

5 Outdoor AP

About This Chapter

- 5.1 Hardware Description
- 5.2 Installing Outdoor APs

5.1 Hardware Description

5.1.1 AirEngine 8760R-X1 (02353GSF-001)

Overview

Table 5-1 Basic information about the AirEngine 8760R-X1

Item	Details
Description	AirEngine8760R-X1 (11ax outdoor,8+8 dual bands,smart antenna,BLE,PSE)
Part Number	02353GSF-001
Model	AirEngine 8760R-X1
First supported version	V200R021C10SPC100

 NOTE

Depending on the production batch, the device has multiple part numbers, which have the same software specifications but different minimum versions supported. Additionally, the hardware specifications, such as the weight and power consumption, are slightly different.

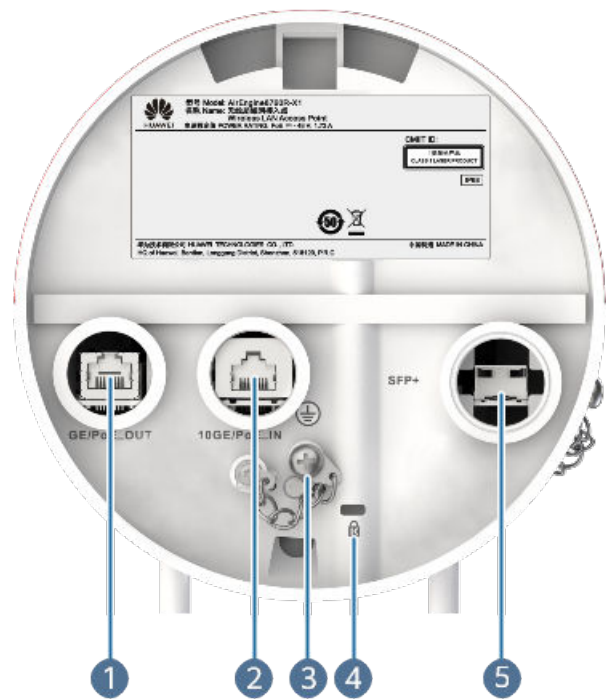
Appearance

Figure 5-1 Appearance of the AirEngine 8760R-X1



Ports

Figure 5-2 Ports on the AirEngine 8760R-X1



1	GE/PoE_OUT	2	10GE/PoE_IN
3	Ground screw	4	Security slot
5	SFP+	-	-

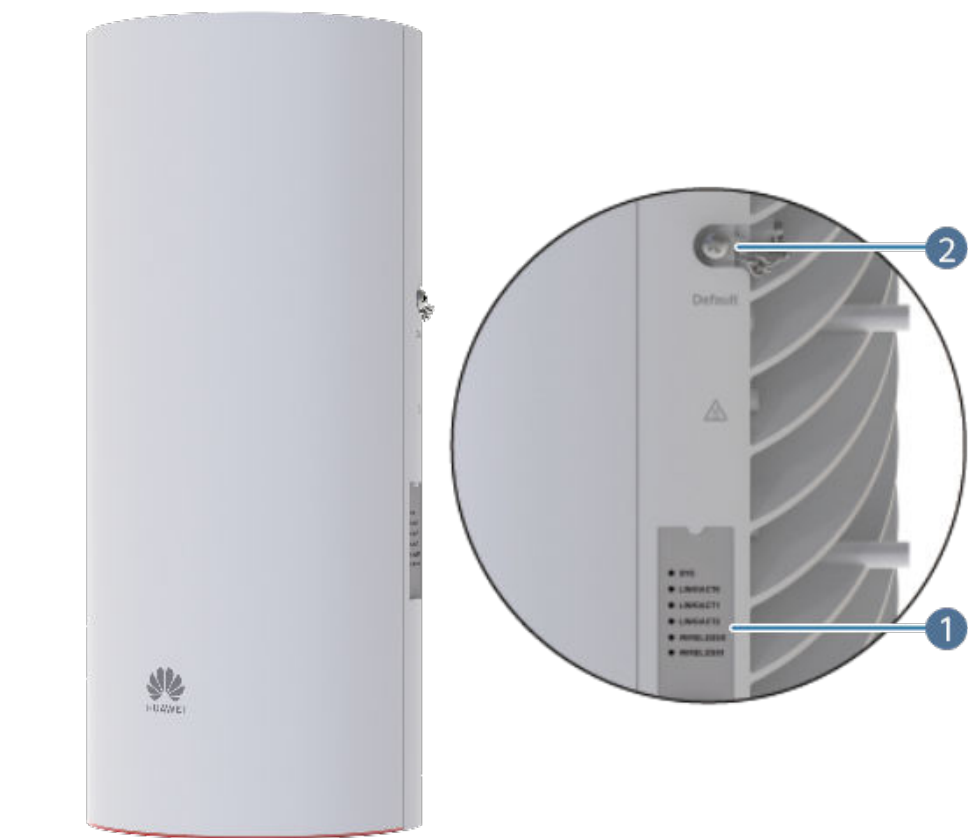
Table 5-2 Ports on the AirEngine 8760R-X1

Port	Connector Type	Description	Available Components
10GE/PoE_IN	RJ45	Ethernet electrical port that supports 100M/1000M/2.5G/5G/10G auto-sensing, connects to the wired Ethernet, and supports PoE input.	Network cable

Port	Connector Type	Description	Available Components
SFP+	SFP+	Ethernet optical port, supporting 1 Gbit/s or 10 Gbit/s auto-sensing and working with a matching optical module	Optical module
GE/PoE_OUT	RJ45	Ethernet electrical port that supports 10M/100M/1000M auto-sensing and connects to the wired Ethernet.	Network cable

Indicators and Buttons

Figure 5-3 Indicators and buttons on the AirEngine 8760R-X1



LINK/ACT0, LINK/ACT1, and LINK/ACT2 show the link status of the 10GE/PoE_IN, GE/PoE_OUT, and SFP+ ports, respectively.

WIRELESS0 and WIRELESS1 show the wireless link status of the radio 0 and radio 1, respectively. This mechanism is valid in V200R022C00 and later versions.

1	Indicator	2	Default
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Table 5-3 Indicators on the AirEngine 8760R-X1

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Steady on after blinking once	After the hardware reset is cleared and the software starts, the indicator blinks once. Then, the indicator is steady on until the bottom-layer system starts.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP. This state is supported in V200R022C00 and later versions.

Silkscreen	Name	Color	Status	Description
		Green	Slow blinking (0.2 Hz)	<p>The AP is running properly, and the Ethernet connection is normal.</p> <p>For V200R022C00 and later versions, this state also indicates that no STA is associated with the AP.</p>
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.

Silkscreen	Name	Color	Status	Description
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V200R024C00 and later versions.
		Red	Steady on	The system is faulty.
LINK/ACT0, LINK/ACT1, and LINK/ACT2	Port indicator	Green	Blinking	The Ethernet connection is normal.
LINK/ACT1	Port indicator (PoE_OUT enabled)	-	Off	The Ethernet connection fails, and the PoE OUT function is available.
		Green	Steady on	The Ethernet connection is normal, and no data is being transmitted. The PoE OUT function is available.

Silkscreen	Name	Color	Status	Description
		Green	Blinking	The Ethernet connection is normal, and the AP is transmitting data. The indicator blinks more frequently when the data traffic increases. The PoE OUT function is available.
		Yellow	Steady on	The Ethernet connection fails, and the PoE OUT function is unavailable.
		Yellow	Slow blinking (0.5 Hz)	The Ethernet connection fails, and the PoE OUT function is faulty.
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.

Silkscreen	Name	Color	Status	Description
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS0	Radio 0 status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Green	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Green	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.
		Green	Steady on	The AP is connected to a Mesh network and has good signal strength.
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios are disabled, and no STA is connected to the AP.

Silkscreen	Name	Color	Status	Description
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Yellow	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Yellow	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.
		Yellow	Steady on	The AP is connected to a Mesh network and has good signal strength.

Table 5-4 Buttons on the AirEngine 8760R-X1

Silkscreen	Name	Description
Default	Reset button	<ul style="list-style-type: none">For versions earlier than V200R022C00SPC100: Hold down the button for more than 3 seconds to restore the factory settings and restart the device.For versions from V200R022C00SPC100 to V200R023C10: if you press the button, the device resets. If you hold down the button for more than 6 seconds, the device restores the factory settings, switches to the Fit mode, and restarts.For V200R024C00 and later versions: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-5 Technical specifications of the AirEngine 8760R-X1

Item	Specification
Installation Type	<ul style="list-style-type: none">WallPole

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	Diameter x length: 165 mm x 387 mm (6.50 in. x 15.24 in.)
Weight without packaging [kg(lb)]	4.15 kg (9.15 lb)
Storage	NAND Flash 512 MB; NOR Flash 16 MB
Console port	BLE console
Maximum power consumption [W]	53.2 (excluding PoE OUT)
Maximum heat dissipation [BTU/hour]	181.5 (without PoE OUT)
Power supply mode	PoE
Input voltage range [V]	PoE: 802.3bt
Service port surge protection	6 kA in common mode
PoE OUT	Supported
Maximum PoE output power [W]	15.4 W
Maximum number of physical ports on the entire device	10GE (RJ45) x 1, 10M/100M/1000M/2.5GE/5GE/10GE auto-sensing GE (RJ45) x 1, 10M/100M/1000M auto-sensing 10GE optical port (SFP+), GE/10GE auto-sensing
Long-term operating temperature [°C(°F)]	-40°C to +65°C (-40°F to +149°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	-40°C to +85°C (-40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	-60 m to +5000 m (-196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP68
Ground	Grounding

Item	Specification
Wind resistance	67 m/s
USB	Not supported
IoT slot	Not supported
BLE	BLE5.2
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Dual-radio standard mode: <ul style="list-style-type: none"> Radio 0 (2.4 GHz): 4x4:4 Radio 1 (5 GHz): 12x12:8 Dual-radio 2G enhanced mode: <ul style="list-style-type: none"> Radio 0 (2.4 GHz): 8x8:4 (A maximum of four antennas can be used to transmit and receive 802.11b packets.) Radio 1 (5 GHz): 8x8:8 Dual-radio + independent radio scanning mode: <ul style="list-style-type: none"> Radio 0 (2.4 GHz): 4x4:4 Radio 1 (5 GHz): 8x8:8
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax 5 GHz: 802.11a/n/ac/ac Wave 2/ax
Radio interface	Built-in directional antennas
Antenna gain	2.4G: 10 dBi 5G: 11 dBi BLE: 5 dBi
Beamwidth of the built-in antenna [degrees]	2.4 GHz: <ul style="list-style-type: none"> Horizontal plane: 180° @ 6 dB, 70° @ 3 dB Vertical plane: 40° 5 GHz: <ul style="list-style-type: none"> Horizontal plane: 180° @ 6 dB, 100° @ 3 dB Vertical plane: 20°

Item	Specification
Maximum transmit power	2.4 GHz: 33 dBm 5 GHz: 33 dBm (Note: This is the total MIMO radio power, the same as: 2.4 GHz: 24 dBm/chain 5 GHz: 24 dBm/chain) BLE: < 10 dBm
Singal radio transmit power [dBm]	2.4G: -10 dBm to 24 dBm/chain 5G: -10 dBm to 24 dBm/chain
MTBF [year]	60.2 year
MTTR [hour]	0.5 hour
Frequency stability [ppm]	+/-20

Item	Specification
802.3bt power supply description	<p>In 802.3bt Class 8 power supply mode:</p> <p>If the PoE OUT port is not used, no function is restricted. In enhanced dual-radio 2G mode, the 2.4 GHz radio supports 8x8:4 MIMO and a maximum of 20 MHz bandwidth.</p> <p>If the PoE OUT port (supporting only 802.3af) is used, the 10GE electrical port and the SFP+ optical port work as combo ports, and when one of them is working, the other is unavailable. The GE electrical port is available. Other functions are not restricted. In enhanced dual-radio 2G mode, the 2.4 GHz radio supports 8x8:4 MIMO and a maximum of 20 MHz bandwidth.</p> <p>In 802.3bt Class 6 power supply mode:</p> <p>If the PoE OUT port is not used:</p> <p>Wi-Fi:</p> <p>The transmit power of radios is not affected.</p> <ul style="list-style-type: none"> • Standard dual-radio mode: 2.4 GHz (4x4) + 5 GHz (12x12:8) • Dual-radio + independent scanning radio mode: 2.4 GHz (4x4) + 5 GHz (8x8) + 5 GHz independent radio scanning • Enhanced dual-radio 2G mode: 2.4 GHz (8x8:4) + 5 GHz (4x4). In this mode, the 2.4 GHz radio supports 8x8:4 MIMO and a maximum of 20 MHz bandwidth. <p>Wired network port:</p> <p>The 10GE electrical port and the SFP+ optical port work as combo ports, and when one of them is working, the other is unavailable. The GE electrical port is available.</p> <p>Other ports:</p> <p>The PoE OUT port is not used.</p> <p>If the PoE OUT port is used:</p> <p>Wi-Fi:</p> <p>The transmit power of radios is automatically adjusted.</p>

Item	Specification
	<ul style="list-style-type: none">Standard dual-radio mode: 2.4 GHz (4x4) + 5 GHz (4x4)Dual-radio + independent scanning radio mode: 2.4 GHz (4x4) + 5 GHz (4x4) + independent radio scanning Wired network port: The 10GE electrical port and the SFP+ optical port are combo ports, and only one of them can be selected. The GE electrical port is available. Other ports: The PoE OUT port (supporting only 802.3af) is used.
802.3at power supply description	Wi-Fi: The transmit power of radios is automatically adjusted. <ul style="list-style-type: none">Standard dual-radio mode: 2.4 GHz (2x2) + 5 GHz (2x2)Dual-radio + independent scanning radio mode: 2.4 GHz (2x2) + 5 GHz (2x2) + independent radio scanning Wired network port: The rate of the 10GE electrical port is reduced to GE or lower. The 10GE electrical port and the SFP+ optical port work as combo ports for each other, and when one of them is working, the other is unavailable. The GE electrical port is unavailable. Other ports: The PoE OUT port is unavailable.

5.1.2 AirEngine 8760R-X1 (02353GSF)

Overview

Table 5-6 Basic information about the AirEngine 8760R-X1

Item	Details
Description	AirEngine8760R-X1(11ax outdoor,8+8 dual bands,smart antenna,BLE,PSE)

Item	Details
Part Number	02353GSF
Model	AirEngine 8760R-X1
First supported version	V200R019C10

 NOTE

Depending on the production batch, the device has multiple part numbers, which have the same software specifications but different minimum versions supported. Additionally, the hardware specifications, such as the weight and power consumption, are slightly different.

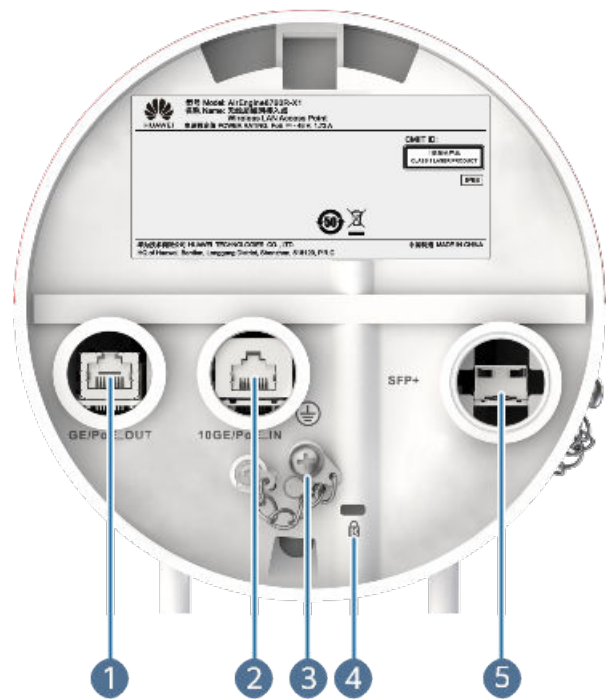
Appearance

Figure 5-4 Appearance of the AirEngine 8760R-X1



Ports

Figure 5-5 Ports on the AirEngine 8760R-X1



1	GE/PoE_OUT	2	10GE/PoE_IN
3	Ground screw	4	Security slot
5	SFP+	-	-

Table 5-7 Ports on the AirEngine 8760R-X1

Port	Connector Type	Description	Available Components
10GE/PoE_IN	RJ45	Ethernet electrical port that supports 100M/1000M/2.5G/5G/10G auto-sensing, connects to the wired Ethernet, and supports PoE input.	Network cable

Port	Connector Type	Description	Available Components
SFP+	SFP+	Ethernet optical port, supporting 1 Gbit/s or 10 Gbit/s auto-sensing and working with a matching optical module	Optical module
GE/PoE_OUT	RJ45	Ethernet electrical port that supports 10M/100M/1000M auto-sensing and connects to the wired Ethernet.	Network cable

Indicators and Buttons

Figure 5-6 Indicators and buttons on the AirEngine 8760R-X1



LINK/ACT0, LINK/ACT1, and LINK/ACT2 show the link status of the 10GE/PoE_IN, GE/PoE_OUT, and SFP+ ports, respectively.

WIRELESS0 and WIRELESS1 show the wireless link status of the radio 0 and radio 1, respectively. This mechanism is valid in V200R022C00 and later versions.

1	Indicator	2	Default
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Table 5-8 Indicators on the AirEngine 8760R-X1

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Steady on after blinking once	After the hardware reset is cleared and the software starts, the indicator blinks once. Then, the indicator is steady on until the bottom-layer system starts.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP. This state is supported in V200R022C00 and later versions.

Silkscreen	Name	Color	Status	Description
		Green	Slow blinking (0.2 Hz)	<p>The AP is running properly, and the Ethernet connection is normal.</p> <p>For V200R022C00 and later versions, this state also indicates that no STA is associated with the AP.</p>
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.

Silkscreen	Name	Color	Status	Description
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V200R024C00 and later versions.
		Red	Steady on	The system is faulty.
LINK/ACT0, LINK/ACT1, and LINK/ACT2	Port indicator	Green	Blinking	The Ethernet connection is normal.
LINK/ACT1	Port indicator (PoE_OUT enabled)	-	Off	The Ethernet connection fails, and the PoE OUT function is available.
		Green	Steady on	The Ethernet connection is normal, and no data is being transmitted. The PoE OUT function is available.

Silkscreen	Name	Color	Status	Description
		Green	Blinking	The Ethernet connection is normal, and the AP is transmitting data. The indicator blinks more frequently when the data traffic increases. The PoE OUT function is available.
		Yellow	Steady on	The Ethernet connection fails, and the PoE OUT function is unavailable.
		Yellow	Slow blinking (0.5 Hz)	The Ethernet connection fails, and the PoE OUT function is faulty.
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.

Silkscreen	Name	Color	Status	Description
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS0	Radio 0 status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Green	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Green	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.
		Green	Steady on	The AP is connected to a Mesh network and has good signal strength.
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios are disabled, and no STA is connected to the AP.

Silkscreen	Name	Color	Status	Description
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Yellow	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Yellow	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.
		Yellow	Steady on	The AP is connected to a Mesh network and has good signal strength.

Table 5-9 Buttons on the AirEngine 8760R-X1

Silkscreen	Name	Description
Default	Reset button	<ul style="list-style-type: none">For versions earlier than V200R022C00SPC100: Hold down the button for more than 3 seconds to restore the factory settings and restart the device.For versions from V200R022C00SPC100 to V200R023C10: if you press the button, the device resets. If you hold down the button for more than 6 seconds, the device restores the factory settings, switches to the Fit mode, and restarts.For V200R024C00 and later versions: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-10 Technical specifications of the AirEngine 8760R-X1

Item	Specification
Installation Type	<ul style="list-style-type: none">WallPole

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	Diameter x length: 165 mm x 387 mm (6.50 in. x 15.24 in.)
Weight without packaging [kg(lb)]	4.15 kg (9.15 lb)
Storage	NAND Flash 512 MB; NOR Flash 16 MB
Console port	BLE console
Maximum power consumption [W]	53.2 (excluding PoE OUT)
Maximum heat dissipation [BTU/hour]	181.5 (without PoE OUT)
Power supply mode	PoE
Input voltage range [V]	PoE: 802.3bt
Service port surge protection	6 kA in common mode
PoE OUT	Supported
Maximum PoE output power [W]	15.4 W
Maximum number of physical ports on the entire device	10GE (RJ45) x 1, 10M/100M/1000M/2.5GE/5GE/10GE auto-sensing GE (RJ45) x 1, 10M/100M/1000M auto-sensing 10GE optical port (SFP+), GE/10GE auto-sensing
Long-term operating temperature [°C(°F)]	–40°C to +65°C (–40°F to +149°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP68
Ground	Grounding

Item	Specification
Wind resistance	67 m/s
USB	Not supported
IoT slot	Not supported
BLE	BLE5.2
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Dual-radio standard mode: <ul style="list-style-type: none"> Radio 0 (2.4 GHz): 4x4:4 Radio 1 (5 GHz): 12x12:8 Dual-radio 2G enhanced mode: <ul style="list-style-type: none"> Radio 0 (2.4 GHz): 8x8:4 (A maximum of four antennas can be used to transmit and receive 802.11b packets.) Radio 1 (5 GHz): 8x8:8 Dual-radio + independent radio scanning mode: <ul style="list-style-type: none"> Radio 0 (2.4 GHz): 4x4:4 Radio 1 (5 GHz): 8x8:8
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax 5 GHz: 802.11a/n/ac/ac Wave 2/ax
Radio interface	Built-in directional antennas
Antenna gain	2.4G: 10 dBi 5G: 11 dBi BLE: 5 dBi
Beamwidth of the built-in antenna [degrees]	2.4 GHz: <ul style="list-style-type: none"> Horizontal plane: 180° @ 6 dB, 70° @ 3 dB Vertical plane: 40° 5 GHz: <ul style="list-style-type: none"> Horizontal plane: 180° @ 6 dB, 100° @ 3 dB Vertical plane: 20°

Item	Specification
Maximum transmit power	2.4 GHz: 33 dBm 5 GHz: 33 dBm (Note: This is the total MIMO radio power, the same as: 2.4 GHz: 24 dBm/chain 5 GHz: 24 dBm/chain) BLE: < 10 dBm
Singal radio transmit power [dBm]	2.4G: -10 dBm to 24 dBm/chain 5G: -10 dBm to 24 dBm/chain
MTBF [year]	60.2 year
MTTR [hour]	0.5 hour
Frequency stability [ppm]	+/-20

Item	Specification
802.3bt power supply description	<p>In 802.3bt Class 8 power supply mode:</p> <p>If the PoE OUT port is not used, no function is restricted. In enhanced dual-radio 2G mode, the 2.4 GHz radio supports 8x8:4 MIMO and a maximum of 20 MHz bandwidth.</p> <p>If the PoE OUT port (supporting only 802.3af) is used, the 10GE electrical port and the SFP+ optical port work as combo ports, and when one of them is working, the other is unavailable. The GE electrical port is available. Other functions are not restricted. In enhanced dual-radio 2G mode, the 2.4 GHz radio supports 8x8:4 MIMO and a maximum of 20 MHz bandwidth.</p> <p>In 802.3bt Class 6 power supply mode:</p> <p>If the PoE OUT port is not used:</p> <p>Wi-Fi:</p> <p>The transmit power of radios is not affected.</p> <ul style="list-style-type: none"> • Standard dual-radio mode: 2.4 GHz (4x4) + 5 GHz (12x12:8) • Dual-radio + independent scanning radio mode: 2.4 GHz (4x4) + 5 GHz (8x8) + 5 GHz independent radio scanning • Enhanced dual-radio 2G mode: 2.4 GHz (8x8:4) + 5 GHz (4x4). In this mode, the 2.4 GHz radio supports 8x8:4 MIMO and a maximum of 20 MHz bandwidth. <p>Wired network port:</p> <p>The 10GE electrical port and the SFP+ optical port work as combo ports, and when one of them is working, the other is unavailable. The GE electrical port is available.</p> <p>Other ports:</p> <p>The PoE OUT port is not used.</p> <p>If the PoE OUT port is used:</p> <p>Wi-Fi:</p> <p>The transmit power of radios is automatically adjusted.</p>

Item	Specification
	<ul style="list-style-type: none"> Standard dual-radio mode: 2.4 GHz (4x4) + 5 GHz (4x4) Dual-radio + independent scanning radio mode: 2.4 GHz (4x4) + 5 GHz (4x4) + independent radio scanning <p>Wired network port: The 10GE electrical port and the SFP+ optical port are combo ports, and only one of them can be selected. The GE electrical port is available.</p> <p>Other ports: The PoE OUT port (supporting only 802.3af) is used.</p>
802.3at power supply description	<p>Wi-Fi:</p> <p>The transmit power of radios is automatically adjusted.</p> <ul style="list-style-type: none"> Standard dual-radio mode: 2.4 GHz (2x2) + 5 GHz (2x2) Dual-radio + independent scanning radio mode: 2.4 GHz (2x2) + 5 GHz (2x2) + independent radio scanning <p>Wired network port: The rate of the 10GE electrical port is reduced to GE or lower. The 10GE electrical port and the SFP+ optical port work as combo ports for each other, and when one of them is working, the other is unavailable. The GE electrical port is unavailable.</p> <p>Other ports: The PoE OUT port is unavailable.</p>

5.1.3 AirEngine 8760R-X1E (02353GSH-001)

Overview

Table 5-11 Basic information about the AirEngine 8760R-X1E

Item	Details
Description	AirEngine8760R-X1E(11ax outdoor,Dedicated 3rd Radio,8+8 dual bands,external antenna,BLE,PSE)
Part Number	02353GSH-001
Model	AirEngine 8760R-X1E
First supported version	V200R021C10SPC100

NOTE

Depending on the production batch, the device has multiple part numbers, which have the same software specifications but different minimum versions supported. Additionally, the hardware specifications, such as the weight and power consumption, are slightly different.

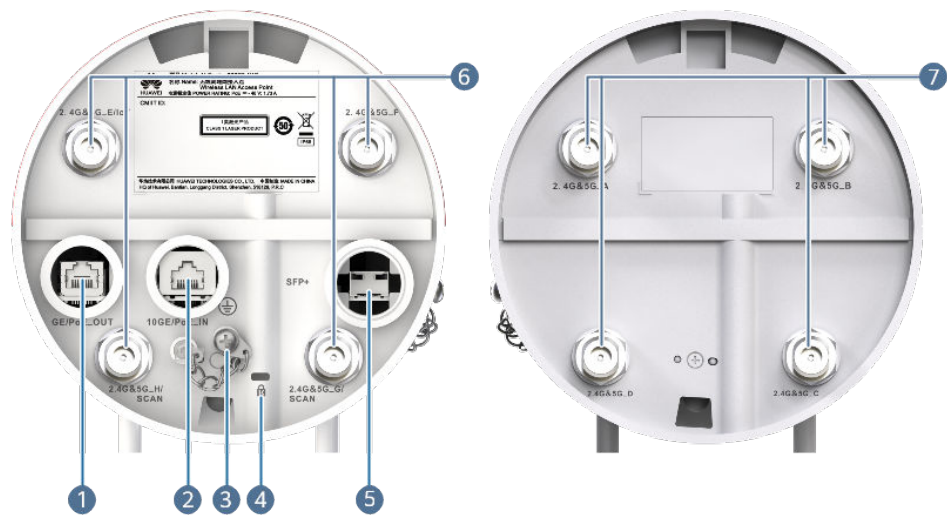
Appearance

Figure 5-7 Appearance of the AirEngine 8760R-X1E



Ports

Figure 5-8 Ports on the AirEngine 8760R-X1E



1	GE/PoE_OUT	2	10GE/PoE_IN
3	Ground screw	4	Security slot
5	SFP+	6	RF ports E to H
7	RF ports A to D	-	-

Table 5-12 Ports on the AirEngine 8760R-X1E

Port	Connector Type	Description	Available Components
10GE/PoE_IN	RJ45	Ethernet electrical port that supports 100M/1000M/2.5G/5G/10G auto-sensing, connects to the wired Ethernet, and supports PoE input.	Network cable

Port	Connector Type	Description	Available Components
SFP+	SFP+	Ethernet optical port, supporting 1 Gbit/s or 10 Gbit/s auto-sensing and working with a matching optical module	Optical module
GE/PoE_OUT	RJ45	Ethernet electrical port that supports 10M/100M/1000M auto-sensing and connects to the wired Ethernet.	Network cable
Antenna port	N-Type Female	Connects to an external antenna for transmitting and receiving service signals, and supports dual-band (2.4 GHz + 5 GHz) antennas.	Antenna

Indicators and Buttons

Figure 5-9 Indicators and buttons on the AirEngine 8760R-X1E



LINK/ACT0, LINK/ACT1, and LINK/ACT2 show the link status of the 10GE/PoE_IN, GE/PoE_OUT, and SFP+ ports, respectively.

