



H3C WA2200 Series WLAN Access Points

Installation Manual

Hangzhou H3C Technologies Co., Ltd.

<http://www.h3c.com>

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About This Manual

Related Documentation

In addition to this manual, each H3C WA2200 Series WLAN Access Points documentation set includes the following:

Manual	Description
H3C WA2200 Series WLAN Access Points Operation Manual	Guides the user to configure features supported by the WA2200 series.
H3C WA2200 Series WLAN Access Points Command Manual	Elaborates on the commands for configuring the WA2200 series.

Organization

The H3C WA2200 Series WLAN Access Points Installation Manual is organized as follows:

Chapter	Contents
1 Product Overview	Introduces the hardware configuration, appearances, and interfaces of the WA2200 series.
2 Installation Preparations	Introduces the environment requirements, precautions, and tools for the installation of the WA2200 series.
3 Installation of Indoor APs	Introduces the mechanical installation, power supply connection, and Ethernet cable connection of the indoor APs and enhanced APs.
4 Installation of Outdoor APs	Introduces the outdoor installation checklist, installation flowchart, antenna installation, cable connection, and network connection of outdoor APs.
5 Software Setting	Introduces the software maintenance (including working mode switching, software debugging environment setup, security setting, and system name and system clock setting) of the WA2200 series.

Conventions

The manual uses the following conventions:




I. Command conventions

Convention	Description
Boldface	The keywords of a command line are in Boldface .
<i>italic</i>	Command arguments are in <i>italic</i> .
[]	Items (keywords or arguments) in square brackets [] are optional.
{ x y ... }	Alternative items are grouped in braces and separated by vertical bars. One is selected.
[x y ...]	Optional alternative items are grouped in square brackets and separated by vertical bars. One or none is selected.
{ x y ... } *	Alternative items are grouped in braces and separated by vertical bars. A minimum of one or a maximum of all can be selected.
[x y ...] *	Optional alternative items are grouped in square brackets and separated by vertical bars. Many or none can be selected.
&<1-n>	The argument(s) before the ampersand (&) sign can be entered 1 to n times.
#	A line starting with the # sign is comments.

II. GUI conventions

Convention	Description
< >	Button names are inside angle brackets. For example, click <OK>.
[]	Window names, menu items, data table and field names are inside square brackets. For example, pop up the [New User] window.
/	Multi-level menus are separated by forward slashes. For example, [File/Create/Folder].

III. Symbols

Convention	Description
 Warning	Means reader be extremely careful. Improper operation may cause bodily injury.
 Caution	Means reader be careful. Improper operation may cause data loss or damage to equipment.
 Note	Means a complementary description.

Environmental Protection

This product has been designed to comply with the requirements on environmental protection. For the proper storage, use and disposal of this product, national laws and regulations must be observed.

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Chapter 1 Product Overview

1.1 Introduction

The H3C WA2200 series WLAN access points (hereinafter referred to as the WA2200 series) are developed by Hangzhou H3C Technologies Co., Ltd. (hereinafter referred to as H3C). The WA2200 series consist of six models of access points (APs), which fall into three types according to the application environment: indoor, enhanced, and outdoor. The WA2200 series can serve as FIT APs to cooperate with wireless switches or controllers or serve as FAT APs to provide wireless access for WLAN users.

Figure 1-1 shows the typical deployment of the WA2200 series on hotspots.

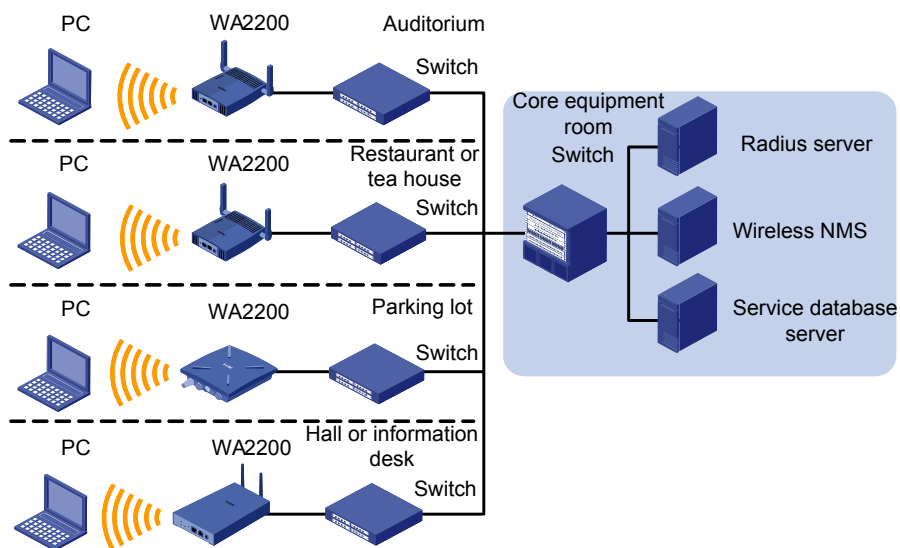


Figure 1-1 Positions of the WA2200 series on the network

Figure 1-2 shows the appearance of the WA2200 series.

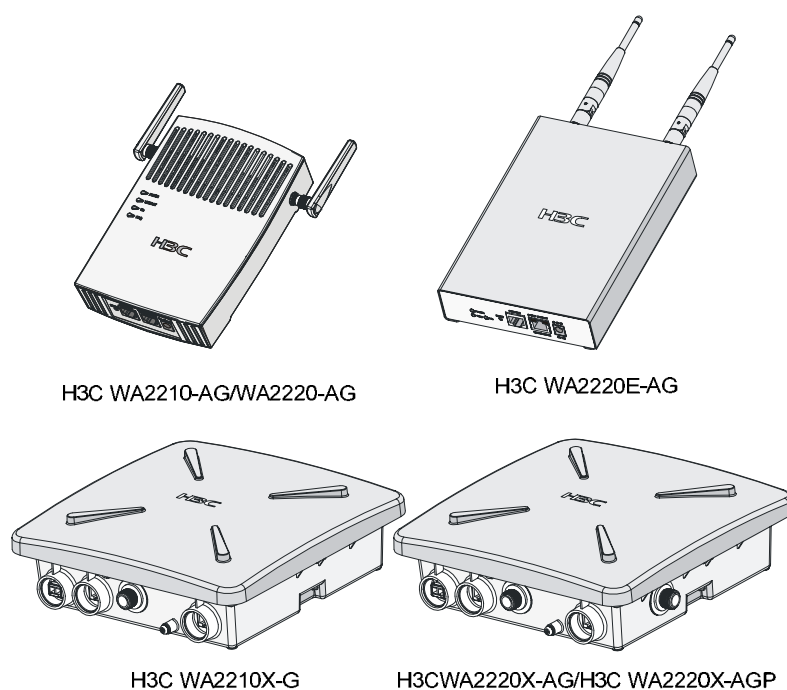


Figure 1-2 Appearance of the WA2200 series

Table 1-1 Physical dimensions of the WA2200 series

Model	Physical dimensions (H×W×D)
H3C WA2210-AG/WA2220-AG, (indoor)	40×166×118 mm (1.57×6.54×4.65 in.)
H3C WA2220E-AG, (enhanced)	35×195×135 mm (1.38×7.68×5.31 in.)
H3C WA2210X-G/WA2220X-AG/WA2220X-AGP, (outdoor)	76×245×245 mm (2.99×9.65×9.65 in.)

1.2 Hardware Configuration

The six models of the WA2200 series have different radio frequencies (RFs) and structures. Table 1-2 lists the protocols that each model supports as well as the chassis materials.

Table 1-2 Protocols that each model supports and the chassis material

Type	Model	Protocols and chassis material
Indoor	H3C WA2210-AG	IEEE802.11a or IEEE802.11b/g, plastic
	H3C WA2220-AG	IEEE802.11a + IEEE802.11b/g, plastic

Type	Model	Protocols and chassis material
Enhanced	H3C WA2220E-AG	IEEE802.11a + IEEE802.11b/g, sheet metal
Outdoor	H3C WA2210X-G	IEEE802.11b/g, waterproof cast aluminum + plastic
	H3C WA2220X-AG	IEEE802.11a + IEEE802.11b/g, waterproof cast aluminum + plastic
	H3C WA2220X-AGP	IEEE802.11a + IEEE802.11b/g, waterproof cast aluminum + plastic

The WA2200 series have extraordinary radio frequency (RF) performance and provide consummate service functions. With IP65 degree of protection, the outdoor models can be directly deployed outdoors to simplify the installation. The models of the WA2200 series are designed for application in various environments.

This section describes the hardware configurations and functions of the WA2200 series in detail.

1.2.1 LEDs

The positions and identifications of LEDs on the panel vary with the models. For details about these LEDs, see Table 1-3, Table 1-4, and Table 1-5.

I. H3C WA2210-AG/WA2220-AG

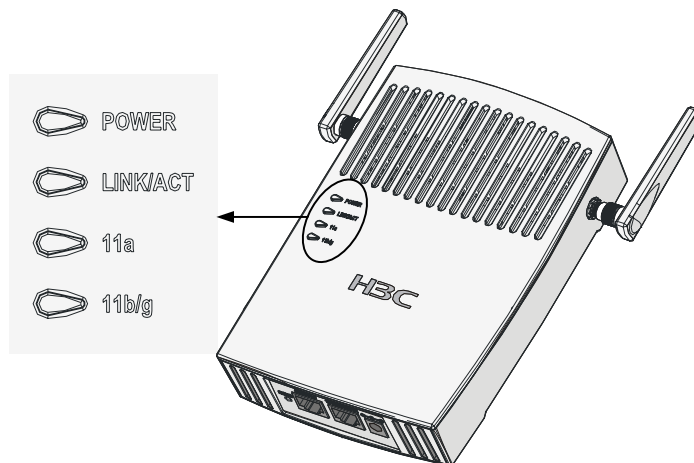


Figure 1-3 LEDs on the H3C WA2210-AG/WA2220-AG

Table 1-3 Description of LEDs on the H3C WA2210-AG/WA2220-AG

LED	Color	QTY	Meaning
POWER	Green	1	<p>Displays the power supply status:</p> <ul style="list-style-type: none"> • On: The power supply is normal. • Off/flashing: The power supply is not connected or well connected, or works abnormally.
LINK/ACT	Green	1	<p>Displays the link status of the Ethernet interface:</p> <ul style="list-style-type: none"> • On: The link on the Ethernet interface is up. • Off: The link on the Ethernet interface is down. • Flashing: Data is being transmitted or received.
11a	Green	1	<p>Displays the wireless link status:</p> <ul style="list-style-type: none"> • On: The wireless link is normal. • Off: The wireless link is not initialized or the link is faulty. • Flashing slowly: A wireless station is accessing the device. • Flashing quickly: Data is being transmitted or received.
11b/g	Green	1	<p>Displays the wireless link status:</p> <ul style="list-style-type: none"> • On: The wireless link is normal. • Off: The wireless link is not initialized or the link is faulty. • Flashing slowly: A wireless station is accessing the device. • Flashing quickly: Data is being transmitted or received.



Caution:

The WA2210-AG is a single-RF device. The 11a and 11b/g LEDs cannot be on or flash at the same time.

II. H3C WA2220E-AG

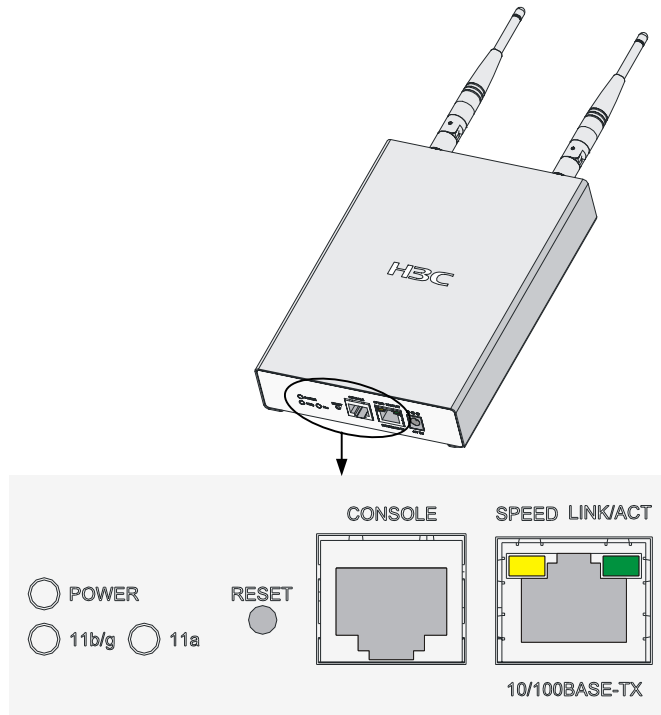


Figure 1-4 LEDs on the H3C WA2220E-AG

Table 1-4 Description of LEDs on the H3C WA2220E-AG

LED	Color	QTY	Meaning
POWER	Green	1	Displays the power supply status: <ul style="list-style-type: none"> On: The power supply is normal.. Off/flashing: The power supply is not connected or well connected or the AP works abnormally.
11b/g	Green	1	Displays the wireless link status: <ul style="list-style-type: none"> On: The wireless link is normal. Off: The wireless link is not initialized or the link is faulty. Flashing slowly: A station is accessing the device. Flashing quickly: Data is being transmitted or received.
11a	Green	1	Displays the wireless link status: <ul style="list-style-type: none"> On: The wireless link is normal. Off: The wireless link is not initialized or the link is faulty. Flashing slowly: A station is accessing the device. Flashing quickly: Data is being transmitted or received.

LED	Color	QTY	Meaning
SPEED	Yellow	1	Displays the speed of the Ethernet interface: <ul style="list-style-type: none"> On: The Ethernet interface operates at 100 Mbps. Off: The Ethernet interface operates at 10 Mbps.
LINK/ACT	Green	1	Displays the connection status of the Ethernet interface: <ul style="list-style-type: none"> On: The link on the Ethernet interface is up. Off: The link on the Ethernet interface is down. Flashing: Data is being transmitted or received.

