

1 Product Overview

Sundray AP-S800 is an outdoor high-speed wireless access point supporting 802.11a/b/g/n, developed by Sundray. It adopts the 2x2 MIMO technology and supports dual-band of 802.11ac/a/n and 802.11b/g/n and the maximum transmission rate can reach up to 600Mbps. AP-S800 adopts the Gigabit port for uplink, ensuring high-speed wireless transmission. It supports PoE, which makes deployment of AP-S800 much easier.

AP-S800 is designed with the shell of the IP 68 protection level and supports waterproof, dampproof, dustproof, fireproof, and sun protection features. The shell can protect AP-S800 against harsh weather and outdoor environment. This ensures that AP-S800 can work in both damp and cold areas. Additionally, AP-S800 supports point-to-point and point-to-multipoint bridge functions, which boosts the feasibility of outdoor network construction. By working with Sundray network access controller(NAC), AP-S800 makes access experience faster and more secure.

AP-S800 is designed for outdoor environment, such as scenic spots, schools and parks, etc. It provides four N-type external antenna interfaces. Omnidirectional or directional antenna can be selected based on the actual environment.

1.1 Product Appearance

There are one 10/100/1000Mbps Ethernet port supporting PoE and four N-type external antenna interfaces.



Figure1-1 Front Panel



Figure1-2 Side Panel

1.2 Specifications

Model	AP-S800
Hardware specifications	
Weight	2.25Kg
Dimensions (Exclusive of antenna interfaces and accessories)	210mmx210mmx70mm
Ethernet Port	1*10/100/1000Mbps

PoE	48 V/800 mA
Power consumption	< 35W
Antenna	External antenna, two 2.4 GHz N-type connectors and two 5 GHz N-type connectors
Reset/Restore factory settings	None
Status indicator	None
Protection level	IP 68
MTBF	> 250000H
RF specifications	
Tx Power	≤27dBm
Tx Power Range	1dBm~the maximum allowed by local regulations
Maximum transmission speed(single frequency)	2.4 G:300 Mbps 5 G:300 Mbps
Operating frequency band	802.11ac/n/a: 5.725GHz-5.850GHz, 5.15~5.35GHz (China) 802.11b/g/n: 2.4GHz-2.483GHz (China)

2 Preparing for Installation

2.1 Safety Precautions

AP-S800 series products should be installed in an outdoor environment. To ensure that AP is operational and extend its lifetime, it must be installed in a qualified environment.



Caution: To avoid damage to access point and bodily injury, please read and follow the safety precautions before installation of the AP-S800 series products. Please install the AP-S800 series products under the instructions of technical support representative.

2.1.1 Installation Site Selection

- ✓ Keep the AP away from places that are susceptible to high temperature, harmful gases, inflammable, explosive, electromagnetic interference (from radar station, transmitter station or substation), unstable voltage, violent shake, or loud noise, or places that are near source of pollutions.
- ✓ The product should be installed in the environment without any water leakage, dripping or dew.
- ✓ In engineering design, the site should be selected according to telecommunication network plan and technical requirements for telecommunication devices, and the following factors should be taken into account: hydrology, geology, occurrence odds of earthquake, electric power and transportation, etc.

2.1.2 Temperature and Humidity Requirements

The requirements for temperature and humidity are listed below:

Item	Description
Operating temperature	-40°C~65°C
Storage temperature	-40°C~65°C

Operating humidity	0%~100% (non-condensing)
Storage humidity	0%~100% (non-condensing)

2.2 Grounding and Lightning Protection

In outdoor deployment, the following must be grounded separately: outdoor AP-S800, feeder lightning protector, lightning protector with Ethernet port and lightning rod. Ensure the grounding points are well grounded and take anti-oxidation measures against the grounding points (Grounding cable should be prepared by customers in advance).