WIRELESS0 and WIRELESS1 show the wireless link status of the radio 0 and radio 1, respectively. They are valid in V200R022C00 and later versions. If the AP runs in triple-radio mode, the WIRELESS0 indicator alternates between green (indicating the radio 0 status) and yellow (indicating the radio 2 status) at an interval of 20s.

1	Indicator	2	Default
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Table 5-13 Indicators on the AirEngine 8760R-X1E

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Steady on after blinking once	After the hardware reset is cleared and the software starts, the indicator blinks once. Then, the indicator is steady on until the bottom-layer system starts.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP. This state is supported in V200R022C00 and later versions.

Silkscreen	Name	Color	Status	Description
		Green	Slow blinking (0.2 Hz)	The AP is running properly, and the Ethernet connection is normal. For V200R022C00 and later versions, this state also indicates that no STA is associated with the AP.
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.

Silkscreen	Name	Color	Status	Description
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V200R024C00 and later versions.
		Red	Steady on	The system is faulty.
LINK/ACT0, LINK/ACT1, and LINK/ACT2	Port indicator	Green	Blinking	The Ethernet connection is normal.
LINK/ACT1	Port indicator (PoE_OUT enabled)	-	Off	The Ethernet connection fails, and the PoE OUT function is available.
		Green	Steady on	The Ethernet connection is normal, and no data is being transmitted. The PoE OUT function is available.

Silkscreen	Name	Color	Status	Description
		Green	Blinking	The Ethernet connection is normal, and the AP is transmitting data. The indicator blinks more frequently when the data traffic increases. The PoE OUT function is available.
		Yellow	Steady on	The Ethernet connection fails, and the PoE OUT function is unavailable.
		Yellow	Slow blinking (0.5 Hz)	The Ethernet connection fails, and the PoE OUT function is faulty.
WIRELESS0	Radio 0/Radio 2 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green (Radio 0)/Yellow (Radio 2)	Steady on	The AP has STAs connected, but no data is being transmitted.

Silkscreen	Name	Color	Status	Description
		Green (Radio 0)/Yellow (Radio 2)	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS0	Radio 0/Radio 2 status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Green (Radio 0)/Yellow (Radio 2)	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Green (Radio 0)/Yellow (Radio 2)	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.
		Green (Radio 0)/Yellow (Radio 2)	Steady on	The AP is connected to a Mesh network and has good signal strength.
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.

Silkscreen	Name	Color	Status	Description
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Yellow	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Yellow	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.
		Yellow	Steady on	The AP is connected to a Mesh network and has good signal strength.

Table 5-14 Buttons on the AirEngine 8760R-X1E

Silkscreen	Name	Description
Default	Reset button	<ul style="list-style-type: none">For versions earlier than V200R022C00SPC100: Hold down the button for more than 3 seconds to restore the factory settings and restart the device.For versions from V200R022C00SPC100 to V200R023C10: if you press the button, the device resets. If you hold down the button for more than 6 seconds, the device restores the factory settings, switches to the Fit mode, and restarts.For V200R024C00 and later versions: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-15 Technical specifications of the AirEngine 8760R-X1E

Item	Specification
Installation Type	<ul style="list-style-type: none">WallPole

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	Diameter x length: 165 mm x 387 mm (6.50 in. x 15.24 in.)
Weight without packaging [kg(lb)]	4.05 kg (8.93 lb)
Storage	NAND Flash 512 MB; NOR Flash 16 MB
Console port	BLE console
Maximum power consumption [W]	53.2 (excluding PoE OUT)
Maximum heat dissipation [BTU/hour]	181.5 (without PoE OUT)
Power supply mode	PoE
Input voltage range [V]	PoE: 802.3bt
Service port surge protection	6 kA in common mode
PoE OUT	Supported
Maximum PoE output power [W]	15.4 W
Maximum number of physical ports on the entire device	10GE (RJ45) x 1, 10M/100M/1000M/2.5GE/5GE/10GE auto-sensing GE (RJ45) x 1, 10M/100M/1000M auto-sensing 10GE optical port (SFP+), GE/10GE auto-sensing
Long-term operating temperature [°C(°F)]	–40°C to +65°C (–40°F to +149°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP68
Ground	Grounding

Item	Specification
Antenna port surge protection [kA]	5 kA surge protection capability without external surge protection devices
Wind resistance	67 m/s
USB	Not supported
IoT slot	Not supported
BLE	BLE5.2
Radio number	2/3
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	<p>Standard dual-radio mode:</p> <ul style="list-style-type: none"> Radio 0 (2.4 GHz): 8x8:4 Radio 1 (5 GHz): 8x8:8 <p>Triple-radio mode:</p> <ul style="list-style-type: none"> Radio 0 (2.4 GHz): 8x8:4 Radio 1 (5 GHz): 4x4:4 Radio 2 (5 GHz): 4x4:4 <p>Dual-radio + independent scanning radio mode:</p> <ul style="list-style-type: none"> Radio 0 (2.4 GHz): 4x4:4 Radio 1 (5 GHz): 4x4:4 <p>NOTE A 2.4 GHz radio supports a maximum of four antennas for sending and receiving 802.11b packets. The effective RF ports in different radio modes are as follows:</p> <ul style="list-style-type: none"> 8+x mode: A, B, E, F 4+x mode: A, B, C, D 2+x mode: A and B
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax 5 GHz: 802.11a/n/ac/ac Wave 2/ax
Radio interface	External antenna
Antenna gain	BLE: 5 dBi

Item	Specification
Maximum transmit power	2.4 GHz: 33 dBm 5 GHz: 33 dBm (Note: This is the total MIMO radio power, the same as: 2.4 GHz: 24 dBm/chain 5 GHz: 24 dBm/chain) BLE: < 10 dBm
Singal radio transmit power [dBm]	2.4G: -10 dBm to 24 dBm/chain 5G: -10 dBm to 24 dBm/chain
MTBF [year]	60.2 year
MTTR [hour]	0.5 hour
Frequency stability [ppm]	+/-20

Item	Specification
802.3bt power supply description	<p>In 802.3bt Class 8 power supply mode:</p> <p>If the PoE OUT port is not used, no function is restricted. In standard dual-radio or three-radio mode, the 2.4 GHz radio supports 8x8:4 MIMO and a maximum of 20 MHz bandwidth.</p> <p>If the PoE OUT port (supporting only 802.3af) is used, the 10GE electrical port and the SFP+ optical port work as combo ports, and when one of them is working, the other is unavailable. The GE electrical port is available. Other functions are not restricted. In standard dual-radio or three-radio mode, the 2.4 GHz radio supports 8x8:4 MIMO and a maximum of 20 MHz bandwidth.</p> <p>In 802.3bt Class 6 power supply mode:</p> <p>If the PoE OUT port is not used:</p> <p>Wi-Fi: The transmit power of radios is not affected.</p> <ul style="list-style-type: none"> • Standard dual-radio mode: 2.4 GHz (4x4) + 5 GHz (8x8) • Dual-radio + independent scanning radio mode: 2.4 GHz (4x4) + 5 GHz (4x4) + 5 GHz independent scanning radio • Triple-radio mode: 2.4 GHz (4x4) + 5 GHz (4x4) + 5 GHz (4x4) <p>Wired network port: The 10GE electrical port and the SFP+ optical port work as combo ports. When one of them is working, the other is unavailable. The GE electrical port is available.</p> <p>Other ports: The PoE OUT port is not used.</p> <p>If the PoE OUT port is used:</p> <p>Wi-Fi: The radio power is self-adapted.</p> <ul style="list-style-type: none"> • Standard dual-radio mode: 2.4 GHz (4x4) + 5 GHz (4x4) • Dual-radio + independent scanning radio mode: 2.4 GHz (4x4) + 5 GHz (4x4) + 5 GHz independent scanning radio

Item	Specification
	<ul style="list-style-type: none">• Triple-radio mode: 2.4 GHz (2x2) + 5 GHz (2x2) + 5 GHz (2x2) <p>Wired network port: The 10GE electrical port and SFP+ optical port work as combo ports. When one of them is working, the other is unavailable. The GE electrical port is available.</p> <p>Other ports: The PoE OUT port (supporting only 802.3af) is used.</p>
802.3at power supply description	<p>Wi-Fi: The radio power is self-adapted.</p> <ul style="list-style-type: none">• Standard dual-radio mode: 2.4 GHz (2x2) + 5 GHz (2x2)• Dual-radio + independent scanning radio mode: 2.4 GHz (2x2) + 5 GHz (2x2) + 5 GHz independent scanning radio• Triple-radio mode: 2.4 GHz (2x2) + 5 GHz (2x2) + 5 GHz (2x2) <p>Wired network port: The rate of the 10GE electrical port rate is reduced to GE or lower and works with the SFP+ optical port as combo ports. When one of them is working, the other is unavailable. The GE electrical port is not available.</p> <p>Other ports: The PoE OUT port is unavailable.</p>

5.1.4 AirEngine 8760R-X1E (02353GSH)

Overview

Table 5-16 Basic information about the AirEngine 8760R-X1E

Item	Details
Description	AirEngine8760R-X1E(11ax outdoor,Dedicated 3rd Radio,8+8 dual bands,external antenna,BLE,PSE)
Part Number	02353GSH
Model	AirEngine 8760R-X1E

Item	Details
First supported version	V200R019C10

 NOTE

Depending on the production batch, the device has multiple part numbers, which have the same software specifications but different minimum versions supported. Additionally, the hardware specifications, such as the weight and power consumption, are slightly different.

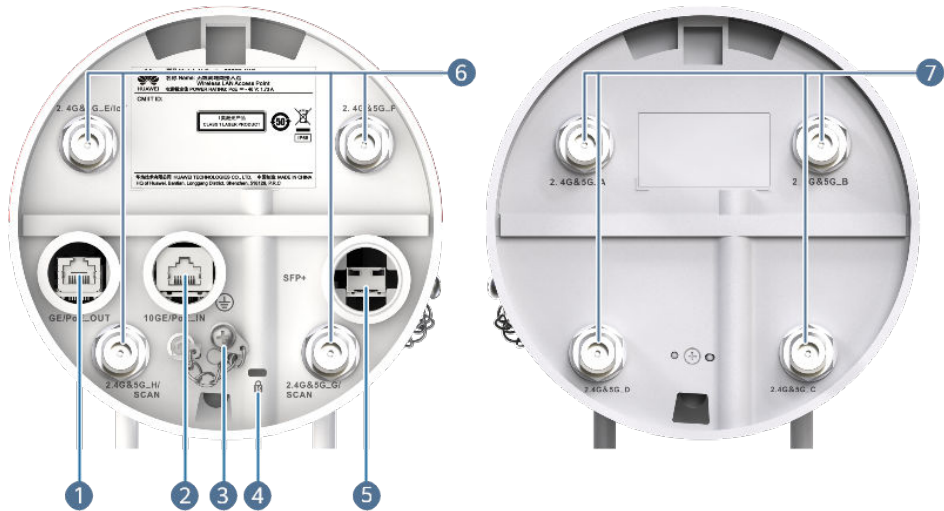
Appearance

Figure 5-10 Appearance of the AirEngine 8760R-X1E



Ports

Figure 5-11 Ports on the AirEngine 8760R-X1E



1	GE/PoE_OUT	2	10GE/PoE_IN
3	Ground screw	4	Security slot
5	SFP+	6	RF ports E to H
7	RF ports A to D	-	-

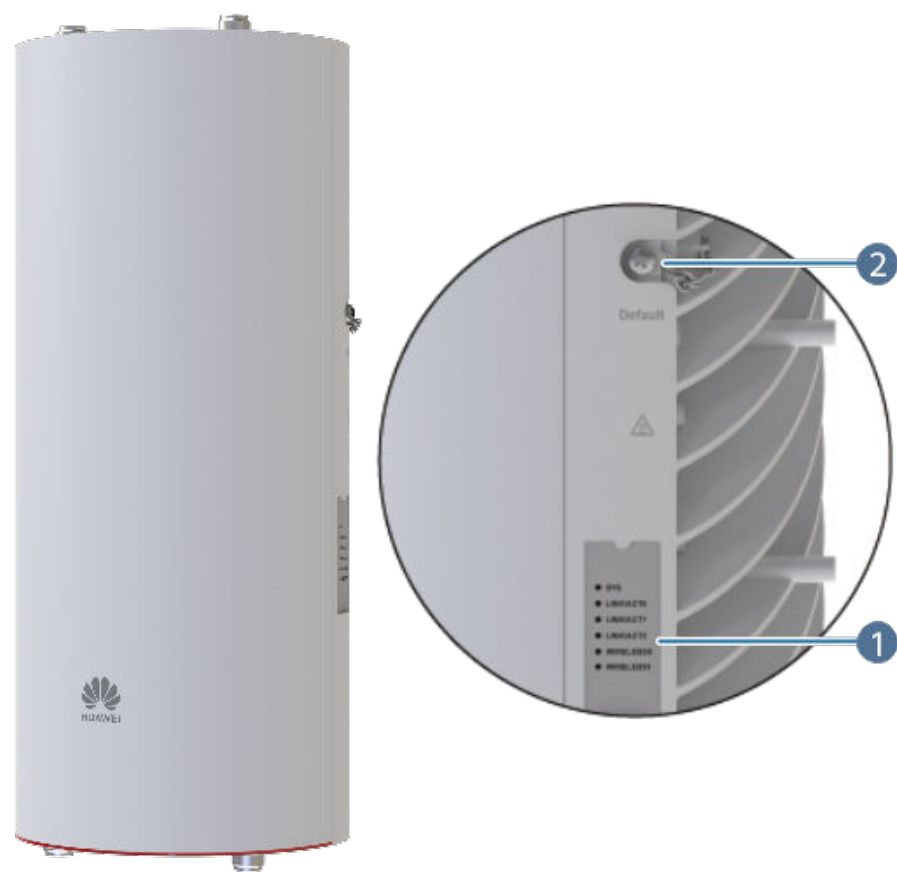
Table 5-17 Ports on the AirEngine 8760R-X1E

Port	Connector Type	Description	Available Components
10GE/PoE_IN	RJ45	Ethernet electrical port that supports 100M/1000M/2.5G/5G/10G auto-sensing, connects to the wired Ethernet, and supports PoE input.	Network cable

Port	Connector Type	Description	Available Components
SFP+	SFP+	Ethernet optical port, supporting 1 Gbit/s or 10 Gbit/s auto-sensing and working with a matching optical module	Optical module
GE/PoE_OUT	RJ45	Ethernet electrical port that supports 10M/100M/1000M auto-sensing and connects to the wired Ethernet.	Network cable
Antenna port	N-Type Female	Connects to an external antenna for transmitting and receiving service signals, and supports dual-band (2.4 GHz + 5 GHz) antennas.	Antenna

Indicators and Buttons

Figure 5-12 Indicators and buttons on the AirEngine 8760R-X1E



LINK/ACT0, LINK/ACT1, and LINK/ACT2 show the link status of the 10GE/PoE_IN, GE/PoE_OUT, and SFP+ ports, respectively.

WIRELESS0 and WIRELESS1 show the wireless link status of the radio 0 and radio 1, respectively. They are valid in V200R022C00 and later versions. If the AP runs in triple-radio mode, the WIRELESS0 indicator alternates between green (indicating the radio 0 status) and yellow (indicating the radio 2 status) at an interval of 20s.

1	Indicator	2	Default
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Table 5-18 Indicators on the AirEngine 8760R-X1E

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Steady on after blinking once	After the hardware reset is cleared and the software starts, the indicator blinks once. Then, the indicator is steady on until the bottom-layer system starts.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP. This state is supported in V200R022C00 and later versions.

Silkscreen	Name	Color	Status	Description
		Green	Slow blinking (0.2 Hz)	<p>The AP is running properly, and the Ethernet connection is normal.</p> <p>For V200R022C00 and later versions, this state also indicates that no STA is associated with the AP.</p>
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.

Silkscreen	Name	Color	Status	Description
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V200R024C00 and later versions.
		Red	Steady on	The system is faulty.
LINK/ACT0, LINK/ACT1, and LINK/ACT2	Port indicator	Green	Blinking	The Ethernet connection is normal.
LINK/ACT1	Port indicator (PoE_OUT enabled)	-	Off	The Ethernet connection fails, and the PoE OUT function is available.
		Green	Steady on	The Ethernet connection is normal, and no data is being transmitted. The PoE OUT function is available.

Silkscreen	Name	Color	Status	Description
		Green	Blinking	The Ethernet connection is normal, and the AP is transmitting data. The indicator blinks more frequently when the data traffic increases. The PoE OUT function is available.
		Yellow	Steady on	The Ethernet connection fails, and the PoE OUT function is unavailable.
		Yellow	Slow blinking (0.5 Hz)	The Ethernet connection fails, and the PoE OUT function is faulty.
WIRELESS0	Radio 0/Radio 2 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green (Radio 0)/Yellow (Radio 2)	Steady on	The AP has STAs connected, but no data is being transmitted.

Silkscreen	Name	Color	Status	Description
		Green (Radio 0)/Yellow (Radio 2)	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS0	Radio 0/Radio 2 status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Green (Radio 0)/Yellow (Radio 2)	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Green (Radio 0)/Yellow (Radio 2)	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.
		Green (Radio 0)/Yellow (Radio 2)	Steady on	The AP is connected to a Mesh network and has good signal strength.
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.

Silkscreen	Name	Color	Status	Description
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Yellow	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Yellow	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.
		Yellow	Steady on	The AP is connected to a Mesh network and has good signal strength.

Table 5-19 Buttons on the AirEngine 8760R-X1E

Silkscreen	Name	Description
Default	Reset button	<ul style="list-style-type: none">For versions earlier than V200R022C00SPC100: Hold down the button for more than 3 seconds to restore the factory settings and restart the device.For versions from V200R022C00SPC100 to V200R023C10: if you press the button, the device resets. If you hold down the button for more than 6 seconds, the device restores the factory settings, switches to the Fit mode, and restarts.For V200R024C00 and later versions: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-20 Technical specifications of the AirEngine 8760R-X1E

Item	Specification
Installation Type	<ul style="list-style-type: none">WallPole

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	Diameter x length: 165 mm x 387 mm (6.50 in. x 15.24 in.)
Weight without packaging [kg(lb)]	4.05 kg (8.93 lb)
Storage	NAND Flash 512 MB; NOR Flash 16 MB
Console port	BLE console
Maximum power consumption [W]	53.2 (excluding PoE OUT)
Maximum heat dissipation [BTU/hour]	181.5 (without PoE OUT)
Power supply mode	PoE
Input voltage range [V]	PoE: 802.3bt
Service port surge protection	6 kA in common mode
PoE OUT	Supported
Maximum PoE output power [W]	15.4 W
Maximum number of physical ports on the entire device	10GE (RJ45) x 1, 10M/100M/1000M/2.5GE/5GE/10GE auto-sensing GE (RJ45) x 1, 10M/100M/1000M auto-sensing 10GE optical port (SFP+), GE/10GE auto-sensing
Long-term operating temperature [°C(°F)]	–40°C to +65°C (–40°F to +149°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP68
Ground	Grounding

Item	Specification
Antenna port surge protection [kA]	5 kA surge protection capability without external surge protection devices
Wind resistance	67 m/s
USB	Not supported
IoT slot	Not supported
BLE	BLE5.2
Radio number	2/3
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	<p>Standard dual-radio mode:</p> <ul style="list-style-type: none"> Radio 0 (2.4 GHz): 8x8:4 Radio 1 (5 GHz): 8x8:8 <p>Triple-radio mode:</p> <ul style="list-style-type: none"> Radio 0 (2.4 GHz): 8x8:4 Radio 1 (5 GHz): 4x4:4 Radio 2 (5 GHz): 4x4:4 <p>Dual-radio + independent scanning radio mode:</p> <ul style="list-style-type: none"> Radio 0 (2.4 GHz): 4x4:4 Radio 1 (5 GHz): 4x4:4 <p>NOTE A 2.4 GHz radio supports a maximum of four antennas for sending and receiving 802.11b packets. The effective RF ports in different radio modes are as follows:</p> <ul style="list-style-type: none"> 8+x mode: A, B, E, F 4+x mode: A, B, C, D 2+x mode: A and B
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax 5 GHz: 802.11a/n/ac/ac Wave 2/ax
Radio interface	External antenna
Antenna gain	BLE: 5 dBi

Item	Specification
Maximum transmit power	2.4 GHz: 33 dBm 5 GHz: 33 dBm (Note: This is the total MIMO radio power, the same as: 2.4 GHz: 24 dBm/chain 5 GHz: 24 dBm/chain) BLE: < 10 dBm
Singal radio transmit power [dBm]	2.4G: -10 dBm to 24 dBm/chain 5G: -10 dBm to 24 dBm/chain
MTBF [year]	60.2 year
MTTR [hour]	0.5 hour
Frequency stability [ppm]	+/-20

Item	Specification
802.3bt power supply description	<p>In 802.3bt Class 8 power supply mode:</p> <p>If the PoE OUT port is not used, no function is restricted. In standard dual-radio or three-radio mode, the 2.4 GHz radio supports 8x8:4 MIMO and a maximum of 20 MHz bandwidth.</p> <p>If the PoE OUT port (supporting only 802.3af) is used, the 10GE electrical port and the SFP+ optical port work as combo ports, and when one of them is working, the other is unavailable. The GE electrical port is available. Other functions are not restricted. In standard dual-radio or three-radio mode, the 2.4 GHz radio supports 8x8:4 MIMO and a maximum of 20 MHz bandwidth.</p> <p>In 802.3bt Class 6 power supply mode:</p> <p>If the PoE OUT port is not used:</p> <p>Wi-Fi: The transmit power of radios is not affected.</p> <ul style="list-style-type: none"> • Standard dual-radio mode: 2.4 GHz (4x4) + 5 GHz (8x8) • Dual-radio + independent scanning radio mode: 2.4 GHz (4x4) + 5 GHz (4x4) + 5 GHz independent scanning radio • Triple-radio mode: 2.4 GHz (4x4) + 5 GHz (4x4) + 5 GHz (4x4) <p>Wired network port: The 10GE electrical port and the SFP+ optical port work as combo ports. When one of them is working, the other is unavailable. The GE electrical port is available.</p> <p>Other ports: The PoE OUT port is not used.</p> <p>If the PoE OUT port is used:</p> <p>Wi-Fi: The radio power is self-adapted.</p> <ul style="list-style-type: none"> • Standard dual-radio mode: 2.4 GHz (4x4) + 5 GHz (4x4) • Dual-radio + independent scanning radio mode: 2.4 GHz (4x4) + 5 GHz (4x4) + 5 GHz independent scanning radio

Item	Specification
	<ul style="list-style-type: none">• Triple-radio mode: 2.4 GHz (2x2) + 5 GHz (2x2) + 5 GHz (2x2) <p>Wired network port: The 10GE electrical port and SFP+ optical port work as combo ports. When one of them is working, the other is unavailable. The GE electrical port is available.</p> <p>Other ports: The PoE OUT port (supporting only 802.3af) is used.</p>
802.3at power supply description	<p>Wi-Fi: The radio power is self-adapted.</p> <ul style="list-style-type: none">• Standard dual-radio mode: 2.4 GHz (2x2) + 5 GHz (2x2)• Dual-radio + independent scanning radio mode: 2.4 GHz (2x2) + 5 GHz (2x2) + 5 GHz independent scanning radio• Triple-radio mode: 2.4 GHz (2x2) + 5 GHz (2x2) + 5 GHz (2x2) <p>Wired network port: The rate of the 10GE electrical port rate is reduced to GE or lower and works with the SFP+ optical port as combo ports. When one of them is working, the other is unavailable. The GE electrical port is not available.</p> <p>Other ports: The PoE OUT port is unavailable.</p>

5.1.5 AirEngine 6760R-51E (02353KCN-001)

Overview

Table 5-21 Basic information about the AirEngine 6760R-51E

Item	Details
Description	AirEngine6760R-51E(11ax outdoor,4+4 dual bands,external antenna,BLE)
Part Number	02353KCN-001
Model	AirEngine 6760R-51E
First supported version	V200R021C10SPC100

 NOTE

Depending on the production batch, the device has multiple part numbers, which have the same software specifications but different minimum versions supported. Additionally, the hardware specifications, such as the weight and power consumption, are slightly different.