III. H3C WA2210X-G, WA2220X-AG, and WA2220X-AGP

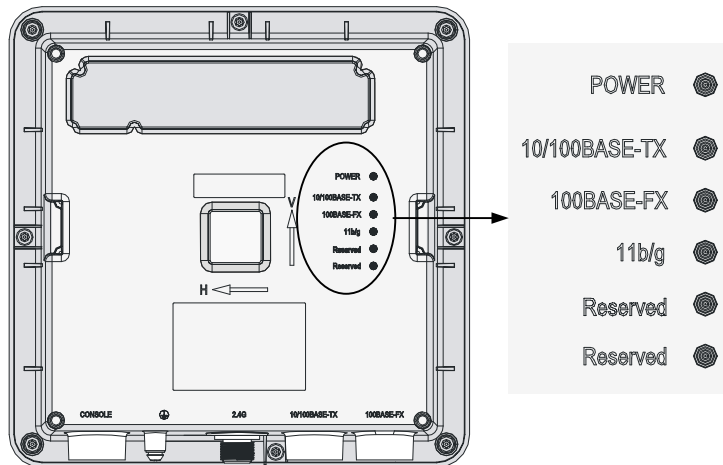


Figure 1-5 LEDs on the H3C WA2210X-G

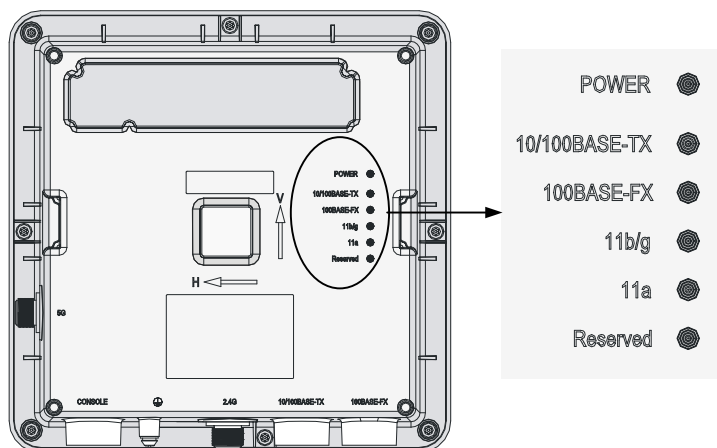


Figure 1-6 LEDs on the WA2220X-AG and WA2220X-AGP

Table 1-5 Description of LEDs on the H3C WA2210X-G, WA2220X-AG, and WA2220X-AGP

LED	Color	QTY	Meaning
POWER	Green	1	Displays the power supply status: <ul style="list-style-type: none"> On: The power supply is normal.. Off/flashing: The power supply is not connected or well connected or the device works abnormally.
10/100BASE-TX	Green	1	Displays the status of the Ethernet interface: <ul style="list-style-type: none"> On: The link on the Ethernet interface is up. Off: The link on the Ethernet interface is down. Flashing: Data is being transmitted or received.
100BASE-FX	Yellow	1	Displays the status of the optical interface: <ul style="list-style-type: none"> On: The link on the optical interface is up. Off: The link on the optical interface is down. Flashing: Data is being transmitted or received.
11a	Green	1	Displays the wireless link status: <ul style="list-style-type: none"> On: The wireless link is normal. Off: The wireless link is not initialized or the link is faulty. Flashing slowly: A station is accessing the device. Flashing quickly: Data is being transmitted or received.
11b/g	Green	1	Displays the wireless link status: <ul style="list-style-type: none"> On: The wireless link is normal. Off: The wireless link is not initialized or the link is faulty. Flashing slowly: A station is accessing the device. Flashing quickly: Data is being transmitted or received.

Note:

- The WA2210X-G is a single-RF device and has no 11a LED.
- The word “reserved” means the LED is reserved for future use.

1.2.2 Interfaces

The interfaces provided by the WA2200 series include:

- 2.4 GHz or/and 5 GHz antenna interface(s)
- Console interface
- Ethernet interface (optical and electrical)
- Power interface for indoor and enhanced models

Note:

In addition, the indoor and enhanced models have a reset button, a security slot, a grounding screw.

Table 1-6 describes the interfaces provided by each model.

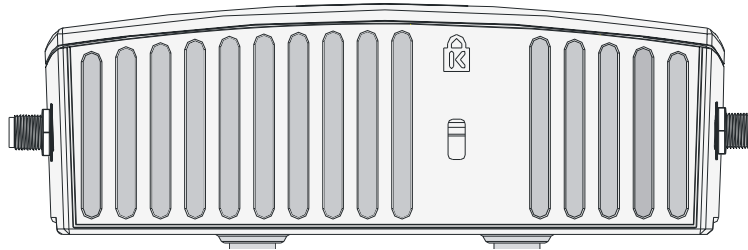
Table 1-6 Descriptions of interfaces on WA2200 series WLAN access points

Model	Interface	Standards and protocols	Description
WA2210-AG/WA2220-AG	Antenna interface 1	IEEE802.11b/g	WA2210-AG: Main antenna interface, 2.4/5-GHz WA2220-AG: 2.4-GHz antenna interface
	Console interface	RS/EIA-232	The console interface is used for device configuration and management.
	Ethernet interface	IEEE802.3 IEEE802.3u IEEE802.3af	The Ethernet interface can serve as an uplink interface of the device to access the Internet or a MAN, and can simultaneously serve as a PoE interface.
	Power interface	N/A	The power interface is used for +48 VDC power supply to the device.
	Antenna interface 2	IEEE802.11a	WA2210-AG: Auxiliary antenna interface, 2.4/5-GHz WA2220-AG: 5-GHz antenna interface

Model	Interface	Standards and protocols	Description
WA2220E-AG	Antenna interface 2	IEEE802.11a	This antenna interface is used to connect a 5-GHz antenna or a feeder.
	Console interface	RS/EIA-232	The console interface is used for device configuration and management
	Ethernet interface	IEEE802.3 IEEE802.3u IEEE802.3af	The Ethernet interface can serve as an uplink interface of the AP to access Internet or MAN, and can simultaneously serve as a PoE interface.
	Power interface	N/A	The power interface is used for +48 VDC power supply to the device.
	Antenna interface 1	IEEE802.11b/g	This antenna interface is used to connect a 2.4-GHz antenna or a feeder.
WA2210X-G/WA2220X-AG/WA2220X-AGP	Ethernet optical interface	IEEE802.3 SFP MSA SFF-8472	The Ethernet optical interface can serve as an uplink interface to access the Internet or a MAN. The Ethernet optical interface is used to connect an SFP module. In practice, either the Ethernet electrical interface or the Ethernet optical interface is used.
	Ethernet electrical interface	IEEE802.3 IEEE802.3u IEEE802.3af	The Ethernet electrical interface can serve as an uplink interface of the device to access the Internet or a MAN, and can simultaneously serve as a PoE interface.
	Antenna interface 1	IEEE802.11b/g	This antenna interface is used to connect a 2.4-GHz antenna or a feeder.
	Console interface	RS/EIA-232	The console interface is used for device configuration and management.
	Antenna interface 2	IEEE802.11a	This antenna interface is used to connect a 5-GHz antenna or a feeder.

I. Interfaces provided by H3C WA2210-AG/WA2220-AG

Top view



Bottom view

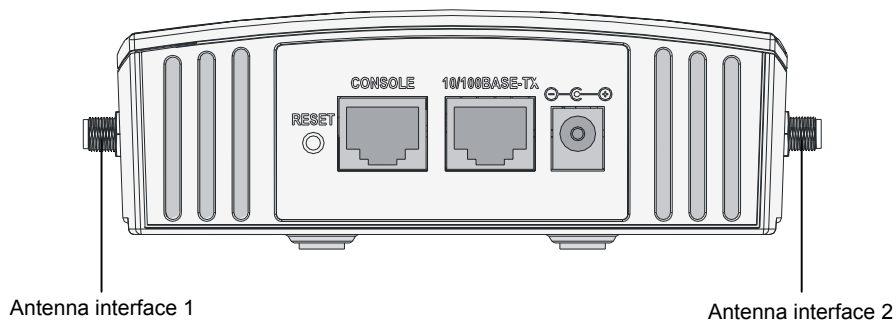


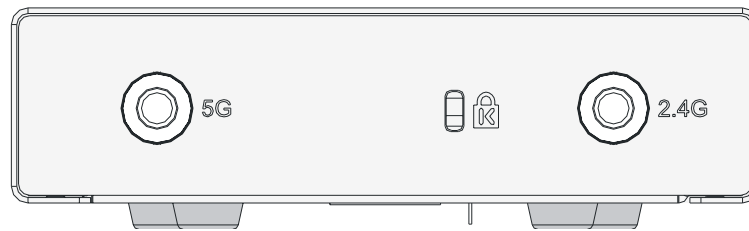
Figure 1-7 Interfaces on H3C WA2210-AG/WA2220-AG

 **Caution:**

- H3C WA2210-AG is a single-RF device. Viewed from the front, the antenna interface on the left (antenna interface 1 in Figure 1-7) is the main antenna interface, while the one on the right (antenna interface 2 in Figure 1-7) is the auxiliary antenna interface. When there is only one antenna, the antenna must be installed on the main antenna interface.
 - H3C WA2220-AG is a dual-RF device. Viewed from the front, the antenna interface on the left (antenna interface 1 in Figure 1-7) is the 2.4-GHz antenna interface, while the one on the right (antenna interface 2 in Figure 1-7) is the 5-GHz antenna interface.
-

II. Interfaces provided by H3C WA2220E-AG

Top view



Bottom view

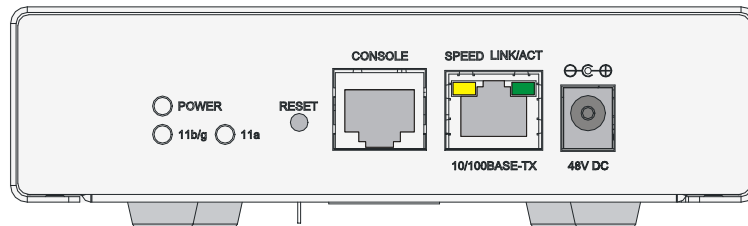
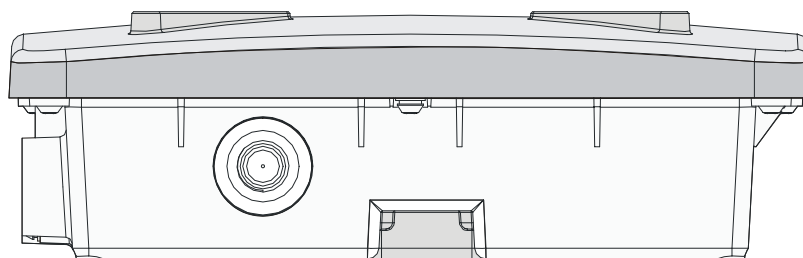


Figure 1-8 Interfaces on H3C WA2220E-AG

III. Interfaces provided by H3C WA2210X-G/WA2220X-AG/WA2220X-AGP

Right view (WA2220X-AG/WA2220X-AGP)



Bottom view

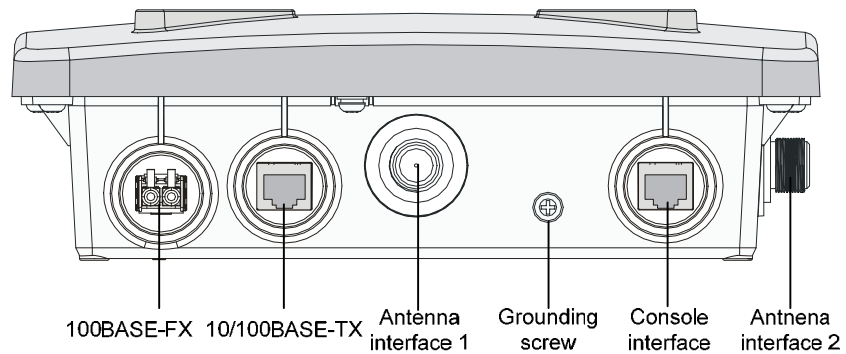


Figure 1-9 Interfaces on H3C WA2210X-G/WA2220X-AG/WA2220X-AGP

 **Note:**

H3C WA2210X-G is a single-RF device and provides no 5-GHz antenna interface.

Chapter 2 Installation Preparations

This chapter describes the preparations for WA2200 installation, including preparation of installation tools, environment examination, and unpacking & inspection.

2.1 Unpacking and Inspection

Before unpacking the package, make sure that the package is intact, without any serious damage or sign of water soaking. When unpacking the package, avoid excessive force or collision. Otherwise, the articles inside the package may get damaged.

After unpacking the package, make sure that the following articles are available in the package:

Table 2-1 List of articles in the package

Description	QTY
WA2200 WLAN AP	1 PCS
Power adapter	1 PCS
220 VAC power cord	1 PCS
Console cable	1 PCS
Installation kit	1 PCS
Omni antenna	2 PCS
H3C WA2200 Series WLAN Access Points Installation Manual	1 PCS
H3C WA2200 Series WLAN Access Points Electronic Documentation	1 PCS
Packing list	1 PCS

Note:

- The accessories may vary with the models and are subject to the packing list.
 - If there is any inconsistency with the packing list, contact your local dealer in time.
 - If the package is rusted or water soaked, stop unpacking and contact your local dealer timely.
-

2.2 Preparing Installation Tools

When installing the AP, you may need the tools listed in Table 2-2. You should select the appropriate tools according to the installation environment.

Table 2-2 List of installation tools

Type of tool	Indoor installation	Outdoor installation
General tools	1-meter-long ruler, marking pen, knife, and percussion drill with matching drills	Digging tool, adjustable spanner, and vices
Special tools	Cable stripper, crimping pliers, and RJ-45 crimping pliers	Cable stripper, crimping pliers, RJ-45 crimping pliers, waterproof tape, and fiber fusion splicer
Auxiliary tools	Ladder and rubber hammer	Ladder

Note:

Table 2-2 is only for reference. If you install the AP on a desk, none of the above tools is required; if you install the AP on top of or under eave of a building, no digging tool is required.

2.3 Examining the Installation Site

Before installation, you should examine the installation site to keep the AP under a good operational environment. You can examine the installation site from the following two aspects:

2.3.1 Installation Site Selection

Keep the AP away from places that are susceptible to high temperature, dust, inflammable, explosive, electromagnetic interference (high power radar, radio station, and transformer), unstable voltage, heavy vibration, or loud noise. The installation site should be dry, without any leakage, dripping, or dew. The AP should be at least 500 m (0.31 mi) away from the seaside and should not face the direction of sea wind.

In engineering design, the site should be selected according to the network planning and technical requirements of communications equipment, as well as the considerations such as climate, hydrology, geology, earthquake, electric power, and transportation.

2.3.2 Temperature and Humidity Requirements

Table 2-3 lists the operating temperature and humidity requirements.

Table 2-3 Environment specifications

Specification	Range	Recommended value	Test condition
Operating temperature (indoor)	0°C to 45°C (32°F to 113°F)	25°C (77°F)	None
Operating temperature (outdoor)	-30°C to +55°C (-22°F to +131°F)	25°C (77°F)	None
Storage temperature	-20°C to +35°C (-4°F to +95°F)	25°C (77°F)	No longer than one year
	-20°C to +45°C (-22°F to +113°F)	25°C (77°F)	No longer than three months
	-20°C to +55°C (-22°F to +131°F)	25°C (77°F)	No longer than one month
Relative humidity (noncondensing)	10% to 95%	—	None

2.3.3 Power Supply

Check that the site power supply is stable. The centralized AC power system consisting of mains, UPS, and self-supplied diesel generator should be

- Easy to connect
- Safe to operate
- Flexible to dispatch
- Convenient to maintain

The low-voltage power supply should adopt the single-phase three-wire system. Table 2-4 lists the nominal voltage and frequency of the low-voltage AC power supply.

Table 2-4 Nominal voltage and frequency of the low-voltage AC power supply

Power supply	Nominal voltage	Stable frequency
Single-phase three-wire	100 VAC to 240 VAC	50 Hz/60 Hz



Caution:

- If the voltage is unstable, a voltage regulator or stabilizer is required.
- An uninterrupted power supply (UPS) is required for uninterrupted communication.