Table Grounding and lightning protection requirements

Item	Requirements
Lightning rod	<p>In plain areas, the protection angle of the lightning rod should be less than 45 degrees. In mountainous areas or areas lightning occurs frequently, the protection angle should be less than 30 degrees.</p> <p>The lightning rod should be high enough so that the access point and antenna can be protected from lightning strikes.</p> <p>The protection grounding of the lightning rod should be connected to the earthing conductor of the server room.</p>
Device protection ground (PGND)	<p>If a grounding strip is available, connect the yellow and green grounding cable of the AP to the grounding strip. The cross-section area of the grounding cable should be equal to or greater than 6mm² and its length should not exceed 3 meters.</p> <p>If no grounding strip is available, bury a piece of angle steel or steel tube at least 0.5 meter long in the earth to function as the earthing conductor. For a piece of angle steel, the size should be at least 50 mm × 50 mm × 5 mm; for a piece of steel tube, it must be zinc-plated and have a wall thickness of at least 3.5 mm. Weld the yellow and green grounding cable of the AP onto the angle steel and take anti-erosion measures against the welding joint. The cross-section area of the grounding cable should be equal to or greater than 6mm². The grounding cable should be as short as possible and must not be</p>

	coiled.
Outdoor antenna	The antenna support should be grounded.
Grounding lead-in	<p>A grounding lead-in is a metal conductor connecting a grounding net and a grounding strip. The grounding cable of the AP should be connected to the grounding strip. The grounding lead-in must be 30 meters or shorter. A piece of zinc-coated flat steel with a cross-section area of 40mm × 4 mm or 50mm × 5 mm is recommended.</p> <p>Connect the grounding strip and the grounding lead-in of the AP through the yellow and green grounding cable with an area of 35mm², or weld them directly. Take anti-erosion measures against the welding joint.</p>
Grounding resistance	<p>Earth resistance should be less than 5 ohms. In an area with a higher earth resistance, reduce the earth resistance by using resistance reducing agent around the earthing conductor.</p> <p>The top of the earthing conductor should be at least 0.7 meter away from the ground surface. In cold areas, the earthing conductor should be buried below the frozen soil layer.</p>
Network cable	Use a shielded twisted pair cables for an AP deployed outdoors. Ensure that the devices at the two ends of the cable are well grounded. If a metal tube is used, the two ends of the tube should be grounded.

2.3 Installation Tools

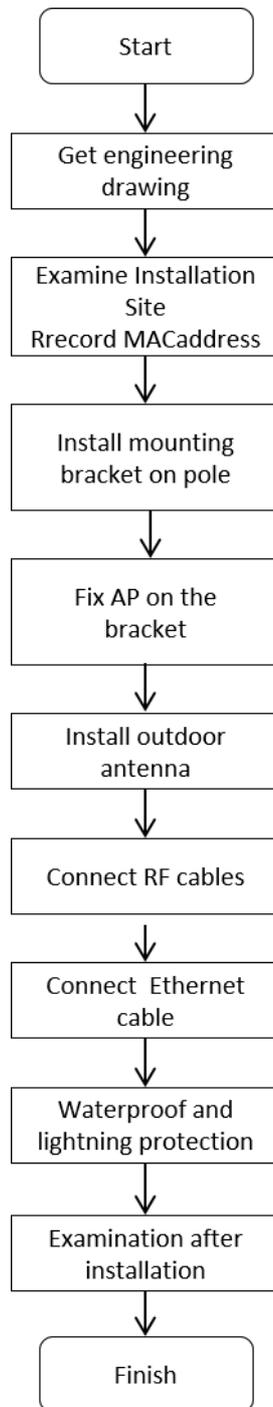
The following tools are required for installation of the AP-S800 series products and should be provided by customers(Sundray does not provide the following tools).

Type of Tools	Tools
Universal tool	Phillips screwdriver, bolts, sleeves, cutting plier, steel measuring tape, marker pen, percussion drill
Special tool	Cable stripper, crimping plier, electrical tape, network cable tester, waterproof

	cement, waterproof glue
Additional tool	PC for troubleshooting

3 Installation Guideline

3.1 Installation Process



Precautions:

- ✓ You need to get the corresponding engineering drawing before beginning installation.
- ✓ AP-S800 series product should be installed at the specified site according to the engineering drawing.
- ✓ Before installation, you need to check whether the installation site is suitable. If it is not suitable, you can change the installation site but the distance between the new and the specified sites on the engineering drawing cannot be greater than 1 meter.
- ✓ Record the MAC address and installation site of the access point(MAC address is on the side panel of the AP), for example, MAC: 100D0E2020CDE1, location: on the top of the building XXX.