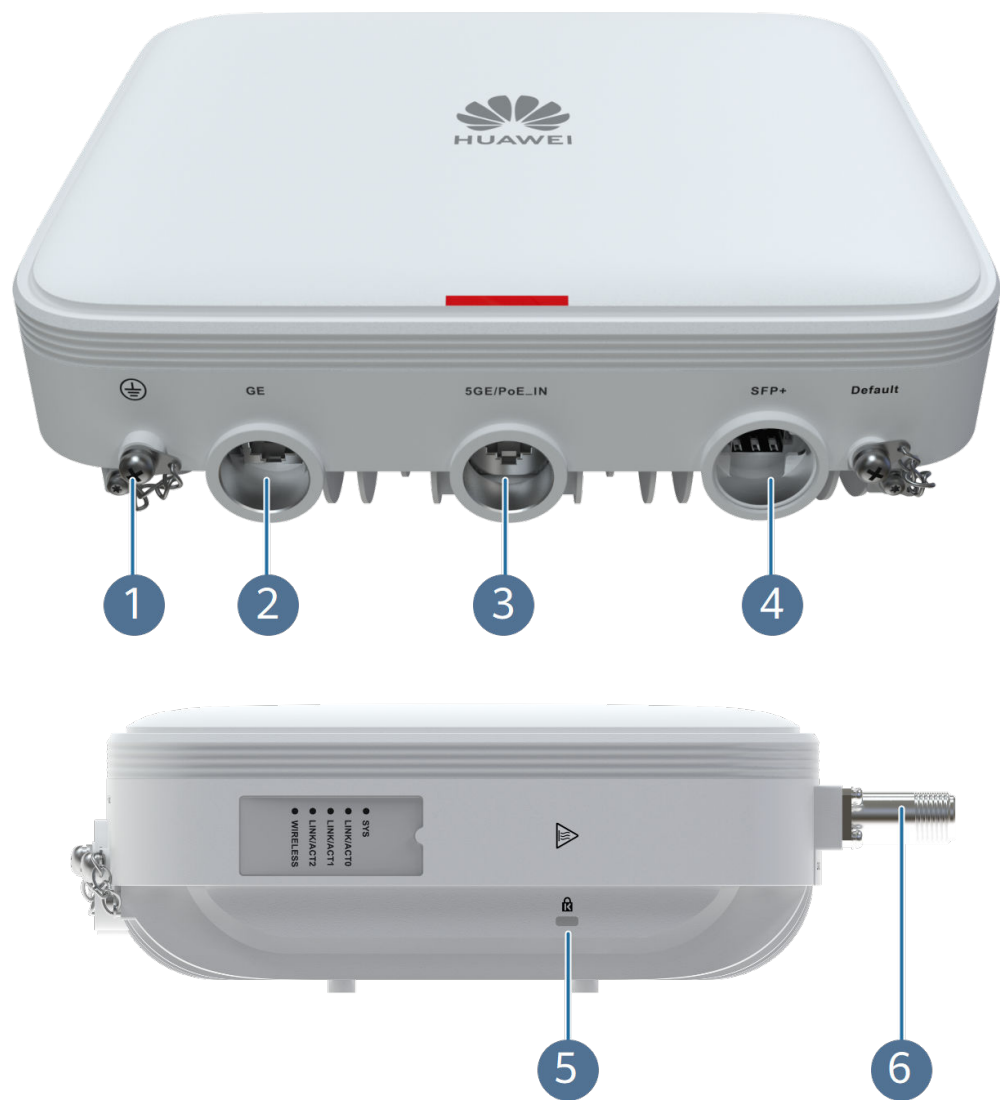
Appearance

Figure 5-13 Appearance of the AirEngine 6760R-51E



Ports

Figure 5-14 Ports on the AirEngine 6760R-51E



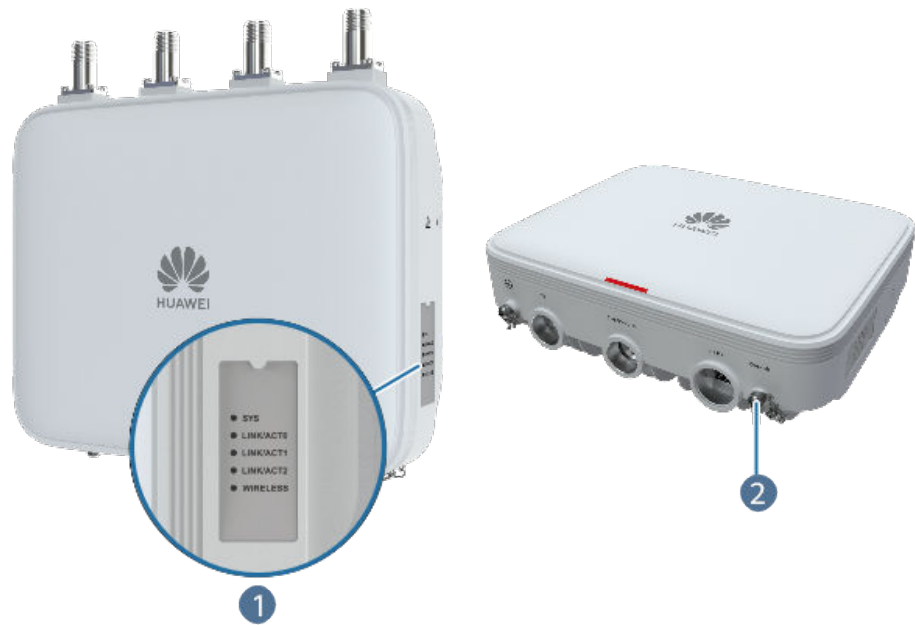
1	Ground screw	2	GE
3	5GE/PoE_IN	4	SFP+
5	Security slot	6	RF port

Table 5-22 Ports on the AirEngine 6760R-51E

Port	Connector Type	Description	Available Components
5GE/PoE_IN	RJ45	Ethernet electrical port that supports 100M/1000M/2.5G/5G auto-sensing, connects to the wired Ethernet, and supports PoE input	Network cable
SFP+	SFP+	Ethernet optical port, supporting 1 Gbit/s or 10 Gbit/s auto-sensing and working with a matching optical module	Optical module
GE	RJ45	Ethernet electrical port that supports 10M/100M/1000M auto-sensing and connects to the wired Ethernet.	Network cable
Antenna port	N-Type Female	Has the impedance of 50 ohms, connects to an external antenna for transmitting and receiving service signals, and supports dual-band (2.4 GHz + 5 GHz) antennas.	Antenna

Indicators and Buttons

Figure 5-15 Indicators and buttons on the AirEngine 6760R-51E



LINK/ACT0, LINK/ACT1, and LINK/ACT2 show the link status of the 5GE/PoE_IN, GE, and SFP+ ports, respectively.

The WIRELESS indicator shows the wireless link status, alternates between green (indicating the radio 0 status) and yellow (indicating the radio 1 status) at an interval of 20s. This mechanism is valid in V200R022C00 and later versions.

1	Indicator	2	Default
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Table 5-23 Indicators on the AirEngine 6760R-51E

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Steady on after blinking once	After the hardware reset is cleared and the software starts, the indicator blinks once. Then, the indicator is steady on until the bottom-layer system starts.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP. This state is supported in V200R022C00 and later versions.

Silkscreen	Name	Color	Status	Description
		Green	Slow blinking (0.2 Hz)	<p>The AP is running properly, and the Ethernet connection is normal.</p> <p>For V200R022C00 and later versions, this state also indicates that no STA is associated with the AP.</p>
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.

Silkscreen	Name	Color	Status	Description
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V200R024C00 and later versions.
		Red	Steady on	The system is faulty.
LINK/ACT0, LINK/ACT1, and LINK/ACT2	Port indicator	Green	Blinking	The system is running properly and the Ethernet connection is normal.
WIRELESS	Radio status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green (2G)/Yellow (5G)	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green (2G)/Yellow (5G)	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Silkscreen	Name	Color	Status	Description
WIRELESS	Radio status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Green (2G)/ Yellow (5G)	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Green (2G)/ Yellow (5G)	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.
		Green (2G)/ Yellow (5G)	Steady on	The AP is connected to a Mesh network and has good signal strength.

Table 5-24 Buttons on the AirEngine 6760R-51E

Silkscreen	Name	Description
Default	Reset button	<ul style="list-style-type: none">For versions earlier than V200R022C00SPC100: Hold down the button for more than 3 seconds to restore the factory settings and restart the device.For versions from V200R022C00SPC100 to V200R023C10: if you press the button, the device resets. If you hold down the button for more than 6 seconds, the device restores the factory settings, switches to the Fit mode, and restarts.For V200R024C00 and later versions: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-25 Technical specifications of the AirEngine 6760R-51E

Item	Specification
Installation Type	<ul style="list-style-type: none">WallPole

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	85 mm x 270 mm x 220 mm (3.35 in. x 10.63 in. x 8.66 in.)
Weight without packaging [kg(lb)]	3.1 kg (6.83 lb)
Storage	NAND Flash 512 MB; NOR Flash 16 MB
Console port	BLE console
Maximum power consumption [W]	35.3 W
Maximum heat dissipation [BTU/hour]	120.4 BTU/hour
Power supply mode	PoE
Input voltage range [V]	PoE: 802.3bt/at
Service port surge protection	6 kA in common mode
PoE OUT	Not supported
Maximum number of physical ports on the entire device	5GE (RJ45) x 1, 10M/100M/1000M/2.5GE/5GE auto-sensing GE (RJ45) x 1, 10M/100M/1000M auto-sensing 10GE optical port (SFP+), GE/10GE auto-sensing
Long-term operating temperature [°C(°F)]	–40°C to +65°C (–40°F to +149°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP68
Ground	Grounding

Item	Specification
Antenna port surge protection [kA]	5 kA surge protection capability without external surge protection devices
Wind resistance	67 m/s
USB	Not supported
IoT slot	Not supported
BLE	BLE5.2
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Radio 0 (2.4 GHz): 4x4 Radio 1 (5 GHz): 4x4
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax 5 GHz: 802.11a/n/ac/ac Wave 2/ax
Radio interface	External antenna
Antenna gain	BLE: 5 dBi
Maximum transmit power	2.4 GHz: 30 dBm 5 GHz: 30 dBm (Note: This is the total MIMO radio power, the same as: 2.4 GHz: 24 dBm/chain 5 GHz: 24 dBm/chain) BLE: < 10 dBm
Singal radio transmit power [dBm]	2.4G: -10 dBm to 24 dBm/chain 5G: -10 dBm to 24 dBm/chain
MTBF [year]	91.9 year
MTTR [hour]	0.5 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	No function is limited.

Item	Specification
802.3at power supply description	Wi-Fi: 2.4 GHz (2x2) + 5 GHz (2x2) is supported, without affecting the transmit power of radios. Wired network ports: The rate of the 5GE electrical port is reduced to GE. The 5GE electrical port and the SFP+ optical port work as combo ports, and when one of them is working, the other is unavailable. The GE electrical port is unavailable.

5.1.6 AirEngine 6760R-51E (02353KCN)

Overview

Table 5-26 Basic information about the AirEngine 6760R-51E

Item	Details
Description	AirEngine6760R-51E(11ax outdoor,4+4 dual bands,external antenna,BLE)
Part Number	02353KCN
Model	AirEngine 6760R-51E
First supported version	V200R019C10

NOTE

Depending on the production batch, the device has multiple part numbers, which have the same software specifications but different minimum versions supported. Additionally, the hardware specifications, such as the weight and power consumption, are slightly different.

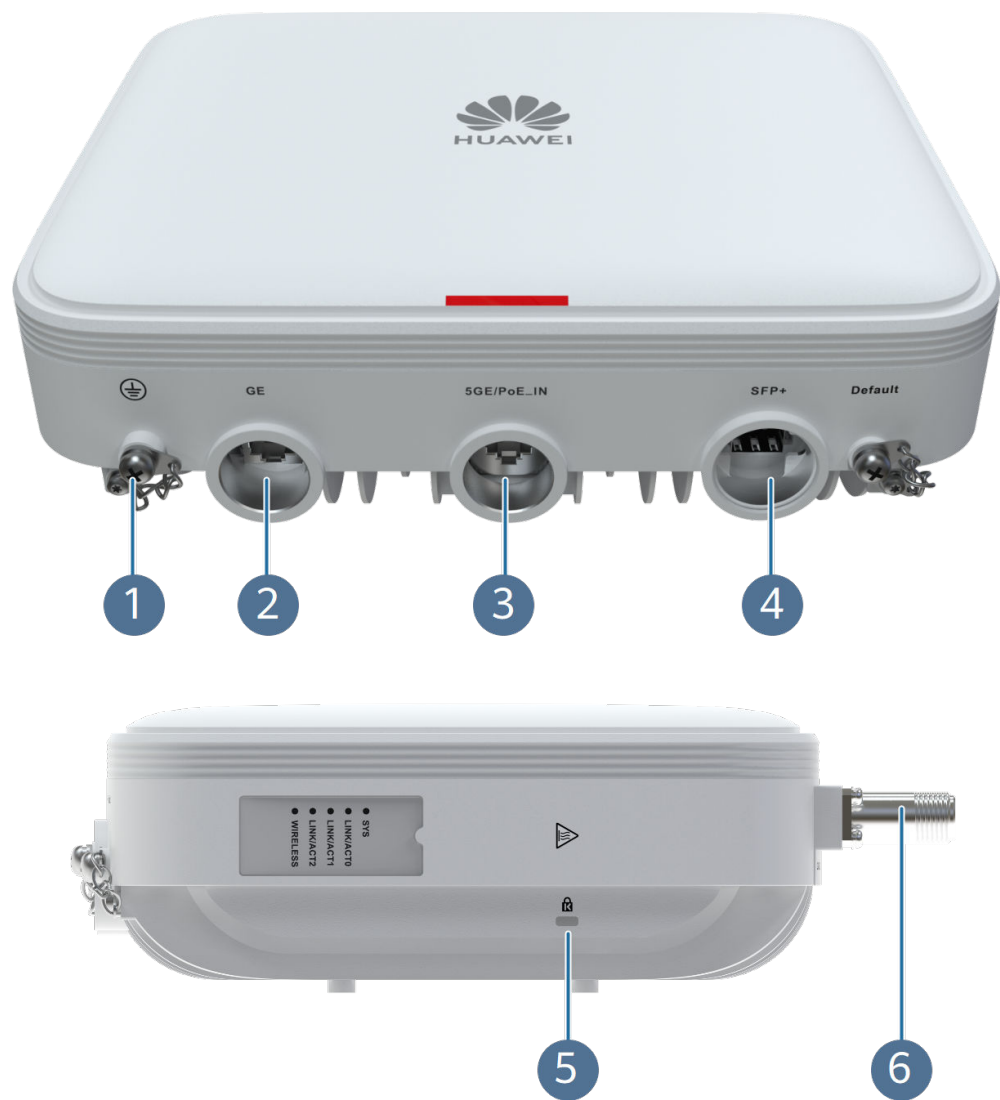
Appearance

Figure 5-16 Appearance of the AirEngine 6760R-51E



Ports

Figure 5-17 Ports on the AirEngine 6760R-51E



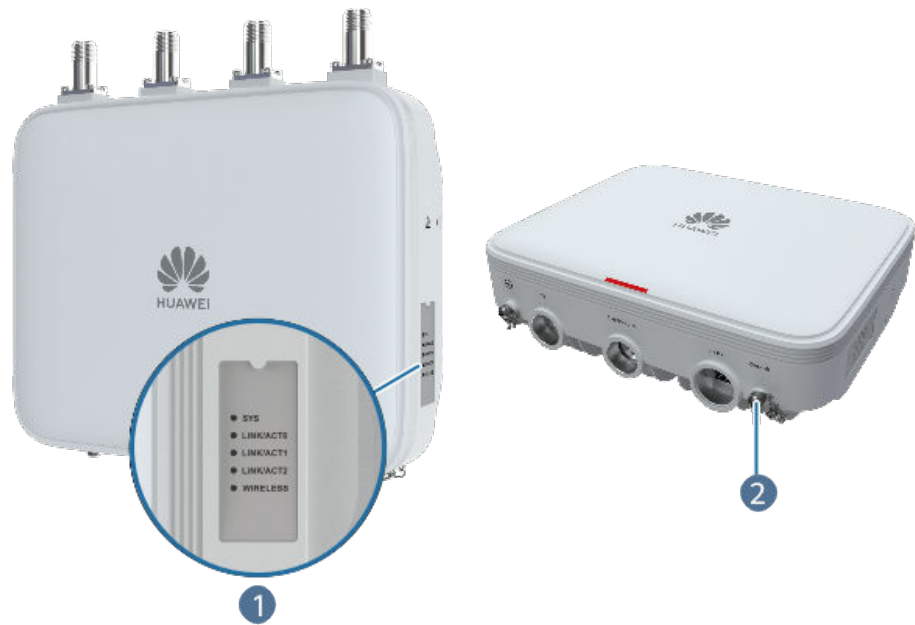
1	Ground screw	2	GE
3	5GE/PoE_IN	4	SFP+
5	Security slot	6	RF port

Table 5-27 Ports on the AirEngine 6760R-51E

Port	Connector Type	Description	Available Components
5GE/PoE_IN	RJ45	Ethernet electrical port that supports 100M/1000M/2.5G/5G auto-sensing, connects to the wired Ethernet, and supports PoE input	Network cable
SFP+	SFP+	Ethernet optical port, supporting 1 Gbit/s or 10 Gbit/s auto-sensing and working with a matching optical module	Optical module
GE	RJ45	Ethernet electrical port that supports 10M/100M/1000M auto-sensing and connects to the wired Ethernet.	Network cable
Antenna port	N-Type Female	Connects to an external antenna for transmitting and receiving service signals, and supports dual-band (2.4 GHz + 5 GHz) antennas.	Antenna

Indicators and Buttons

Figure 5-18 Indicators and buttons on the AirEngine 6760R-51E



LINK/ACT0, LINK/ACT1, and LINK/ACT2 show the link status of the 5GE/PoE_IN, GE, and SFP+ ports, respectively.

The WIRELESS indicator shows the wireless link status, alternates between green (indicating the radio 0 status) and yellow (indicating the radio 1 status) at an interval of 20s. This mechanism is valid in V200R022C00 and later versions.

1	Indicator	2	Default
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Table 5-28 Indicators on the AirEngine 6760R-51E

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Steady on after blinking once	After the hardware reset is cleared and the software starts, the indicator blinks once. Then, the indicator is steady on until the bottom-layer system starts.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP. This state is supported in V200R022C00 and later versions.

Silkscreen	Name	Color	Status	Description
		Green	Slow blinking (0.2 Hz)	<p>The AP is running properly, and the Ethernet connection is normal.</p> <p>For V200R022C00 and later versions, this state also indicates that no STA is associated with the AP.</p>
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.

Silkscreen	Name	Color	Status	Description
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V200R024C00 and later versions.
		Red	Steady on	The system is faulty.
LINK/ACT0, LINK/ACT1, and LINK/ACT2	Port indicator	Green	Blinking	The system is running properly and the Ethernet connection is normal.
WIRELESS	Radio status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green (2G)/Yellow (5G)	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green (2G)/Yellow (5G)	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Silkscreen	Name	Color	Status	Description
WIRELESS	Radio status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Green (2G)/ Yellow (5G)	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Green (2G)/ Yellow (5G)	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.
		Green (2G)/ Yellow (5G)	Steady on	The AP is connected to a Mesh network and has good signal strength.

Table 5-29 Buttons on the AirEngine 6760R-51E

Silkscreen	Name	Description
Default	Reset button	<ul style="list-style-type: none"> For versions earlier than V200R022C00SPC100: Hold down the button for more than 3 seconds to restore the factory settings and restart the device. For versions from V200R022C00SPC100 to V200R023C10: if you press the button, the device resets. If you hold down the button for more than 6 seconds, the device restores the factory settings, switches to the Fit mode, and restarts. For V200R024C00 and later versions: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-30 Technical specifications of the AirEngine 6760R-51E

Item	Specification
Installation Type	<ul style="list-style-type: none"> Wall Pole

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	85 mm x 270 mm x 220 mm (3.35 in. x 10.63 in. x 8.66 in.)
Weight without packaging [kg(lb)]	3.1 kg (6.83 lb)
Storage	NAND Flash 512 MB; NOR Flash 16 MB
Console port	BLE console
Maximum power consumption [W]	35.3 W
Maximum heat dissipation [BTU/hour]	120.4 BTU/hour
Power supply mode	PoE
Input voltage range [V]	PoE: 802.3bt/at
Service port surge protection	6 kA in common mode
PoE OUT	Not supported
Maximum number of physical ports on the entire device	5GE (RJ45) x 1, 10M/100M/1000M/2.5GE/5GE auto-sensing GE (RJ45) x 1, 10M/100M/1000M auto-sensing 10GE optical port (SFP+), GE/10GE auto-sensing
Long-term operating temperature [°C(°F)]	–40°C to +65°C (–40°F to +149°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP68
Ground	Grounding

Item	Specification
Antenna port surge protection [kA]	5 kA surge protection capability without external surge protection devices
Wind resistance	67 m/s
USB	Not supported
IoT slot	Not supported
BLE	BLE5.2
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> • 2.4GHz • 5GHz
MIMO spatial streams	Radio 0 (2.4 GHz): 4x4 Radio 1 (5 GHz): 4x4
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax 5 GHz: 802.11a/n/ac/ac Wave 2/ax
Radio interface	External antenna
Antenna gain	BLE: 5 dBi
Maximum transmit power	2.4 GHz: 30 dBm 5 GHz: 30 dBm (Note: This is the total MIMO radio power, the same as: 2.4 GHz: 24 dBm/chain 5 GHz: 24 dBm/chain) BLE: < 10 dBm
Singal radio transmit power [dBm]	2.4G: -10 dBm to 24 dBm/chain 5G: -10 dBm to 24 dBm/chain
MTBF [year]	91.9 year
MTTR [hour]	0.5 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	No function is limited.

Item	Specification
802.3at power supply description	Wi-Fi: 2.4 GHz (2x2) + 5 GHz (2x2) is supported, without affecting the transmit power of radios. Wired network ports: The rate of the 5GE electrical port is reduced to GE. The 5GE electrical port and the SFP+ optical port work as combo ports, and when one of them is working, the other is unavailable. The GE electrical port is unavailable.

5.1.7 AirEngine 6760R-51 (02353KCM-001)

Overview

Table 5-31 Basic information about the AirEngine 6760R-51

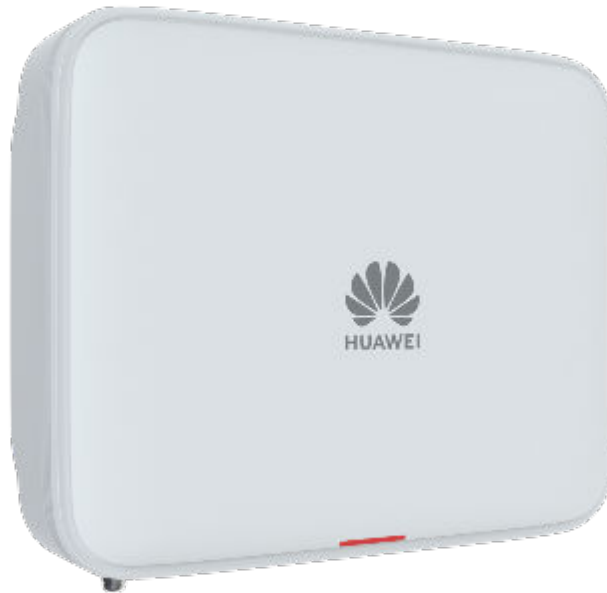
Item	Details
Description	AirEngine6760R-51 (11ax outdoor, 4+4 dual bands, smart antenna, BLE)
Part Number	02353KCM-001
Model	AirEngine 6760R-51
First supported version	V200R021C10SPC100

 NOTE

Depending on the production batch, the device has multiple part numbers, which have the same software specifications but different minimum versions supported. Additionally, the hardware specifications, such as the weight and power consumption, are slightly different.

Appearance

Figure 5-19 Appearance of the AirEngine 6760R-51



Ports

Figure 5-20 Ports on the AirEngine 6760R-51



1	Ground screw	2	GE
3	5GE/PoE_IN	4	SFP+
5	Security slot	-	-

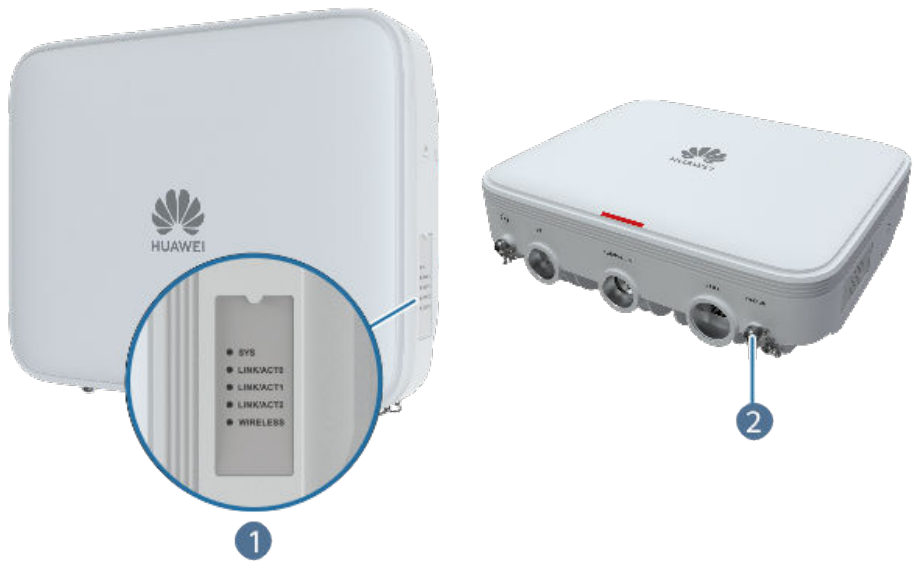
Table 5-32 Ports on the AirEngine 6760R-51

Port	Connector Type	Description	Available Components
5GE/PoE_IN	RJ45	Ethernet electrical port that supports 100M/1000M/2.5G/5G auto-sensing, connects to the wired Ethernet, and supports PoE input	Network cable

Port	Connector Type	Description	Available Components
SFP+	SFP+	Ethernet optical port, supporting 1 Gbit/s or 10 Gbit/s auto-sensing and working with a matching optical module	Optical module
GE	RJ45	Ethernet electrical port that supports 10M/100M/1000M auto-sensing and connects to the wired Ethernet.	Network cable

Indicators and Buttons

Figure 5-21 Indicators and buttons on the AirEngine 6760R-51



LINK/ACT0, LINK/ACT1, and LINK/ACT2 show the link status of the 5GE/PoE_IN, GE, and SFP+ ports, respectively.

The WIRELESS indicator shows the wireless link status, alternates between green (indicating the radio 0 status) and yellow (indicating the radio 1 status) at an interval of 20s. This mechanism is valid in V200R022C00 and later versions.

1	Indicator	2	Default
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Table 5-33 Indicators on the AirEngine 6760R-51

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Steady on after blinking once	After the hardware reset is cleared and the software starts, the indicator blinks once. Then, the indicator is steady on until the bottom-layer system starts.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP. This state is supported in V200R022C00 and later versions.

Silkscreen	Name	Color	Status	Description
		Green	Slow blinking (0.2 Hz)	<p>The AP is running properly, and the Ethernet connection is normal.</p> <p>For V200R022C00 and later versions, this state also indicates that no STA is associated with the AP.</p>
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.

Silkscreen	Name	Color	Status	Description
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V200R024C00 and later versions.
		Red	Steady on	The system is faulty.
LINK/ACT0, LINK/ACT1, and LINK/ACT2	Port indicator	Green	Blinking	The system is running properly and the Ethernet connection is normal.
WIRELESS	Radio status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green (2G)/Yellow (5G)	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green (2G)/Yellow (5G)	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Silkscreen	Name	Color	Status	Description
WIRELESS	Radio status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Green (2G)/ Yellow (5G)	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Green (2G)/ Yellow (5G)	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.
		Green (2G)/ Yellow (5G)	Steady on	The AP is connected to a Mesh network and has good signal strength.