2.3.4 Grounding and Lightning Protection

Table 2-5 Grounding and lightning protection requirements

SN	Item	Requirements
1	Grounding resistance	<ul style="list-style-type: none"> • The grounding resistance is usually required to be less than 5 ohms, and less than 10 ohms in an area with less than 20 thunderstorm days a year. • The top of the grounding body should be at least 0.7 m (2.30 ft) away from the ground surface. In cold areas, the grounding body should be buried below the frozen soil layer.
2	Grounding lead-in	The grounding lead-in should be no longer than 30 m (98.43 ft). A zinc-coated flat steel with a cross-section area of 40 × 4 mm (1.57 × 0.16 in) or 50 × 5 mm (1.97 × 0.20 in) is recommended.
3	AC power grounding	The neutral line of the power cord should not be connected with the PGND of other communications equipment.
4	Lightning protection	<ul style="list-style-type: none"> • In plain areas, the protection angle of the lightning rod should be less than 45 degrees. In mountainous areas or lightning areas, the protection angle should be less than 30 degrees. The lightning protection grounding (for example, the grounding of the lightning rod) should be connected to the grounding body of the equipment room. • The AC power system in the equipment room should be equipped with a lightning protection box. The grounding cable for the lightning protection box should be greater than 25 mm² (0.039 in²) in area, and less than 30 m (98.42 ft) in length.
5	Feeder	<ul style="list-style-type: none"> • The antenna support is already prepared according to the design requirements. • A feeder lightning rod is already installed and grounded according to the design requirements.

After you have completed the preparations, you can start installing the AP. The installation of indoor models (including the enhanced model) is different from that of the outdoor models. For details, refer to Chapter 3 “Installation of Indoor APs” on page 3-1 and Chapter 4 “Installation of Outdoor APs” on page 4-5.

Chapter 3 Installation of Indoor APs

You can directly place an indoor model (including the enhanced model) on a desk. The rubber feet on the bottom of the AP help you to place it horizontally. Or you can fix it onto a wall by using the wall-mounting bracket. The indoor models and enhanced model have the same wall-mounting brackets and accessories. The following introduces the wall-mounting procedure of the indoor models and enhanced model in detail.

3.1 Installation Flowchart

Figure 3-1 shows the installation flowchart of the indoor models and enhanced model.

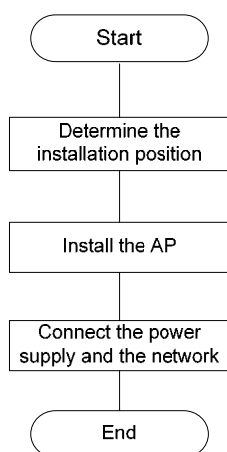


Figure 3-1 Installation flowchart of an indoor (enhanced) AP

3.2 Determining the Installation Position

Determine the installation position by observing the following principles:

- Leave as few obstacles (such as wall and ceiling) as possible between the AP and stations.
- Keep the AP far away from electronic devices (such as microwave oven) that may generate RF noise.
- Install the AP in a place where it will not hinder people's daily work and life.

Note:

A padlock is required for ceiling mounting to prevent any falloff in case of shocks. A Blossom 071 padlock or similar padlock is recommended.

3.3 Installing the AP

The following describes how to install the AP on a wall.

- Installing the Wall-Mounting Bracket on a Wall
- Installing the AP on the Wall-Mounting Bracket
- Locking the AP onto the Wall-Mounting Bracket (Optional)

3.3.1 Installing the Wall-Mounting Bracket on a Wall

Follow these steps to install the wall-mounting bracket on a wall:

- 1) Drill holes 6 mm (0.24 in) in diameter on the wall where the AP should be mounted. The drilled holes should correspond to those in the wall-mounting bracket. There are eight installation holes in total in the wall-mounting bracket. You should select at least three in a triangle for installation.

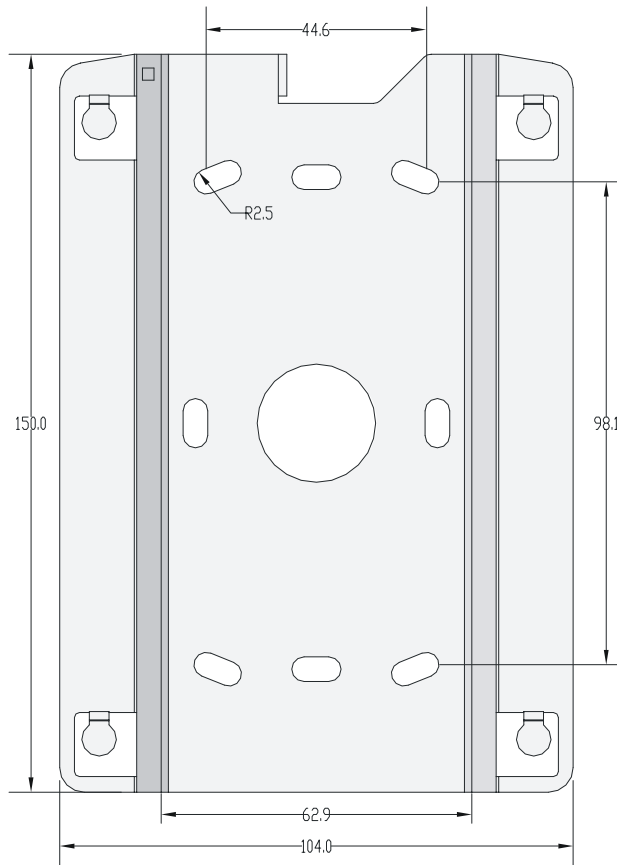


Figure 3-2 Screw hole locations and screw hole size

- 2) Insert the pointed end of anchors into the drilled holes and tap the flat end of anchors with a rubber hammer until they are all flush with the wall surface.
- 3) Align the holes in the wall-mounting bracket with the anchors and insert screws through the installation holes into the anchors, as shown in Figure 3-3.
- 4) Adjust the position of the wall-mounting bracket and tighten the screws.

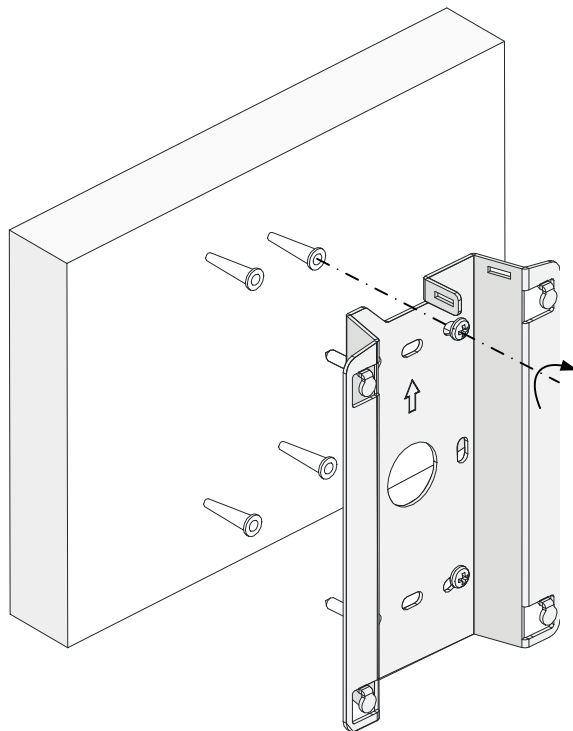


Figure 3-3 Install the wall-mounting bracket

3.3.2 Installing the AP on the Wall-Mounting Bracket

Follow these steps to install the AP on the wall-mounting bracket:

- 1) Align the AP with the hooks on the wall-mounting bracket and hang the AP on the bracket (see (1) in Figure 3-4 and Figure 3-5).
- 2) Then press the AP downward to fix it (see (2) in Figure 3-4 and Figure 3-5).

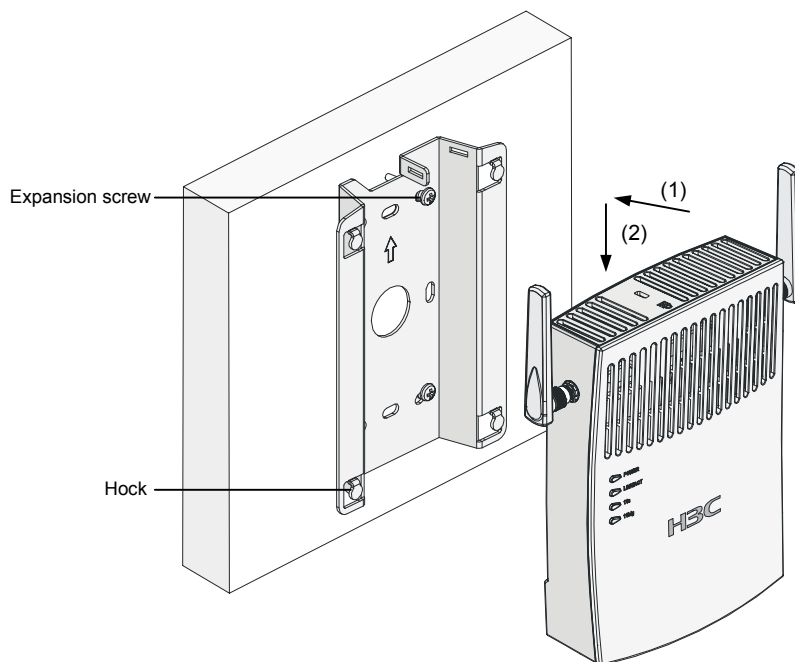


Figure 3-4 Fix the indoor AP onto the wall-mounting bracket

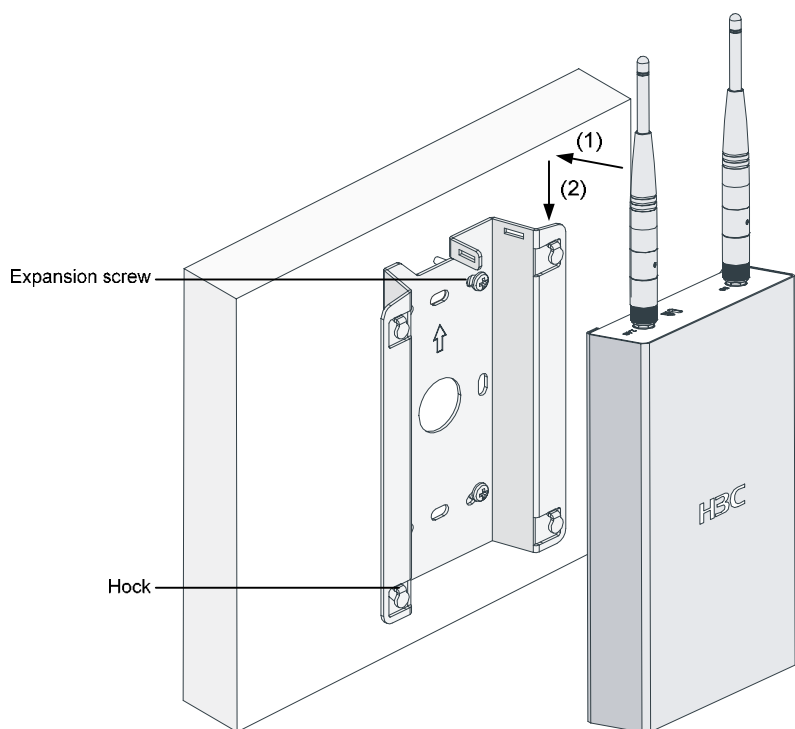


Figure 3-5 Fix the enhanced AP onto the wall-mounting bracket

3.3.3 Locking the AP onto the Wall-Mounting Bracket (Optional)

The indoor and enhanced APs have a security slot on the top, which can be used to lock the AP onto the wall-mounting bracket to prevent theft.

Follow these steps to lock the AP onto the wall-mounting bracket:

- 1) Insert the locking plate into the security slot on the top of the AP (see (1) in Figure 3-6 and Figure 3-7).
- 2) Turn the locking plate counterclockwise until the hole on the locking plate is aligned with the hole in the wall-mounting bracket (see (2) in Figure 3-6 and Figure 3-7).
- 3) Put the latch through the two holes that are aligned in step 2 (see (3) in Figure 3-6 and Figure 3-7).
- 4) Lock the latch with a lock.

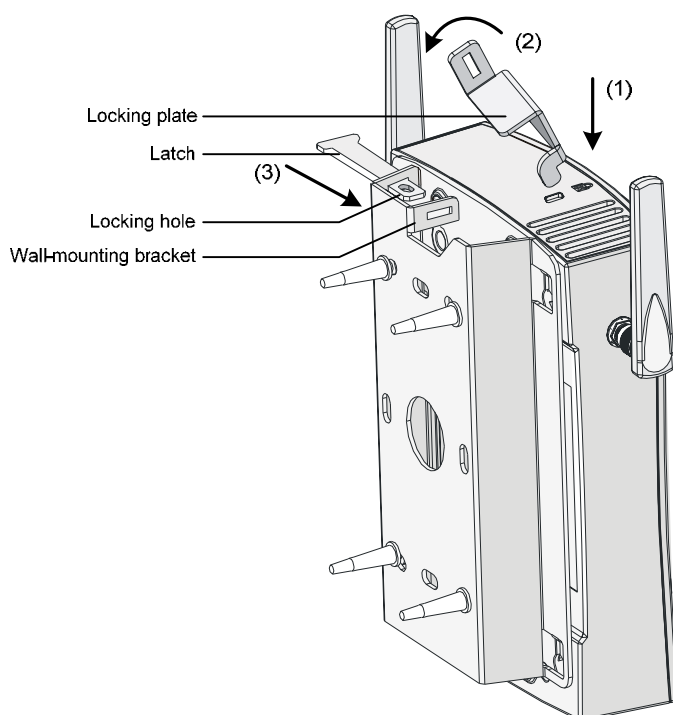


Figure 3-6 Lock the indoor AP onto the wall-mounting bracket

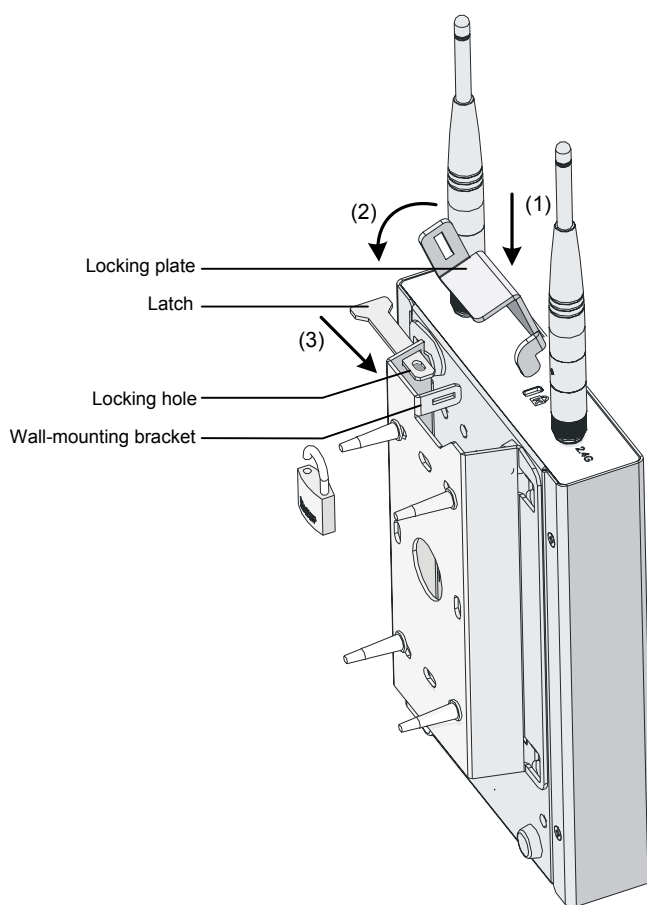


Figure 3-7 Lock the enhanced AP onto the wall-mounting bracket

Note:

The lock is user supplied.