3.2 Examining Installation Site

- ✓ Outdoor access point must be installed on a pole or a bracket. The pole and bracket must be vertical. If the pole or bracket is made of iron, it should be protected from oxidation. The installation site of the access point and its height must meet the design requirements.
- ✓ If an outdoor AP-S800 is installed on a pole on the top of a building, it cannot be suspended outwards in the air.
- ✓ On the top of a building, outdoor AP-S800 should be installed in a place with less sunlight exposure. If necessary, the corresponding sunproof protection can be applied to the device.
- ✓ If the access point has an Ethernet port supporting PoE, it should be installed outdoors with that port facing down.

3.3 Installing Access Point

Access point is fixed on a pole through the pole mount kit. The outer diameter of the pole should be between 48mm and 76mm. The pole mounting kit includes a mounting bracket and a fixing plate, as shown below:

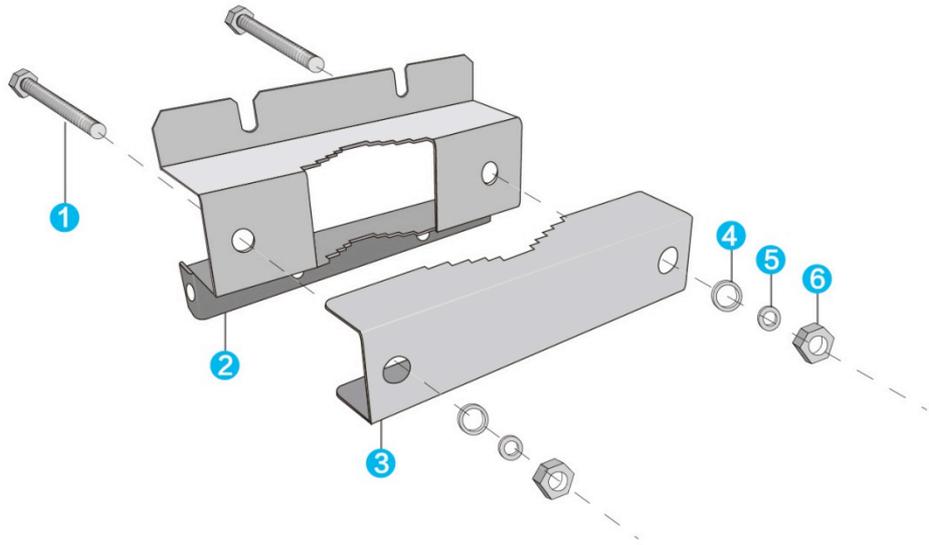


Figure3-1 Pole Mounting Kit

No.	Component
1	Long bolt
2	Mounting bracket
3	Fixing plate
4	Flat washer
5	Spring washer
6	Nut

Step 1: Install a pole and fix the bracket on the pole, as shown below:

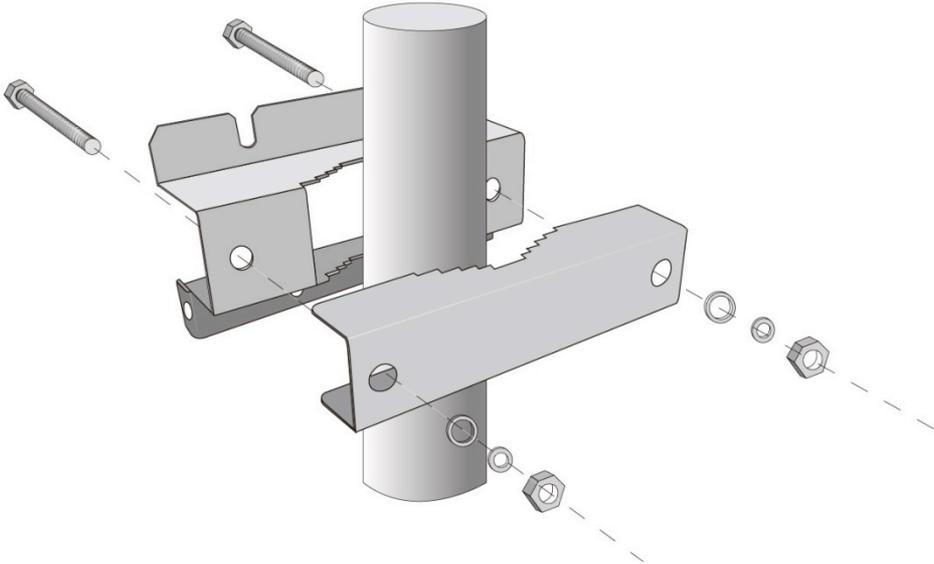


Figure3-2 Install Bracket on a Pole

Step 2: Insert two hex head bolts into the installation holes on the upper part of the plate of access point and do not tighten the bolts, as shown below:

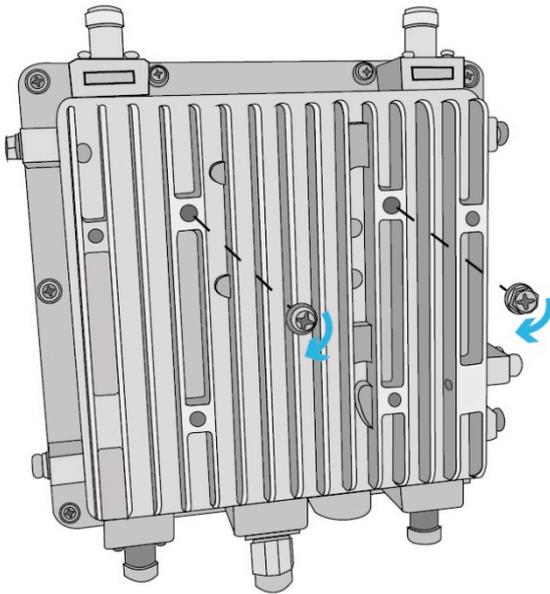


Figure3-3 Insert Hex Head Bolts

Step 3: Position the installation holes on the plate of access point over the holes on the mounting bracket, as shown in ①, and press the access point downwards, as shown in ②, until it is tightened.

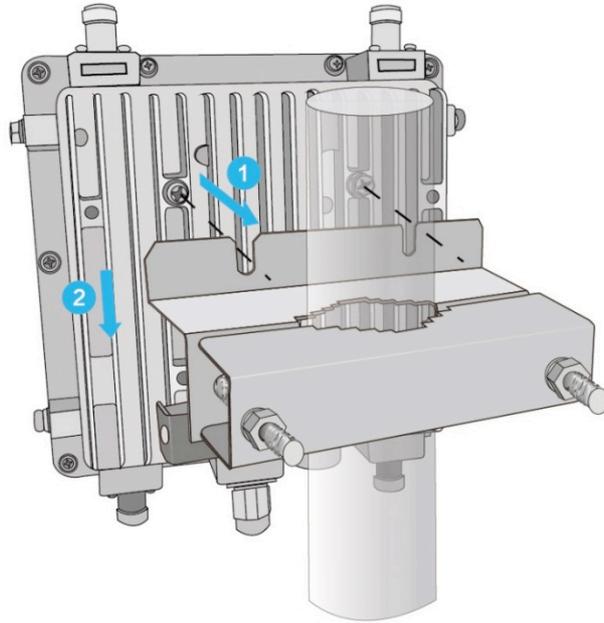


Figure3-4 View 1 of Installing AP on the Mounting Bracket

Step 4: Insert the other two bolts into the installation holes on the lower part of the plate of access point.