Table 5-34 Buttons on the AirEngine 6760R-51

Silkscreen	Name	Description
Default	Reset button	<ul style="list-style-type: none">For versions earlier than V200R022C00SPC100: Hold down the button for more than 3 seconds to restore the factory settings and restart the device.For versions from V200R022C00SPC100 to V200R023C10: if you press the button, the device resets. If you hold down the button for more than 6 seconds, the device restores the factory settings, switches to the Fit mode, and restarts.For V200R024C00 and later versions: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-35 Technical specifications of the AirEngine 6760R-51

Item	Specification
Installation Type	<ul style="list-style-type: none">WallPole

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	85 mm x 270 mm x 220 mm (3.35 in. x 10.63 in. x 8.66 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	160 mm x 490 mm x 390 mm (6.30 in. x 19.29 in. x 15.35 in.)
Weight without packaging [kg(lb)]	3 kg (6.61 lb)
Weight with packaging [kg(lb)]	5 kg (11.02 lb)
Storage	NAND Flash 512 MB; NOR Flash 16 MB
Console port	BLE console
Maximum power consumption [W]	35.3 W
Maximum heat dissipation [BTU/hour]	120.4 BTU/hour
Power supply mode	PoE
Input voltage range [V]	PoE: 802.3bt/at
Service port surge protection	6 kA in common mode
PoE OUT	Not supported
Maximum number of physical ports on the entire device	5GE (RJ45) x 1, 10M/100M/1000M/2.5GE/5GE auto-sensing GE (RJ45) x 1, 10M/100M/1000M auto-sensing 10GE optical port (SFP+), GE/10GE auto-sensing
Long-term operating temperature [°C(°F)]	–40°C to +65°C (–40°F to +149°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP68

Item	Specification
Ground	Grounding
Wind resistance	67 m/s
USB	Not supported
IoT slot	Not supported
BLE	BLE5.2
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Radio 0 (2.4 GHz): 4x4 Radio 1 (5 GHz): 4x4
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax 5 GHz: 802.11a/n/ac/ac Wave 2/ax
Radio interface	Built-in directional antennas
Antenna gain	2.4G: 10 dBi 5G: 11 dBi BLE: 5 dBi
Beamwidth of the built-in antenna [degrees]	2.4 GHz: <ul style="list-style-type: none"> Horizontal plane: 60° Vertical plane: 40° 5 GHz: <ul style="list-style-type: none"> Horizontal plane: 60° Vertical plane: 20°
Maximum transmit power	2.4 GHz: 30 dBm 5 GHz: 30 dBm (Note: This is the total MIMO radio power, the same as: 2.4 GHz: 24 dBm/chain 5 GHz: 24 dBm/chain) BLE: < 10 dBm
Singal radio transmit power [dBm]	2.4G: -10 dBm to 24 dBm/chain 5G: -10 dBm to 24 dBm/chain
MTBF [year]	91.9 year
MTTR [hour]	0.5 hour
Frequency stability [ppm]	+/-20

Item	Specification
802.3bt power supply description	No function is limited.
802.3at power supply description	Wi-Fi: 2.4 GHz (2x2) + 5 GHz (2x2) is supported, without affecting the transmit power of radios. Wired network ports: The rate of the 5GE electrical port is reduced to GE. The 5GE electrical port and the SFP+ optical port work as combo ports, and when one of them is working, the other is unavailable. The GE electrical port is unavailable.

5.1.8 AirEngine 6760R-51 (02353KCM)

Overview

Table 5-36 Basic information about the AirEngine 6760R-51

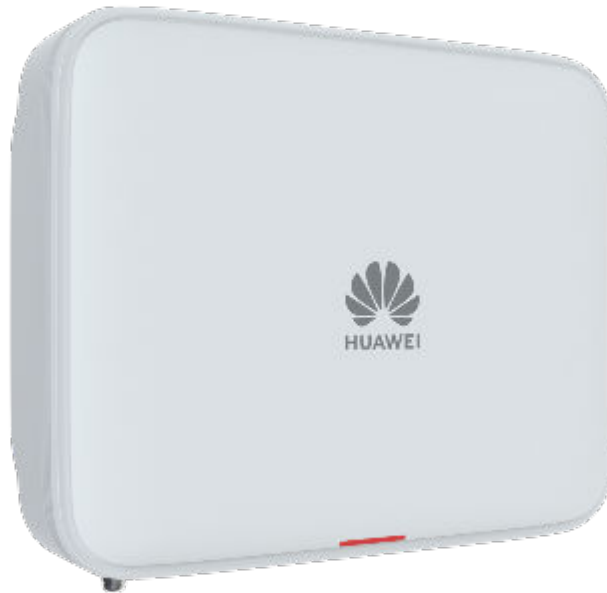
Item	Details
Description	AirEngine6760R-51(11ax outdoor,4+4 dual bands,smart antenna,BLE)
Part Number	02353KCM
Model	AirEngine 6760R-51
First supported version	V200R019C10

 NOTE

Depending on the production batch, the device has multiple part numbers, which have the same software specifications but different minimum versions supported. Additionally, the hardware specifications, such as the weight and power consumption, are slightly different.

Appearance

Figure 5-22 Appearance of the AirEngine 6760R-51



Ports

Figure 5-23 Ports on the AirEngine 6760R-51



1	Ground screw	2	GE
3	5GE/PoE_IN	4	SFP+
5	Security slot	-	-

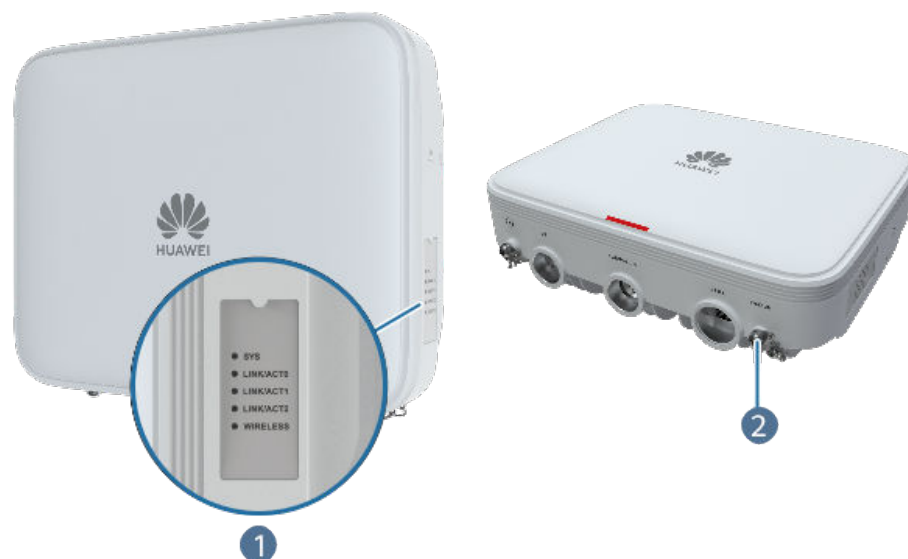
Table 5-37 Ports on the AirEngine 6760R-51

Port	Connector Type	Description	Available Components
5GE/PoE_IN	RJ45	Ethernet electrical port that supports 100M/1000M/2.5G/5G auto-sensing, connects to the wired Ethernet, and supports PoE input	Network cable

Port	Connector Type	Description	Available Components
SFP+	SFP+	Ethernet optical port, supporting 1 Gbit/s or 10 Gbit/s auto-sensing and working with a matching optical module	Optical module
GE	RJ45	Ethernet electrical port that supports 10M/100M/1000M auto-sensing and connects to the wired Ethernet.	Network cable

Indicators and Buttons

Figure 5-24 Indicators and buttons on the AirEngine 6760R-51



LINK/ACT0, LINK/ACT1, and LINK/ACT2 show the link status of the 5GE/PoE_IN, GE, and SFP+ ports, respectively.

The WIRELESS indicator shows the wireless link status, alternates between green (indicating the radio 0 status) and yellow (indicating the radio 1 status) at an interval of 20s. This mechanism is valid in V200R022C00 and later versions.

1	Indicator	2	Default
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Table 5-38 Indicators on the AirEngine 6760R-51

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Steady on after blinking once	After the hardware reset is cleared and the software starts, the indicator blinks once. Then, the indicator is steady on until the bottom-layer system starts.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP. This state is supported in V200R022C00 and later versions.

Silkscreen	Name	Color	Status	Description
		Green	Slow blinking (0.2 Hz)	<p>The AP is running properly, and the Ethernet connection is normal.</p> <p>For V200R022C00 and later versions, this state also indicates that no STA is associated with the AP.</p>
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.

Silkscreen	Name	Color	Status	Description
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V200R024C00 and later versions.
		Red	Steady on	The system is faulty.
LINK/ACT0, LINK/ACT1, and LINK/ACT2	Port indicator	Green	Blinking	The system is running properly and the Ethernet connection is normal.
WIRELESS	Radio status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green (2G)/Yellow (5G)	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green (2G)/Yellow (5G)	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Silkscreen	Name	Color	Status	Description
WIRELESS	Radio status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Green (2G)/ Yellow (5G)	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Green (2G)/ Yellow (5G)	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.
		Green (2G)/ Yellow (5G)	Steady on	The AP is connected to a Mesh network and has good signal strength.

Table 5-39 Buttons on the AirEngine 6760R-51

Silkscreen	Name	Description
Default	Reset button	<ul style="list-style-type: none">For versions earlier than V200R022C00SPC100: Hold down the button for more than 3 seconds to restore the factory settings and restart the device.For versions from V200R022C00SPC100 to V200R023C10: if you press the button, the device resets. If you hold down the button for more than 6 seconds, the device restores the factory settings, switches to the Fit mode, and restarts.For V200R024C00 and later versions: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-40 Technical specifications of the AirEngine 6760R-51

Item	Specification
Installation Type	<ul style="list-style-type: none">WallPole

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	85 mm x 270 mm x 220 mm (3.35 in. x 10.63 in. x 8.66 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	160 mm x 490 mm x 390 mm (6.30 in. x 19.29 in. x 15.35 in.)
Weight without packaging [kg(lb)]	3 kg (6.61 lb)
Weight with packaging [kg(lb)]	5 kg (11.02 lb)
Storage	NAND Flash 512 MB; NOR Flash 16 MB
Console port	BLE console
Maximum power consumption [W]	35.3 W
Maximum heat dissipation [BTU/hour]	120.4 BTU/hour
Power supply mode	PoE
Input voltage range [V]	PoE: 802.3bt/at
Service port surge protection	6 kA in common mode
PoE OUT	Not supported
Maximum number of physical ports on the entire device	5GE (RJ45) x 1, 10M/100M/1000M/2.5GE/5GE auto-sensing GE (RJ45) x 1, 10M/100M/1000M auto-sensing 10GE optical port (SFP+), GE/10GE auto-sensing
Long-term operating temperature [°C(°F)]	–40°C to +65°C (–40°F to +149°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP68

Item	Specification
Ground	Grounding
Wind resistance	67 m/s
USB	Not supported
IoT slot	Not supported
BLE	BLE5.2
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Radio 0 (2.4 GHz): 4x4 Radio 1 (5 GHz): 4x4
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax 5 GHz: 802.11a/n/ac/ac Wave 2/ax
Radio interface	Built-in directional antennas
Antenna gain	2.4G: 10 dBi 5G: 11 dBi BLE: 5 dBi
Beamwidth of the built-in antenna [degrees]	2.4 GHz: <ul style="list-style-type: none"> Horizontal plane: 60° Vertical plane: 40° 5 GHz: <ul style="list-style-type: none"> Horizontal plane: 60° Vertical plane: 20°
Maximum transmit power	2.4 GHz: 30 dBm 5 GHz: 30 dBm (Note: This is the total MIMO radio power, the same as: 2.4 GHz: 24 dBm/chain 5 GHz: 24 dBm/chain) BLE: < 10 dBm
Singal radio transmit power [dBm]	2.4G: -10 dBm to 24 dBm/chain 5G: -10 dBm to 24 dBm/chain
MTBF [year]	91.9 year
MTTR [hour]	0.5 hour
Frequency stability [ppm]	+/-20

Item	Specification
802.3bt power supply description	No function is limited.
802.3at power supply description	Wi-Fi: 2.4 GHz (2x2) + 5 GHz (2x2) is supported, without affecting the transmit power of radios. Wired network ports: The rate of the 5GE electrical port is reduced to GE. The 5GE electrical port and the SFP+ optical port work as combo ports, and when one of them is working, the other is unavailable. The GE electrical port is unavailable.

5.1.9 AirEngine 5761R-11

Overview

Table 5-41 Basic information about the AirEngine 5761R-11

Item	Details
Description	AirEngine5761R-11(11ax outdoor,2+2 dual bands,directional antenna,BLE)
Part Number	02354DKS
Model	AirEngine 5761R-11
First supported version	V200R021C00

Appearance

Figure 5-25 Appearance of the AirEngine 5761R-11



Ports

Figure 5-26 Ports on the AirEngine 5761R-11



1	Ground screw	2	GE/PoE_IN
3	SFP	4	Security slot

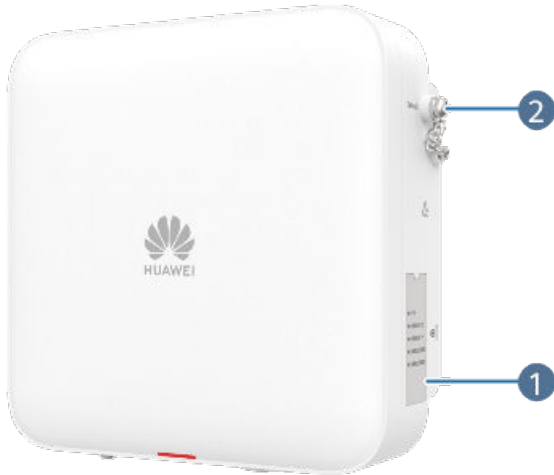
Table 5-42 Ports on the AirEngine 5761R-11

Port	Connector Type	Description	Available Components
GE/PoE_IN	RJ45	Ethernet electrical port that supports 10/100/1000M auto-sensing, connects to the wired Ethernet, and supports PoE input	Network cable

Port	Connector Type	Description	Available Components
SFP	SFP	Ethernet optical port, supporting 1000 Mbit/s and working with a matching optical transceiver.	Optical module

Indicators and Buttons

Figure 5-27 Indicators and buttons on the AirEngine 5761R-11



WIRELESS0 and WIRELESS1 show the wireless link status of the radio 0 and radio 1, respectively. The signal strength mode is valid in V200R022C00 and later versions.

1	Indicator	2	Default
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Table 5-43 Indicators on the AirEngine 5761R-11

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Steady on after blinking once	After the hardware reset is cleared and the software starts, the indicator blinks once. Then, the indicator is steady on until the bottom-layer system starts.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP. This state is supported in V200R022C00 and later versions.

Silkscreen	Name	Color	Status	Description
		Green	Slow blinking (0.2 Hz)	<p>The AP is running properly, and the Ethernet connection is normal.</p> <p>For V200R022C00 and later versions, this state also indicates that no STA is associated with the AP.</p>
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.

Silkscreen	Name	Color	Status	Description
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V200R024C00 and later versions.
		Red	Steady on	The system is faulty.
LINK/ACT0	GE electrical port indicator	Green	Blinking	The port is running properly and the Ethernet connection is normal.
		-	Off	The port is in link-down state.
LINK/ACT1	SFP optical port indicator	Green	Blinking	The port is running properly and the Ethernet connection is normal.
		-	Off	The port is in link-down state.
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.

Silkscreen	Name	Color	Status	Description
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS0	Radio 0 status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Green	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Green	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.
		Green	Steady on	The AP is connected to a Mesh network and has good signal strength.

Silkscreen	Name	Color	Status	Description
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Yellow	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Yellow	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.

Silkscreen	Name	Color	Status	Description
		Yellow	Steady on	The AP is connected to a Mesh network and has good signal strength.

Table 5-44 Buttons on the AirEngine 5761R-11

Silkscreen	Name	Description
Default	Reset button	<ul style="list-style-type: none">For versions earlier than V200R022C00SPC100: Hold down the button for more than 3 seconds to restore the factory settings and restart the device.For versions from V200R022C00SPC100 to V200R023C10: if you press the button, the device resets. If you hold down the button for more than 6 seconds, the device restores the factory settings, switches to the Fit mode, and restarts.For V200R024C00 and later versions: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-45 Technical specifications of the AirEngine 5761R-11

Item	Specification
Installation Type	<ul style="list-style-type: none"> • Wall • Pole
Dimensions without packaging (H x W x D) [mm(in.)]	69 mm x 200 mm x 200 mm (2.72 in. x 7.87 in. x 7.87 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	160 mm x 470 mm x 390 mm (6.30 in. x 18.50 in. x 15.35 in.)
Weight without packaging [kg(lb)]	1.91 kg (4.21 lb)
Weight with packaging [kg(lb)]	3.73 kg (8.22 lb)
Storage	NAND Flash 512 MB
Console port	Bluetooth console
Maximum power consumption [W]	17.7 W
Maximum heat dissipation [BTU/hour]	60.4 BTU/hour
Power supply mode	PoE
Input voltage range [V]	PoE: 802.3at/af
Service port surge protection	6 kA in common mode
PoE OUT	Not supported
Maximum number of physical ports on the entire device	GE (RJ45) x 1, 10M/100M/1000M auto-sensing GE optical port (SFP)
Long-term operating temperature [°C(°F)]	-40°C to +65°C (-40°F to +149°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	-40°C to +85°C (-40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	-60 m to +5000 m (-196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3

Item	Specification
Ingress protection level (dustproof/waterproof)	IP68
Ground	Grounding
Antenna port surge protection [kA]	N/A
Wind resistance	67 m/s
USB	Not supported
IoT slot	Not supported
BLE	BLE5.2
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Radio 0 (2.4 GHz): 2x2 Radio 1 (5 GHz): 2x2
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax 5 GHz: 802.11a/n/ac/ac Wave 2/ax
Radio interface	Built-in directional antennas
Antenna gain	2.4G: 10 dBi 5G: 11 dBi BLE: 5 dBi
Beamwidth of the built-in antenna [degrees]	2.4 GHz: <ul style="list-style-type: none"> Horizontal plane: 65° Vertical plane: 40° 5 GHz: <ul style="list-style-type: none"> Horizontal plane: 65° Vertical plane: 20°
Maximum transmit power	2.4G: 28 dBm (Max) 5G: 27 dBm (Max) NOTE This is the total MIMO radio power, which is the same as: 2.4G: 25 dBm/chain (Max) 5G: 24 dBm/chain (Max) BLE: < 10 dBm
Singal radio transmit power [dBm]	2.4G: -10 dBm to 25 dBm/chain 5G: -10 dBm to 24 dBm/chain

Item	Specification
MTBF [year]	123 year
MTTR [hour]	0.5 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	No function is limited.
802.3at power supply description	No function is limited.
802.3af power supply description	<p>Wi-Fi: 2.4 GHz (2x2) + 5 GHz (2x2). The maximum combined power is adjusted to 23 dBm (2.4 GHz) and 23 dBm (5 GHz).</p> <p>Wired network port: The SFP optical port and GE/PoE_IN work as combo ports, and only one of them is working at a time. If both of them are enabled, the optical port takes effect preferentially.</p>

5.1.10 AirEngine 5761R-11E

Overview

Table 5-46 Basic information about the AirEngine 5761R-11E

Item	Details
Description	AirEngine5761R-11E(11ax outdoor,2+2/2 dual bands,external antenna,BLE)
Part Number	02354DKT
Model	AirEngine 5761R-11E
First supported version	V200R021C00

Appearance

Figure 5-28 Appearance of the AirEngine 5761R-11E



Ports

Figure 5-29 Ports on the AirEngine 5761R-11E



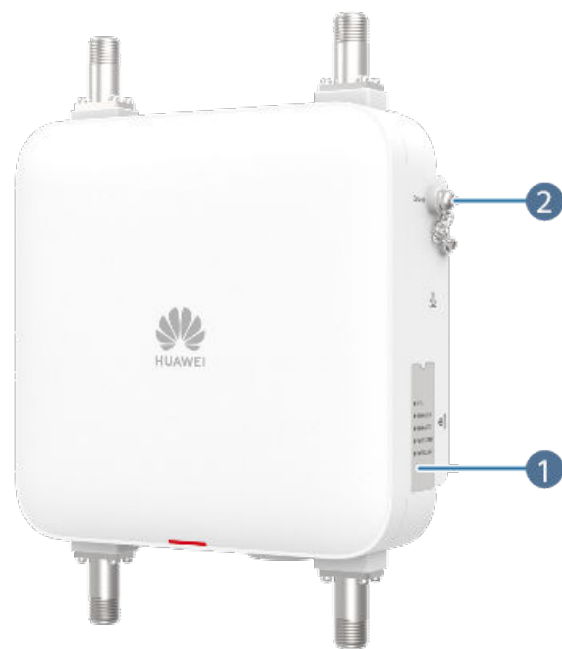
1	Ground screw	2	GE/PoE_IN
3	SFP	4	5 GHz RF port
5	Security slot	6	2.4 GHz/5 GHz RF port

Table 5-47 Ports on the AirEngine 5761R-11E

Port	Connector Type	Description	Available Components
GE/PoE_IN	RJ45	Ethernet electrical port that supports 10/100/1000M auto-sensing, connects to the wired Ethernet, and supports PoE input	Network cable
SFP	SFP	Ethernet optical port, supporting 1000 Mbit/s and working with a matching optical transceiver.	Optical module
5 GHz antenna port	N-Type Female	Connects to a 5 GHz antenna to transmit and receive service signals.	Antenna
2.4 GHz/5 GHz antenna port	N-Type Female	Connects to a 2.4 GHz or 5 GHz antenna to transmit and receive service signals.	Antenna

Indicators and Buttons

Figure 5-30 Indicators and buttons on the AirEngine 5761R-11E



WIRELESS0 and WIRELESS1 show the wireless link status of the radio 0 and radio 1, respectively. The signal strength mode is valid in V200R022C00 and later versions.

1	Indicator	2	Default
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Table 5-48 Indicators on the AirEngine 5761R-11E

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Steady on after blinking once	After the hardware reset is cleared and the software starts, the indicator blinks once. Then, the indicator is steady on until the bottom-layer system starts.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP. This state is supported in V200R022C00 and later versions.

Silkscreen	Name	Color	Status	Description
		Green	Slow blinking (0.2 Hz)	<p>The AP is running properly, and the Ethernet connection is normal.</p> <p>For V200R022C00 and later versions, this state also indicates that no STA is associated with the AP.</p>
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.

Silkscreen	Name	Color	Status	Description
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V200R024C00 and later versions.
		Red	Steady on	The system is faulty.
LINK/ACT0	GE electrical port indicator	Green	Blinking	The port is running properly and the Ethernet connection is normal.
		-	Off	The port is in link-down state.
LINK/ACT1	SFP optical port indicator	Green	Blinking	The port is running properly and the Ethernet connection is normal.
		-	Off	The port is in link-down state.
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.

Silkscreen	Name	Color	Status	Description
		Green (2G)/ Yellow (5G)	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green (2G)/ Yellow (5G)	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS0	Radio 0 status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Green (2G)/ Yellow (5G)	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Green (2G)/ Yellow (5G)	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.
		Green (2G)/ Yellow (5G)	Steady on	The AP is connected to a Mesh network and has good signal strength.

Silkscreen	Name	Color	Status	Description
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Yellow	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Yellow	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.

Silkscreen	Name	Color	Status	Description
		Yellow	Steady on	The AP is connected to a Mesh network and has good signal strength.

Table 5-49 Buttons on the AirEngine 5761R-11E

Silkscreen	Name	Description
Default	Reset button	<ul style="list-style-type: none">For versions earlier than V200R022C00SPC100: Hold down the button for more than 3 seconds to restore the factory settings and restart the device.For versions from V200R022C00SPC100 to V200R023C10: if you press the button, the device resets. If you hold down the button for more than 6 seconds, the device restores the factory settings, switches to the Fit mode, and restarts.For V200R024C00 and later versions: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-50 Technical specifications of the AirEngine 5761R-11E

Item	Specification
Installation Type	<ul style="list-style-type: none"> • Wall • Pole
Dimensions without packaging (H x W x D) [mm(in.)]	69 mm x 200 mm x 200 mm (2.72 in. x 7.87 in. x 7.87 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	160 mm x 470 mm x 390 mm (6.30 in. x 18.50 in. x 15.35 in.)
Weight without packaging [kg(lb)]	2.04 kg (4.50 lb)
Weight with packaging [kg(lb)]	4.12 kg (9.08 lb)
Storage	NAND Flash 512 MB
Console port	Bluetooth console
Maximum power consumption [W]	19.6 W
Maximum heat dissipation [BTU/hour]	66.9 BTU/hour
Power supply mode	PoE
Input voltage range [V]	PoE: 802.3at/af
Service port surge protection	6 kA in common mode
PoE OUT	Not supported
Maximum number of physical ports on the entire device	GE (RJ45) x 1, 10M/100M/1000M auto-sensing GE optical port (SFP)
Long-term operating temperature [°C(°F)]	-40°C to +65°C (-40°F to +149°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	-40°C to +85°C (-40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	-60 m to +5000 m (-196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3

Item	Specification
Ingress protection level (dustproof/waterproof)	IP68
Ground	Grounding
Antenna port surge protection [kA]	5 kA surge protection capability without external surge protection devices
Wind resistance	67 m/s
USB	Not supported
IoT slot	Not supported
BLE	BLE5.2
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Radio 0 (2.4 GHz/5 GHz): 2x2 Radio 1 (5 GHz): 2x2
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax 5 GHz: 802.11a/n/ac/ac Wave 2/ax
Radio interface	External antenna
Antenna gain	BLE: 5 dBi
Maximum transmit power	2.4G: 28 dBm (Max) 5G: 27 dBm (Max) NOTE This is the total MIMO radio power, which is the same as: 2.4G: 25 dBm/chain (Max) 5G: 24 dBm/chain (Max) BLE: < 10 dBm
Singal radio transmit power [dBm]	2.4G: -10 dBm to 25 dBm/chain 5G: -10 dBm to 24 dBm/chain
MTBF [year]	108 year
MTTR [hour]	0.5 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	No function is limited.
802.3at power supply description	No function is limited.