3.4 Connecting the Power Supply

3.4.1 Local Power Supply

Connect the AP to the power adapter and then to the power source, as shown in Figure 3-8.

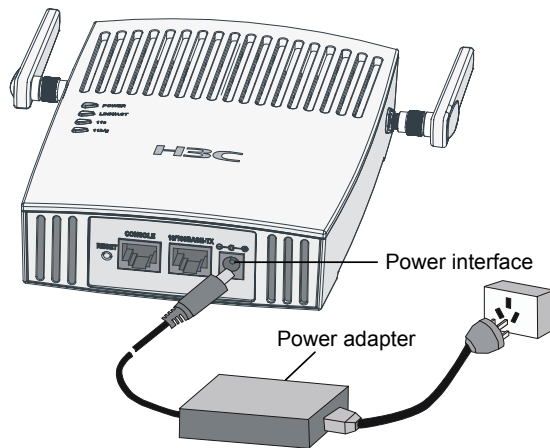


Figure 3-8 Local power supply connection

3.4.2 Power over Ethernet

If the uplink device of the AP is a PoE-capable switch or the like, use an Ethernet cable to directly connect the Ethernet interface of the AP to the PoE-capable device.

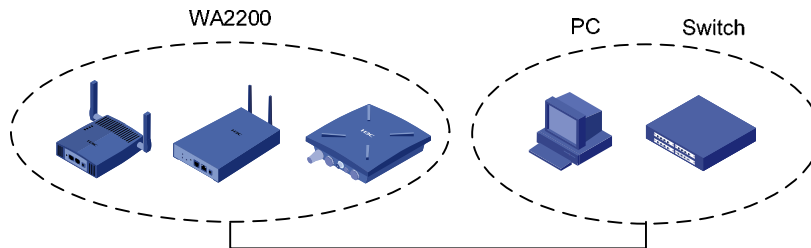


Figure 3-9 PoE connection



Caution:

- In the case of PoE, you do not need to connect the power interface to a power source. You only need to connect one end of an Ethernet cable to the Ethernet interface of the AP and the other end to an Ethernet interface of the PoE-capable device (for example, Ethernet switch).
 - Identify the silkscreen on the device to avoid taking the console interface for the Ethernet interface and vice versa.
-

3.5 Connecting the Network

Connect the Ethernet interface of the AP to an Ethernet interface of the switch to implement Internet or MAN access, as shown in Figure 3-10.

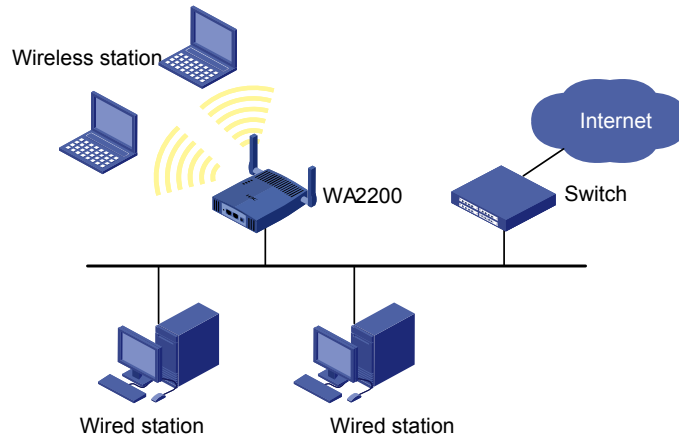


Figure 3-10 Connect the AP to the network

Chapter 4 Installation of Outdoor APs

The outdoor models of the WA2200 series are H3C WA2210X-G, H3C WA2220X-AG, and H3C WA2220X-AGP. You can select an appropriate model according to the actual requirement. The three outdoor models are waterproof, dustproof, and lightningproof.

4.1 Installation Flowchart

You can install your outdoor AP on a wall or a pole. As a wireless device, the installation location directly affects the coverage and performance of wireless signals. Therefore, it is recommended that the AP be installed by a professional. Figure 4-1 shows the installation flowchart of the outdoor models.

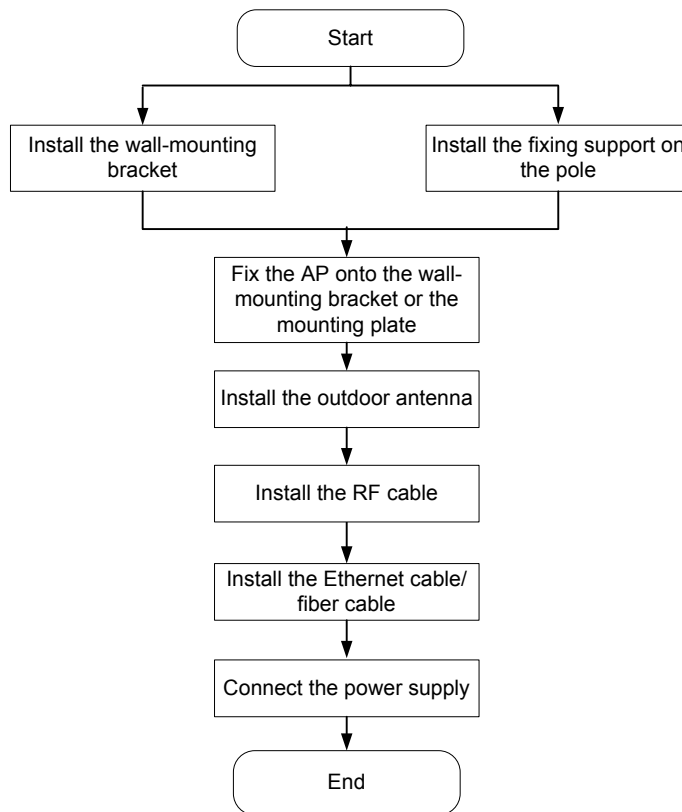


Figure 4-1 Installation flowchart of the outdoor models

4.1.1 Installing the AP

The following describes how to install the AP on a wall and a pole respectively.

I. Installing the AP on a wall

Figure 4-2 illustrates the installation flowchart of the AP on a wall.

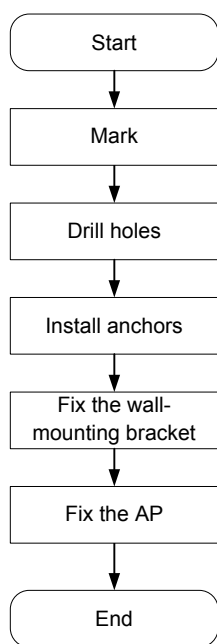


Figure 4-2 Installation flowchart of the AP on a wall

1) Mark

Step	Operation
1	Put the wall-mounting bracket on the installation position against the wall.
2	Mark three expansion screw holes on the wall. For the distance (in mm) between the expansion screw holes, see Figure 4-3.

Note:

The wall-mounting bracket is not supplied unless ordered.

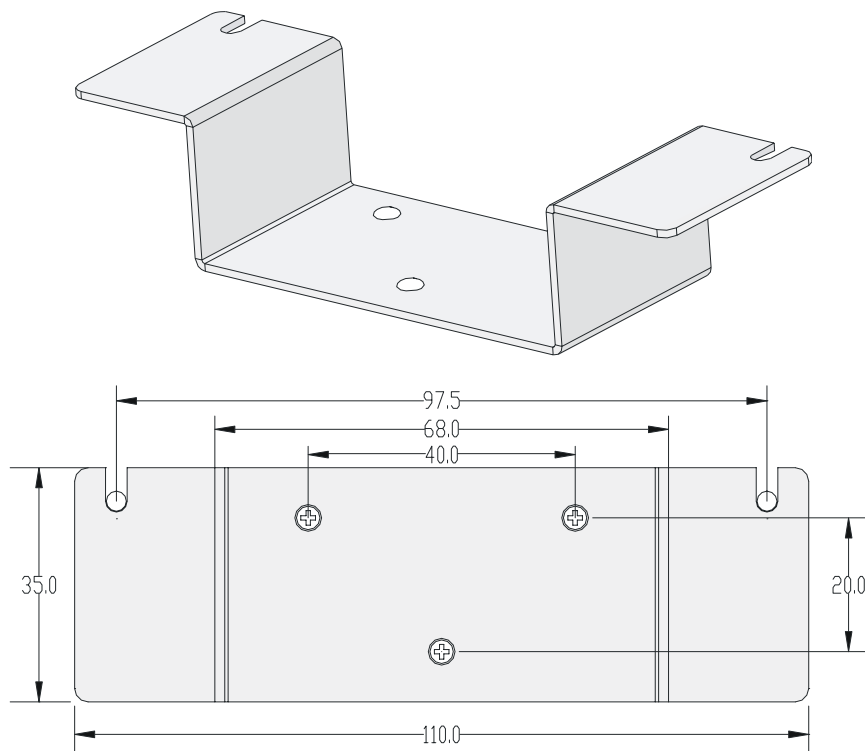


Figure 4-3 Wall-mounting bracket structure and positions of screw holes

2) Drill holes

Step	Operation
1	Use a percussion drill with a 6-mm (0.24-in) bit to drill holes on the three markings.

Observe the following precautions when drilling:

- Hold the drill handle with both hands, with the bit perpendicular to the wall surface, and prevent wall damage or tilted holes.
- The hole depth should be the anchor length plus the bit length. Each hole should have the same depth. Remove the dust from the hole before measuring the hole depth. Use a vacuum cleaner to prevent dust from spreading around.
- If the wall surface is too solid and slippery to locate the bit, punch a notch first.

3) Install anchors

Note:

Before installation, remove dust inside and around all holes with a vacuum cleaner, and then measure the distances between holes. If there is a large error, mark and drill holes again.

Step	Operation
1	Put an anchor into each hole vertically.
2	Tap the flat end of the anchor with a rubber hammer until the anchor is flush with the wall surface.

4) Fix the wall-mounting bracket

Step	Operation
1	Align the three holes in the wall-mounting bracket with the anchors and insert three expansion screws through the installation holes into the anchors.
2	Adjust the position of the wall-mounting bracket and tighten the expansion screws.

5) Fix the AP

Step	Operation
1	Method 1: Align the two installation holes in the AP with the corresponding holes in the wall-mounting bracket and then use two screws to fix them. Method 2: Insert a screw into each installation hole in the AP, but do not tighten them. Then insert the screws into the corresponding holes in the wall-mounting bracket.
2	Tighten the screws so that the AP touches against the wall-mounting bracket, as shown in Figure 4-4.

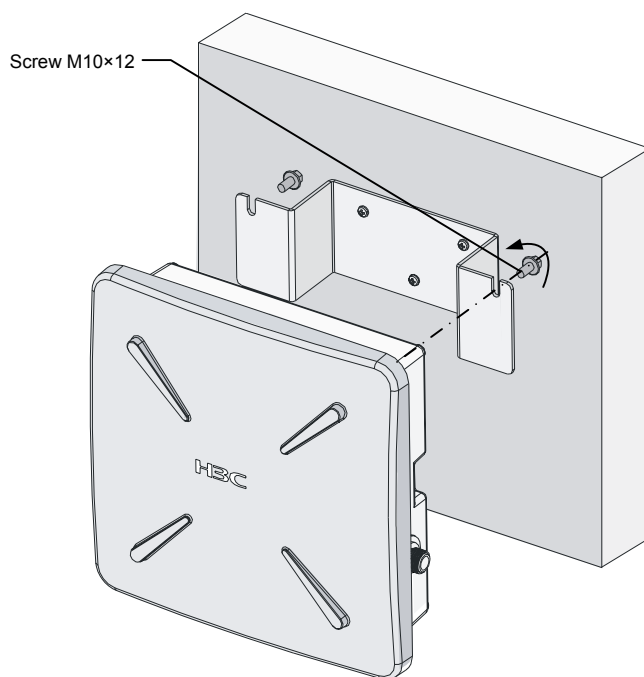


Figure 4-4 Install the outdoor AP on a wall

II. Installing the AP on a pole

The fixing support for installing the outdoor AP on a pole consists of two major components: a pair of V-shaped brackets and a mounting plate. The outdoor AP can be fixed on a vertical or horizontal pole with an outer diameter of 60 to 110 mm (2.36 to 4.33 in) through the fixing support. The tilt of the AP is adjustable.

On the top of a building, the outdoor AP is usually installed on a pole.

Follow these steps to install the outdoor AP on a pole:

- 1) As shown in Figure 4-5, fix the pole base onto the top surface of a building or onto a cement pier.

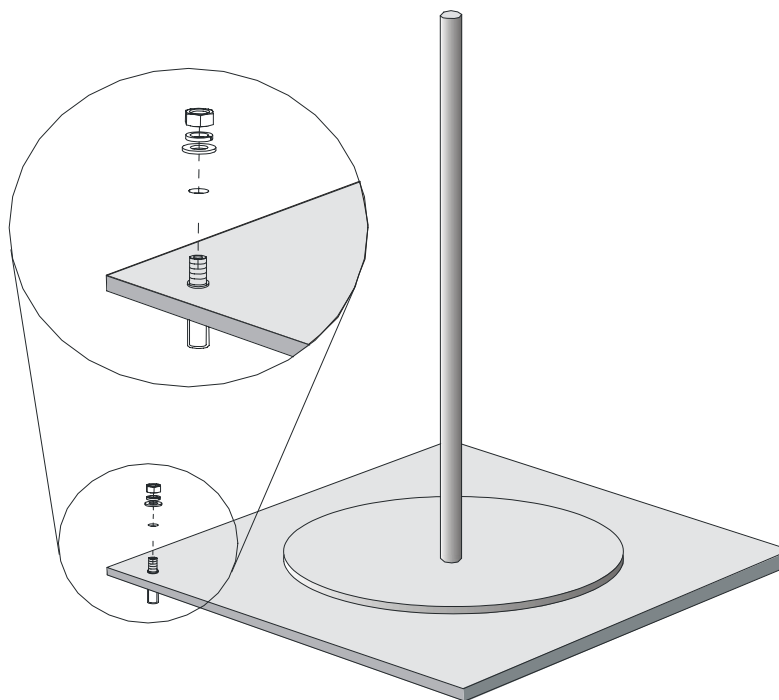


Figure 4-5 Pole and pole base

- 2) Fix the mounting plate onto one V-shaped fixing bracket with screws.
- 3) Fix the pair of V-shaped fixing brackets on a vertical or horizontal pole with bolts, flat washers, spring washers, and nuts (see Figure 4-6 or Figure 4-7).