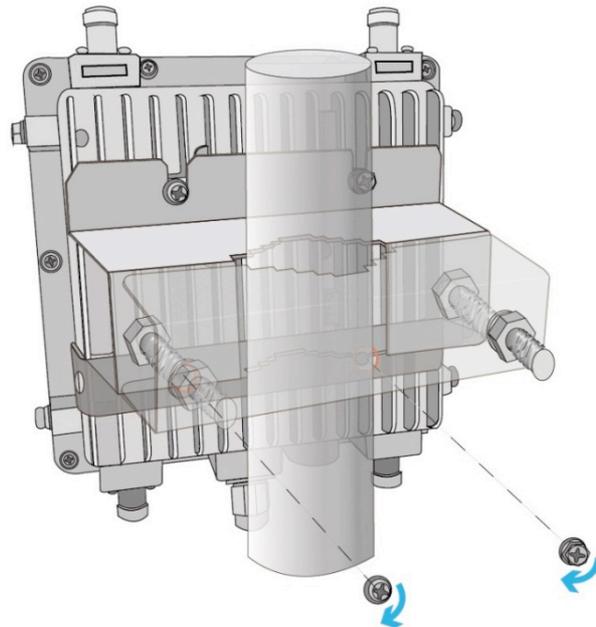


Figure3-5 View 2 of Installing AP on the Mounting Bracket

3.4 Grounding Access Point

Connect access point to protection grounding using a yellow and green grounding cable(provided by customers). For details, refer to **Grounding and Lightning Protection** section.

3.5 Installing Outdoor Antenna

Outdoor antennas are classified as directional and omnidirectional antennas. The following introduces how to install the two types of outdoor antennas.

Installation precautions:

- ✓ Outdoor antenna should be installed away from high-power electronic devices and no large obstruction or metal object is allowed in the coverage direction.
- ✓ The antenna height should meet the requirements of signal coverage and the tip of the antenna should fall within the 45° protection angle of the lightning rod.
- ✓ Outdoor antenna support should be solid. The pole on which the antenna is installed should be vertical. If the pole is made of iron, anti-oxidation measures should be taken against the pole.

3.5.1 Installing Omnidirectional Outdoor Antenna

- ✓ The diameter of the omni antenna pole should be between 40mm and 50mm.
- ✓ The omnidirectional outdoor antenna should be vertical to the top surface of the building.
- ✓ Generally, no lightning rod is directly soldered onto an omni antenna pole (no metal object is allowed within one meter in the horizontal direction of the omni antenna). Instead, a lightning rod is set on a separate pole between two omni antenna poles and the lightning rod is high enough to keep the tip of omni antennas within the protection angle.

- 1) Install a lightning rod.
- 2) Install the antenna pole onto a cement pier.
- 3) Use the pole-mounting bracket to install the omni outdoor antenna on the pole.

