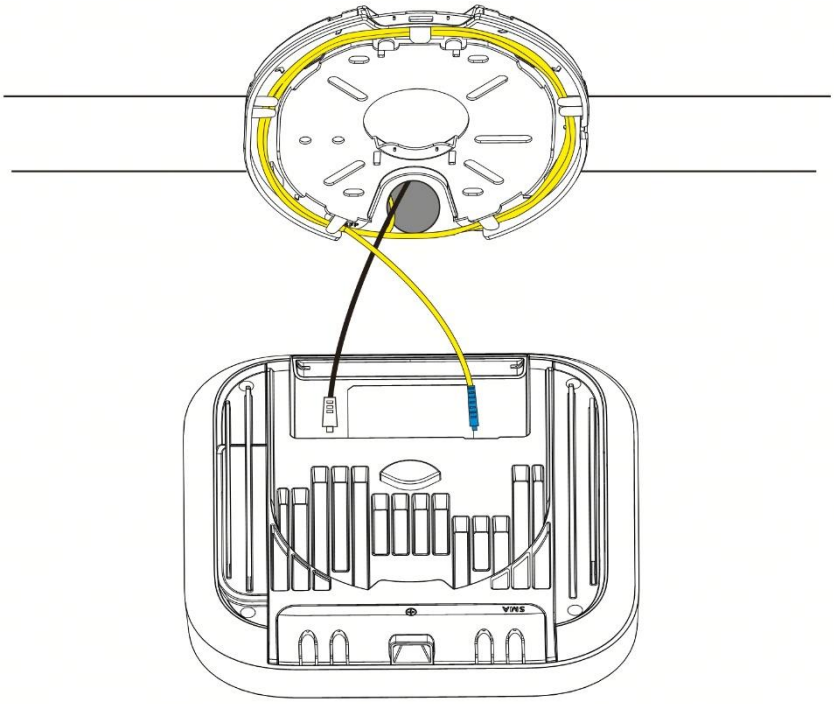
- Ethernet cable: Connect the Ethernet cable to the RJ45 port (WAN 10G/PoE or LAN/2.5G) on the rear of the AP. WAN 10G/PoE port supports PoE input.



- Optical cable: Connect the optical fiber to the 10GE SFP+ port on the rear of the AP. Leave a 110-mm (4.33-in.) fiber slack at the fiber connector. Coil the optical fiber in the fiber management trough on the rear of the AP.



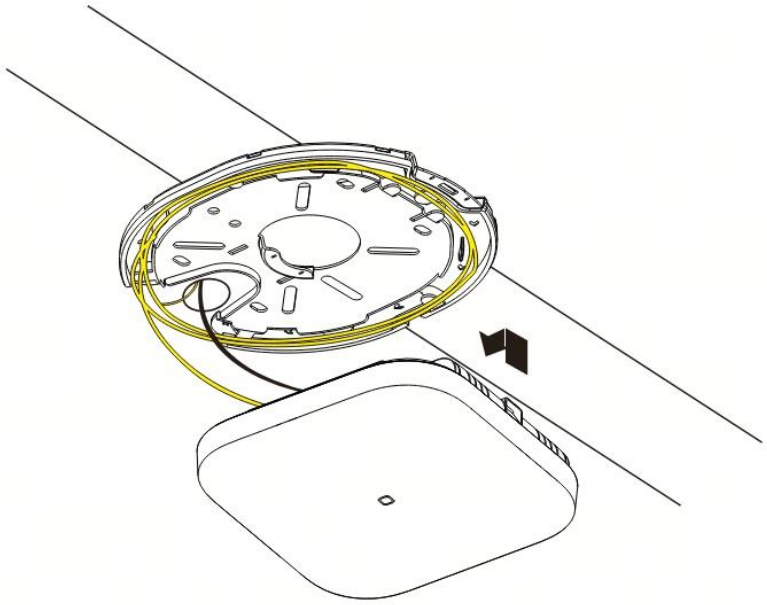
- DC power cord: Connect the DC power cord to the DC connector on the rear of the AP.



(6) Align the mounting posts on the bottom of the AP with the mounting holes on the mounting bracket. Slide the AP onto the mounting bracket until it clicks in place.

Caution

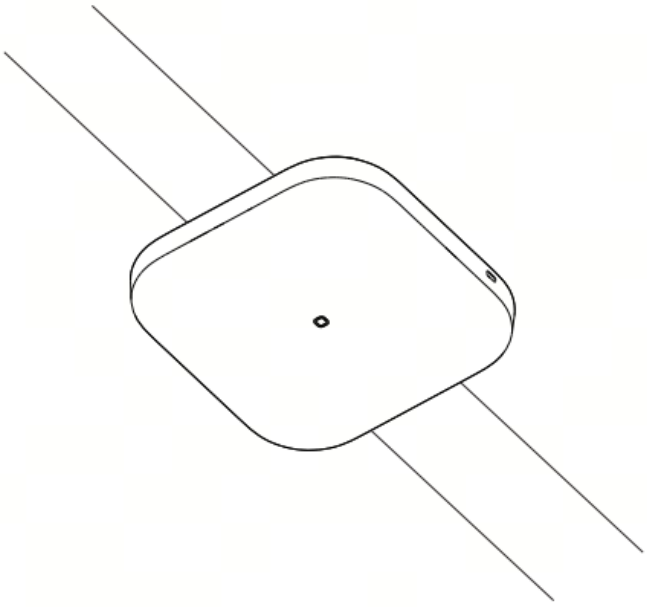
- Connect the Ethernet cables properly before sliding the AP onto the mounting bracket.
- The mounting posts on the bottom of the AP must be aligned with and slid into the mounting holes on the mounting bracket during installation. Do not press the mounting posts into the mounting holes by force.
- After installation, check whether the AP is secured properly in case it falls down.



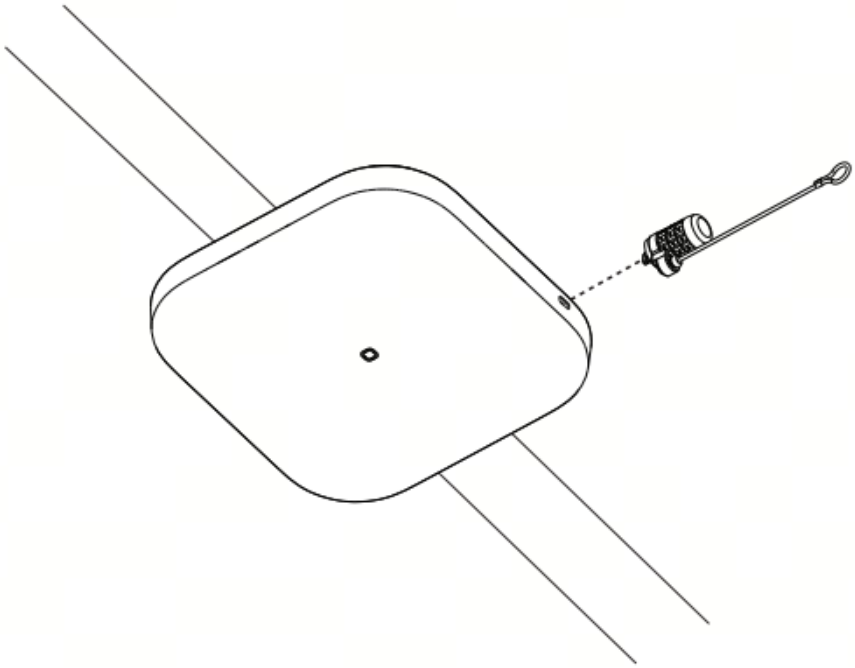
(7) The installation is complete.