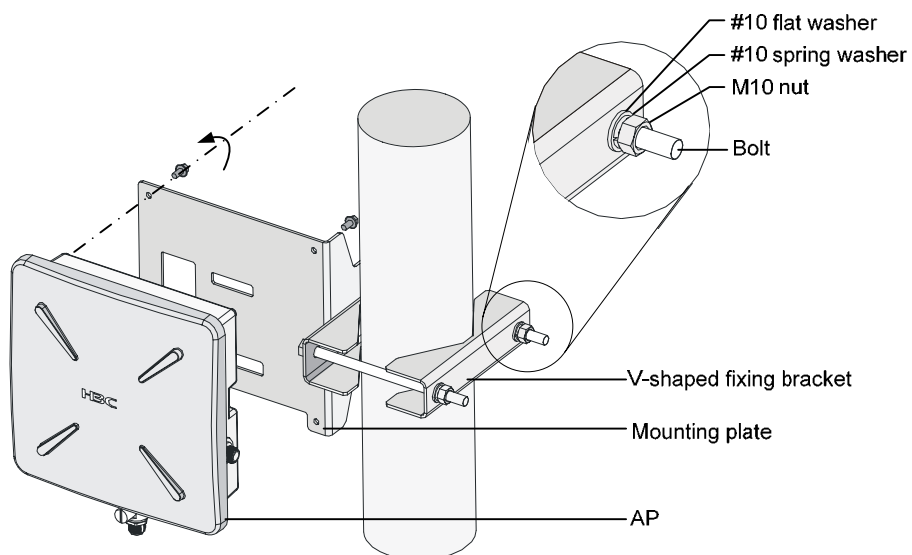


Figure 4-6 Install the outdoor AP on a vertical pole

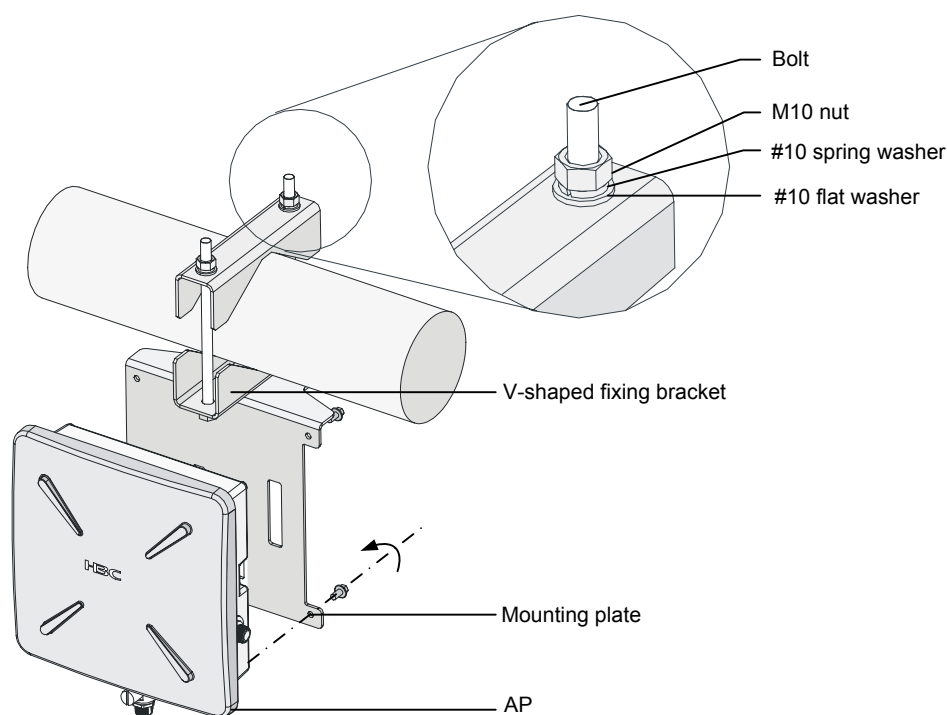


Figure 4-7 Install the outdoor AP on a horizontal pole

- 4) Fix the AP onto the mounting plate with screws (see the dashed line and arrow in Figure 4-6 or Figure 4-7).

Note:

You can first install the fixing support onto the pole and then the AP onto the mounting plate, or vice versa.

4.1.2 Installing an Outdoor Antenna

There are two types of outdoor antennas: directional antenna and omni antenna. An omni antenna can be directly installed on an outdoor AP.

I. Installing a directional outdoor antenna on a pole

Note:

You should select such an installation location for the pole that the antenna direction and tilt could be adjusted freely.

Follow these steps to install a pole on a parapet:

- 1) Weld the lightning rod onto the tip of the pole.
- 2) Install the pole on a parapet or cement pier.
- 3) Use a 40 × 4 mm (1.57 × 0.16 in) flat steel to connect the pole to the ground grid
- 4) Use pole-mounting brackets to install the directional outdoor antenna on the pole.

The pole should be vertical to the building top surface, as shown in Figure 4-8 and Figure 4-9.

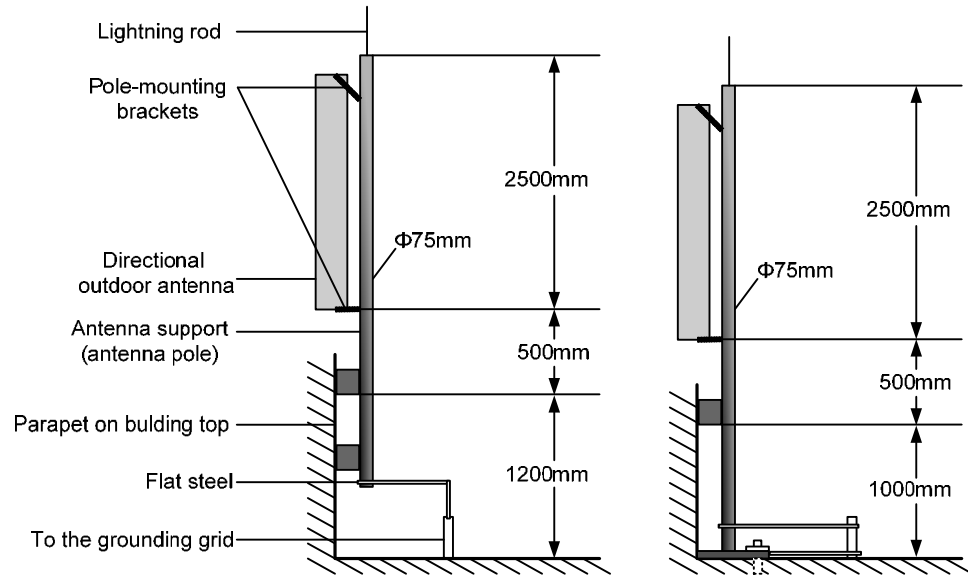


Figure 4-8 Install a directional outdoor antenna on a parapet

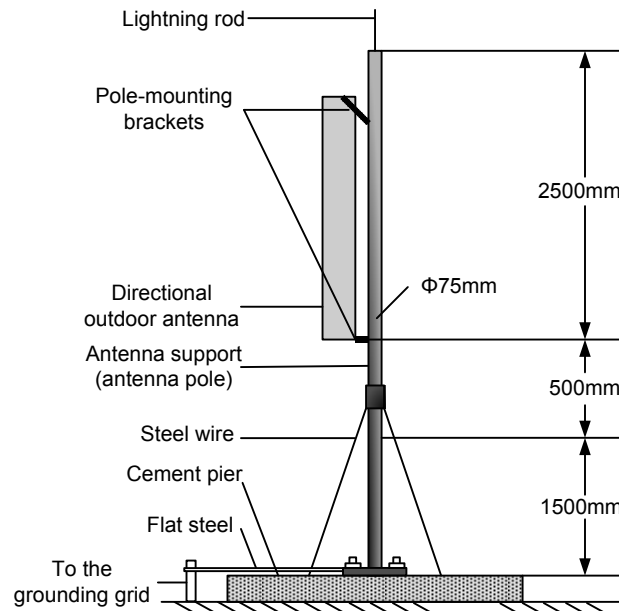


Figure 4-9 Install a directional outdoor antenna on a building top surface or cement pier

- If there are parapets around the building top and the parapets are 1200 mm (47.24 in) high or higher, install the antenna pole on a parapet with expansion bolts and fix the directional outdoor antenna onto the pole with pole-mounting brackets (see the left diagram in Figure 4-8).
- If there are parapets around the building top and the parapet height is less than 1200 mm (47.24 in), fix one point of the pole to the parapet with one expansion bolt and the other point to the building top surface with another expansion bolt, and fix the directional outdoor antenna onto the pole with pole-mounting brackets (see the right diagram in Figure 4-8).
- If there is no parapet around the building top, first use expansion bolts to secure the pole vertically on the building top surface or cement pier, and then use pole-mounting brackets to fix the directional outdoor antenna onto the pole, as shown in Figure 4-9.

II. Installing an omni outdoor antenna on a pole

When installing an omni outdoor antenna on a pole, observe the following precautions:

- The pole should be 35 to 50 mm (1.38 to 1.97 in) in diameter. Usually, a round steel with a diameter of 50 mm (1.97 in) is adopted.
- The top of the pole should be flush with the upper clamp, as shown in Figure 4-10.
- The antenna height should meet the signal coverage requirement and the tip of the antenna should fall within the 45° protection angle of the lightning rod.

Usually, 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.

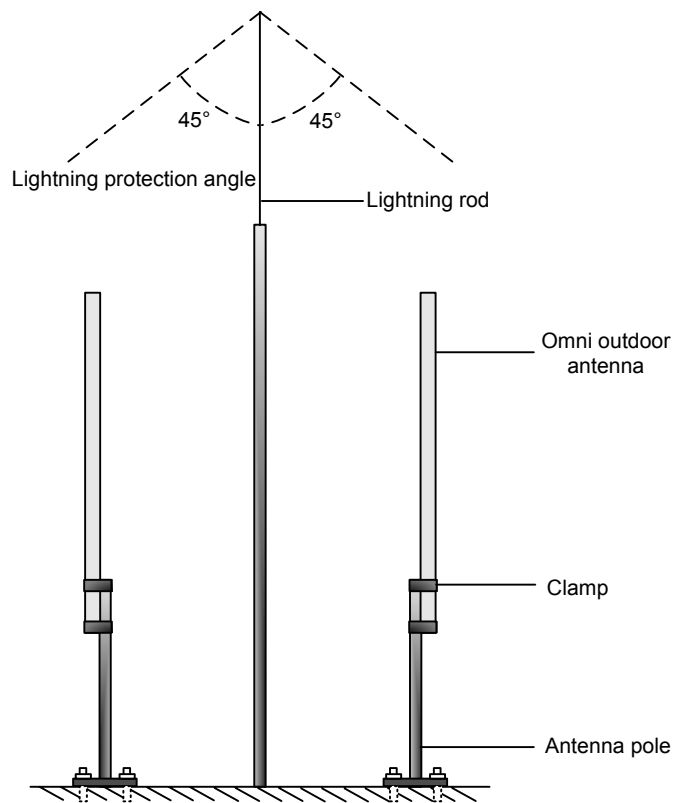


Figure 4-10 Install omni antennas

If the lightning rod cannot be installed on a separate pole owing to the environment limitation, the installation method shown in Figure 4-11 can be adopted. In this case, the lightning rod pole should be at least one meter away from the omni antenna pole.

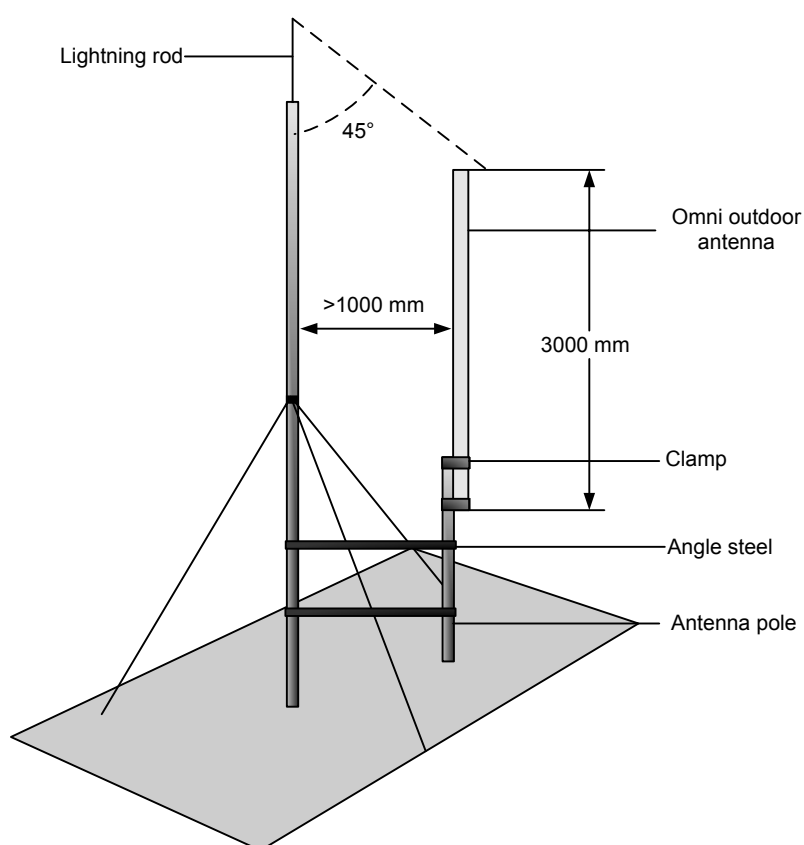


Figure 4-11 Install an omni antenna under a special environment

Note:

In Figure 4-11, the antenna pole is welded with two angle steels to the lightning rod pole, instead of a cement pier.

III. Installing an omni antenna on the AP directly

A low-gain omni rod antenna can be directly installed on the AP. The installation procedure is as follows:

- 1) Screw a feeder lightning arrester onto the downward 2.4-GHz antenna interface.
- 2) Screw the omni rod antenna onto the N-type connector of the feeder lightning arrester.
- 3) Ground the feeder lightning arrester with a grounding cable. (See Figure 4-12)
- 4) Ground the AP with a grounding cable.

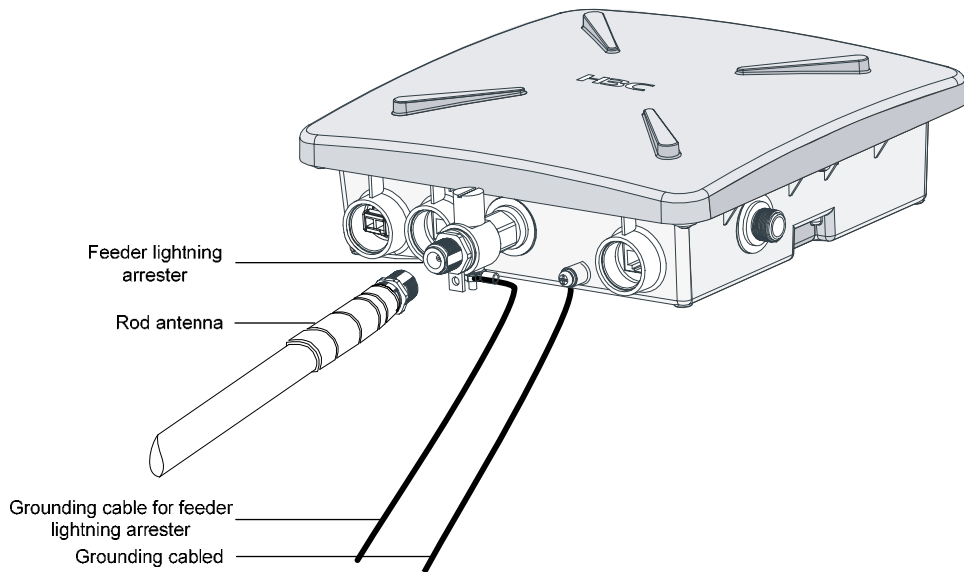


Figure 4-12 Install an omni antenna on the AP directly

Note:

- After the omni antenna is installed on the AP, the antenna should be at least one meter away from the pole or other metal objects.
 - The outdoor AP and the feeder lightning arrester are each equipped with a 3-meter-long grounding cable. If the length is not long enough, you need to supply longer grounding cables. For the grounding requirements, refer to section 2.3.4 “Grounding and Lightning Protection” on page 2-4.
 - You are recommended to install the feeder lightning arrester on the antenna side.
-

4.1.3 Connecting External Cables

Caution:

Before connecting external cables, check that all power lines are disconnected, and that there is no dangerous voltage on the neutral (N) line.