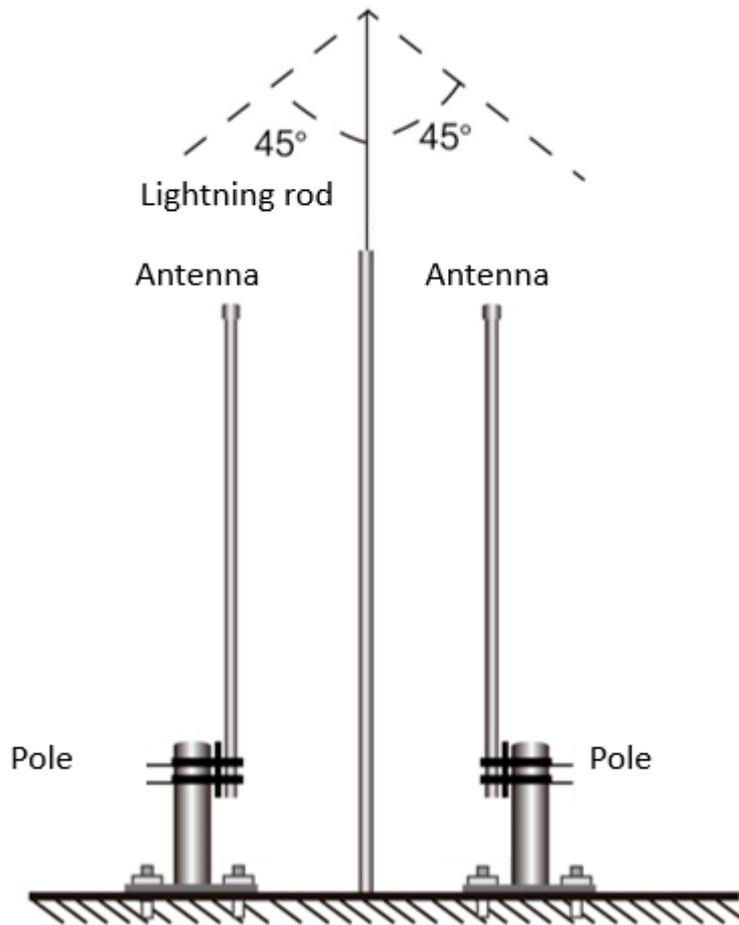


Figure3-6 Installation of Omni Outdoor Antenna

3.5.2 Installing Directional Outdoor Antenna

- ✓ The directional antenna pole should be 40mm to 70mm in diameter.
 - ✓ You should select such an installation location for the pole that the antenna direction and tilt could be adjusted freely.
- 1) Weld the lightning rod onto the tip of the pole.
 - 2) Install the antenna pole onto a cement pier.
 - 3) Use a 40mm × 4 mm flat steel to connect the pole to the ground grid.
 - 4) Use the pole-mounting bracket to install the directional outdoor antenna on the pole.

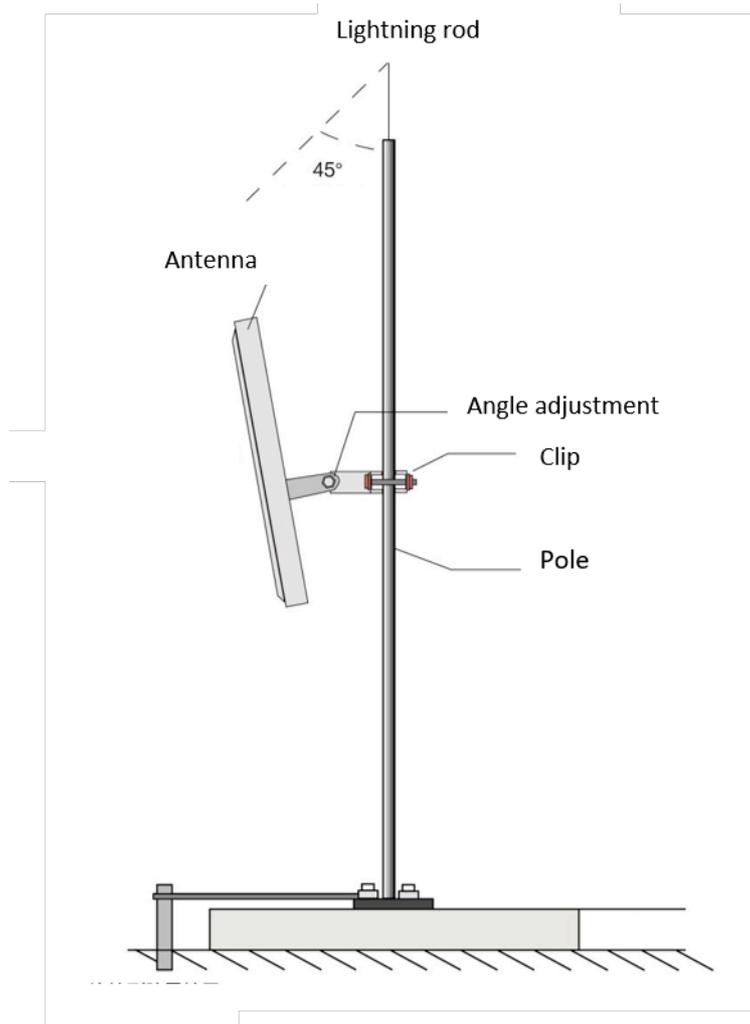


Figure3-7 Installation of Directional Outdoor Antenna



Notes: Directional outdoor antennas cannot be installed at the same height on a same pole. If two directional outdoor antennas are installed on a same pole, the vertical distance between those antennas should be more than 2 meters.