Caution

After the AP is installed, remove the protective film from its surface to ensure proper heat dissipation.



(8) (Optional) Install a Kensington lock into the Kensington lock slot. The Kensington lock is customer-supplied.



3.3.6 (Optional) Gypsum Board Mount

Caution

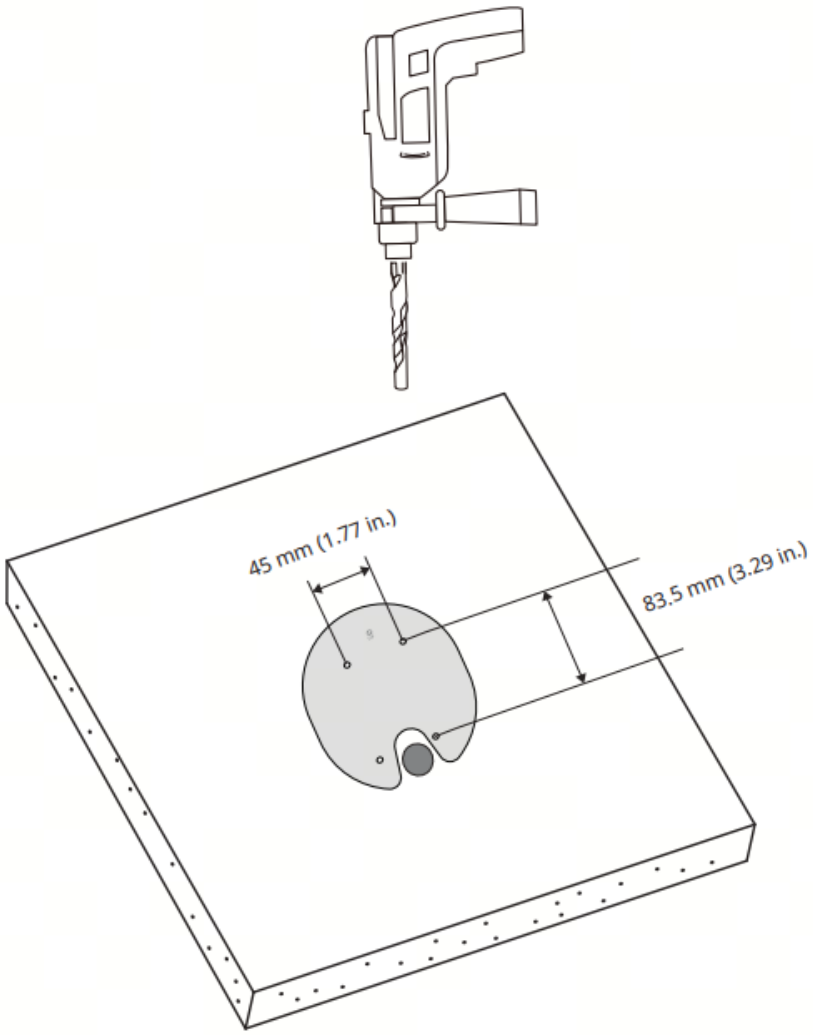
- The accessories for gypsum board mount are customer-supplied.
- The mounting bracket can be installed in four orientations. Install the AP in one orientation based on the cable routing.
- After installation, check whether the AP is secured properly in case it falls down.

(1) Drill holes on the gypsum board using the alignment sticker.

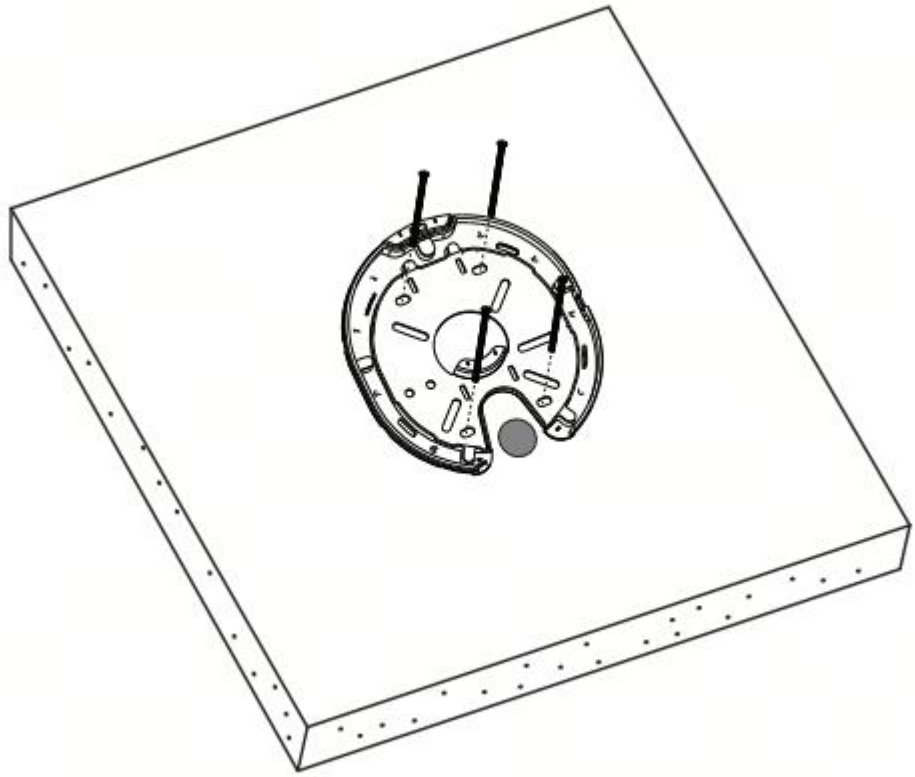
- Mounting holes: Center-to-center spacing of 45 mm (1.77 in.), hole diameter of 6.35 mm (0.25 in.).
- Cable threading holes: Hole diameter of 30 mm (1.18 in.).