Item	Specification
802.3af power supply description	<p>Wi-Fi:</p> <ul style="list-style-type: none">2.4 GHz + 5 GHz dual-radio mode: 2.4 GHz (2x2) + 5 GHz (2x2). The maximum combined transmit power is adjusted to 23 dBm (2.4 GHz radio) and 23 dBm (5 GHz radio).Dual-5 GHz radio mode: 5 GHz (2x2) + 5 GHz (2x2). The maximum combined transmit power is adjusted to 23 dBm (both 5 GHz radios) . <p>Wired network port: The GE/PoE_IN port and the SFP optical port cannot work simultaneously. Only one of them works at a time, and the optical port takes precedence.</p>

5.1.11 AirEngine 5561R-11E

Overview

Table 5-51 Basic information about the AirEngine 5561R-11E

Item	Details
Description	AirEngine5561R-11E(11ax outdoor,2+2/2 dual bands,external antenna,BLE)
Part Number	02355XGB
Model	AirEngine 5561R-11E
First supported version	V200R023C10

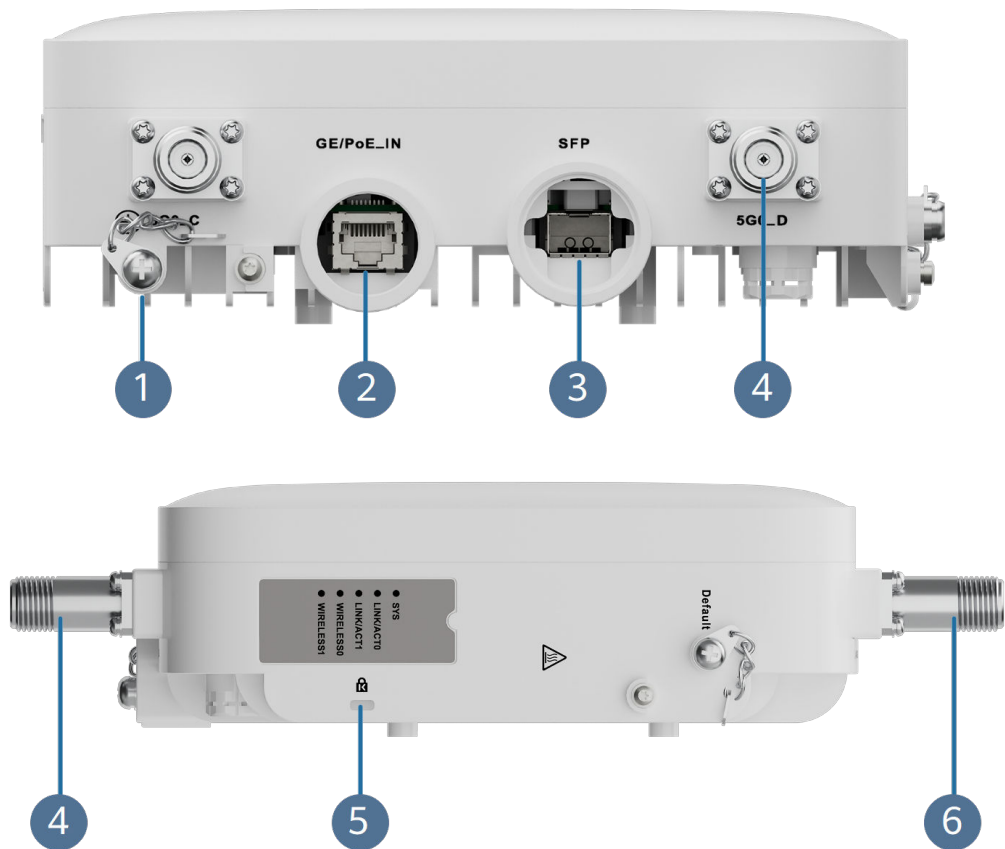
Appearance

Figure 5-31 Appearance of the AirEngine 5561R-11E



Ports

Figure 5-32 Ports on the AirEngine 5561R-11E



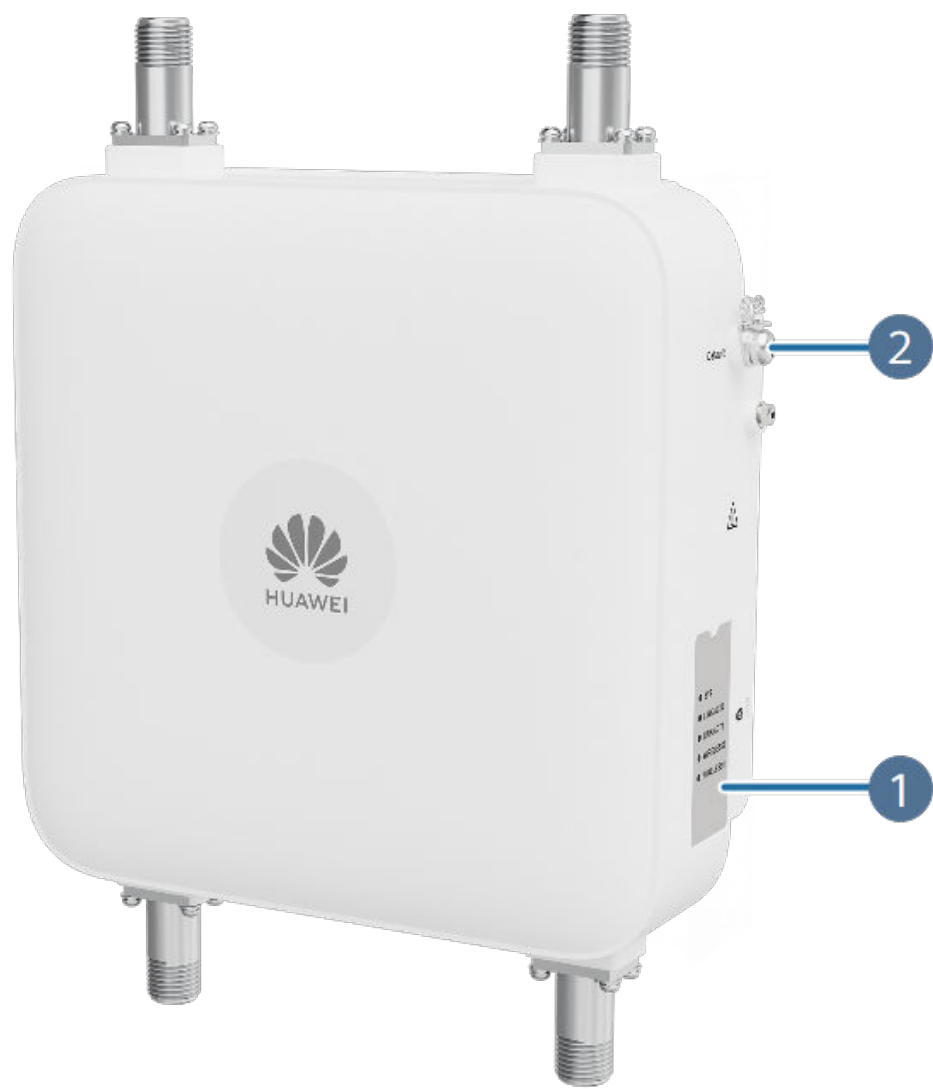
1	Ground screw	2	GE/PoE_IN
3	SFP	4	5 GHz RF port
5	Security slot	6	2.4 GHz/5 GHz RF port

Table 5-52 Ports on the AirEngine 5561R-11E

Port	Connector Type	Description	Available Components
GE/PoE_IN	RJ45	Ethernet electrical port that supports 10/100/1000M auto-sensing, connects to the wired Ethernet, and supports PoE input	Network cable
SFP	SFP	Ethernet optical port, supporting 2.5 Gbit/s or 1 Gbit/s auto-sensing and working with a matching optical module.	Optical module
5 GHz antenna port	N-Type Female	Connects to a 5 GHz antenna to transmit and receive service signals.	Antenna
2.4 GHz/5 GHz antenna port	N-Type Female	Connects to a 2.4 GHz or 5 GHz antenna to transmit and receive service signals.	Antenna

Indicators and Buttons

Figure 5-33 Indicators and buttons on the AirEngine 5561R-11E



1	Indicator	2	Default
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Table 5-53 Indicators on the AirEngine 5561R-11E

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Steady on after blinking once	After the hardware reset is cleared and the software starts, the indicator blinks once. Then, the indicator is steady on until the bottom-layer system starts.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP. This state is supported in V200R022C00 and later versions.

Silkscreen	Name	Color	Status	Description
		Green	Slow blinking (0.2 Hz)	<p>The AP is running properly, and the Ethernet connection is normal.</p> <p>For V200R022C00 and later versions, this state also indicates that no STA is associated with the AP.</p>
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.

Silkscreen	Name	Color	Status	Description
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V200R024C00 and later versions.
		Red	Steady on	The system is faulty.
LINK/ACT0	GE electrical port indicator	Green	Blinking	The port is running properly and the Ethernet connection is normal.
		-	Off	The port is in link-down state.
LINK/ACT1	SFP optical port indicator	Green	Blinking	The port is running properly and the Ethernet connection is normal.
		-	Off	The port is in link-down state.
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.

Silkscreen	Name	Color	Status	Description
		Green (2G)/ Yellow (5G)	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green (2G)/ Yellow (5G)	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS0	Radio 0 status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Green (2G)/ Yellow (5G)	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Green (2G)/ Yellow (5G)	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.
		Green (2G)/ Yellow (5G)	Steady on	The AP is connected to a Mesh network and has good signal strength.

Silkscreen	Name	Color	Status	Description
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Yellow	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Yellow	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.

Silkscreen	Name	Color	Status	Description
		Yellow	Steady on	The AP is connected to a Mesh network and has good signal strength.

Table 5-54 Buttons on the AirEngine 5561R-11E

Silkscreen	Name	Description
Default	Reset button	<ul style="list-style-type: none">For V200R023C10: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the device restores the factory settings, switches to the Fit mode, and restarts.For V200R024C00 and later versions: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-55 Technical specifications of the AirEngine 5561R-11E

Item	Specification
Installation Type	<ul style="list-style-type: none"> • Wall • Pole
Dimensions without packaging (H x W x D) [mm(in.)]	69 mm x 200 mm x 200 mm (2.72 in. x 7.87 in. x 7.87 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	160 mm x 470 mm x 390 mm (6.30 in. x 18.50 in. x 15.35 in.)
Weight without packaging [kg(lb)]	2.04 kg (4.50 lb)
Weight with packaging [kg(lb)]	4.12 kg (9.08 lb)
Storage	NAND Flash 512 MB
Console port	BLE console
Maximum power consumption [W]	19.6 W
Maximum heat dissipation [BTU/hour]	66.9 BTU/hour
Power supply mode	PoE
Input voltage range [V]	PoE: 802.3at/af
Service port surge protection	6 kA in common mode
PoE OUT	Not supported
Maximum number of physical ports on the entire device	GE (RJ45) x 1, 10M/100M/1000M auto-sensing GE optical port (SFP)
Long-term operating temperature [°C(°F)]	–40°C to +65°C (–40°F to +149°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	0% RH to 100% RH, non-condensing
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP68

Item	Specification
Ground	Grounding
Antenna port surge protection [kA]	5 kA surge protection capability without external surge protection devices
Wind resistance	67 m/s
USB	Not supported
IoT slot	Not supported
BLE	BLE5.2
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Radio 0 (2.4 GHz/5 GHz): 2x2 Radio 1 (5 GHz): 2x2
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax 5 GHz: 802.11a/n/ac/ac Wave 2/ax
Radio interface	External antenna
Antenna gain	BLE: 5 dBi
Maximum transmit power	2.4G: 28 dBm (Max) 5G: 27 dBm (Max) NOTE This is the total MIMO radio power, which is the same as: 2.4G: 25 dBm/chain (Max) 5G: 24 dBm/chain (Max) BLE: < 10 dBm
Singal radio transmit power [dBm]	2.4G: -10 dBm to 25 dBm/chain 5G: -10 dBm to 24 dBm/chain
MTBF [year]	108 year
MTTR [hour]	0.5 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	The power supply mode is negotiated to 802.3at, and no function is restricted.
802.3at power supply description	No function is limited.

Item	Specification
802.3af power supply description	<p>Wi-Fi:</p> <ul style="list-style-type: none"> 2.4 GHz + 5 GHz dual-radio mode: 2.4 GHz (2x2) + 5 GHz (2x2). The maximum combined transmit power is adjusted to 23 dBm (2.4 GHz radio) and 23 dBm (5 GHz radio). Dual-5 GHz radio mode: 5 GHz (2x2) + 5 GHz (2x2). The maximum combined transmit power is adjusted to 23 dBm (both 5 GHz radios) . <p>Wired network port: The GE/PoE_IN port and the SFP optical port cannot work simultaneously. Only one of them works at a time, and the optical port takes precedence.</p>

5.1.12 AirEngine 6776I-X6TH

Overview

Table 5-56 Basic information about the AirEngine 6776I-X6TH

Item	Details
Description	AirEngine6776I-X6TH (11be outdoor, 2+2+4 three radios, built-in directional antenna, USB, Bluetooth)
Part Number	50087137
Model	AirEngine 6776I-X6TH
First supported version	V600R024C00

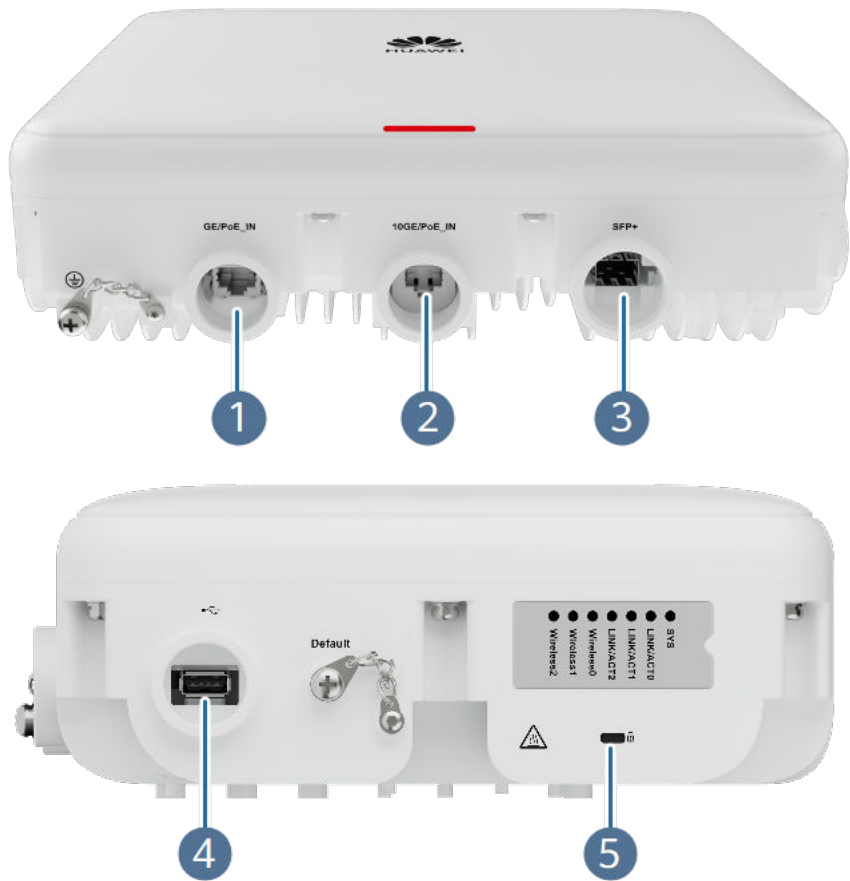
Appearance

Figure 5-34 Appearance of the AirEngine 6776I-X6TH



Ports

Figure 5-35 Ports on the AirEngine 6776I-X6TH



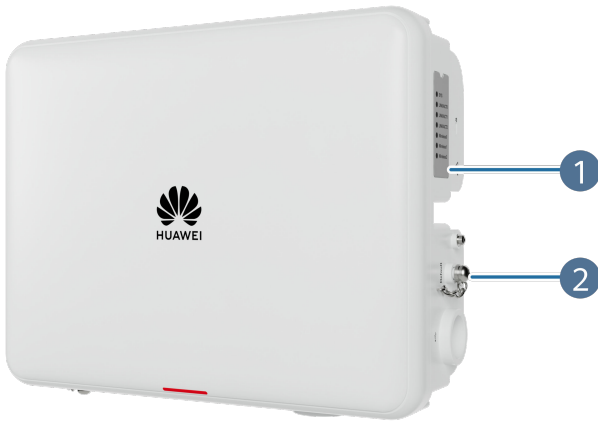
1	GE/PoE_IN	2	10GE/PoE_IN
3	SFP+	4	USB
5	Security slot	-	-

Table 5-57 Ports on the AirEngine 6776I-X6TH

Port	Connector Type	Description	Available Components
10GE/PoE_IN	RJ45	Ethernet electrical port that supports 100M/1000M/2.5G/5G/10G auto-sensing, connects to the wired Ethernet, and supports PoE input.	Network cable
GE/PoE_IN	RJ45	Ethernet electrical port that supports 10M/100M/1000M auto-sensing, connects to the wired Ethernet, and supports PoE input.	Network cable
SFP+	SFP+	Ethernet uplink optical port, which supports 1G/2.5G/10G auto-sensing and works with a matching optical module.	Optical module
USB	USB 2.0 Type A	Connects to an IoT terminal to implement IoT applications. This function is supported after the system software is upgraded to V600R024C10 or a later version.	IoT module

Indicators and Buttons

Figure 5-36 Indicators and buttons on the AirEngine 6776I-X6TH



1	Indicator	2	Default
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Table 5-58 Indicators on the AirEngine 6776I-X6TH

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.
		Green	Steady on	<ul style="list-style-type: none">The system is just powered on.The system is starting after a reset.The upper-layer system is starting.

Silkscreen	Name	Color	Status	Description
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP.
		Green	Slow blinking (0.2 Hz)	The AP is running properly, the Ethernet connection is normal, and no STA is associated with the AP.
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.

Silkscreen	Name	Color	Status	Description
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V600R024C10 and later versions.
		Red	Steady on	The system is faulty.
LINK/ACT0 to 2	Port indicator	Green	Blinking	The Ethernet connection is normal.
		-	Off	The port is in link-down state.
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.

Silkscreen	Name	Color	Status	Description
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS2	Radio 2 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.

Silkscreen	Name	Color	Status	Description
		Blue	Steady on	The AP has STAs connected, but no data is being transmitted.
		Blue	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Table 5-59 Buttons on the AirEngine 6776I-X6TH

Silkscreen	Name	Description
Default	Reset button	<ul style="list-style-type: none"> For versions earlier than V600R024C10: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the device restores the factory settings, switches to the Fit mode, and restarts. For V600R024C10 and later versions: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-60 Technical specifications of the AirEngine 6776I-X6TH

Item	Specification
Installation Type	<ul style="list-style-type: none"> Wall Pole
Dimensions without packaging (H x W x D) [mm(in.)]	85 mm x 280 mm x 220 mm (3.35 in. x 11.02 in. x 8.66 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	185 mm x 570 mm x 380 mm (7.28 in. x 22.44 in. x 14.96 in.)
Weight without packaging [kg(lb)]	3.28 kg (7.23 lb)
Weight with packaging [kg(lb)]	5.97 kg (13.16 lb)
Storage	NAND Flash 512 MB

Item	Specification
Console port	Bluetooth console
Maximum power consumption [W]	33.1 (excluding USB)
Maximum heat dissipation [BTU/hour]	107.3 BTU/hour
Power supply mode	PoE
Rated input voltage [V]	PoE: 802.3bt/at
Input voltage range [V]	PoE: 802.3bt/at When multiple ports are used for receive PoE power: If the power supply classes are different, the port with the highest power class is used. If the power supply classes are the same, power supply backup can be implemented.
Service port surge protection	PoE port: Surge: Differential mode: 1.5 kV (D.1), 10/700 us, 15 ohms + 25 ohms, criterion B Differential mode: 1.5 kV (D.2), 10/700 us, 15 ohms + 25 ohms, criterion C Common mode: 6 kV (C.3), 10/700 us, 15 ohms + 25 ohms/wire, criterion B: 6) Differential mode: 1 kV (D.1), 1.2/50 us, 42 ohms, criterion B; Differential mode: 1 kV (D.2), 1.2/50 us, 42 ohms, criterion B; Common mode: 2 kV (C.3), 1.2/50 us, 2 ohms + 40 ohms x n/wire, criterion B Inrush current: Differential mode: 250 A (D.2), 8/20 μs, criterion C Common mode: 6 kA/8-wire, 8/20 us, criterion C
PoE OUT	Not supported
Maximum number of physical ports on the entire device	10GE (RJ45) x 1, 100M/1000M/2500M/5000M/10GE auto-sensing GE (RJ45) x 1, 10M/100M/1000M auto-sensing 10GE optical (SFP+), GE/2.5GE/10GE auto-sensing

Item	Specification
Long-term operating temperature [°C(°F)]	–40°C to +70°C (–40°F to +158°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/ waterproof)	IP68
Ground	Grounding
Wind resistance	67 m/s
USB	The USB port can supply 2.5 W or 5 W power. USB 2.0 is supported after the system software is upgraded to V600R024C10 or a later version.
IoT slot	Not supported
BLE	BLE5.2
Radio number	3
Operating frequency band	<ul style="list-style-type: none"> • 2.4GHz • 5GHz • 6GHz
MIMO spatial streams	Triple-radio 6G mode: Radio 0 (2.4 GHz): 2x2 Radio 1 (5 GHz): 2x2 Radio 2 (6 GHz): 4x4 Triple-radio dual-5G mode: Radio 0 (2.4 GHz): 2x2 Radio 1 (5GH): 2x2 (high frequency band) Radio 2 (5GL): 4x4 (low frequency band)

Item	Specification
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax/be 5 GHz: 802.11a/n/ac/ac Wave 2/ax/be 6 GHz: 802.11a/ax/be
Radio interface	Built-in directional antennas
Antenna gain	Triple-radio 6G mode: 2.4G: 10 dBi/chain (peak gain) 10 dBi (combined gain) 5G: 11 dBi/chain (peak gain) 10 dBi (combined gain) 6G: 12 dBi/chain (peak gain) 10 dBi (combined gain) BLE: 5 dBi (peak value) Triple-radio dual-5G mode: 2.4G: 10 dBi/chain (peak gain) 10 dBi (combined gain) 5GH: 11 dBi/chain (peak gain) 10 dBi (combined gain) 5GL: 11 dBi/chain (peak gain) 10 dBi (combined gain) BLE: 5 dBi (peak value)

Item	Specification
Beamwidth of the built-in antenna [degrees]	<div>Triple-radio 6G mode:</div> <div>2.4G:</div> <div><div>• Horizontal plane: 70°</div><div>• Vertical plane: 35°</div></div> <div>5G:</div> <div><div>• Horizontal plane: 60°</div><div>• Vertical plane: 20°</div></div> <div>6G:</div> <div><div>• Horizontal plane: 55°</div><div>• Vertical plane: 20°</div></div> <div>Triple-radio dual-5G mode:</div> <div>2.4G:</div> <div><div>• Horizontal plane: 70°</div><div>• Vertical plane: 35°</div></div> <div>5GH:</div> <div><div>• Horizontal plane: 60°</div><div>• Vertical plane: 20°</div></div> <div>5GL:</div> <div><div>• Horizontal plane: 60°</div><div>• Vertical plane: 25°</div></div>

Item	Specification
Maximum transmit power	<p>Triple-radio 6G mode:</p> <p>2.4G:</p> <p>25 dBm/chain</p> <p>28 dBm (combined power)</p> <p>5G:</p> <p>20 dBm/chain</p> <p>23 dBm (combined power)</p> <p>6G:</p> <p>21dBm/chain</p> <p>27 dBm (combined power)</p> <p>BLE: < 10 dBm</p> <p>Triple-radio dual-5G mode:</p> <p>2.4G:</p> <p>25 dBm/chain</p> <p>28 dBm (combined power)</p> <p>5GH:</p> <p>20 dBm/chain</p> <p>23 dBm (combined power)</p> <p>5GL:</p> <p>21 dBm/chain</p> <p>27 dBm (combined power)</p> <p>BLE: < 10 dBm</p>
Singal radio transmit power [dBm]	<p>Triple-radio 6G mode:</p> <p>2.4G: -10 dBm to 25 dBm/chain</p> <p>5G: -10 dBm to 20 dBm/chain</p> <p>6G: -10 dBm to 21 dBm/chain</p> <p>Triple-radio dual-5G mode:</p> <p>2.4G: -10 dBm to 25 dBm/chain</p> <p>5GH: -10 dBm to 20 dBm/chain</p> <p>5GL: -10 dBm to 21 dBm/chain</p>
MTBF [year]	81.14417704 year
MTTR [hour]	2 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	No function is limited.

Item	Specification
802.3at power supply description	Wi-Fi service: supports a maximum of 2.4 GHz (2x2) + 5 GHz (2x2), 20 MHz bandwidth at 2.4 GHz, and 80 MHz bandwidth at 5 GHz. The USB function is unavailable, and other functions are not restricted.

5.1.13 AirEngine 6776I-X6ETH

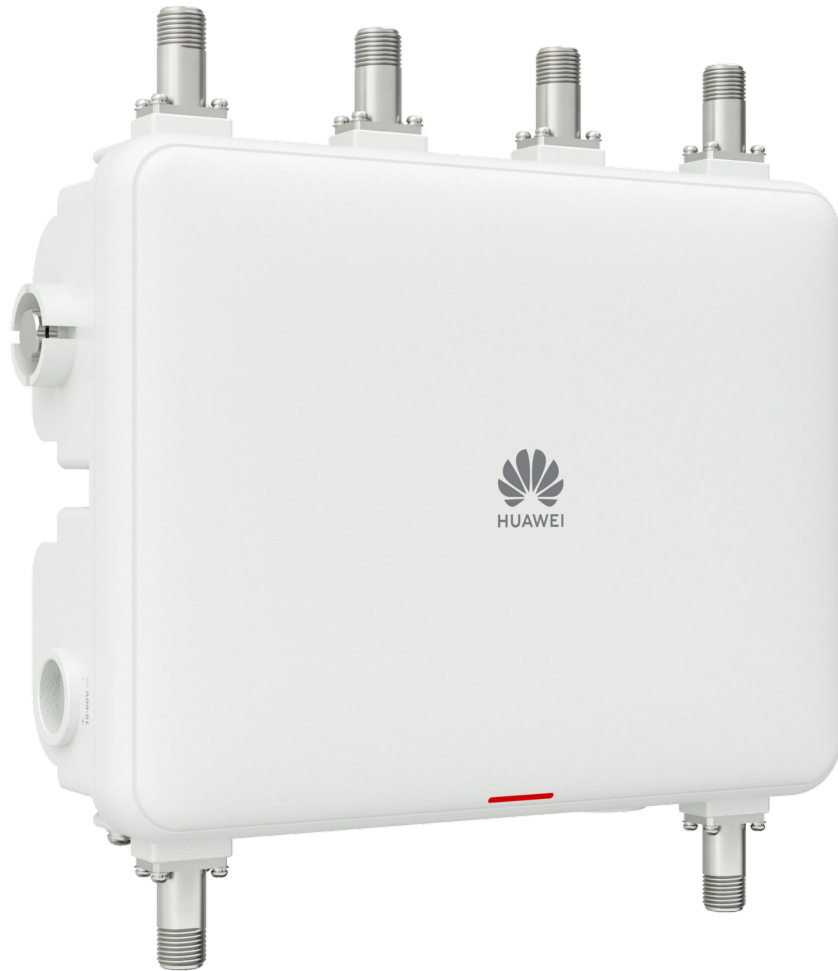
Overview

Table 5-61 Basic information about the AirEngine 6776I-X6ETH

Item	Details
Description	AirEngine6776I-X6ETH(11be outdoor,2+2+4 tri bands,external antenna,USB,BLE)
Part Number	50088012
Model	AirEngine 6776I-X6ETH
First supported version	V600R024C10

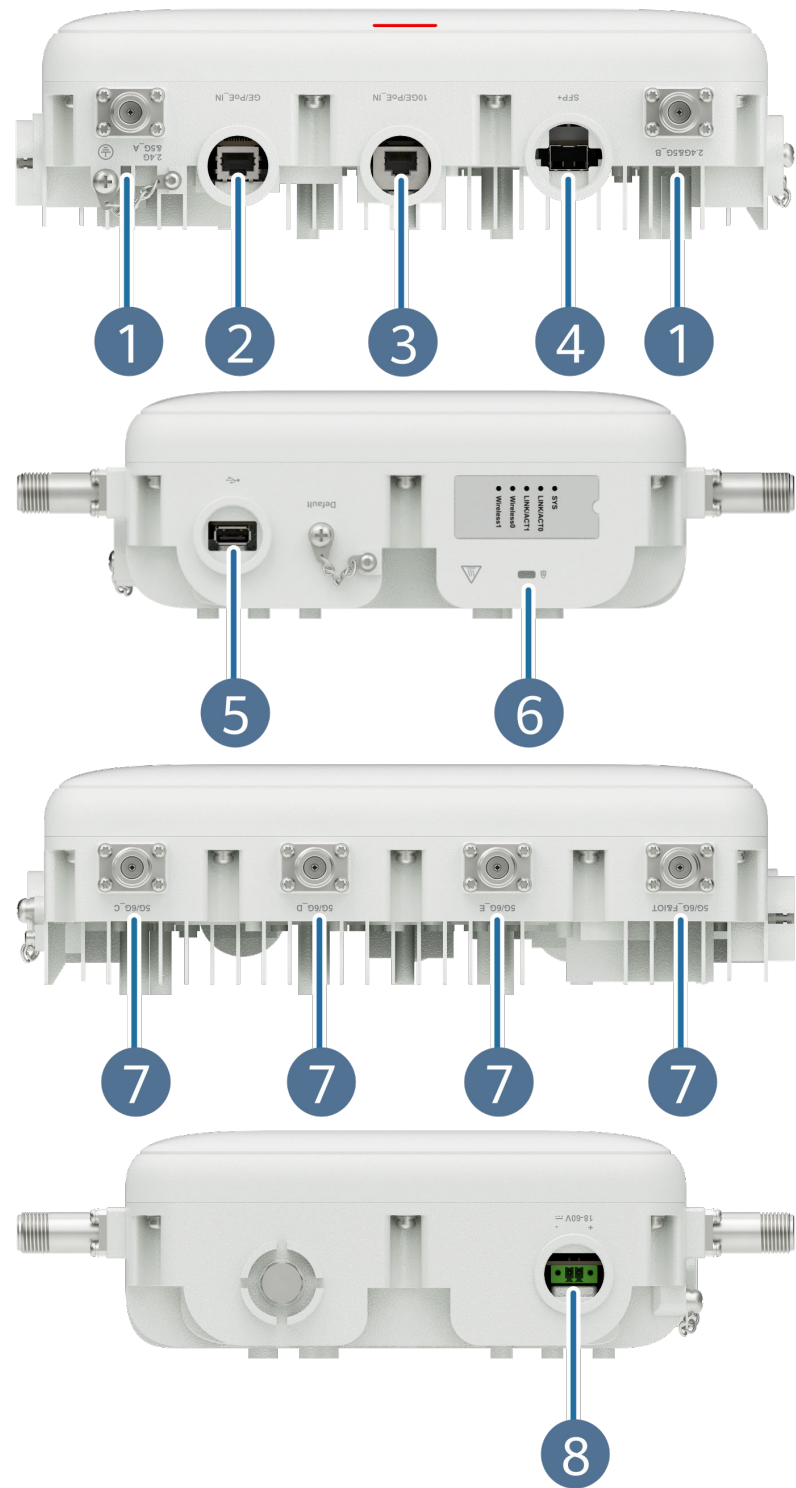
Appearance

Figure 5-37 Appearance of the AirEngine 6776I-X6ETH



Ports

Figure 5-38 Ports on the AirEngine 6776I-X6ETH



1	2.4G&5G_A~B	2	GE/PoE_IN
3	10GE/PoE_IN	4	SFP+
5	USB	6	Security slot
7	5G/6G_C~F&IOT	8	DC port