3.6 Connecting Cables

RF and Ethernet cables need to be connected to AP-S800 after the access point and outdoor antenna are installed.

Precautions:

- ✓ Cables should be placed according to design requirements.

- ✓ Cables should not be placed near high-voltage pipe, fire pipe or lightning protection cable to avoid electromagnetic interference.
- ✓ It is recommended to use PVC pipe, iron pipe, Plica pipe, or cable trunking to run cables. If a metal pipe is used, the two ends of the pipe should be grounded.
- ✓ For outdoors PVC pipe placed horizontally, drill a small hole on the pipe so that the water can drain out.
- ✓ For the holes in the wall, through which cables go, they should be blocked with waterproof and fireproof materials.

3.6.1 Connecting RF Cable

Follow the following steps to connect RF cables to RF interfaces(2.4GHz and 5GHz):

- (1) Install a feeder lightning arrester onto each RF interface, as shown below:

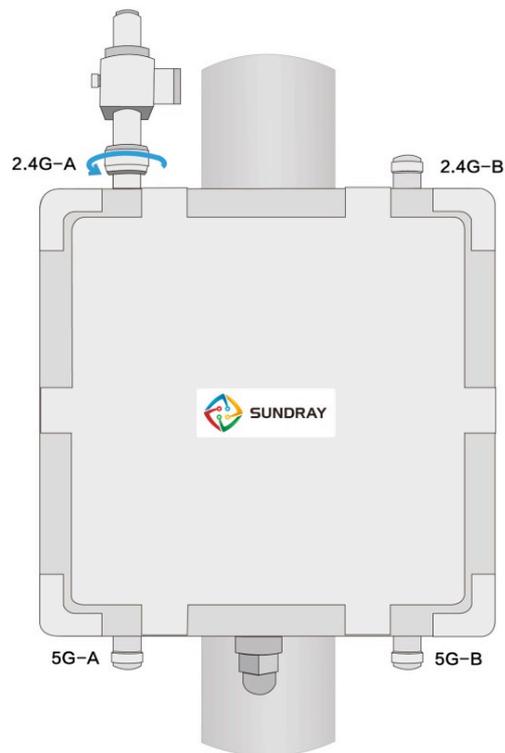


Figure3-8 Installation of Feeder Lightning Arrester on RF Interface

- (2) Connect one end of the RF cable to the feeder lightning arrester and the other end to the outdoor antenna.

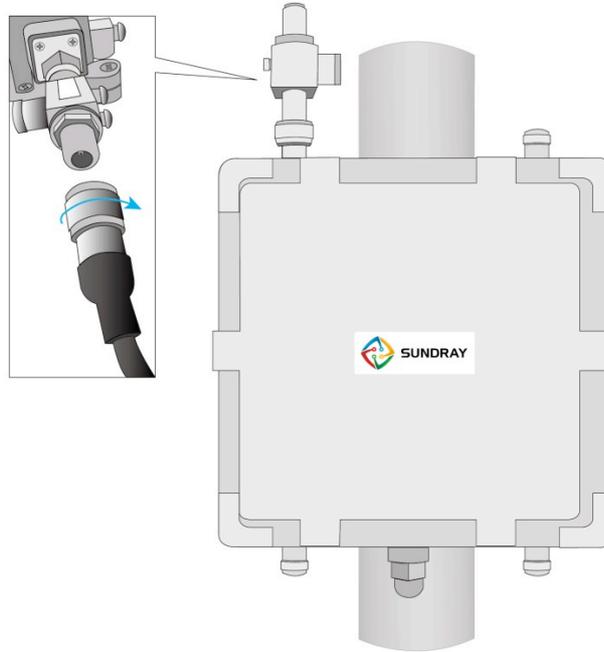


Figure3-8 Connect RF Cable to Feeder Lightning Arrester

- (3) Connect a grounding wire to lightning arrester and then wrap the joint of lightning arrester with waterproof tape.