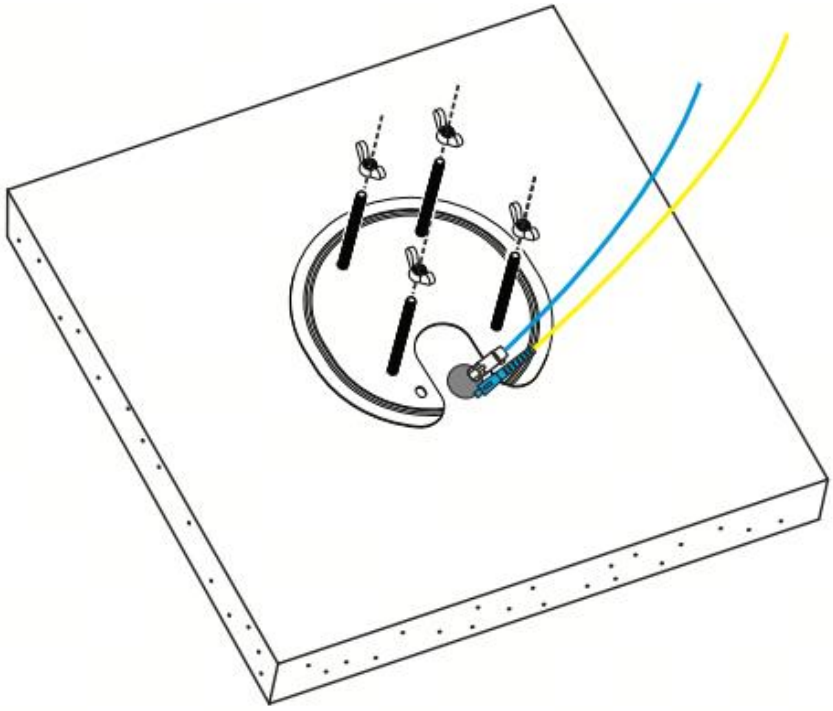
Caution

After the holes is drilled, peel the alignment sticker off the gypsum board.



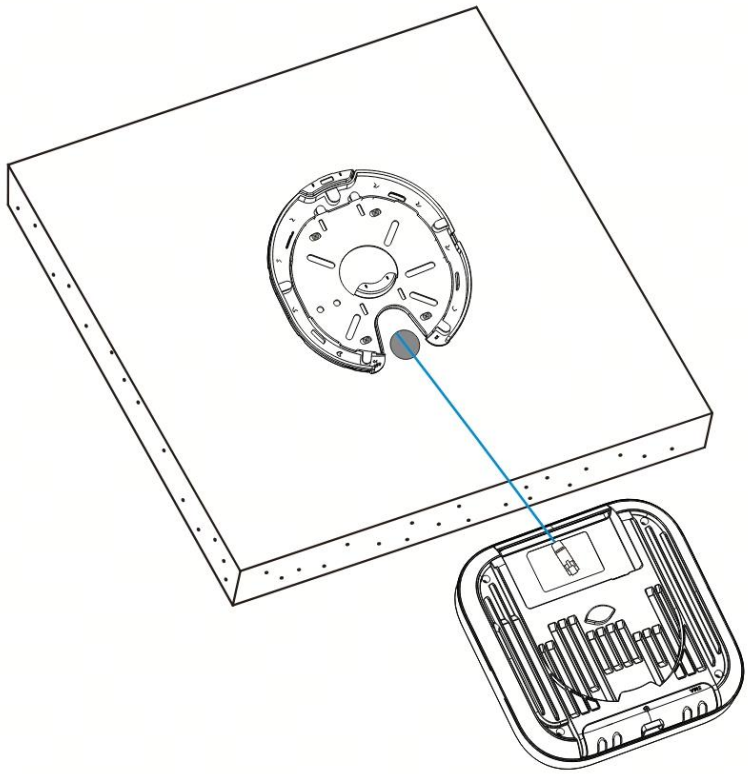
(2) Attach the mounting bracket to the gypsum board. Insert M4 x 40 mm machine screws into the holes. Secure the mounting bracket to the gypsum board using wing nuts.



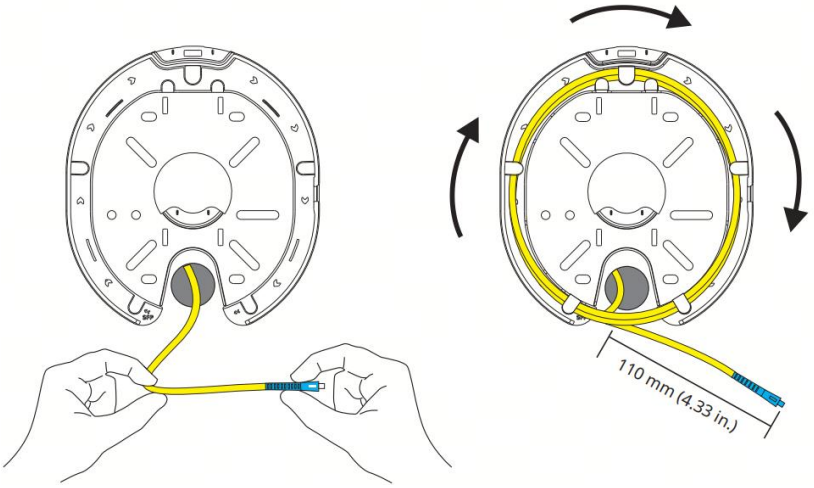


(3) Connect the cables to the ports on the AP based on your networking requirements.

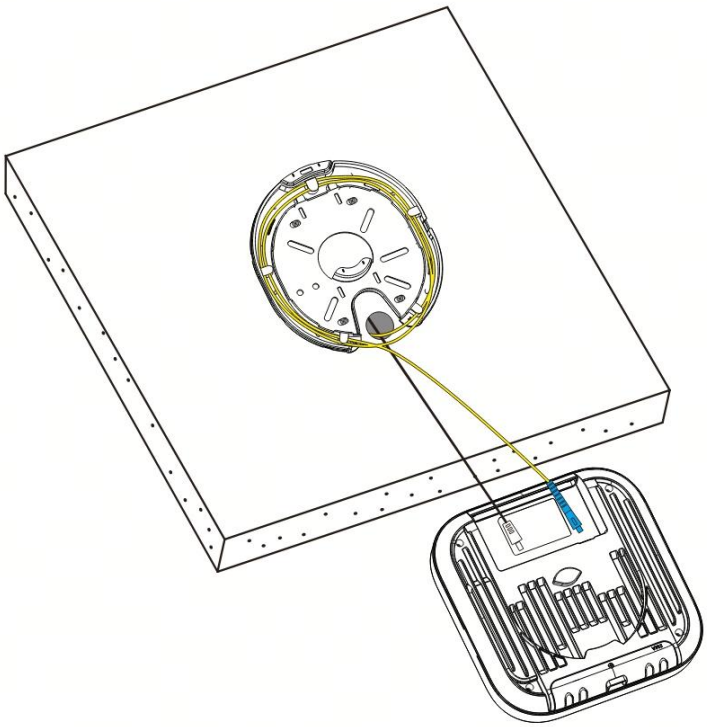
- Ethernet cable: Connect the Ethernet cable to the RJ45 port (WAN 10G/PoE or LAN/2.5G) on the rear of the AP. WAN 10G/PoE port supports PoE input.