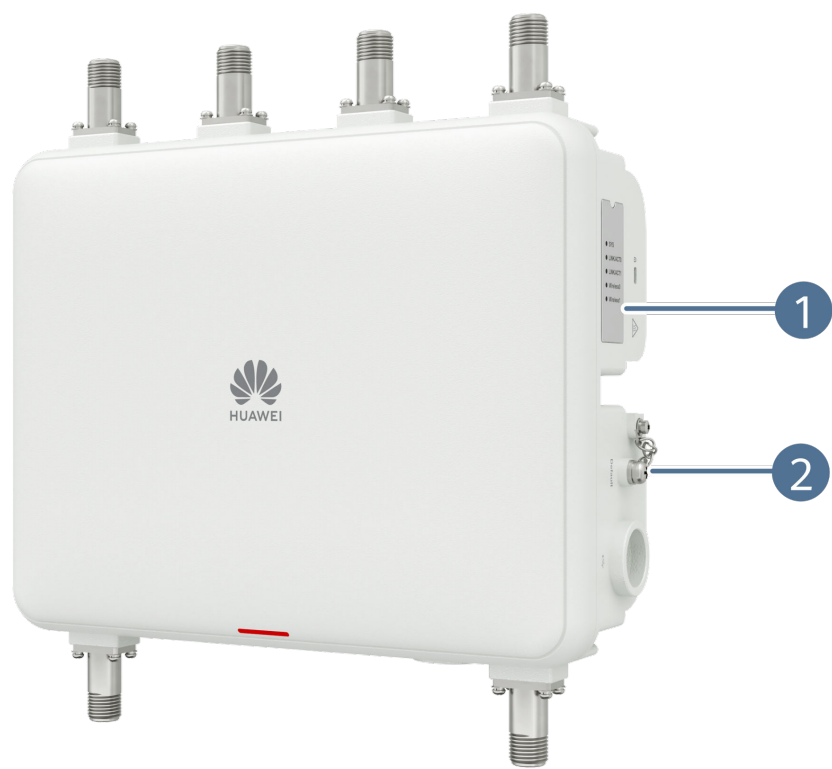
Table 5-62 Ports on the AirEngine 6776I-X6ETH

Port	Connector Type	Description	Available Components
10GE/PoE_IN	RJ45	Ethernet electrical port that supports 100M/1000M/2.5G/5G/10G auto-sensing, connects to the wired Ethernet, and supports PoE input.	Network cable
GE/PoE_IN	RJ45	Ethernet electrical port that supports 10M/100M/1000M auto-sensing, connects to the wired Ethernet, and supports PoE input.	Network cable
SFP+	SFP+	Ethernet uplink optical port, which supports 1G/2.5G/10G auto-sensing and works with a matching optical module.	Optical module
USB	USB 2.0 Type A	Connects to an IoT terminal to implement IoT applications.	IoT module

Port	Connector Type	Description	Available Components
2.4G&5G_A and B	N-Type Female	Connects to a dual-band (2.4 GHz + 5 GHz) antenna for transmitting and receiving service signals.	Antenna
5G/6G_C to F&IOT	N-Type Female	Connects to a 5 GHz or 6 GHz antenna for transmitting and receiving service signals.	Antenna
DC port	Phoenix terminal block	DC power port, used in DC power supply scenarios and supporting a voltage range of 18 V to 60 V.	Phoenix terminal block

Indicators and Buttons

Figure 5-39 Indicators and buttons on the AirEngine 6776I-X6ETH



1	Indicator	2	Default
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Table 5-63 Indicators on the AirEngine 6776I-X6ETH

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP.
		Green	Slow blinking (0.2 Hz)	The AP is running properly, the Ethernet connection is normal, and no STA is associated with the AP.

Silkscreen	Name	Color	Status	Description
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings.
		Red	Steady on	The system is faulty.
LINK/ACT0 to 2	Port indicator	Green	Blinking	The Ethernet connection is normal.
		-	Off	The port is in link-down state.

Silkscreen	Name	Color	Status	Description
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.

Silkscreen	Name	Color	Status	Description
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS2	Radio 2 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Blue	Steady on	The AP has STAs connected, but no data is being transmitted.
		Blue	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Table 5-64 Buttons on the AirEngine 6776I-X6ETH

Silkscreen	Name	Description
Default	Reset button	If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-65 Technical specifications of the AirEngine 6776I-X6ETH

Item	Specification
Installation Type	<ul style="list-style-type: none"> Wall Pole
Dimensions without packaging (H x W x D) [mm(in.)]	220 mm x 280 mm x 85 mm (8.66 in. x 11.02 in. x 3.35 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	185 mm x 570 mm x 380 mm (7.28 in. x 22.44 in. x 14.96 in.)
Weight without packaging [kg(lb)]	3.70 kg (8.16 lb)
Weight with packaging [kg(lb)]	5.69 kg (12.54 lb)
Storage	NAND Flash 512 MB
Console port	Bluetooth console
Maximum power consumption [W]	33.9 (excluding USB)
Maximum heat dissipation [BTU/hour]	109.9 BTU/hour
Power supply mode	<ul style="list-style-type: none"> PoE DC power adapter
Rated input voltage [V]	DC: 18 V to 60 V PoE: 802.3bt/at

Item	Specification
Input voltage range [V]	PoE: 802.3bt/at When multiple ports are used for receive PoE power: If the power supply classes are different, the port with the highest power class is used. If the power supply classes are the same, power supply backup can be implemented.
Service port surge protection	PoE port: Surge: Differential mode: 1.5 kV (D.1), 10/700 us, 15 ohms + 25 ohms, criterion B Differential mode: 1.5 kV (D.2), 10/700 us, 15 ohms + 25 ohms, criterion C Common mode: 6 kV (C.3), 10/700 us, 15 ohms + 25 ohms/wire, criterion B: 6) Differential mode: 1 kV (D.1), 1.2/50 us, 42 ohms, criterion B; Differential mode: 1 kV (D.2), 1.2/50 us, 42 ohms, criterion B; Common mode: 2 kV (C.3), 1.2/50 us, 2 ohms + 40 ohms x n/wire, criterion B Inrush current: Differential mode: 250 A (D.2), 8/20 μs, criterion C Common mode: 6 kA/8-wire, 8/20 us, criterion C
PoE OUT	Not supported
Maximum number of physical ports on the entire device	10GE (RJ45) x 1, 100M/1000M/2500M/5000M/10GE auto-sensing GE (RJ45) x 1, 10M/100M/1000M auto-sensing 10GE optical (SFP+), GE/2.5GE/10GE auto-sensing
Long-term operating temperature [°C(°F)]	–40°C to +70°C (–40°F to +158°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)

Item	Specification
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	-60 m to +5000 m (-196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP68
Ground	Grounding
Antenna port surge protection [kA]	5 kA surge protection capability without external surge protection devices
Wind resistance	67 m/s
USB	USB 2.0, power supply: 2.5 W/5 W
IoT slot	Not supported
BLE	BLE5.2
Radio number	3
Operating frequency band	<ul style="list-style-type: none"> • 2.4GHz • 5GHz • 6GHz
MIMO spatial streams	Triple-radio 6G mode: <ul style="list-style-type: none"> • Radio 0 (2.4G): 2x2 • Radio 1 (5G): 2x2 • Radio 2 (6G): 4x4 Triple-radio dual-5G mode: <ul style="list-style-type: none"> • Radio 0 (2.4G): 2x2 • Radio 1 (5G): 2x2 • Radio 2 (5G): 4x4
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax/be 5 GHz: 802.11a/n/ac/ac Wave 2/ax/be 6 GHz: 802.11a/ax/be
Radio interface	External antenna
Antenna gain	BLE: 5 dBi

Item	Specification
Maximum transmit power	<p>Triple-radio 6G mode:</p> <p>2.4G:</p> <p>25 dBm/chain</p> <p>28 dBm (combined power)</p> <p>5G:</p> <p>24 dBm/chain</p> <p>27 dBm (combined power)</p> <p>6G:</p> <p>23 dBm/chain</p> <p>29 dBm (combined power)</p> <p>BLE: < 10 dBm</p> <p>Triple-radio dual-5G mode:</p> <p>2.4G:</p> <p>25 dBm/chain</p> <p>28 dBm (combined power)</p> <p>5G:</p> <p>24 dBm/chain</p> <p>27 dBm (combined power)</p> <p>5G:</p> <p>23 dBm/chain</p> <p>29 dBm (combined power)</p> <p>BLE: < 10 dBm</p>
Singal radio transmit power [dBm]	<p>Triple-radio 6G mode:</p> <p>2.4G: -10 dBm to 25 dBm/chain</p> <p>5G: -10 dBm to 24 dBm/chain</p> <p>6G: -10 dBm to 23 dBm/chain</p> <p>Triple-radio dual-5G mode:</p> <p>2.4G: -10 dBm to 25 dBm/chain</p> <p>5G: -10 dBm to 24 dBm/chain</p> <p>5G: -10 dBm to 23 dBm/chain</p>
MTBF [year]	68.95098523 year
MTTR [hour]	2 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	The power supply mode is negotiated to 802.3bt, and no function is restricted.

Item	Specification
802.3at power supply description	When the power supply mode is negotiated to 802.3at: The maximum bandwidth is 20 MHz at the 2.4 GHz frequency band and 80 MHz at the 5 GHz frequency band, the USB port is unavailable, and other functions are not restricted.
DC power supply description	No function is limited.

5.1.14 AirEngine 6776I-X7TH

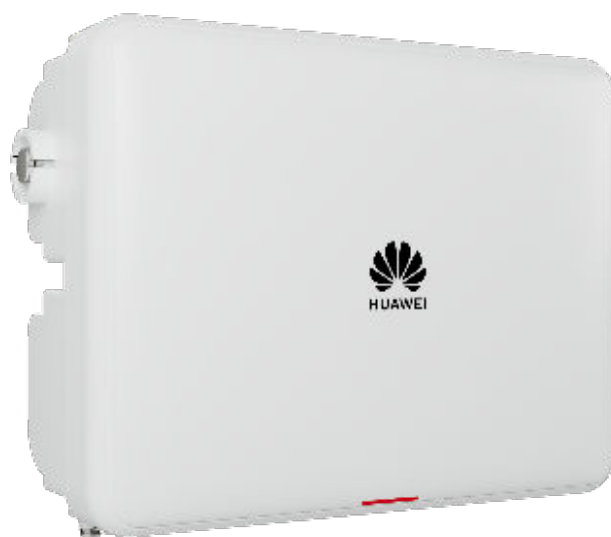
Overview

Table 5-66 Basic information about the AirEngine 6776I-X7TH

Item	Details
Description	AirEngine6776I-X7TH (11be outdoor, 2+2+4 three radios, built-in omnidirectional antenna, USB, Bluetooth)
Part Number	50087286
Model	AirEngine 6776I-X7TH
First supported version	V600R024C00

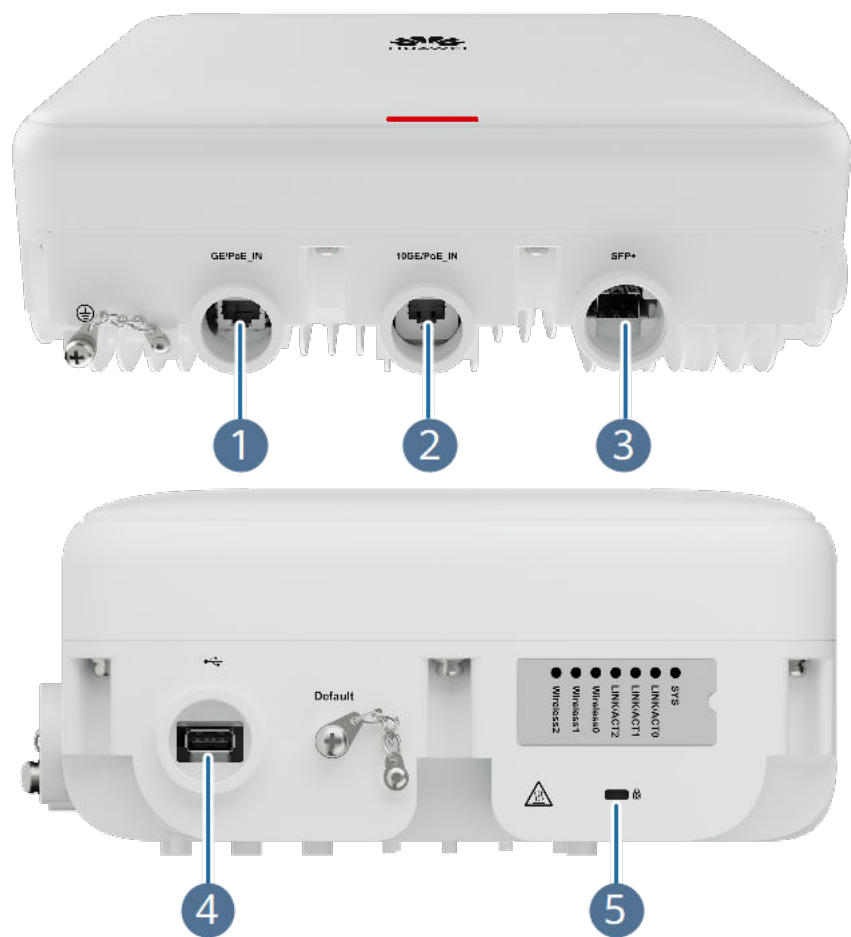
Appearance

Figure 5-40 Appearance of the AirEngine 6776I-X7TH



Ports

Figure 5-41 Ports on the AirEngine 6776I-X7TH



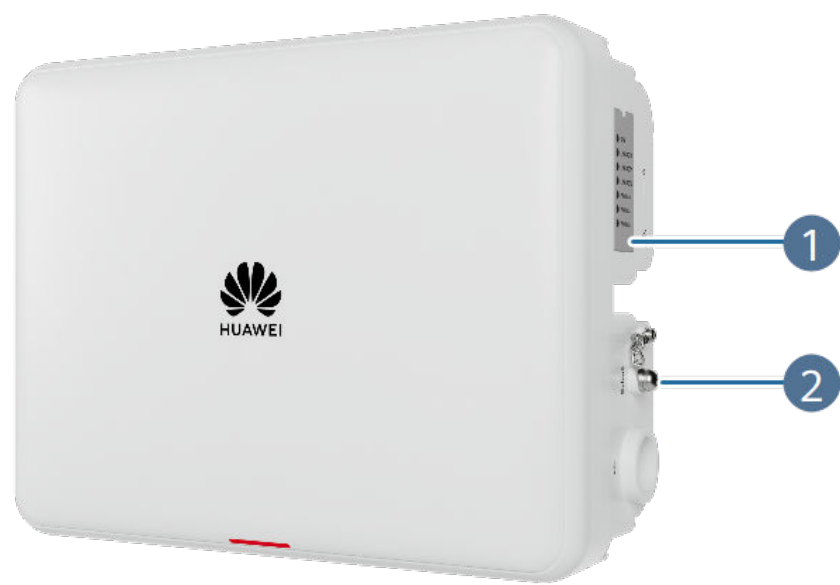
1	GE/PoE_IN	2	10GE/PoE_IN
3	SFP+	4	USB
5	Security slot	-	-

Table 5-67 Ports on the AirEngine 6776I-X7TH

Port	Connector Type	Description	Available Components
10GE/PoE_IN	RJ45	Ethernet electrical port that supports 100M/1000M/2.5G/5G/10G auto-sensing, connects to the wired Ethernet, and supports PoE input.	Network cable
GE/PoE_IN	RJ45	Ethernet electrical port that supports 10M/100M/1000M auto-sensing, connects to the wired Ethernet, and supports PoE input.	Network cable
SFP+	SFP+	Ethernet uplink optical port, which supports 1G/2.5G/10G auto-sensing and works with a matching optical module.	Optical module
USB	USB 2.0 Type A	Connects to an IoT terminal to implement IoT applications. This function is supported after the system software is upgraded to V600R024C10 or a later version.	IoT module

Indicators and Buttons

Figure 5-42 Indicators and buttons on the AirEngine 6776I-X7TH



1	Indicator	2	Default
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Table 5-68 Indicators on the AirEngine 6776I-X7TH

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.
		Green	Steady on	<ul style="list-style-type: none">The system is just powered on.The system is starting after a reset.The upper-layer system is starting.

Silkscreen	Name	Color	Status	Description
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP.
		Green	Slow blinking (0.2 Hz)	The AP is running properly, the Ethernet connection is normal, and no STA is associated with the AP.
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.

Silkscreen	Name	Color	Status	Description
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V600R024C10 and later versions.
		Red	Steady on	The system is faulty.
LINK/ACT0 to 2	Port indicator	Green	Blinking	The Ethernet connection is normal.
		-	Off	The port is in link-down state.
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.

Silkscreen	Name	Color	Status	Description
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS2	Radio 2 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.

Silkscreen	Name	Color	Status	Description
		Blue	Steady on	The AP has STAs connected, but no data is being transmitted.
		Blue	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Table 5-69 Buttons on the AirEngine 6776I-X7TH

Silkscreen	Name	Description
Default	Reset button	<ul style="list-style-type: none"> For versions earlier than V600R024C10: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the device restores the factory settings, switches to the Fit mode, and restarts. For V600R024C10 and later versions: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-70 Technical specifications of the AirEngine 6776I-X7TH

Item	Specification
Installation Type	<ul style="list-style-type: none"> Wall (Facing Down) Pole (Facing Down)
Dimensions without packaging (H x W x D) [mm(in.)]	100 mm x 280 mm x 220 mm (3.94 in. x 11.02 in. x 8.66 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	185 mm x 570 mm x 380 mm (7.28 in. x 22.44 in. x 14.96 in.)
Weight without packaging [kg(lb)]	3.59 kg (7.91 lb)
Weight with packaging [kg(lb)]	5.57 kg (12.28 lb)
Storage	NAND Flash 512 MB

Item	Specification
Console port	Bluetooth console
Maximum power consumption [W]	33.5 (excluding USB)
Maximum heat dissipation [BTU/hour]	108.6 BTU/hour
Power supply mode	PoE
Rated input voltage [V]	PoE: 802.3bt/at
Input voltage range [V]	PoE: 802.3bt/at When multiple ports are used for receive PoE power: If the power supply classes are different, the port with the highest power class is used. If the power supply classes are the same, power supply backup can be implemented.
Service port surge protection	PoE port: Surge: Differential mode: 1.5 kV (D.1), 10/700 us, 15 ohms + 25 ohms, criterion B Differential mode: 1.5 kV (D.2), 10/700 us, 15 ohms + 25 ohms, criterion C Common mode: 6 kV (C.3), 10/700 us, 15 ohms + 25 ohms/wire, criterion B: 6) Differential mode: 1 kV (D.1), 1.2/50 us, 42 ohms, criterion B; Differential mode: 1 kV (D.2), 1.2/50 us, 42 ohms, criterion B; Common mode: 2 kV (C.3), 1.2/50 us, 2 ohms + 40 ohms x n/wire, criterion B Inrush current: Differential mode: 250 A (D.2), 8/20 μs, criterion C Common mode: 6 kA/8-wire, 8/20 us, criterion C
PoE OUT	Not supported
Maximum number of physical ports on the entire device	10GE (RJ45) x 1, 100M/1000M/2500M/5000M/10GE auto-sensing GE (RJ45) x 1, 10M/100M/1000M auto-sensing 10GE optical (SFP+), GE/2.5GE/10GE auto-sensing

Item	Specification
Long-term operating temperature [°C(°F)]	–40°C to +70°C (–40°F to +158°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/ waterproof)	IP68
Ground	Grounding
Wind resistance	67 m/s
USB	The USB port can supply 2.5 W or 5 W power. USB 2.0 is supported after the system software is upgraded to V600R024C10 or a later version.
IoT slot	Not supported
BLE	BLE5.2
Radio number	3
Operating frequency band	<ul style="list-style-type: none"> • 2.4GHz • 5GHz • 6GHz
MIMO spatial streams	Triple-radio 6G mode: Radio 0 (2.4 GHz): 2x2 Radio 1 (5 GHz): 2x2 Radio 2 (6 GHz): 4x4 Triple-radio dual-5G mode: Radio 0 (2.4 GHz): 2x2 Radio 1 (5GH): 2x2 (high frequency band) Radio 2 (5GL): 4x4 (low frequency band)

Item	Specification
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax/be 5 GHz: 802.11a/n/ac/ac Wave 2/ax/be 6 GHz: 802.11a/ax/be
Radio interface	Built-in omnidirectional antennas
Antenna gain	Triple-radio 6G mode: 2.4G: 5 dBi/chain (peak gain) 3 dBi (combined gain) 5G: 5 dBi/chain (peak gain) 3 dBi (combined gain) 6G: 5 dBi/chain (peak gain) 3 dBi (combined gain) BLE: 5 dBi (peak gain) Triple-radio dual-5G mode: 2.4G: 5 dBi/chain (peak gain) 3 dBi (combined gain) 5GH: 5 dBi/chain (peak gain) 3 dBi (combined gain) 5GL: 5 dBi/chain (peak gain) 3 dBi (combined gain) BLE: 5 dBi (peak gain)

Item	Specification
Maximum transmit power	<p>Triple-radio 6G mode:</p> <p>2.4G:</p> <p>25 dBm/chain</p> <p>28 dBm (combined power)</p> <p>5G:</p> <p>21 dBm/chain</p> <p>24 dBm (combined power)</p> <p>6G:</p> <p>21 dBm/chain</p> <p>27 dBm (combined power)</p> <p>BLE: < 10 dBm</p> <p>Triple-radio dual-5G mode:</p> <p>2.4G:</p> <p>25 dBm/chain</p> <p>28 dBm (combined power)</p> <p>5GH:</p> <p>21 dBm/chain</p> <p>24 dBm (combined power)</p> <p>5GL:</p> <p>21 dBm/chain</p> <p>27 dBm (combined power)</p> <p>BLE: < 10 dBm</p>
Singal radio transmit power [dBm]	<p>Triple-radio 6G mode:</p> <p>2.4G: -10 dBm to 25 dBm/chain</p> <p>5G: -10 dBm to 21 dBm/chain</p> <p>6G: -10 dBm to 21 dBm/chain</p> <p>Triple-radio dual-5G mode:</p> <p>2.4G: -10 dBm to 25 dBm/chain</p> <p>5GH: -10 dBm to 21 dBm/chain</p> <p>5GL: -10 dBm to 21 dBm/chain</p>
MTBF [year]	81.16033041 year
MTTR [hour]	2 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	No function is limited.

Item	Specification
802.3at power supply description	Wi-Fi service: supports a maximum of 2.4 GHz (2x2) + 5 GHz (2x2), 20 MHz bandwidth at 2.4 GHz, and 80 MHz bandwidth at 5 GHz. The USB function is unavailable, and other functions are not restricted.