3.6.2 Connecting Ethernet Cable

Figure3-9 Connect Ethernet Cable

Follow the following steps to connect an Ethernet cable:

- (1) An Ethernet cable needs to pass through a waterproof cover for waterproof purpose (an Ethernet cable with a RJ-45 connector is unable to pass through), you need to make an Ethernet cable connector on site.
- (2) Connect the Ethernet cable to the Ethernet port on the access point.
- (3) Tighten the waterproof cover.
- (4) Use waterproof tape to wrap the joint between the waterproof cover and the cable.



Notes: In outdoor environment, Ethernet cable must have waterproof cover. It is recommended to use shielded Cat5 or enhanced Cat5 cable, and the length of the Ethernet cable used to connect AP to switch cannot exceed 100 meters.

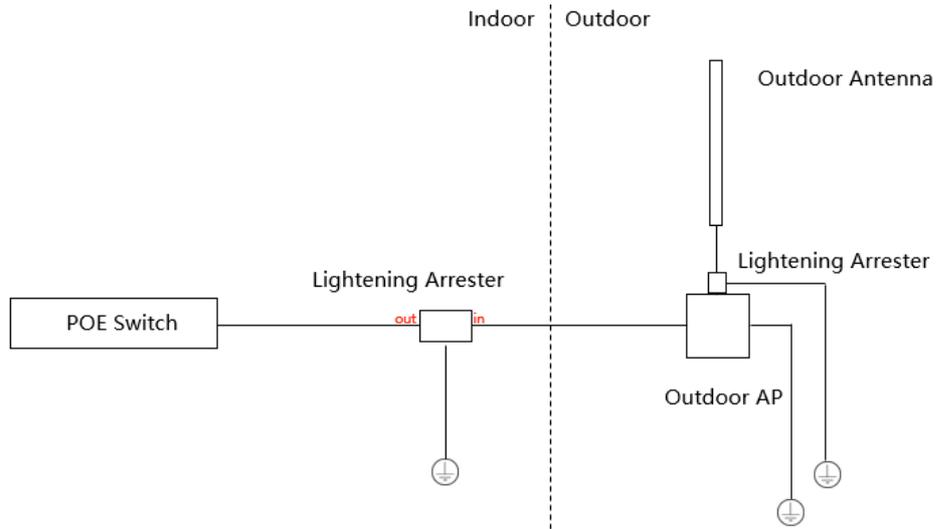
3.7 Waterproof and Lightning Protection

To ensure that access point and feeder lightning arrester are well grounded, refer to **Grounding and Lightning Protection** section. Make sure that the following joints are wrapped with waterproof tape: four joints of feeder lightning arresters, four joints between antennas and feeder lightning arresters, one joint of Ethernet port. For how to wrap joint with waterproof tape, refer to the attached figure 2.

3.8 Examination After Installation

After the installation and cabling, check the following items before powering access point:

- ✓ Access point and antenna are installed firmly.
- ✓ Power source meets the power specifications of the AP.
- ✓ The access point is well grounded.
- ✓ Waterproof measures are taken against the each joint of access point.
- ✓ Unconnected ports on the AP are connected with RSMA-50KR load and then blocked waterproof plugs.



Attached Figure1 Connect Involved Components



施工前，先清洁线缆、接头及所需包裹区域。



由一端开始，半重叠绕包一层绝缘防水胶带。



半重叠绕包防水泥，绕时均匀拉伸胶泥（拉伸至原宽度的3/4），共绕3层，每层都要拉紧压实，避免松脱。



由一端开始，半重叠绕包防水胶带，将胶泥区域完全覆盖，共绕3层。



收尾时要用剪刀剪断并压紧，避免因翘边而且影响防潮效果。

Attached Figure 2 How to use waterproof tape

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