- Optical cable: Connect the optical fiber to the 10GE SFP+ port on the rear of the AP. Leave a 110-mm (4.33-in.) fiber slack at the fiber connector. Coil the optical fiber in the fiber management trough on the rear of the AP.



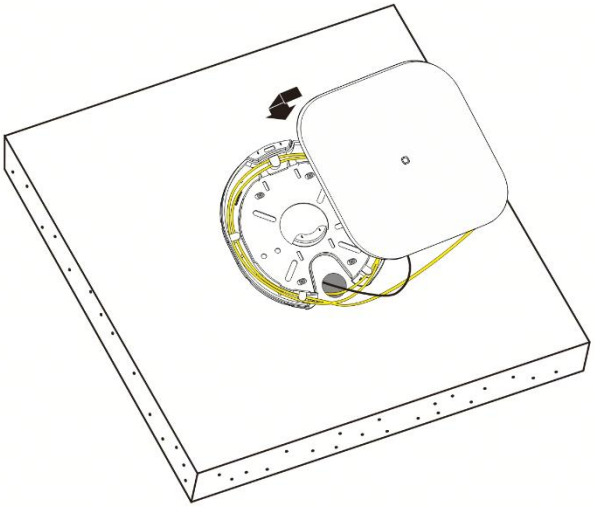
- DC power cord: Connect the DC power cord to the DC connector on the rear of the AP.



(4) Align the mounting posts on the bottom of the AP with the mounting holes on the mounting bracket. Slide the AP onto the mounting bracket until it clicks in place.

Caution

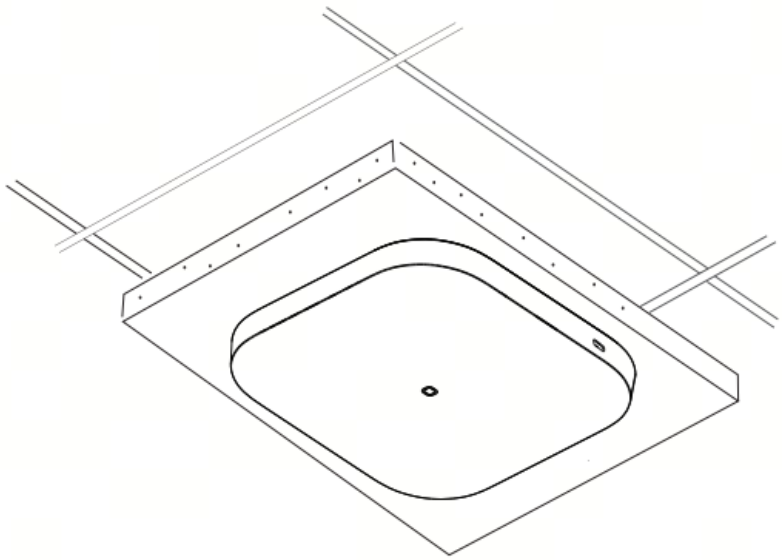
- Connect the Ethernet cables properly before sliding the AP onto the mounting bracket.
- The mounting posts on the bottom of the AP must be aligned with and slid into the mounting holes on the mounting bracket during installation. Do not press the mounting posts into the mounting holes by force.
- After installation, check whether the AP is secured properly in case it falls down.



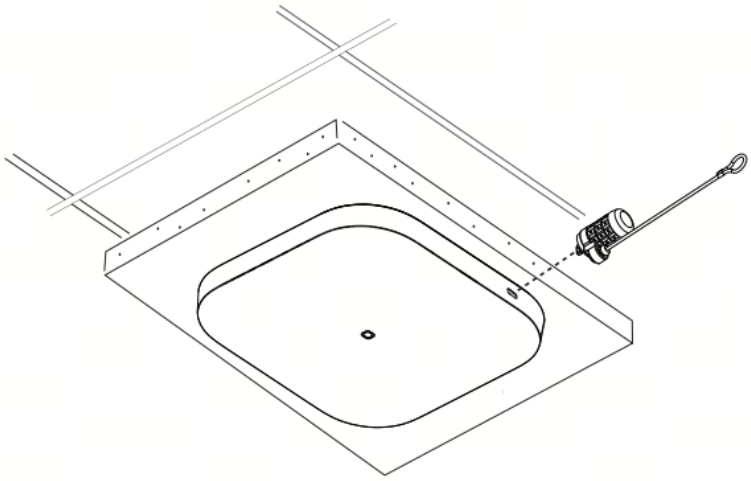
(5) Mount the gypsum board to the ceiling. The installation is complete.

Caution

After the AP is installed, remove the protective film from its surface to ensure proper heat dissipation.

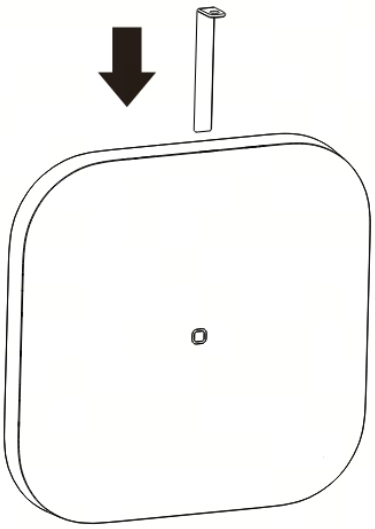


(6) (Optional) Install a Kensington lock into the Kensington lock slot. The Kensington lock is customer-supplied.

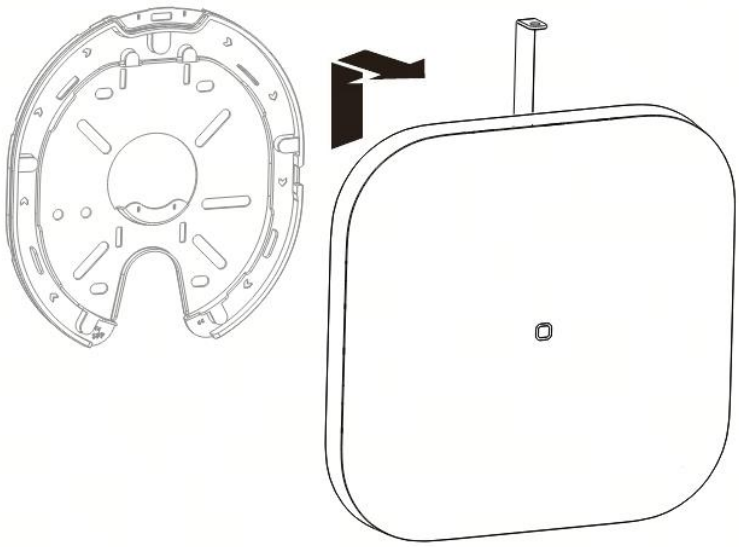


3.4 Removing the Access Point

(1) Insert the key to security lock into the square hole on the top of the AP.