5.1.15 AirEngine 5776I-X7TH

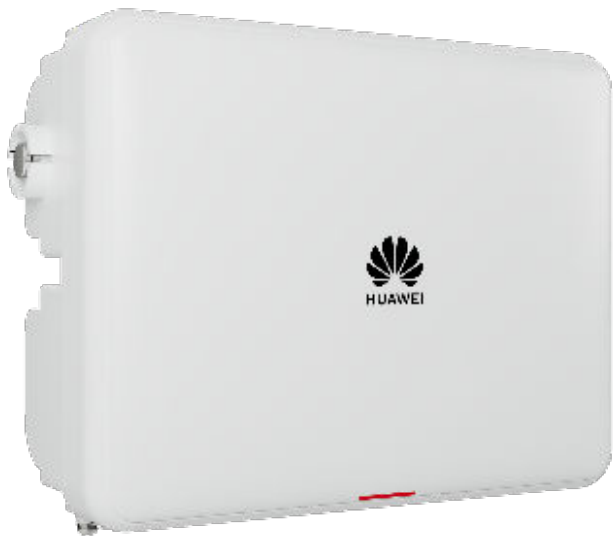
Overview

Table 5-71 Basic information about the AirEngine 5776I-X7TH

Item	Details
Description	AirEngine5776I-X7TH (11be outdoor, 2+2+2 tri-band, built-in omnidirectional antenna, USB, BLE)
Part Number	50088975
Model	AirEngine 5776I-X7TH
First supported version	V600R025C00

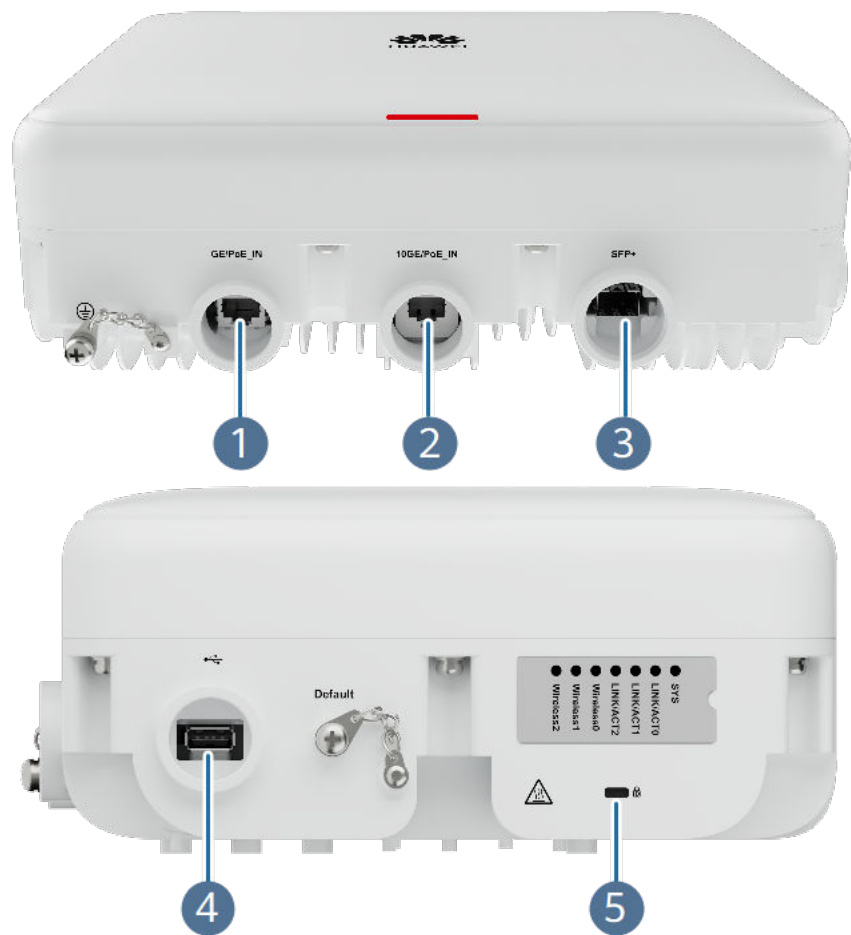
Appearance

Figure 5-43 Appearance of the AirEngine 5776I-X7TH



Ports

Figure 5-44 Ports on the AirEngine 5776I-X7TH



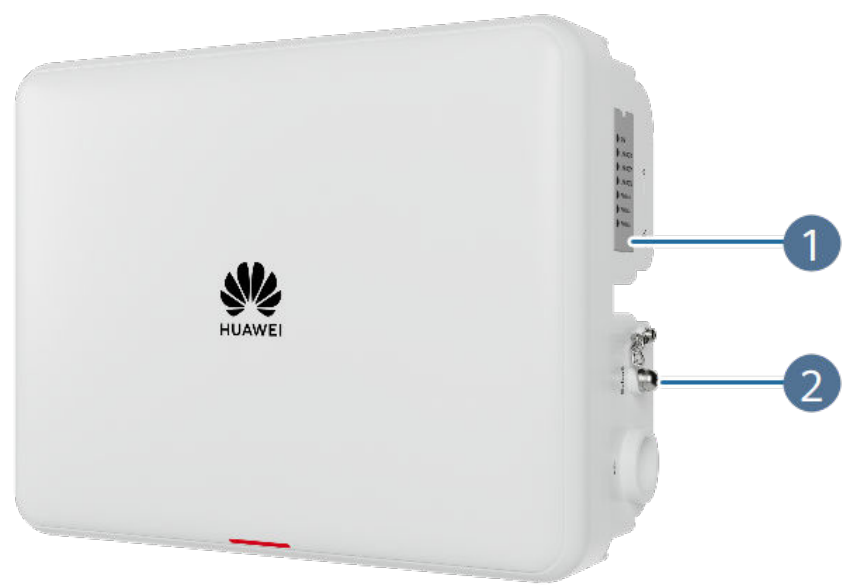
1	GE/PoE_IN	2	10GE/PoE_IN
3	SFP+	4	USB
5	Security slot	-	-

Table 5-72 Ports on the AirEngine 5776I-X7TH

Port	Connector Type	Description	Available Components
10GE/PoE_IN	RJ45	Ethernet electrical port that supports 100M/1000M/2.5G/5G/10G auto-sensing, connects to the wired Ethernet, and supports PoE input.	Network cable
GE/PoE_IN	RJ45	Ethernet electrical port that supports 10M/100M/1000M auto-sensing, connects to the wired Ethernet, and supports PoE input.	Network cable
SFP+	SFP+	Ethernet uplink optical port, which supports 1G/2.5G/10G auto-sensing and works with a matching optical module.	Optical module
USB	USB 2.0 Type A	Connects to an IoT terminal to implement IoT applications.	IoT module

Indicators and Buttons

Figure 5-45 Indicators and buttons on the AirEngine 5776I-X7TH



1	Indicator	2	Default
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Table 5-73 Indicators on the AirEngine 5776I-X7TH

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.
		Green	Steady on	<ul style="list-style-type: none">The system is just powered on.The system is starting after a reset.The upper-layer system is starting.

Silkscreen	Name	Color	Status	Description
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP.
		Green	Slow blinking (0.2 Hz)	The AP is running properly, the Ethernet connection is normal, and no STA is associated with the AP.
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.

Silkscreen	Name	Color	Status	Description
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings.
		Red	Steady on	The system is faulty.
LINK/ACT0 to 2	Port indicator	Green	Blinking	The Ethernet connection is normal.
		-	Off	The port is in link-down state.
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Silkscreen	Name	Color	Status	Description
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS2	Radio 2 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Blue	Steady on	The AP has STAs connected, but no data is being transmitted.

Silkscreen	Name	Color	Status	Description
		Blue	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Table 5-74 Buttons on the AirEngine 5776I-X7TH

Silkscreen	Name	Description
Default	Reset button	If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-75 Technical specifications of the AirEngine 5776I-X7TH

Item	Specification
Installation Type	<ul style="list-style-type: none"> Wall (Facing Down) Pole (Facing Down)
Dimensions without packaging (H x W x D) [mm(in.)]	100 mm x 280 mm x 220 mm (3.94 in. x 11.02 in. x 8.66 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	185 mm x 570 mm x 380 mm (7.28 in. x 22.44 in. x 14.96 in.)
Weight without packaging [kg(lb)]	3.59 kg (7.91 lb)

Item	Specification
Weight with packaging [kg(lb)]	5.57 kg (12.28 lb)
Storage	NAND Flash 512 MB
Console port	Bluetooth console
Maximum power consumption [W]	33.5 (excluding USB)
Maximum heat dissipation [BTU/hour]	108.6 BTU/hour
Power supply mode	PoE
Rated input voltage [V]	PoE: 802.3bt/at
Input voltage range [V]	PoE: 802.3bt/at When multiple ports are used for receive PoE power: If the power supply classes are different, the port with the highest power class is used. If the power supply classes are the same, power supply backup can be implemented.
Service port surge protection	PoE port: Surge: Differential mode: 1.5 kV (D.1), 10/700 us, 15 ohms + 25 ohms, criterion B Differential mode: 1.5 kV (D.2), 10/700 us, 15 ohms + 25 ohms, criterion C Common mode: 6 kV (C.3), 10/700 us, 15 ohms + 25 ohms/wire, criterion B: 6) Differential mode: 1 kV (D.1), 1.2/50 us, 42 ohms, criterion B; Differential mode: 1 kV (D.2), 1.2/50 us, 42 ohms, criterion B; Common mode: 2 kV (C.3), 1.2/50 us, 2 ohms + 40 ohms x n/wire, criterion B Inrush current: Differential mode: 250 A (D.2), 8/20 μs, criterion C Common mode: 6 kA/8-wire, 8/20 us, criterion C
PoE OUT	Not supported

Item	Specification
Maximum number of physical ports on the entire device	10GE (RJ45) x 1, 100M/1000M/2500M/5000M/10GE auto-sensing GE (RJ45) x 1, 10M/100M/1000M auto-sensing 10GE optical (SFP+), GE/2.5GE/10GE auto-sensing
Long-term operating temperature [°C(°F)]	–40°C to +70°C (–40°F to +158°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP68
Wind resistance	67 m/s
USB	USB 2.0, supporting 2.5 W or 5 W power supply.
IoT slot	Not supported
BLE	BLE5.2
Radio number	3
Operating frequency band	<ul style="list-style-type: none"> • 2.4GHz • 5GHz • 6GHz

Item	Specification
MIMO spatial streams	<p>Triple-radio 6G mode:</p> <p>Radio 0 (2.4 GHz): 2x2</p> <p>Radio 1 (5 GHz): 2x2</p> <p>Radio 2 (6 GHz): 2x2</p> <p>Triple-radio dual-5G mode:</p> <p>Radio 0 (2.4 GHz): 2x2</p> <p>Radio 1 (5 GHz-H): 2x2 (high frequency band)</p> <p>Radio 2 (5 GHz-L): 2x2 (low frequency band)</p>
Wi-Fi standard	<p>2.4 GHz: 802.11b/g/n/ax/be</p> <p>5 GHz: 802.11a/n/ac/ac Wave 2/ax/be</p> <p>6 GHz: 802.11a/ax/be</p>
Radio interface	Built-in omnidirectional antennas
Antenna gain	<p>Triple-radio 6G mode:</p> <p>2.4G:</p> <p>5 dBi/chain (peak gain)</p> <p>3 dBi (combined gain)</p> <p>5G:</p> <p>5 dBi/chain (peak gain)</p> <p>3 dBi (combined gain)</p> <p>6G:</p> <p>5 dBi/chain (peak gain)</p> <p>3 dBi (combined gain)</p> <p>BLE: 5 dBi (peak gain)</p> <p>Triple-radio dual-5G mode:</p> <p>2.4G:</p> <p>5 dBi/chain (peak gain)</p> <p>3 dBi (combined gain)</p> <p>5GH:</p> <p>5 dBi/chain (peak gain)</p> <p>3 dBi (combined gain)</p> <p>5GL:</p> <p>5 dBi/chain (peak gain)</p> <p>3 dBi (combined gain)</p> <p>BLE: 5 dBi (peak gain)</p>

Item	Specification
Maximum transmit power	<p>Triple-radio 6G mode:</p> <p>2.4 GHz:</p> <p>25 dBm/chain</p> <p>28 dBm (combined power)</p> <p>5 GHz:</p> <p>21 dBm/chain</p> <p>24 dBm (combined power)</p> <p>6 GHz:</p> <p>21 dBm/chain</p> <p>24 dBm (combined power)</p> <p>BLE: < 10 dBm</p> <p>Triple-radio dual-5G mode:</p> <p>2.4 GHz:</p> <p>25 dBm/chain</p> <p>28 dBm (combined power)</p> <p>5 GHz-H:</p> <p>21 dBm/chain</p> <p>24 dBm (combined power)</p> <p>5 GHz-L:</p> <p>21 dBm/chain</p> <p>24 dBm (combined power)</p> <p>BLE: < 10 dBm</p>
Singal radio transmit power [dBm]	<p>Triple-radio 6G mode:</p> <p>2.4G: -10 dBm to 25 dBm/chain</p> <p>5G: -10 dBm to 21 dBm/chain</p> <p>6G: -10 dBm to 21 dBm/chain</p> <p>Triple-radio dual-5G mode:</p> <p>2.4G: -10 dBm to 25 dBm/chain</p> <p>5GH: -10 dBm to 21 dBm/chain</p> <p>5GL: -10 dBm to 21 dBm/chain</p>
MTBF [year]	81.16033041 year
MTTR [hour]	2 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	No function is limited.

Item	Specification
802.3at power supply description	Wi-Fi service: A maximum of 2.4 GHz (2x2) + 5 GHz (2x2) is supported. The maximum bandwidth of 2.4 GHz is 40 MHz, and that of 5 GHz is 80 MHz. The USB function is unavailable, and other functions are not restricted.

5.1.16 AirEngine 5776I-X6H (50087922)

Overview

Table 5-76 Basic information about the AirEngine 5776I-X6H

Item	Details
Description	AirEngine5776I-X6H(11be outdoor,2+4 dual bands,directional antenna,USB,BLE)
Part Number	50087922
Model	AirEngine 5776I-X6H
First supported version	V600R024C10

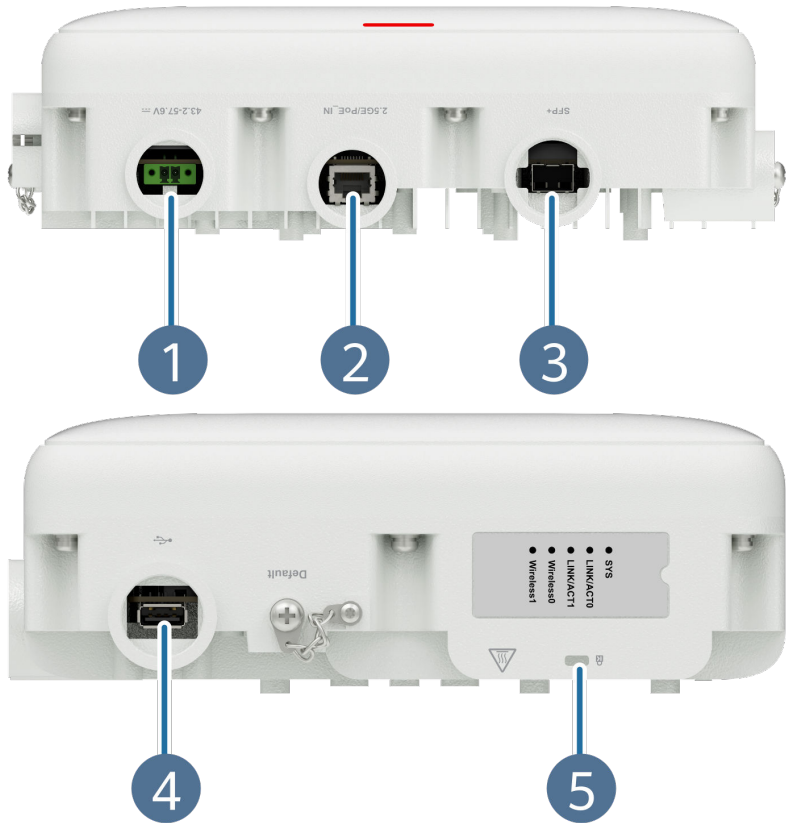
Appearance

Figure 5-46 Appearance of the AirEngine 5776I-X6H



Ports

Figure 5-47 Ports on the AirEngine 5776I-X6H



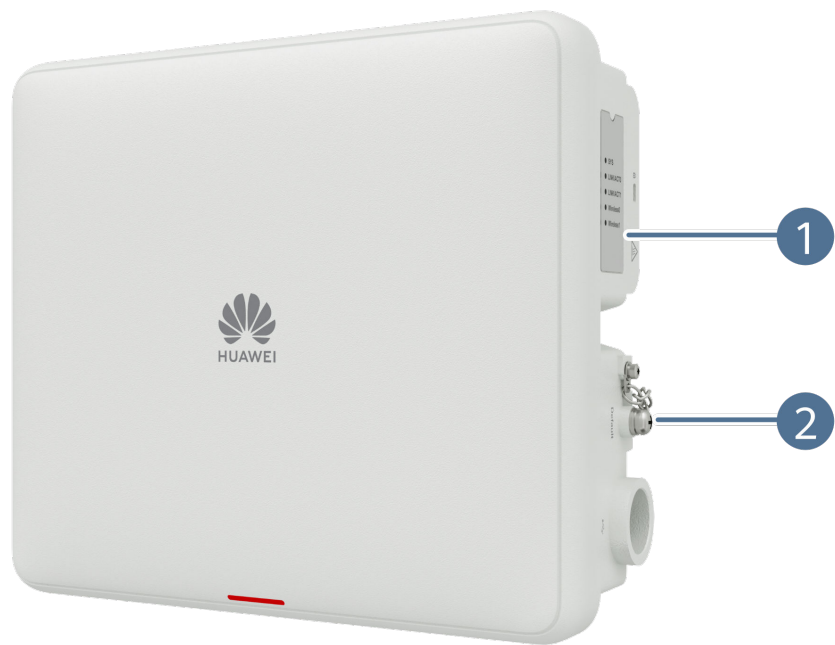
1	DC port	2	2.5GE/PoE_IN
3	SFP+	4	USB
5	Security slot	-	-

Table 5-77 Ports on the AirEngine 5776I-X6H

Port	Connector Type	Description	Available Components
2.5GE/PoE_IN	RJ45	100M/1000M/2.5G auto-sensing Ethernet electrical port that connects to the wired Ethernet and supports PoE input.	Network cable
SFP+	SFP+	Ethernet optical port, supporting 1G/2.5G/10G auto-sensing and working with a matching optical module.	Optical module
DC 48V	Phoenix terminal block	DC power port, used in DC power supply scenarios and supporting a voltage range of 43.2 V to 57.6 V. (Easy installation with no restrictions on the positive and negative poles on the port side)	Phoenix terminal block
USB	USB 2.0 Type A	Connects to an IoT terminal to implement IoT applications.	IoT module

Indicators and Buttons

Figure 5-48 Indicators and buttons on the AirEngine 5776I-X6H



1	Indicator	2	Default
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Table 5-78 Indicators on the AirEngine 5776I-X6H

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP.
		Green	Slow blinking (0.2 Hz)	The AP is running properly, the Ethernet connection is normal, and no STA is associated with the AP.

Silkscreen	Name	Color	Status	Description
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings.
		Red	Steady on	The system is faulty.
LINK/ACT0 and LINK/ACT1	Port indicator	Green	Blinking	The Ethernet connection is normal.
		-	Off	The port is in link-down state.

Silkscreen	Name	Color	Status	Description
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.

Silkscreen	Name	Color	Status	Description
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Table 5-79 Buttons on the AirEngine 5776L-X6H

Silkscreen	Name	Description
Default	Reset button	If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-80 Technical specifications of the AirEngine 5776L-X6H

Item	Specification
Installation Type	<ul style="list-style-type: none"> Wall Pole
Dimensions without packaging (H x W x D) [mm(in.)]	220 mm x 250 mm x 77 mm (8.66 in. x 9.84 in. x 3.03 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	170 mm x 555 mm x 370 mm (6.69 in. x 21.85 in. x 14.57 in.)
Weight without packaging [kg(lb)]	2.76 kg (6.08 lb)

Item	Specification
Weight with packaging [kg(lb)]	5.65 kg (12.46 lb)
Storage	NAND Flash 512 MB
Console port	Bluetooth console
Maximum power consumption [W]	20.4 (excluding USB)
Maximum heat dissipation [BTU/hour]	69.61 BTU/hour
Power supply mode	<ul style="list-style-type: none"> PoE DC power adapter
Rated input voltage [V]	DC: 48 V PoE: 802.3bt/at/af
Input voltage range [V]	DC: 43.2 V to 57.6 V PoE: 802.3bt/at/af
Service port surge protection	<p>PoE port:</p> <p>Surge:</p> <p>Differential mode: 1.5 kV (D.1), 10/700 us, 15 ohms + 25 ohms, criterion B</p> <p>Differential mode: 1.5 kV (D.2), 10/700 us, 15 ohms + 25 ohms, criterion C</p> <p>Common mode: 6 kV (C.3), 10/700 us, 15 ohms + 25 ohms/wire, criterion B: 6)</p> <p>Differential mode: 1 kV (D.1), 1.2/50 us, 42 ohms, criterion B;</p> <p>Differential mode: 1 kV (D.2), 1.2/50 us, 42 ohms, criterion B;</p> <p>Common mode: 2 kV (C.3), 1.2/50 us, 2 ohms + 40 ohms x n/wire, criterion B</p> <p>Inrush current:</p> <p>Differential mode: 250 A (D.2), 8/20 μs, criterion C</p> <p>Common mode: 6 kA/8-wire, 8/20 us, criterion C</p>
PoE OUT	Not supported
Maximum number of physical ports on the entire device	2.5GE (RJ45) x 1, 100M/1000M/2500M auto-sensing 10GE optical (SFP+), GE/2.5GE/10GE auto-sensing

Item	Specification
Long-term operating temperature [°C(°F)]	–40°C to +70°C (–40°F to +158°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/ waterproof)	IP68
Ground	Grounding
Wind resistance	67 m/s
USB	USB 2.0, power supply: 2.5 W/5 W
IoT slot	Not supported
BLE	BLE5.2
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Radio 0 (2.4 GHz): 2x2 Radio 1 (5 GHz): 4x4
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax/be 5 GHz: 802.11a/n/ac/ac Wave 2/ax/be
Radio interface	Built-in directional antennas
Antenna gain	2.4 GHz: 10 dBi/chain (peak value) 10 dBi (combined gain) 5 GHz: 11 dBi/chain (peak value) 10 dBi (combined gain) BLE: 5 dBi

Item	Specification
Beamwidth of the built-in antenna [degrees]	2.4 GHz: <ul style="list-style-type: none"> Horizontal plane: 70° Vertical plane: 35° 5 GHz: <ul style="list-style-type: none"> Horizontal plane: 60° Vertical plane: 20°
Maximum transmit power	2.4 GHz: 25 dBm/chain 28 dBm (combined power) 5 GHz: 24 dBm/chain 30 dBm (combined power) BLE: < 10 dBm
Singal radio transmit power [dBm]	2.4 GHz: -10 dBm to 25 dBm/chain 5 GHz: -10 dBm to 24 dBm/chain
MTBF [year]	132.7633643 year
MTTR [hour]	2 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	The power supply mode is negotiated to 802.3bt, and no function is restricted.
802.3at power supply description	When the power supply mode is negotiated to 802.3at and a 5 W USB module is used, the radio transmit power decreases by 3 dB.
802.3af power supply description	When the power supply mode is negotiated to 802.3af, the radio mode is limited to 2.4 GHz (2x2), the 5 GHz radio is disabled, and the radio transmit power decreases by 3 dB.
DC power supply description	No function is limited.

5.1.17 AirEngine 5776I-X6H (50087922-003)

Overview

Table 5-81 Basic information about the AirEngine 5776I-X6H

Item	Details
Description	AirEngine5776I-X6H(11be outdoor,2+4 dual bands,directional antenna,USB,BLE)
Part Number	50087922-003
Model	AirEngine 5776I-X6H
First supported version	V600R024C10

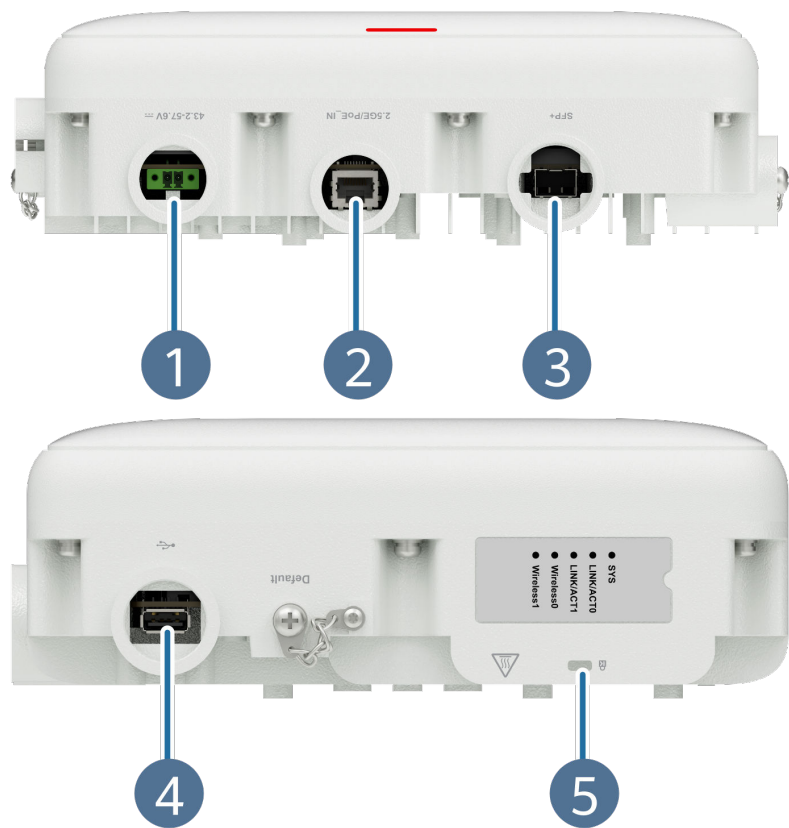
Appearance

Figure 5-49 Appearance of the AirEngine 5776I-X6H



Ports

Figure 5-50 Ports on the AirEngine 5776I-X6H



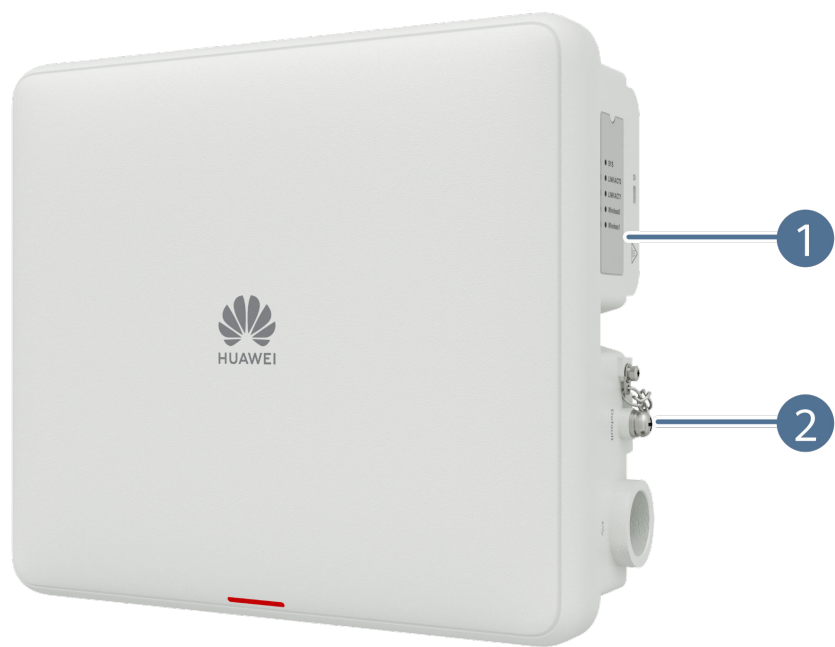
1	DC port	2	2.5GE/PoE_IN
3	SFP+	4	USB
5	Security slot	-	-

Table 5-82 Ports on the AirEngine 5776I-X6H

Port	Connector Type	Description	Available Components
2.5GE/PoE_IN	RJ45	100M/1000M/2.5G auto-sensing Ethernet electrical port that connects to the wired Ethernet and supports PoE input.	Network cable
SFP+	SFP+	Ethernet optical port, supporting 1G/2.5G/10G auto-sensing and working with a matching optical module.	Optical module
DC 48V	Phoenix terminal block	DC power port, used in DC power supply scenarios and supporting a voltage range of 43.2 V to 57.6 V. (Easy installation with no restrictions on the positive and negative poles on the port side)	Phoenix terminal block
USB	USB 2.0 Type A	Connects to an IoT terminal to implement IoT applications.	IoT module

Indicators and Buttons

Figure 5-51 Indicators and buttons on the AirEngine 5776I-X6H



1	Indicator	2	Default
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Table 5-83 Indicators on the AirEngine 5776I-X6H

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP.
		Green	Slow blinking (0.2 Hz)	The AP is running properly, the Ethernet connection is normal, and no STA is associated with the AP.

Silkscreen	Name	Color	Status	Description
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings.
		Red	Steady on	The system is faulty.
LINK/ACT0 and LINK/ACT1	Port indicator	Green	Blinking	The Ethernet connection is normal.
		-	Off	The port is in link-down state.

Silkscreen	Name	Color	Status	Description
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.