External cables to be connected include an RF cable, Ethernet cable, fiber cable, grounding cable, and power cord.

I. Connecting the RF cable

The RF cable refers to the cable between the antenna interface and the antenna. Follow these steps to connect the RF cable:

- 1) Screw one end of the feeder lightning arrester onto the antenna interface.
- 2) Connect one end of the RF cable to the feeder lightning arrester and the other end to the outdoor antenna.
- 3) Wrap each joint with insulation tape first, and then with waterproof tape.

Note:

- It is recommended to install a feeder lightning arrester on each antenna interface and ground it well.
 - A finished RF cable with a fixed length can be shipped with the AP if ordered. If such an RF cable is not long enough, you should provide a longer RF cable and an N-type RF connector and prepare the cable at the site.
 - Distinguish the stickiness of the two sides of waterproof tape. Before wrapping a cable joint, stretch the waterproof tape so that the width is three quarters of the original one to ensure the tightness.
-

II. Connecting an Ethernet cable

Caution:

Follow the steps below to connect an Ethernet cable. Otherwise, the AP may get damaged

- 1) As shown in Figure 4-13, Figure 4-14, and Figure 4-15, route the waterproof Ethernet cable from the equipment room to the AP installation location.

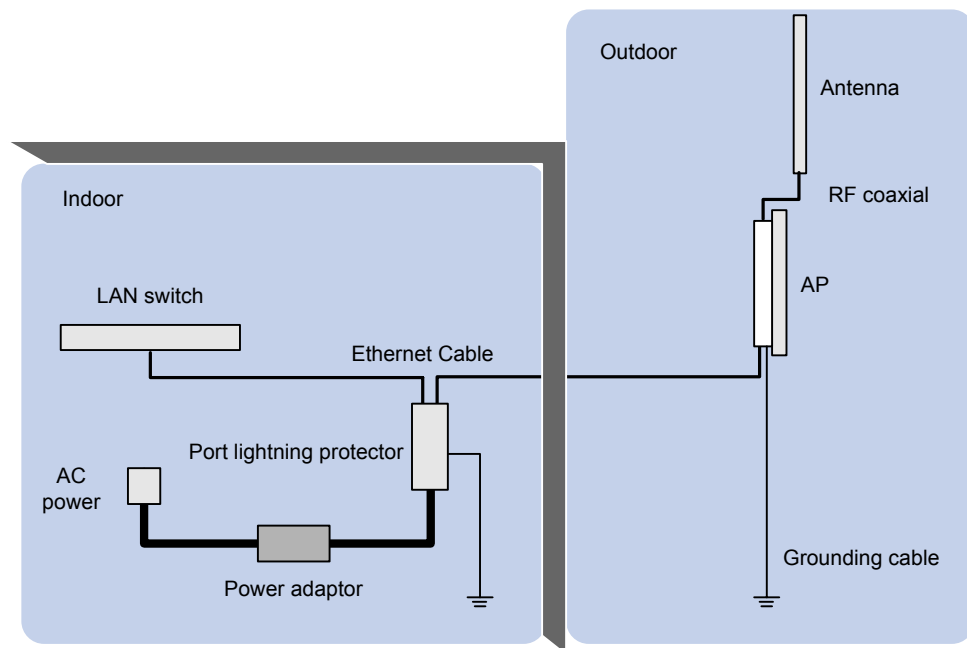


Figure 4-13 Connect the Ethernet electrical interface to the uplink device

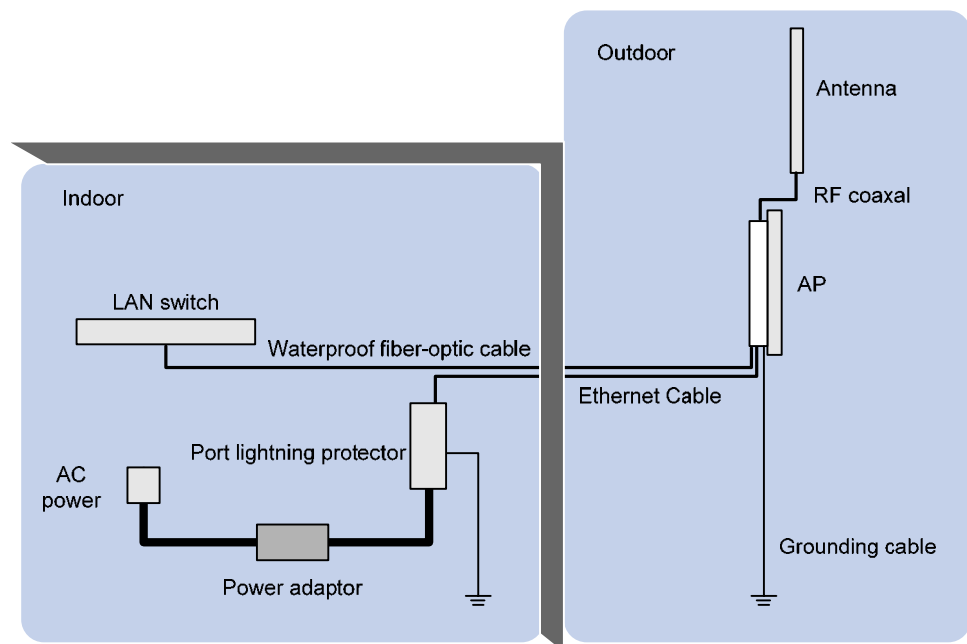


Figure 4-14 Connect the Ethernet optical interface to the uplink device

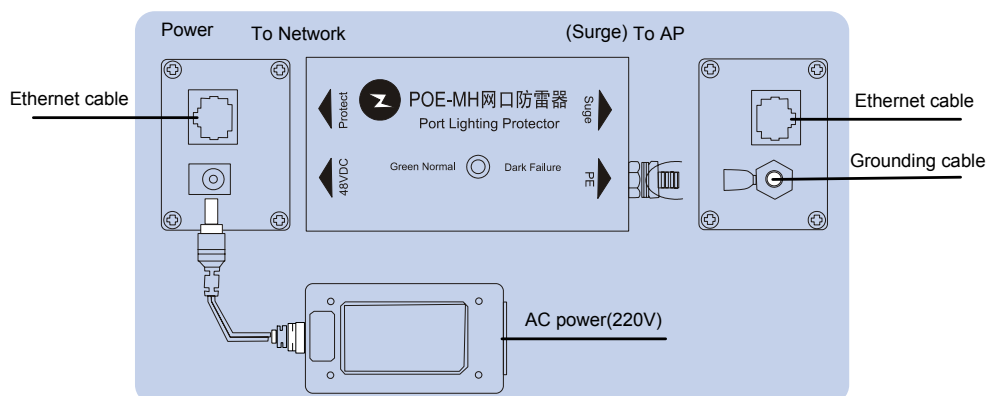


Figure 4-15 Exploded view of the port lightning protector (PoE)

Note:

- If the uplink device is a PoE switch, no port lightning protector or power adapter is required.
 - If the Ethernet optical interface serves as an uplink data interface, the Ethernet electrical interface only serves as a PoE interface.
 - There are two Ethernet interfaces on the power injector, as shown in Figure 4-15. Ensure that the Ethernet interface on the surge side is connected to the AP.
 - Whether the AP is powered by a PoE switch or the power injector, ensure that the AP has been installed as required before power-on.
-

2) Prepare an Ethernet cable connector

Since an Ethernet cable needs to pass through a waterproof cover for waterproof purpose (an Ethernet cable with an RJ-45 connector is unable to pass through), you need to prepare an Ethernet cable connector on site. Usually a category-5 or enhanced category-5 twisted pair cable is adopted. Figure 4-16 shows an Ethernet cable connector.

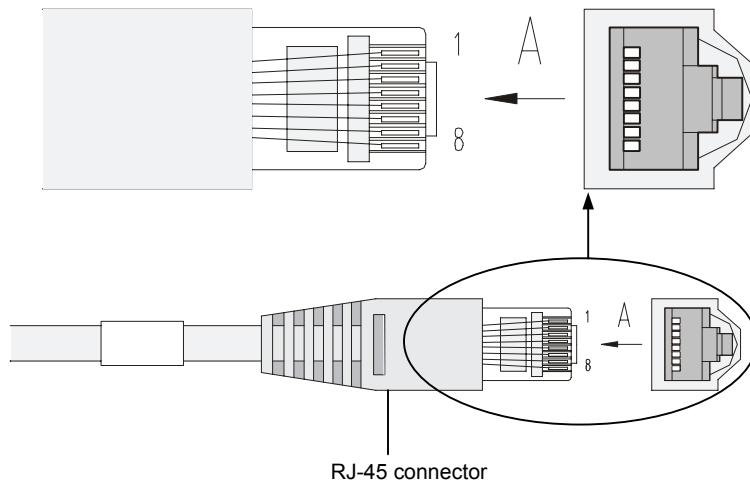


Figure 4-16 Ethernet cable connector

Ethernet cables fall into straight-through Ethernet cables and crossover Ethernet cables.

- Straight-through Ethernet cable: The wires of a twisted pair cable are crimped in the same sequence in the RJ-45 connectors at both ends. A straight-through cable is used to connect a terminal device (such as PC or router) to a hub or LAN Switch.
- Crossover Ethernet cable: The wires of a twisted pair cable are crimped in different sequences in the RJ-45 connectors at both ends. A crossover Ethernet cable is used to connect a terminal device (such as PC or router) to another terminal device. You can make such a cable by yourself.

Table 4-1 RJ-45 straight-through Ethernet cable pinouts

Pin of RJ-45 connector	Signal	Category-5 twisted pair cable	Signal direction	Pin of RJ-45 connector
1	Tx+	White (orange)	→	1
2	Tx-	Orange	→	2
3	Rx+	White (green)	←	3
4	—	Blue	—	4
5	—	White (blue)	—	5
6	Rx-	Green	←	6
7	—	White (brown)	—	7
8	—	Brown	—	8

Table 4-2 RJ-45 crossover Ethernet cable pinouts

Pin of RJ-45 connector	Signal	Category-5 twisted pair cable	Signal direction	Pin of RJ-45 connector
1	Tx+	White (orange)	→	3
2	Tx-	Orange	→	6
3	Rx+	White (green)	←	1
4	—	Blue	—	4
5	—	White (blue)	—	5
6	Rx-	Green	←	2
7	—	White (brown)	—	7
8	—	Brown	—	8

Note:

- When distinguishing or preparing these two types of Ethernet cables, you can refer to the above tables. Since the Ethernet interface of the WA2200 series is auto-sensing, these two types of Ethernet cables can be used for the Ethernet interface.
- Refer to Table 4-1 and Table 4-2 to arrange the wire sequence when preparing an Ethernet cable. Otherwise, the communication quality will not be high, even if the devices at both ends can communicate.
- The Ethernet cable should be equipped with a waterproof sheath when routed outdoors. If possible, cable routing in waterproof tubes is recommended.

- 3) Insert the Ethernet cable connector into the Ethernet interface, as shown in Figure 4-17.

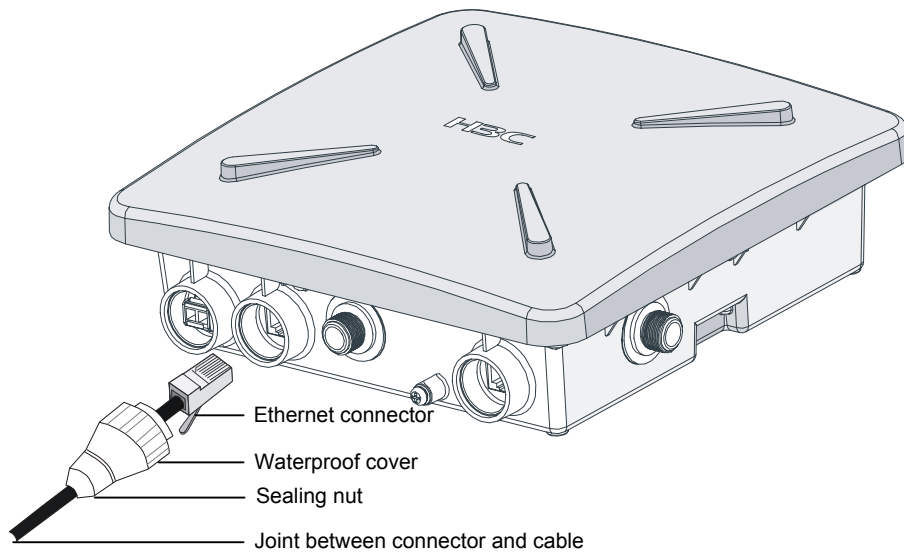


Figure 4-17 Insert the Ethernet cable connector into the Ethernet interface

- 4) First tighten the waterproof cover and then the sealing nut.
- 5) Use waterproof tape to wrap the joint between the waterproof cover and the cable.

III. Connecting an optical fiber



Caution:

Follow the steps below to connect a fiber cable. Otherwise, the AP may get damaged.

You need to configure an SFP module and a waterproof cover when connecting the AP to an uplink device through a fiber cable, as shown in Figure 4-18.

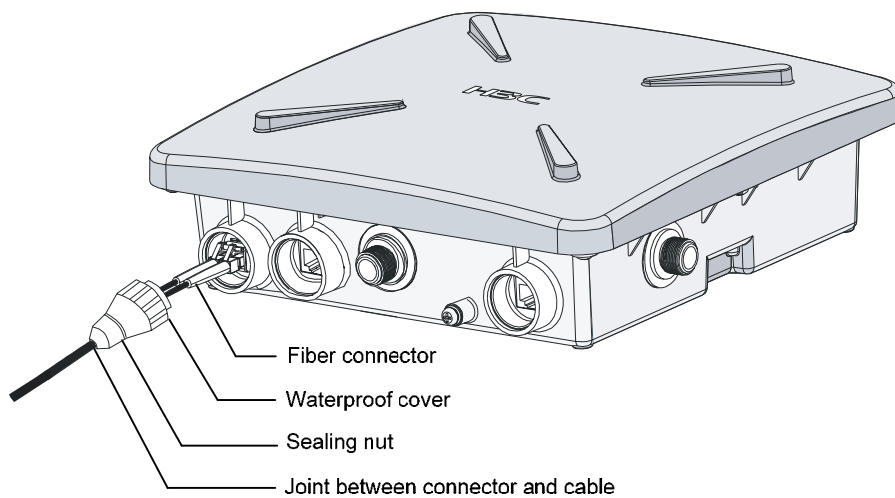


Figure 4-18 Connect a fiber cable

Follow these steps to connect a fiber cable:

- 1) Insert an SFP module into the Ethernet optical interface on the AP.
- 2) Insert the LC connectors of two ZX fibers with a waterproof cover into the two optical interfaces on the SFP module.
- 3) First tighten the waterproof cover and then the sealing nut.
- 4) Use waterproof tape to wrap the joint between the waterproof cover and the fiber cable.
- 5) Splice the tail fibers with those of the uplink device, and bind the joints with waterproof tape, respectively.

4.1.4 Powering On the AP

After all cables are correctly connected as shown in Figure 4-19, power on the AP and check the status of the LEDs. For the description of the LED status, refer to section 1.2.1 “LEDs” on page 1-3.