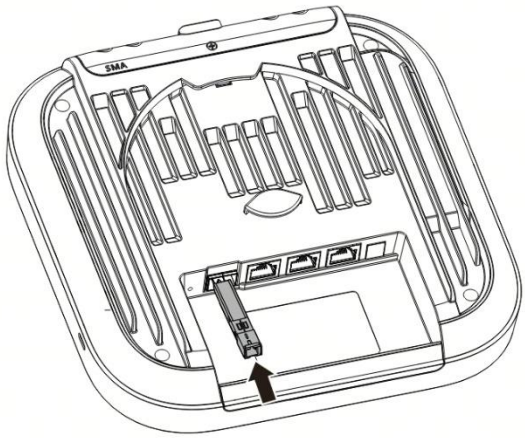


(2) Remove the AP from the mounting bracket in the orientation indicated by the arrow



3.5 Installing an Optical Transceiver

Insert an optical transceiver into the 10GE SFP+ port as required.



3.6 (Optional) Connecting the Console Cable

By default, the baud rate is set to 9,600, data bit to 8, stop bit to 1, with no parity check and no flow control on the console port of the AP. Use the RJ45 cable to connect the AP to a laptop or a serial terminal for direct management. The console port is used only when you want to configure the AP manually.

3.7 (Optional) Connecting the External Antenna

The AP provides four external antenna connectors: ANT1(5G), ANT2(5G), ANT3(5G), and ANT4(5G).

Caution

- External antennas must be installed by qualified personnel. Ruijie-certified antennas are recommended.
- The EIRP of all external antennas must comply with local regulations.

3.8 Bundling Cables

Precautions

- The bundles of cables should be tidy and neat.
- Make sure that the cables at the connectors have natural bends or bends of large radius.
- Do not overtighten the cable bundle as it may reduce the cable life and performance.

Steps

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

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

(3) Extend the twisted pair cables under the AP and route them in a straight line.

3.9 Checklist After Installation

3.9.1 Checking the Access Point

- Verify that the external power supply matches with the AP.

- Verify that the AP is properly secured.

3.9.2 Checking Cable Connections

- Verify that the cables match with the port types.
- Verify that the cables are properly bundled.

3.9.3 Checking Power Supply

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

4 Commissioning

4.1 Setting Up the Configuration Environment

The AP can be powered by PoE. When setting up the environment, pay attention to the following:

- When the AP is powered by PoE, ensure that the power supply functions properly and meets safety requirements.
- Use a twisted pair cable to connect the AP that is powered properly to the AC.
- When the AP is connected with a PC, verify that the PC and PoE switch are properly grounded.

4.2 Powering On the Device

4.2.1 Checklist Before Power-on

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

4.2.2 Checklist After Power-on

After power-on, you are advised to check the following to ensure the normal operation of the AP:

- There are system logs printed on the configuration interface of the device.
- The LED status is normal.

4.3 Troubleshooting Power Failures

You can determine whether the power system of the AP is faulty based on the LED on the front panel. For the LED status description, see Table 1-3 LED. If an exception occurs, check the following:

- Verify that the AP is properly powered.
- Verify that the cables are correctly connected.

Note

If the issue persists, contact your local distributor or technical support.

5 Monitoring and Maintenance

5.1 Monitoring

5.1.1 LED

When the AP is operating, monitor the system status by observing the LED.

5.1.2 CLI Commands

You can run related commands to remotely monitor the device status, including:

- Port configuration and status
- System logs

Note

- For details, see the configuration guide.
- The AP supports remote maintenance.

5.2 Remote Maintenance

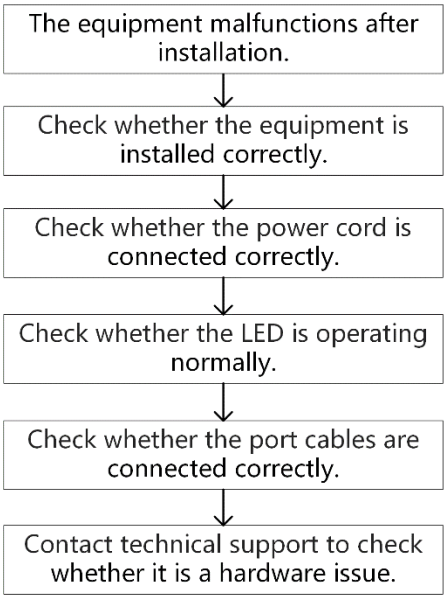
- If the AP works in Cloud mode, you can log in to the AP remotely for maintenance.
- If the AP works in Fit mode, you can use an AC to centrally manage and maintain the AP.

5.3 Hardware Maintenance

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

6 Troubleshooting

6.1 Troubleshooting Flowchart



6.2 Common Faults

6.2.1 Ethernet Port Does Not Work After the Ethernet Cable Is Plugged In

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.

6.2.2 LED Is Off for a Long Time

- If the AP is powered by PoE, check whether the PSE is at least 802.3af-capable, and then check whether the Ethernet cable is connected properly.
- If the AP is powered by DC power supply, check whether the power supply has mains input and works properly.

6.2.3 LED Is Solid Red for a Long Time

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

6.2.4 The LED Blinks Green Quickly for a Long Time

The device performs initialization after power-on. During this period, the LED blinks green quickly. The LED does not turn solid blue until the initialization is completed.

Caution

If the LED keeps blinking green quickly for an hour, it indicates the device initialization has failed and the device is faulty.

6.2.5 The LED Blinks Blue Quickly for a Long Time (Fit AP Mode)

The device may perform software upgrade after power-on. During this period, the LED blinks blue quickly. The LED does not turn solid blue until the upgrade is completed.

Caution

Do not plug or unplug the power cord when the status LED is blinking, as software upgrade takes an indeterminate amount of time. If the LED keeps blinking blue quickly for 10 minutes, it indicates that the device has failed to complete the software upgrade, and the device is faulty.

6.2.6 The LED Is Solid Red with Brief Off Periods

After the system has started up, if the LED is solid red with brief off periods, this indicates that the AP and AC have not established CAPWAP communication. Ensure that the AC is powered and the network configuration is correct.

6.2.7 A Client Fails to Detect the Wireless Signal

(1) Check whether the AP is properly powered.

(2) Check whether the Ethernet port is properly connected.

(3) Check whether the AP is correctly configured.

(4) Move the client closer to the AP.

7 Appendix

7.1 Connectors and Media

7.1.1 10/100/1000/2.5G/5G/10GBASE-T Port

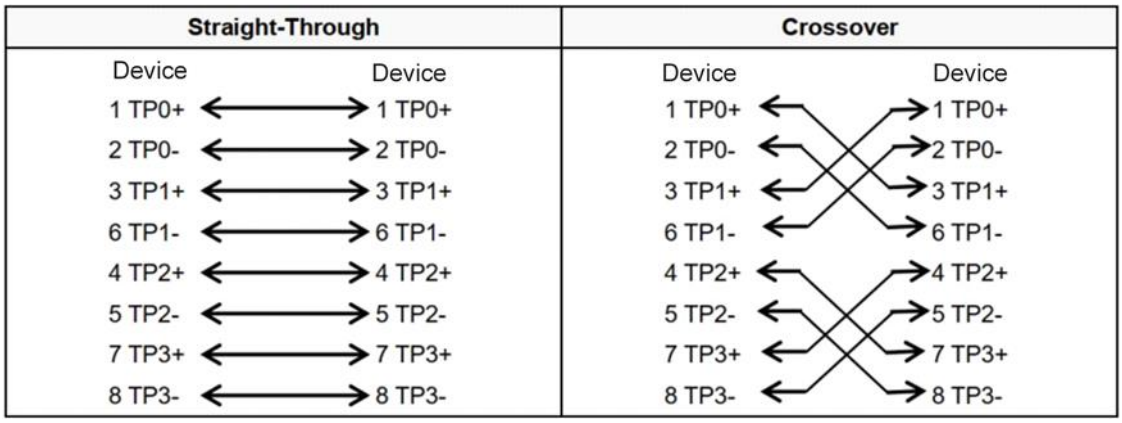
The 10/100/1000/2.5G/5G/10GBASE-T port supports six rates, and is an auto-negotiation port that supports auto MDI/MDIX Crossover.

Compliant with IEEE 802.3bz, the 2.5/5G/10GBASE-T port requires a 100-ohm Category 5e UTP or STP cables with a maximum distance of 100 meters (328.08 feet). Category 6, 6A, 7 or higher STP cables are recommended.

Compliant with IEEE 802.3ab, the 1000BASE-T port requires 100-ohm Category (CAT) 5/5e Unshielded Twisted Paired (UTP) or Shielded Twisted Pair (STP) with a maximum distance of 100 meters (328.08 ft.).

The 1000/2.5G/5G/10GBASE-T Ethernet port requires four pairs of wires for data transmission. The following figure shows twisted pair connections of the 1000/2.5G/5GBASE-T Ethernet port.

Figure 7-1 1000/2.5G/5G/10GBASE-T Twisted Pair Connections



The 100BASE-TX/10BASE-T port can also be connected by cables of the preceding specifications. Besides, the 10BASE-T port can be connected by 100-ohm Category 3, Category 4, and Category 5 cables with a maximum distance of 100 meters (328.08 feet). The 100BASE-TX port can be connected by 100-ohm Category 5 cables with a maximum distance of 100 meters (328.08 feet). The following table lists 100BASE-TX/10BASE-T pin assignments.

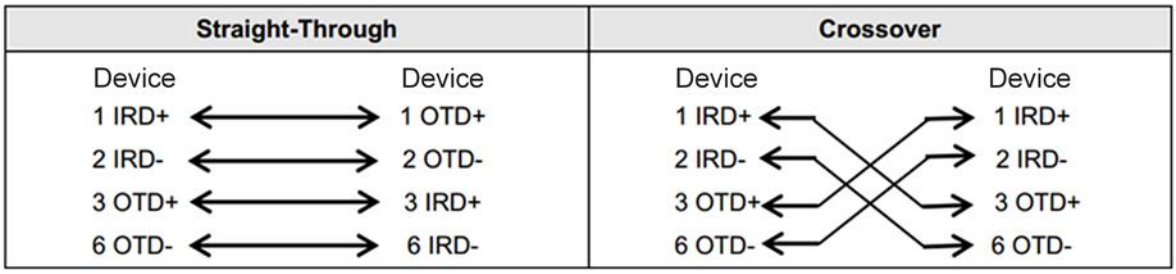
Table 7-1 100BASE-TX/10BASE-T Pin Assignments

Pin	Socket	Plug
1	Input Receive Data+	Output Transmit Data+
2	Input Receive Data-	Output Transmit Data-
3	Output Transmit Data+	Input Receive Data+
6	Output Transmit Data-	Input Receive Data-

Pin	Socket	Plug
4, 5, 7, 8	Not Used	Not Used

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

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



7.1.2 10/100/1000/2.5GBASE-T Port

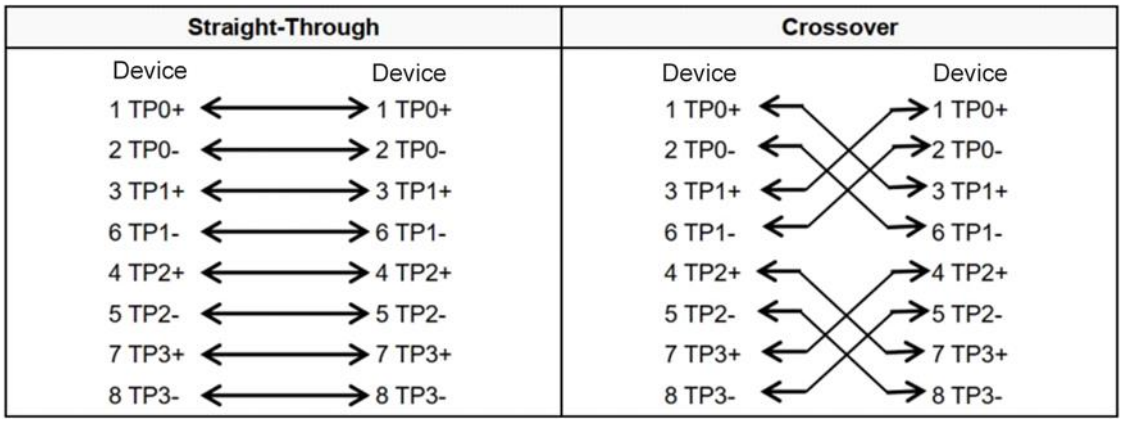
The 10/100/1000/2.5GBASE-T port supports four rates, and is an auto-negotiation port that supports auto MDI/MDIX Crossover.

Compliant with IEEE 802.3bz, the 2.5GBASE-T port requires a 100-ohm Category 5e UTP or STP cables with a maximum distance of 100 meters (328.08 feet). Category 6, 6A, 7 or higher STP cables are recommended.

Compliant with IEEE 802.3ab, the 1000BASE-T port requires 100-ohm Category (CAT) 5/5e Unshielded Twisted Paired (UTP) or Shielded Twisted Pair (STP) with a maximum distance of 100 meters (328.08 ft.).

The 1000/2.5GBASE-T Ethernet port requires four pairs of wires for data transmission. The following figure shows twisted pair connections of the 1000/2.5G/5GBASE-T Ethernet port.