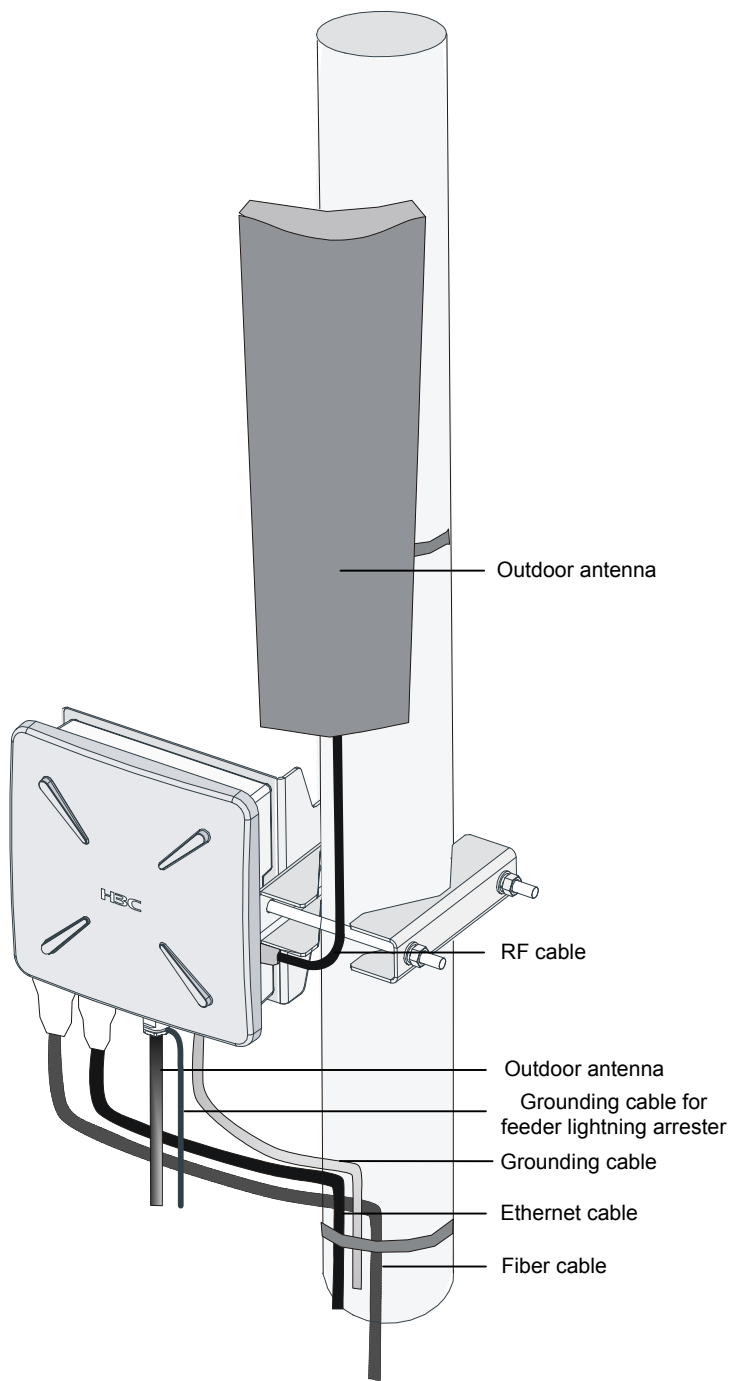


Figure 4-19 Connection of external cables of the AP

4.2 Connecting the Network

In practice, the AP can be connected to the Internet or a MAN through an Ethernet interface, as shown in Figure 4-20.

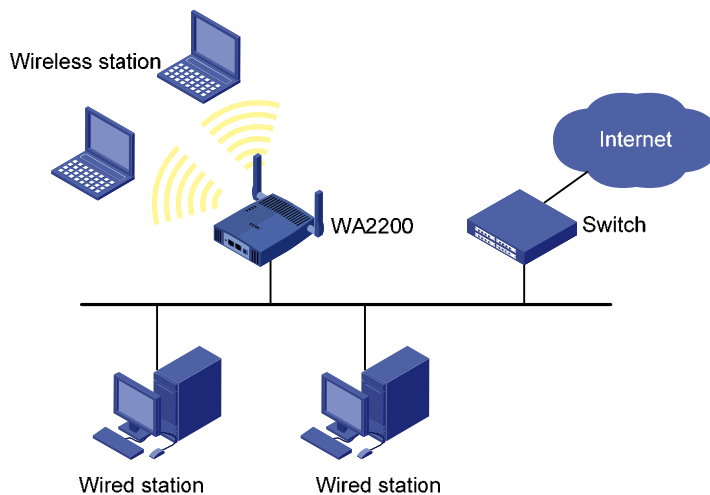


Figure 4-20 Connection between the AP and Internet



Caution:

A special outdoor waterproof Ethernet cable is required to connect the AP and waterproof treatment should be made to the Ethernet cable at the outlet of the chassis.

Chapter 5 Software Setting

The WA2200 series can work in the FIT mode or FAT mode. When setting the AP, you must first determine its working mode. The software of the WA2200 series has been loaded and debugged before delivery. After the installation, you can debug the software of the system.

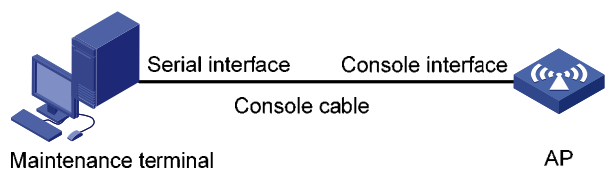
5.1 Working Mode Switching

The WA2200 series can work in the FAT mode, or cooperate with a wireless controller to work in the FIT mode, and they can switch between the FIT mode and the FAT mode. By default, the WA2200 series work in the FAT mode.

Before switching, identify the current working mode of the AP to determine whether it is necessary to perform a mode switching.

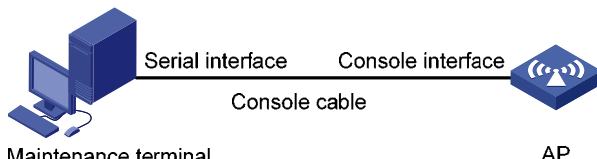
5.1.1 Identifying the Current Working Mode

Follow these steps to identify the current working mode of the AP:

Step	Operation
1	<p>Connect one end of a serial cable to the serial interface on the maintenance terminal and the other end to the console interface on the AP, as shown in the figure below:</p>  <p>The diagram illustrates the physical connection for step 1. On the left, a 'Maintenance terminal' (represented by a computer monitor and tower) has a 'Serial interface' port. A 'Console cable' is connected between this port and the 'Console interface' port on the 'AP' (represented by a blue wireless access point icon).</p>
2	<p>Run a terminal emulation program on the maintenance terminal and set the communication parameters as follows:</p> <ul style="list-style-type: none"> • Bits per second: 9600 • Data bits: 8 • Parity: None • Stop bits: 1 • Flow control: None:
3	<p>Power on the AP and press Ctrl+B to enter BootWare menu. Select 9 to enter a submenu and then select 1 to display the current working mode.</p>

5.1.2 Switching from the FAT Mode to the FIT Mode

Follow these steps to switch from the FAT mode to the FIT mode:

Step	Operation
1	<p>Connect one end of a serial cable to the serial interface on the maintenance terminal and the other end to the console interface on the AP, as shown in the figure below:</p>  <p>Maintenance terminal</p> <p>AP</p>
2	<p>Run a terminal emulation program on the maintenance terminal and set the communication parameters as follows:</p> <ul style="list-style-type: none"> • Bits per second: 9600 • Data bits: 8 • Parity: None • Stop bits: 1 • Flow control: None
3	<p>Determine whether the AP contains the FIT image file, namely, WA2200_fit.bin file in the Flash by using the dir command in user view. By default, the AP contains both the FAT image file and the FIT image file.</p>
4	<p>Specify the image file for the next boot by using the boot-loader file wa2200_fit.bin main command in user view.</p>

5.1.3 Switching from the FIT Mode to the FAT Mode

Follow these steps to switch from the FIT mode to the FAT mode:

Step	Operation
1	<p>Associate the FIT AP with the access controller (AC) by reference to section 5.3.1 "Associating a FIT AP with the AC on page 5-5.</p>
2	<p>Configure the AP to work in the FAT mode by using the wlan ap-execute ap-name conversion-to-fatap command in system view. The <i>ap-name</i> argument in the command is the name of the AP whose working mode needs to be switched. If the FAT image file already exists in the AP, the AP will successfully switch from the FIT mode to the FAT mode. You can log in to the AP through the console interface.</p>

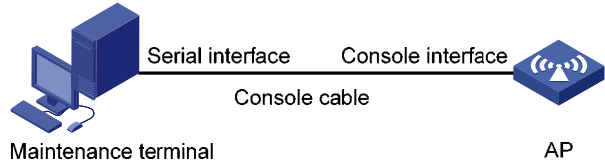
5.2 Setting Up a Configuration Environment

You can set up a connection with the AP through the console interface or telnet to the telnet-enabled AP through the Ethernet interface to perform software debugging. You cannot directly manage the AP working in the FIT mode, but you can by associating it

with an AC. This section only describes the software configuration for the AP working in the FAT mode.

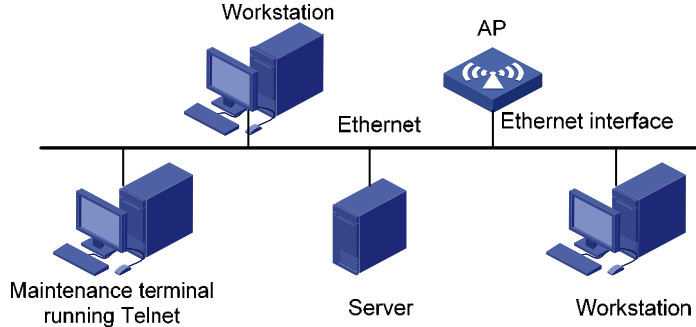
5.2.1 Setting Up a Connection with the AP Through the Console Interface

Follow these steps to set up a connection with the AP through the console interface:

Step	Operation
1	<p>Connect one end of a serial cable to the serial interface on the maintenance terminal and the other end to the console interface on the AP, as shown in the figure below:</p>  <p>Maintenance terminal</p> <p>AP</p>
2	<p>Run a terminal emulation program on the maintenance terminal and set the communication parameters as follows:</p> <ul style="list-style-type: none"> • Bits per second: 9600 • Data bits: 8 • Parity: None • Stop bits: 1 • Flow control: None
3	<p>Power on the AP and the POST result is displayed on the maintenance terminal. When POST completes, press Enter to log in to the command line interface.</p>

5.2.2 Telnetting to the AP

Follow these steps to telnet from the maintenance terminal to the AP:

Step	Operation
1	<p>Connect the maintenance terminal to the Ethernet interface of the AP over a LAN, as shown in the figure below.</p>  <p>Workstation</p> <p>AP</p> <p>Ethernet</p> <p>Ethernet interface</p> <p>Maintenance terminal running Telnet</p> <p>Server</p> <p>Workstation</p>

Step	Operation
2	Run the Telnet program on the maintenance terminal and enter the IP address of the AP to log in to the command line interface.

By default, Telnet is disabled on the AP. Therefore, you need to enable Telnet on the AP and configure the IP address, login username, and password if you want to use Telnet. For the detailed configuration procedure, refer to section 5.2.3 “Configuring Telnet” on 5-5.

5.2.3 Configuring Telnet

Follow these steps to configuring Telnet:

Step	Operation
1	Enter system view. <H3C>system-view System View: return to User View with Ctrl+Z. [H3C]
2	Enable Telnet. [H3C]telnet server enable % Start Telnet server [H3C]
3	Enter VTU view [H3C]user-interface vty 0 4 [H3C-ui-vty0-4]
4	Set a Telnet authentication mode, for example, none authentication . [H3C-ui-vty0-4]authentication-mode none [H3C-ui-vty0-4]
5	Set the user priority level, for example, 3 . [H3C-ui-vty0-4]user privilege level ? INTEGER<0-3> Specify privilege level [H3C-ui-vty0-4]user privilege level 3 [H3C-ui-vty0-4]

Note:

In the none authentication mode, you need to enter the password **h3capadmin** to telnet to a FIT AP, but no password to telnet to a FAT AP.

In the password authentication mode, you need to first enter the default password **h3capadmin** and then the authentication password to telnet to a FIT AP, but only the authentication password to telnet to a FAT AP.

5.3 Configuring a FIT AP

A FIT AP needs to cooperate with the AC and there is originally no configuration on the FIT AP. All configurations of the FIT AP are first performed on the AC and then sent to the FIT AP. Figure 5-1 shows the connection between the FIT AP and the AC.

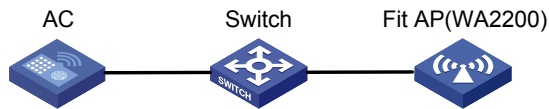


Figure 5-1 Connection between a FIT AP and the AC

5.3.1 Associating a FIT AP with the AC

I. Viewing the system information of a FIT AP

Since a FIT AP is uniquely associated with the AC by the serial-ID of the FIT AP, you need to first view the serial-ID of the FIT AP. Each model of the WA2200 series has a model number. The serial-ID and the model number of a FIT AP are set before delivery.

Follow these steps to view the system information of a FIT AP:

Step	Operation
1	Display the system information of a FIT AP in user view: <pre> <H3C>display wlan ap Display AP Profile ----- Model Number : WA2210_AG Description : -NA- AP Address : 192.168.3.4 AC Address : 192.168.3.1 Serial-ID : 1234567891 State : Run H/W Version : Ver.A S/W Version : V100R001B01D001(270549120) Boot Version : 100 Mode : Split Mac Mode ----- Unicast static AC IPv4 address: -NA- Unicast static AC IPv6 address: -NA- ----- <H3C> </pre>

II. Associating a FIT AP with the AC

Follow these steps to associate a FIT AP with the AC:

Step	Operation
1	Enter system view. <H3C>system-view System View: return to User View with Ctrl+Z. [H3C]
2	Create AP view for the FIT AP on the AC, with the view type consistent with the model number of the FIT AP. For example, create AP view with the name being aptest2 and the type being WA2210_AG. [[H3C]wlan ap aptest2 model WA2210_AG [H3C-wlan-ap-aptest2]
3	Configure the corresponding serial-ID of a FIT AP in AP view, for example, 1234567891. [H3C-wlan-ap-aptest2]serial-id 1234567891 [H3C-wlan-ap-aptest2]
4	Configure the first RF interface in AP view and enable and the RF interface. For example, set the RF type of the first RF interface in AP view named aptest2 to 802.11a and the channel number to 36 , and enable the RF interface. [H3C-wlan-ap-aptest2]radio 1 type 11a [H3C-wlan-ap-aptest2-radio-1]channel 36 [H3C-wlan-ap-aptest2-radio-1]radio enable [H3C-wlan-ap-aptest2-radio-1]

After the above operations, AP view named aptest2 is associated with the FIT AP whose serial-ID is 1234567891 and you can configure the FIT AP on the AC.

5.3.2 Configuring a FIT AP on the AC

Configure a WLAN extended service set (WLAN-ESS), service template, and radio policy on the AC, and then bind them to AP view. After that, the AC will automatically send the configuration information to the associated FIT AP.