Figure 7-3 1000/2.5GBASE-T Twisted Pair Connections



The 100BASE-TX/10BASE-T port can also be connected by cables of the preceding specifications. Besides, the 10BASE-T port can be connected by 100-ohm Category 3, Category 4, and Category 5 cables with a maximum distance of 100 meters (328.08 feet). The 100BASE-TX port can be connected by 100-ohm Category 5 cables

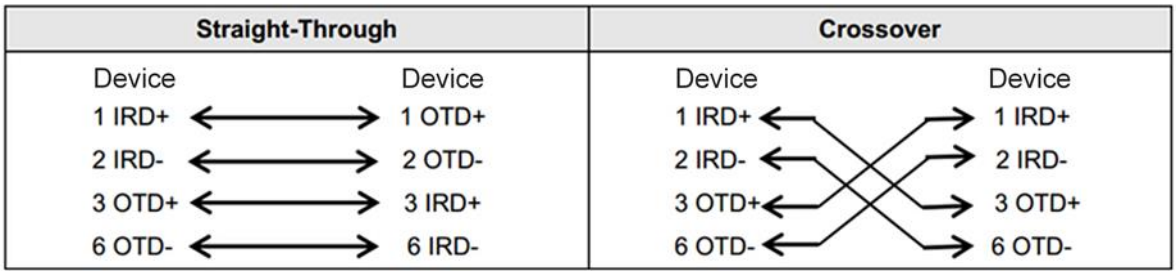
with a maximum distance of 100 meters (328.08 feet). The following table lists 100BASE-TX/10BASE-T pin assignments.

Table 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 pairs for a 100BASE-TX/10BASE-T port.

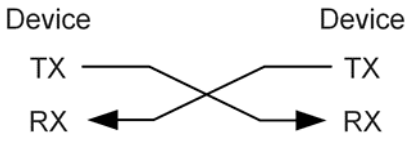
Figure 7-4 100BASE-TX/10BASE-T Twisted Pair Connections



7.1.3 Optical Cable Connection

For the optical ports, select single-mode or multimode fiber-optic cables for connections according to the optical module connected. Figure 7-5 shows the connection schematic diagram.

Figure 7-5 Fiber-Optic Cable Connections



7.2 Optical Transceivers and Specifications

We provide appropriate optical modules according to the port types. You can select the module to suit your specific needs. The optical module types and corresponding specifications are provided for reference.

Table 7-3 Models and Technical Specifications of SFP Transceivers

Model.	Speed	Wavelength (nm)	DDM	Transmit Power (dBm)		Receive Power (dBm)	
				Min.	Max.	Min.	Max.
GE-SFP-LH40-SM1310-BIDI	1G	TX1310/RX1550	Supported	-5.0	0.0	-23.0	-3.0
GE-SFP-LH40-SM1550-BIDI	1G	TX1550/RX1310	Supported	-5.0	0.0	-23.0	-3.0
MINI-GBIC-LH40-SM1310	1G	1310nm	Supported	-5.0	0.0	-23.0	-3.0
MINI-GBIC-LX-SM1310	1G	1310nm	Supported	-11.0	-3.0	-19.0	-3.0
MINI-GBIC-SX-MM850	1G	850nm	Supported	-9.5	0.0	-17.0	0.0
MINI-GBIC-ZX80-SM1550	1G	1550 nm	Supported	-2.0	5.0	-23.0	-3.0
CO-GE-SFP-LX-SM1310	1G	1310nm	Not supported	-11.0	-3.0	-19.0	0.0
2.5G-SFP-LX03-SM1310-BIDI-I	2.5G	TX1310/RX1550	Supported	-9.0	-3.0	-16.0	-3.0
2.5G-SFP-LX03-SM1550-BIDI-I	2.5G	TX1550/RX1310	Supported	-9.0	-3.0	-16.0	-3.0
XG-SFP-LR-SM1310	10G	1310nm	Supported	-8.2	0.5	-14.4	0.5
XG-SFP-SR-MM850	10G	850nm	Supported	-7.3	-1	-9.9	-1
CO-XG-SFP-LR-SM1310	10G	1310nm	Supported	-8.2	0.5	-14.4	0.5
CO-XG-SFP-SR-MM850	10G	850nm	Supported	-7.3	-1	-9.9	-1

Note

Only partial transceiver models are listed. For more supported models, contact Ruijie pre-sales engineers.

Table 7-4 SFP Module Cabling Specifications

Model	Connector Type	Fiber Type	Core Size (μm)	Max. Cabling Distance
GE-SFP-LH40-SM1310-BIDI	LC	SMF(G.652)	9/125um	40km
GE-SFP-LH40-SM1550-BIDI	LC	SMF(G.652)	9/125um	40km
MINI-GBIC-LH40-SM1310	Dual LC	SMF(G.652)	9/125um	40km
MINI-GBIC-LX-SM1310	Dual LC	SMF(G.652)	9/125um	10km
MINI-GBIC-SX-MM850	Dual LC	MMF(OM3/OM4)	50/125um	550m
MINI-GBIC-ZX80-SM1550	Dual LC	SMF(G.652)	9/125um	80km
CO-GE-SFP-LX-SM1310	Dual LC	SMF(G.652)	9/125um	10km
2.5G-SFP-LX03-SM1310-BIDI-I	LC	SMF(G.652)	9/125um	3km
2.5G-SFP-LX03-SM1550-BIDI-I	LC	SMF(G.652)	9/125um	3km
XG-SFP-LR-SM1310	Dual LC	SMF(G.652)	9/125um	10km
XG-SFP-SR-MM850	Dual LC	MMF(OM3/OM4)	50/125um	300m
CO-XG-SFP-LR-SM1310	Dual LC	SMF(G.652)	9/125um	10km
CO-XG-SFP-SR-MM850	Dual LC	MMF(OM3/OM4)	50/125um	300m

Caution

- For optical transceivers with a cabling distance of over 40 km/24.85 miles (including 40 km), install an optical attenuator to avoid overload on the optical receiver when using short-distance single-mode fibers (SMFs).
- An optical transceiver is a laser transmitter. Do not look into the laser beam to avoid burning your eyes.

- To keep an optical transceiver clean and dust-free, make sure that the unused ports remain capped.

Table 7-5 Pairing of BIDI Optical Transceivers

Speed/Distance	Pairing Model
1G/40km	GE-SFP-LH40-SM1310-BIDI GE-SFP-LH40-SM1550-BIDI
2.5G/3km	2.5G-SFP-LX03-SM1310-BIDI-I 2.5G-SFP-LX03-SM1550-BIDI-I

Caution

BIDI optical transceivers must be used in pairs. For example, if a GE-SFP-LH40-SM1310-BIDI optical module is used at one end, a GE-SFP-LH40-SM1550-BIDI optical module must be used at the other end.

7.3 Recommended Cabling

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 are routed beside the cabinet, and top cabling or bottom cabling is adopted according to the actual situation in the equipment room, such as the positions of the DC power distribution box, AC socket, or lightning protection box.

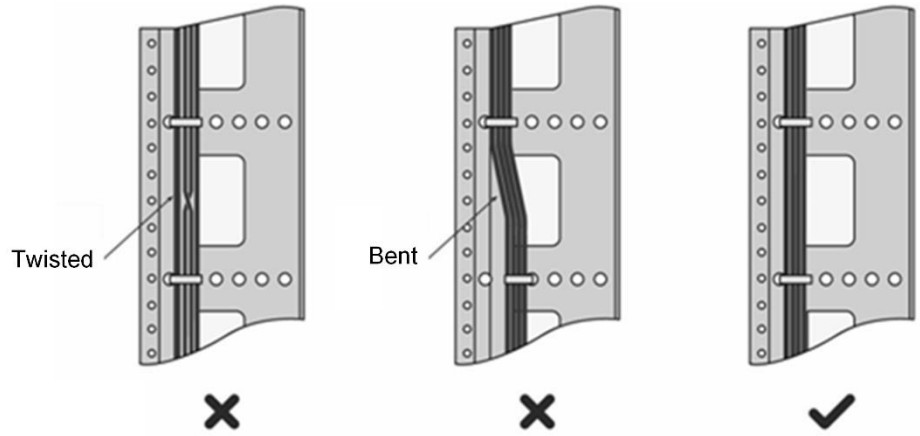
7.3.1 Requirements for the Minimum Bend Radius of Ethernet Cables

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

7.3.2 Precautions for Cable Bundling

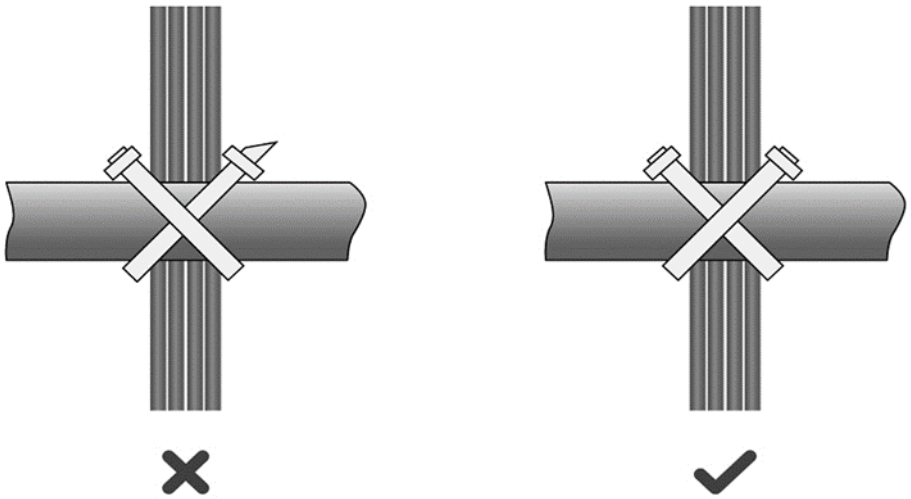
- Before cables are bound, mark labels and stick them to cables wherever appropriate.
- Cables should be neatly and properly bundled in the rack without twisting or bending, as shown in the following figure.

Figure 7-6 Bundling Cables (1)



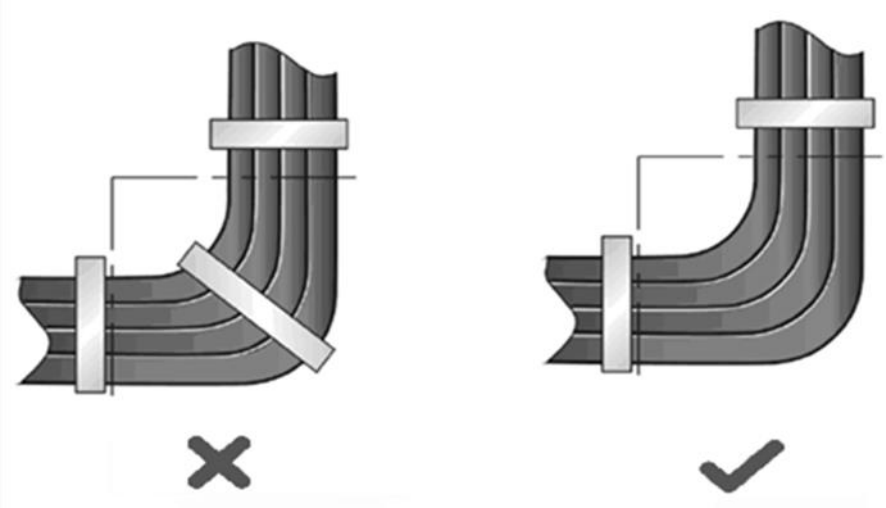
- Route and bundle power, signal, ground cables separately. Mixed bundling is not allowed. When the cables are close to each other, crossover cabling is recommended. In the case of parallel cabling, maintain a minimum distance of 30 mm (1.18 in.) between power cords and signal cables.
- The cable management brackets and cabling troughs inside and outside the rack should be smooth without sharp corners.
- The metal holes traversed by cables should have a smooth and fully rounded surface or an insulated lining.
- Use cable ties to bundle up cables properly. Do not connect two or more cable ties to bundle up cables.
- After bundling up cables with cable ties, cut off the remaining part. The cut should be smooth and trim without sharp corners, as shown in the following figure.

Figure 7-7 Bundling Up Cables (2)



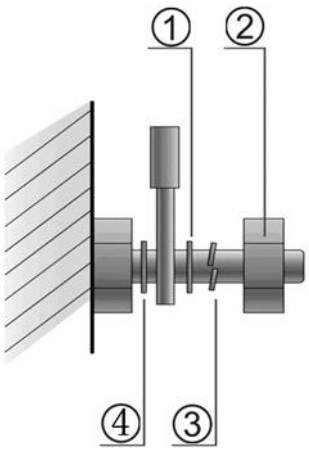
- When cables need to be bent, bind them first, but do not tie cable ties within the bend. Otherwise, stress may be generated on the cables and causes the wires inside to break, as shown in the following figure.

Figure 7-8 Binding Cables



- Cables not to be assembled or remaining parts of cables should be folded and placed in a proper position of the cabinet or cable trough. The proper position refers to a position that does not affect device running or damage the device or cable.
- Do not bind power cords to the guide rails of moving parts.
- The power cords connecting moving parts such as door grounding wires should be reserved with some excess after being assembled to avoid suffering tension or stress. After the moving part is installed, the remaining cable part should not touch heat sources, sharp corners, or sharp edges. If heat sources cannot be avoided, high-temperature cables should be used.
- When using screw threads to secure a cable lug, ensure that the bolt or screw is properly tightened and take measures to prevent it from loosening, as shown in the following figure.

Figure 7-9 Cable Fastening



Note:	1. Flat washer	3. Spring washer
	2. Screw nut	4. Flat washer

- Hard power cords should be secured near the cable termination area to prevent stress on the cable termination area and cables.
- Do not use tapping screws to secure cable lugs.
- Power cords of the same type and in the same cabling direction should be bundled up into bunches, with the cables arranged neatly and straight.
- Bundle up cables by using cable ties.

Cable Bunch Diameter (mm)	Distance Between Every Binding Point (mm)
10	80–150
10–30	150–200
30	200–300

- Do not tie cables or bundles in a knot.
- For terminal blocks (such as air switches) with cord end terminals, the metal part of the cord end terminal should not be exposed outside the terminal block when assembled.