I. Configuring a WLAN-ESS

Follow these steps to configure a WLAN-ESS:

Step	Operation
1	Enter system view. <H3C>system-view System View: return to User View with Ctrl+Z. [H3C]
2	Create a WLAN-ESS, for example, WLAN-ESS 101. [[H3C]interface WLAN-ESS 101 [H3C-WLAN-ESS101]

II. Configuring a service template

Follow these steps to configure a service template:

Step	Operation
1	Enter system view. <H3C>system-view System View: return to User View with Ctrl+Z. [H3C]
2	Create a service template. For example, create clear service template 101. [H3C]wlan service-template 101 clear [H3C-wlan-st-101]
3	Configure an authentication method. For example, configure the open-system authentication method. [H3C-wlan-st-101]authentication-method open-system [H3C-wlan-st-101]
4	Configure the SSID. For example, set the SSID to fyttest1. [H3C-wlan-st-101]ssid fyttest1 [H3C-wlan-st-101]
5	Bind a WLAN-ESS to the service template. For example, bind WLAN-ESS 101 to the service template. [H3C-wlan-st-101]bind WLAN-ESS 101 [H3C-wlan-st-101]
6	Enable the service template. [H3C-wlan-st-101]service-template enable [H3C-wlan-st-101]

III. Configuring a radio policy

Follow these steps to configure a radio policy:

Step	Operation
1	Enter system view. <H3C>system-view System View: return to User View with Ctrl+Z. [H3C]
2	Create a radio policy, for example, radio policy 1. [H3C]wlan radio-policy 1 [H3C-wlan-rp-1]

IV. Binding the configurations to AP view

Follow these steps to bind the configurations to AP view:

Step	Operation
1	Enter system view. <H3C>system-view System View: return to User View with Ctrl+Z. [H3C]
2	Enter AP view and then radio view. For example, enter AP view named aptest2 and then radio 1 view. [H3C]wlan ap aptest2 [H3C-wlan-ap-aptest2]radio 1 [H3C-wlan-ap-aptest2-radio-1]
3	Bind a radio policy and a service template to an RF interface in AP view. For example, bind radio-policy 1 and service template 101 to the first RF interface in AP view named aptest2. [H3C-wlan-ap-aptest2-radio-1]radio-policy 1 [H3C-wlan-ap-aptest2-radio-1]service-template 101 [H3C-wlan-ap-aptest2-radio-1]

After the above configurations, wireless stations can detect and access the network whose SSID is fyttest1.

5.3.3 Security Setting

For the purpose of security, an encryption method can be applied to the authentication of wireless stations and communication between wireless stations and the FIT AP. The following describes how to set the WEP104 encryption method on the AC.

I. Setting the encryption template

Follow these steps to set the encryption template:

Step	Operation
1	Enter system view. <H3C>system-view System View: return to User View with Ctrl+Z. [H3C]
2	Create a service template, for example, encryption template 22, and enter its view. [H3C]wlan service-template 22 crypto [H3C-wlan-st-22]

Step	Operation
3	<p>Configure the TKIP encryption template.</p> <p>Configure an encryption template for SSID testwep104, with the encryption method being WEP104, key-id being 1, and key being 1234567980123.</p> <pre>[H3C-wlan-st-22]ssid testwep104 [H3C-wlan-st-22]bind WLAN-ESS 22 [H3C-wlan-st-22]authentication-method open-system [H3C-wlan-st-22]cipher-suite wep104 [H3C-wlan-st-22]wep default-key 1 wep104 pass-phrase 1234567890123 [H3C-wlan-st-22]wep key-id 1 [H3C-wlan-st-22]service-template enable</pre>

5.4 Configuring a FAT AP

5.4.1 System Setting

The following simply describes how to configure a FAT AP so that wireless stations can access it.

I. Configuring a WLAN-BSS

Follow these steps to configure a WLAN basic service set (WLAN-BSS):

Step	Operation
1	<p>Enter system view.</p> <pre><H3C>system-view System View: return to User View with Ctrl+Z. [H3C]</pre>
2	<p>Create a WLAN-BSS, for example, WLAN-BSS 2.</p> <pre>[H3C]interface WLAN-BSS 2 [H3C-WLAN-BSS2]</pre>

II. Configuring a service template

Follow these steps to configure a service template:

Step	Operation
1	<p>Enter system view.</p> <pre><H3C>system-view System View: return to User View with Ctrl+Z. [H3C]</pre>
2	<p>Create a service template.</p> <p>For example, create clear service template 2.</p> <pre>[H3C]wlan service-template 2 clear [H3C-wlan-st-2]</pre>
3	<p>Configure an authentication method, for example, open-system authentication.</p> <pre>[H3C-wlan-st-2]authentication-method open-system [H3C-wlan-st-2]</pre>

Step	Operation
4	<p>Set the SSID.</p> <p>For example, set the SSID to testFatAP2.</p> <pre>[H3C-wlan-st-2]ssid testFatAP2 [H3C-wlan-st-2]</pre>
5	<p>Enable the service template.</p> <pre>[H3C-wlan-st-2]service-template enable [H3C-wlan-st-2]</pre>

III. Configuring an RF interface (WLAN-radio)

Bind the WLAN-BSS and service template to the specified RF interface.

Follow these steps to configure an RF interface (WLAN-radio):

Step	Operation
1	<p>Enter system view.</p> <pre><H3C>system-view System View: return to User View with Ctrl+Z. [H3C]</pre>
2	<p>Enter WLAN-radio view, for example, WLAN-radio 1/0/1 view</p> <pre>[H3C]interface WLAN-Radio 1/0/1 [H3C-WLAN-Radio1/0/1]</pre>
3	<p>Configure the RF type, for example, 802.11a.</p> <pre>[H3C-WLAN-Radio1/0/1]radio-type 11a [H3C-WLAN-Radio1/0/1]</pre>
4	<p>Set a channel number, for example, 36.</p> <pre>[H3C-WLAN-Radio1/0/1]channel 36 [H3C-WLAN-Radio1/0/1]</pre>
5	<p>Bind the WLAN-BSS and service template to the specified RF interface.</p> <p>For example, bind WLAN-BSS 2 and service template 2 to RF interface WLAN-radio 1/0/1.</p> <pre>[H3C-WLAN-Radio1/0/1]service-template 2 wlan-bss 2 [H3C-WLAN-Radio1/0/1]</pre>

After the above configurations, wireless stations can detect and access the network whose SSID is testFatAP2.

5.4.2 Setting a System Name and the System Clock

Enter command line view through telnet or the console interface.

I. Setting a system name

Multiple FAT APs in a network can be identified by their system names.

Follow these steps to set a system name:

Step	Operation
1	Enter system view. <H3C>system-view System View: return to User View with Ctrl+Z. [H3C]
2	Use the sysname command to set a system name for the AP, for example, AP. <H3C>system-view [H3C]sysname AP [AP]

II. Setting the system clock

Follow these steps to set the system clock:

Step	Operation
1	Run the clock datetime command in user view to set a system time, for example, 10:35:46, November 28, 2007. <H3C>clock datetime 10:35:46 2007/11/28

5.4.3 Security Setting

For the purpose of security, an encryption method can be applied to the authentication of stations and communication between wireless stations and the FAT AP. The following describes how to set TKIP encryption.

I. Setting port encryption for WLAN-BSS

Follow these steps to set port encryption for WLAN-BSS:

Step	Operation
1	Enter system view. <H3C>system-view System View: return to User View with Ctrl+Z. [H3C]
2	Enter WLAN-BSS view, for example, WLAN-BSS 3 view. [H3C]interface WLAN-BSS 3 [H3C-WLAN-BSS3]
3	Set an encryption method for WLAN-BSS, for example, PSK authentication with the key being 12345678. [H3C-WLAN-BSS3]port-security port-mode psk [H3C-WLAN-BSS3]port-security tx-key-type 11key [H3C-WLAN-BSS3]port-security preshared-key pass-phrase 12345678 [H3C-WLAN-BSS3]undo dot1x multicast-trigger [H3C-WLAN-BSS3]

II. Setting the encryption template

Follow these steps to set the encryption template:

Step	Operation
1	Enter system view. <pre><H3C>system-view System View: return to User View with Ctrl+Z. [H3C]</pre>
2	Enter service template view, for example, encryption template 3. <pre>[H3C]wlan service-template 3 crypto [H3C-wlan-st-3]</pre>
3	Configure the TKIP encryption template. For example, configure the TKIP encryption template for SSID testFatAP3. <pre>[H3C-wlan-st-3]ssid testFatAP3 [H3C-wlan-st-3]authentication-method open-system [H3C-wlan-st-3]cipher-suite tkip [H3C-wlan-st-3]security-ie wpa [H3C-wlan-st-3]service-template enable [H3C-wlan-st-3]</pre>

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Chapter 1 Regulatory Compliance Information

1.1 Regulatory compliance standards

Table 1-1 Regulatory compliance standards

Discipline	Standards
EMC & RF	FCC Bulletin OET-65C FCC Part 15.207 & 15.209 & 15.247 FCC Part 15.207 & 15.209 & 15.407 ETSI EN 300 328 ETSI EN 301 893 CISPR22 CLASS B EN 55022 CLASS B CISPR24 EN 55024 EN 60601-1-2 IEC 61000-3-2 IEC 61000-3-3 ETSI EN 301 489-1 ETSI EN 301 489-17

Discipline	Standards
Safety	UL 60950-1:2003 CAN/CSA C22.2 No 60950-1-03 IEC 60950-1:2001 EN 60950-1/A11:2004 EN 50385

1.2 European Regulatory compliance

WA 2200 Series Wireless LAN Access Point complies with the following European Directives: R&TTE Directive 1999/5/EC.

1.2.1 EU Compliance information

- 1) CE Mark



Equipment may be operated in the following country:

AT	BE	CY	CZ	DK	EE	FI	FR
DE	GR	HU	IE	IT	LV	LT	LU
MT	NL	PL	PT	SK	SI	ES	SE
GB	IS	LI	NO	CH	BG	RO	TR



Note:

Select the country in which the product is installed to ensure product operation is in compliance with local regulations. For information on how to select the country, refer to the “*Wireless Configuration Command*” module in *H3C Wireless Control Manager Command Manual*.

- 2) Intended use: IEEE 802.11 a/b/g radio LAN device.

1.2.2 EU Country Restriction in 2.4GHz band

WA 2200 series Wireless LAN Access Point may be used indoors or outdoors in all countries of the European Community using the 2.4GHz band: Channel 1-13, except where noted below.

- France

For 2.4 GHz, the output power is restricted to 10 mW EIRP when the product is used outdoors in the band 2454 - 2483.5 MHz. There are no restrictions when used in other parts of the 2.4 GHz band.

The frequency band 5470-5750MHz is not allowed.

Check <http://www.arcep.fr/> for more details.

- Latvia

The outdoor usage of the 2.4-GHz band requires an authorization from the Electronic Communications Office. Please check <http://www.esd.lv> for more details.

1.2.3 EU Country Restriction in 5GHz band

- 1) The frequency band 5150-5250MHz can not be used outdoors.
- 2) This device support DFS function.

- Austria

Only the frequency band 5150-5250MHz is allowed.

- France

The frequency band 5470-5750MHz is not allowed.

- Cyprus

The frequency band 5470-5750MHz is not allowed.

- Czech Republic

The frequency band 5470-5750MHz is not allowed.

- Hungary

The frequency band 5470-5750MHz is not allowed.

- Slovakia

The frequency band 5470-5750MHz is not allowed.

- Italy

This product meets the National Radio Interface and the requirements specified in the National Frequency Allocation Table for Italy. Unless this wireless LAN product is operating within the boundaries of the owner's property, its use requires a "general authorization". Please check <http://www.comunicazioni.it/it/> for more details.

1.3 USA regulatory compliance

1.3.1 FCC Part 15

I. US Federal Communications Commission (FCC) EMC Compliance

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.

1.3.2 RF Requirements

- 1) RF exposure Hazard Warning

To ensure compliance with the requirements of FCC RF exposure, a minimum body to antenna distance of 20cm (8 inch) must be maintained when the device is operated.

2) RF Frequency Requirements

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

This device is for indoor use only when it is operated at 5.15 to 5.25GHz frequency range.

High power radars are allocated as primary users of the 5.25 to 5.35GHz and 5.65 to 5.85GHz bands. These radar stations can cause interference with and /or damage this device.

3) Antennas

Only use the supplied antenna. Unauthorized antennas, modifications or change to the antennas could violate FCC regulations and void the user's authority to operate the equipment.

(15.21)

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.

15.19 (a)(3)

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.

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Chapter 2 Safety Information

Sicherheitsinformationen 安全信息

2.1 General Requirements Allgemeine Anforderungen 通用要求

In order to reduce the technically unavoidable residual risk to a minimum, it is imperative to follow the rules below:

Um das technisch bedingte Restrisiko auf ein Minimum zu begrenzen, ist es unbedingt erforderlich, die folgenden Regeln zu beachten:

为了避免对人和设备造成伤害，请认真执行下列要求：

- Read all the instructions before operation.
- Lesen Sie alle Anweisungen sorgfältig durch, bevor Sie mit dem Arbeiten beginnen.
- 在进行操作前仔细阅读手册内容。
- Do not block ventilation openings while the system is on, and keep at least 5 cm distance from ventilation openings and walls or other things which may block the openings.
- Sorgen Sie dafür, dass die Öffnungen der Ventilation zu keinem Zeitpunkt verschlossen, verstopft oder anderweitig blockiert sind. Zwischen den Ventilationsöffnungen und Wänden bzw. anderen Gegenständen muss stets ein Abstand von mindestens 5cm bestehen.

- 设备在工作时必须确保通风口的畅通，确保设备离墙壁或是其它的可能堵塞通风口的物体的间距至少 5cm。
- For AC supplied model: To ensure the safety of the equipment and human body, please unplug the AC power connector and do not use the fixed terminal in the lightning weather. Furthermore, please do not touch the terminal or antenna connector in such weather.
- Mit Wechselstrom betriebenes Modell: Um die Sicherheit des Personals und der Ausrüstung zu gewährleisten, muss der Stecker aus der Steckdose gezogen werden, wenn die Gefahr eines Blitzeinschlages besteht. Verwenden Sie bei Blitzgefahr keine festinstallierten Steckdosen. Berühren Sie bei Blitzgefahr nicht die Antenne.
- 对于 AC 输入设备，为保证设备和人身安全，请在雷雨天气时拔下 AC 电源连接器，并不要使用固定终端，或者不要接触该终端或者天线。

2.2 Electricity Safety Elektrische Sicherheit 用电安全

- Conducting articles, such as watch, hand chain, bracelet and ring are prohibited during the operation.
- Es ist nicht erlaubt während dieser Arbeiten leitende Gegenstände wie Uhren, Armbänder, Armreifen und Ringe am Körper zu tragen.
- 在操作中不能穿戴导电性的物品，如：手表，手链，手镯和项链等。
- When water is found in the rack, or the rack is damp, please immediately switch off the power supply.

- Sollte sich Wasser im Baugruppenträger befinden oder der Baugruppenträger feucht sein, ist die Energiezufuhr sofort zu unterbrechen und das System abzuschalten.
- 当有液体进入机架或机架有损坏时，请立即切断电源。
- When operation is performed in a damp environment, make sure that water is kept off the equipment.
- Muss in einem feuchten Umgebung gearbeitet werden, ist sicherzustellen, dass kein Wasser in die Ausrüstung dringen kann.
- 在潮湿环境下进行安装时，请避免液体进入设备。