Silkscreen	Name	Color	Status	Description
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Table 5-84 Buttons on the AirEngine 5776L-X6H

Silkscreen	Name	Description
Default	Reset button	If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-85 Technical specifications of the AirEngine 5776L-X6H

Item	Specification
Installation Type	<ul style="list-style-type: none"> Wall Pole
Dimensions without packaging (H x W x D) [mm(in.)]	220 mm x 250 mm x 77 mm (8.66 in. x 9.84 in. x 3.03 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	170 mm x 555 mm x 370 mm (6.69 in. x 21.85 in. x 14.57 in.)
Weight without packaging [kg(lb)]	2.76 kg (6.08 lb)

Item	Specification
Weight with packaging [kg(lb)]	5.65 kg (12.46 lb)
Storage	NAND Flash 512 MB
Console port	Bluetooth console
Maximum power consumption [W]	20.4 (excluding USB)
Maximum heat dissipation [BTU/hour]	69.61 BTU/hour
Power supply mode	<ul style="list-style-type: none"> PoE DC power adapter
Rated input voltage [V]	DC: 48 V PoE: 802.3bt/at/af
Input voltage range [V]	DC: 43.2 V to 57.6 V PoE: 802.3bt/at/af
Service port surge protection	<p>PoE port:</p> <p>Surge:</p> <p>Differential mode: 1.5 kV (D.1), 10/700 us, 15 ohms + 25 ohms, criterion B</p> <p>Differential mode: 1.5 kV (D.2), 10/700 us, 15 ohms + 25 ohms, criterion C</p> <p>Common mode: 6 kV (C.3), 10/700 us, 15 ohms + 25 ohms/wire, criterion B: 6)</p> <p>Differential mode: 1 kV (D.1), 1.2/50 us, 42 ohms, criterion B;</p> <p>Differential mode: 1 kV (D.2), 1.2/50 us, 42 ohms, criterion B;</p> <p>Common mode: 2 kV (C.3), 1.2/50 us, 2 ohms + 40 ohms x n/wire, criterion B</p> <p>Inrush current:</p> <p>Differential mode: 250 A (D.2), 8/20 μs, criterion C</p> <p>Common mode: 6 kA/8-wire, 8/20 us, criterion C</p>
PoE OUT	Not supported
Maximum number of physical ports on the entire device	2.5GE (RJ45) x 1, 100M/1000M/2500M auto-sensing 10GE optical (SFP+), GE/2.5GE/10GE auto-sensing

Item	Specification
Long-term operating temperature [°C(°F)]	–40°C to +70°C (–40°F to +158°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/ waterproof)	IP68
Ground	Grounding
Wind resistance	67 m/s
USB	USB 2.0, power supply: 2.5 W/5 W
IoT slot	Not supported
BLE	BLE5.2
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Radio 0 (2.4 GHz): 2x2 Radio 1 (5 GHz): 4x4
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax/be 5 GHz: 802.11a/n/ac/ac Wave 2/ax/be
Radio interface	Built-in directional antennas
Antenna gain	2.4 GHz: 10 dBi/chain (peak value) 10 dBi (combined gain) 5 GHz: 11 dBi/chain (peak value) 10 dBi (combined gain) BLE: 5 dBi

Item	Specification
Beamwidth of the built-in antenna [degrees]	2.4 GHz: <ul style="list-style-type: none"> Horizontal plane: 70° Vertical plane: 35° 5 GHz: <ul style="list-style-type: none"> Horizontal plane: 60° Vertical plane: 20°
Maximum transmit power	2.4 GHz: 25 dBm/chain 28 dBm (combined power) 5 GHz: 24 dBm/chain 30 dBm (combined power) BLE: < 10 dBm
Singal radio transmit power [dBm]	2.4 GHz: -10 dBm to 25 dBm/chain 5 GHz: -10 dBm to 24 dBm/chain
MTBF [year]	132.7633643 year
MTTR [hour]	2 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	The power supply mode is negotiated to 802.3bt, and no function is restricted.
802.3at power supply description	When the power supply mode is negotiated to 802.3at and a 5 W USB module is used, the radio transmit power decreases by 3 dB.
802.3af power supply description	When the power supply mode is negotiated to 802.3af, the radio mode is limited to 2.4 GHz (2x2), the 5 GHz radio is disabled, and the radio transmit power decreases by 3 dB.
DC power supply description	No function is limited.

5.1.18 AirEngine 5776I-X6H (50087922-002)

Overview

Table 5-86 Basic information about the AirEngine 5776I-X6H

Item	Details
Description	AirEngine5776I-X6H(11be outdoor,2+4 dual bands,directional antenna,USB,BLE)
Part Number	50087922-002
Model	AirEngine 5776I-X6H
First supported version	V600R024C10

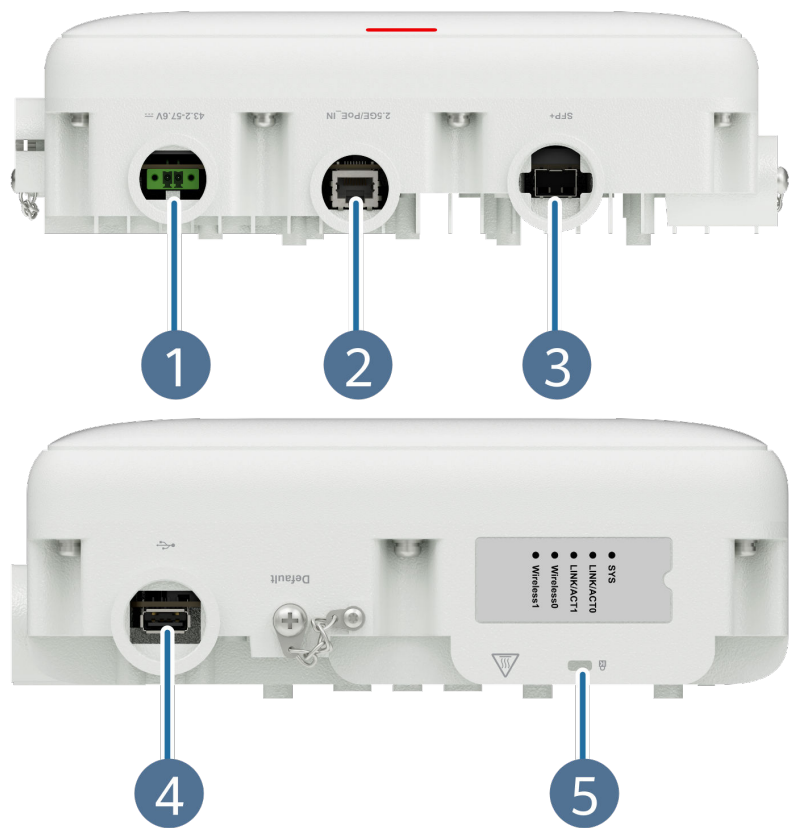
Appearance

Figure 5-52 Appearance of the AirEngine 5776I-X6H



Ports

Figure 5-53 Ports on the AirEngine 5776I-X6H



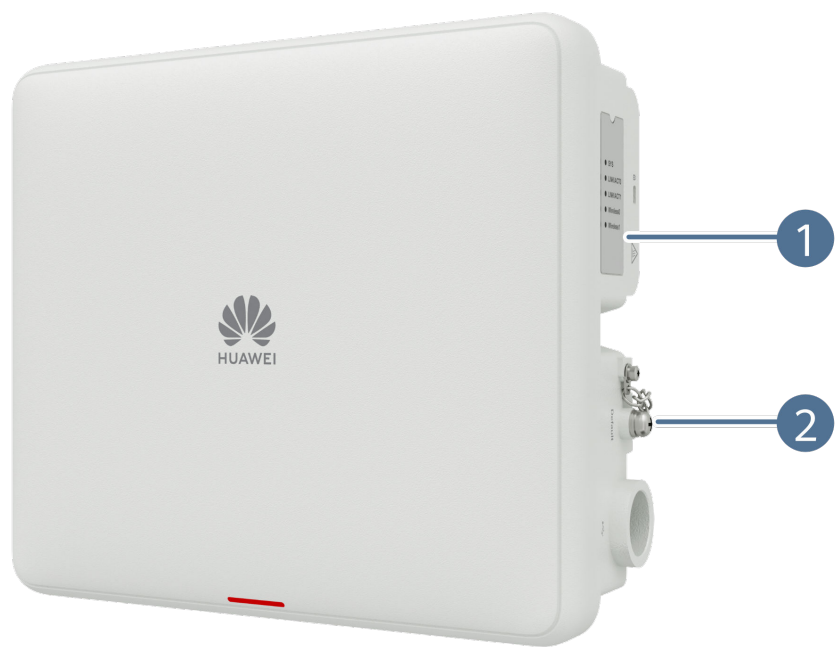
1	DC port	2	2.5GE/PoE_IN
3	SFP+	4	USB
5	Security slot	-	-

Table 5-87 Ports on the AirEngine 5776I-X6H

Port	Connector Type	Description	Available Components
2.5GE/PoE_IN	RJ45	100M/1000M/2.5G auto-sensing Ethernet electrical port that connects to the wired Ethernet and supports PoE input.	Network cable
SFP+	SFP+	Ethernet optical port, supporting 1G/2.5G/10G auto-sensing and working with a matching optical module.	Optical module
DC 48V	Phoenix terminal block	DC power port, used in DC power supply scenarios and supporting a voltage range of 43.2 V to 57.6 V. (Easy installation with no restrictions on the positive and negative poles on the port side)	Phoenix terminal block
USB	USB 2.0 Type A	Connects to an IoT terminal to implement IoT applications.	IoT module

Indicators and Buttons

Figure 5-54 Indicators and buttons on the AirEngine 5776I-X6H



1	Indicator	2	Default
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Table 5-88 Indicators on the AirEngine 5776I-X6H

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP.
		Green	Slow blinking (0.2 Hz)	The AP is running properly, the Ethernet connection is normal, and no STA is associated with the AP.

Silkscreen	Name	Color	Status	Description
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings.
		Red	Steady on	The system is faulty.
LINK/ACT0 and LINK/ACT1	Port indicator	Green	Blinking	The Ethernet connection is normal.
		-	Off	The port is in link-down state.

Silkscreen	Name	Color	Status	Description
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.

Silkscreen	Name	Color	Status	Description
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Table 5-89 Buttons on the AirEngine 5776L-X6H

Silkscreen	Name	Description
Default	Reset button	If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-90 Technical specifications of the AirEngine 5776L-X6H

Item	Specification
Installation Type	<ul style="list-style-type: none">WallPole
Dimensions without packaging (H x W x D) [mm(in.)]	220 mm x 250 mm x 77 mm (8.66 in. x 9.84 in. x 3.03 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	170 mm x 555 mm x 370 mm (6.69 in. x 21.85 in. x 14.57 in.)
Weight without packaging [kg(lb)]	2.76 kg (6.08 lb)

Item	Specification
Weight with packaging [kg(lb)]	5.65 kg (12.46 lb)
Storage	NAND Flash 512 MB
Console port	Bluetooth console
Maximum power consumption [W]	20.4 (excluding USB)
Maximum heat dissipation [BTU/hour]	69.61 BTU/hour
Power supply mode	<ul style="list-style-type: none"> PoE DC power adapter
Rated input voltage [V]	DC: 48 V PoE: 802.3bt/at/af
Input voltage range [V]	DC: 43.2 V to 57.6 V PoE: 802.3bt/at/af
Service port surge protection	<p>PoE port:</p> <p>Surge:</p> <p>Differential mode: 1.5 kV (D.1), 10/700 us, 15 ohms + 25 ohms, criterion B</p> <p>Differential mode: 1.5 kV (D.2), 10/700 us, 15 ohms + 25 ohms, criterion C</p> <p>Common mode: 6 kV (C.3), 10/700 us, 15 ohms + 25 ohms/wire, criterion B: 6)</p> <p>Differential mode: 1 kV (D.1), 1.2/50 us, 42 ohms, criterion B;</p> <p>Differential mode: 1 kV (D.2), 1.2/50 us, 42 ohms, criterion B;</p> <p>Common mode: 2 kV (C.3), 1.2/50 us, 2 ohms + 40 ohms x n/wire, criterion B</p> <p>Inrush current:</p> <p>Differential mode: 250 A (D.2), 8/20 μs, criterion C</p> <p>Common mode: 6 kA/8-wire, 8/20 us, criterion C</p>
PoE OUT	Not supported
Maximum number of physical ports on the entire device	2.5GE (RJ45) x 1, 100M/1000M/2500M auto-sensing 10GE optical (SFP+), GE/2.5GE/10GE auto-sensing

Item	Specification
Long-term operating temperature [°C(°F)]	–40°C to +70°C (–40°F to +158°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP68
Ground	Grounding
Wind resistance	67 m/s
USB	USB 2.0, power supply: 2.5 W/5 W
IoT slot	Not supported
BLE	BLE5.2
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Radio 0 (2.4 GHz): 2x2 Radio 1 (5 GHz): 4x4
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax/be 5 GHz: 802.11a/n/ac/ac Wave 2/ax/be
Radio interface	Built-in directional antennas
Antenna gain	2.4 GHz: 10 dBi/chain (peak value) 10 dBi (combined gain) 5 GHz: 11 dBi/chain (peak value) 10 dBi (combined gain) BLE: 5 dBi

Item	Specification
Beamwidth of the built-in antenna [degrees]	2.4 GHz: <ul style="list-style-type: none"> Horizontal plane: 70° Vertical plane: 35° 5 GHz: <ul style="list-style-type: none"> Horizontal plane: 60° Vertical plane: 20°
Maximum transmit power	2.4 GHz: 25 dBm/chain 28 dBm (combined power) 5 GHz: 24 dBm/chain 30 dBm (combined power) BLE: < 10 dBm
Singal radio transmit power [dBm]	2.4 GHz: -10 dBm to 25 dBm/chain 5 GHz: -10 dBm to 24 dBm/chain
MTBF [year]	132.7633643 year
MTTR [hour]	2 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	The power supply mode is negotiated to 802.3bt, and no function is restricted.
802.3at power supply description	When the power supply mode is negotiated to 802.3at and a 5 W USB module is used, the radio transmit power decreases by 3 dB.
802.3af power supply description	When the power supply mode is negotiated to 802.3af, the radio mode is limited to 2.4 GHz (2x2), the 5 GHz radio is disabled, and the radio transmit power decreases by 3 dB.
DC power supply description	No function is limited.

5.1.19 AirEngine 5776I-X6EH (50087923)

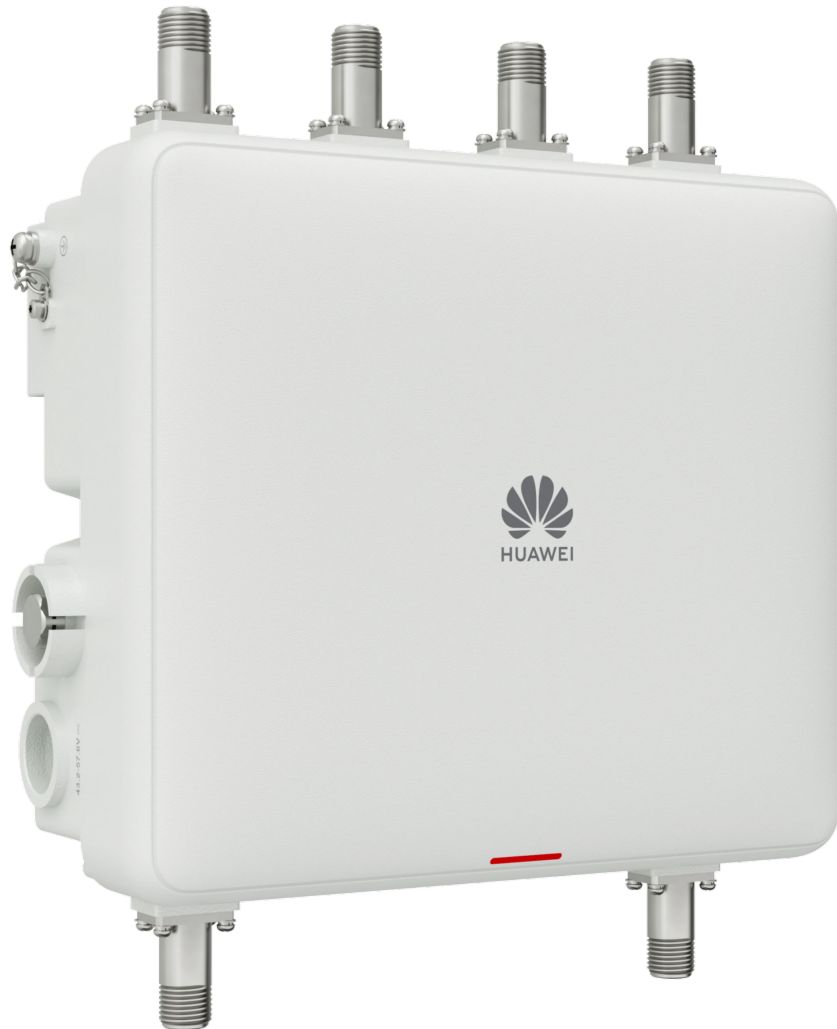
Overview

Table 5-91 Basic information about the AirEngine 5776I-X6EH

Item	Details
Description	AirEngine5776I-X6EH(11be outdoor,2+4 dual bands,external antenna,USB,BLE)
Part Number	50087923
Model	AirEngine 5776I-X6EH
First supported version	V600R024C10

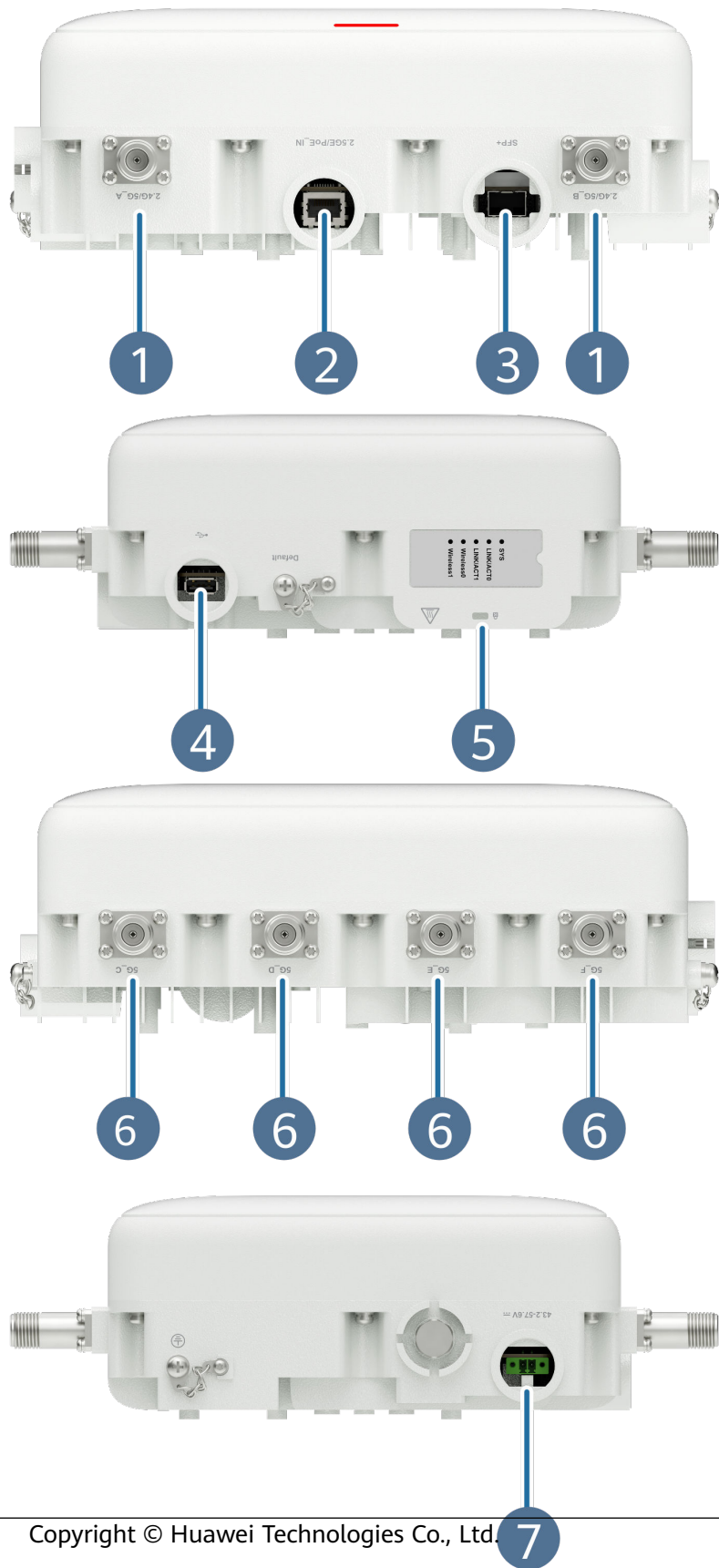
Appearance

Figure 5-55 Appearance of the AirEngine 5776I-X6EH



Ports

Figure 5-56 Ports on the AirEngine 5776I-X6EH



1	2.4G/5G_A~B	2	2.5GE/PoE_IN
3	SFP+	4	USB
5	Security slot	6	5G_C to 5G_F
7	DC port	-	-

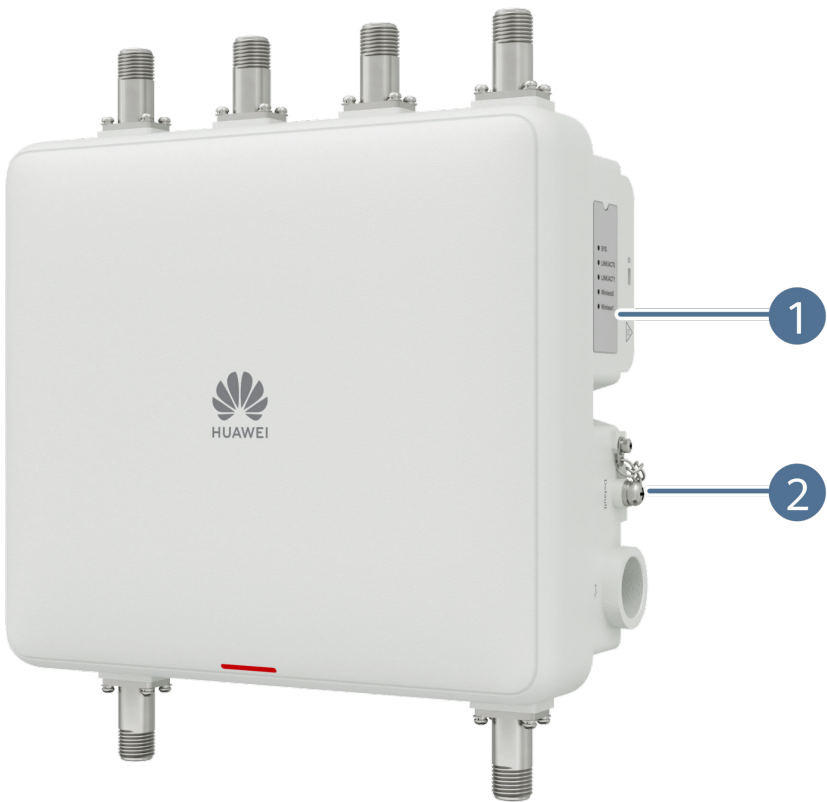
Table 5-92 Ports on the AirEngine 5776I-X6EH

Port	Connector Type	Description	Available Components
2.5GE/PoE_IN	RJ45	100M/1000M/2.5G auto-sensing Ethernet electrical port that connects to the wired Ethernet and supports PoE input.	Network cable
SFP+	SFP+	Ethernet uplink optical port, which supports 1G/2.5G/10G auto-sensing and works with a matching optical module.	Optical module
DC 48V	Phoenix terminal block	DC power port, used in DC power supply scenarios and supporting a voltage range of 43.2 V to 57.6 V. (Easy installation with no restrictions on the positive and negative poles on the port side)	Phoenix terminal block
USB	USB 2.0 Type A	Connects to an IoT terminal to implement IoT applications.	IoT module

Port	Connector Type	Description	Available Components
2.4G/5G_A and 2.4G/5G_B	N-Type Female	Connects to a 2.4 GHz or 5 GHz antenna for transmitting and receiving service signals.	Antenna
5G_C to 5G_F	N-Type Female	Connects to a 5 GHz antenna for transmitting and receiving service signals.	Antenna

Indicators and Buttons

Figure 5-57 Indicators and buttons on the AirEngine 5776I-X6EH



1	Indicator	2	Default
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Table 5-93 Indicators on the AirEngine 5776I-X6EH

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP.
		Green	Slow blinking (0.2 Hz)	The AP is running properly, the Ethernet connection is normal, and no STA is associated with the AP.

Silkscreen	Name	Color	Status	Description
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none"> The bottom-layer system is being started. The software is being upgraded. After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings.
		Red	Steady on	The system is faulty.
LINK/ACT0 and LINK/ACT1	Port indicator	Green	Blinking	The Ethernet connection is normal.
		-	Off	The port is in link-down state.

Silkscreen	Name	Color	Status	Description
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.

Silkscreen	Name	Color	Status	Description
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Table 5-94 Buttons on the AirEngine 5776I-X6EH

Silkscreen	Name	Description
Default	Reset button	If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-95 Technical specifications of the AirEngine 5776I-X6EH

Item	Specification
Installation Type	<ul style="list-style-type: none">WallPole
Dimensions without packaging (H x W x D) [mm(in.)]	220 mm x 250 mm x 77 mm (8.66 in. x 9.84 in. x 3.03 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	170 mm x 555 mm x 370 mm (6.69 in. x 21.85 in. x 14.57 in.)
Weight without packaging [kg(lb)]	2.97 kg (6.55 lb)

Item	Specification
Weight with packaging [kg(lb)]	5.78 kg (12.74 lb)
Storage	NAND Flash 512 MB
Console port	Bluetooth console
Maximum power consumption [W]	21.4 (excluding USB)
Maximum heat dissipation [BTU/hour]	73.02 BTU/hour
Power supply mode	<ul style="list-style-type: none"> PoE DC power adapter
Rated input voltage [V]	DC: 48 V PoE: 802.3bt/at/af
Input voltage range [V]	DC: 43.2 V to 57.6 V PoE: 802.3bt/at/af
Service port surge protection	<p>PoE port:</p> <p>Surge:</p> <p>Differential mode: 1.5 kV (D.1), 10/700 us, 15 ohms + 25 ohms, criterion B</p> <p>Differential mode: 1.5 kV (D.2), 10/700 us, 15 ohms + 25 ohms, criterion C</p> <p>Common mode: 6 kV (C.3), 10/700 us, 15 ohms + 25 ohms/wire, criterion B: 6)</p> <p>Differential mode: 1 kV (D.1), 1.2/50 us, 42 ohms, criterion B;</p> <p>Differential mode: 1 kV (D.2), 1.2/50 us, 42 ohms, criterion B;</p> <p>Common mode: 2 kV (C.3), 1.2/50 us, 2 ohms + 40 ohms x n/wire, criterion B</p> <p>Inrush current:</p> <p>Differential mode: 250 A (D.2), 8/20 μs, criterion C</p> <p>Common mode: 6 kA/8-wire, 8/20 us, criterion C</p>
PoE OUT	Not supported
Maximum number of physical ports on the entire device	2.5GE (RJ45) x 1, 100M/1000M/2500M auto-sensing 10GE optical (SFP+), GE/2.5GE/10GE auto-sensing

Item	Specification
Long-term operating temperature [°C(°F)]	–40°C to +70°C (–40°F to +158°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/ waterproof)	IP68
Ground	Grounding
Antenna port surge protection [kA]	5 kA surge protection capability without external surge protection devices
Wind resistance	67 m/s
USB	USB 2.0, power supply: 2.5 W/5 W
IoT slot	Not supported
BLE	BLE5.2
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Mode 1: Radio 0 (2.4 GHz): 2x2 Radio 1 (5 GHz): 4x4 Mode 2: Radio 0 (5 GHz-0): 2x2 Radio 1 (5 GHz-1): 4x4
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax/be 5 GHz: 802.11a/n/ac/ac Wave 2/ax/be
Radio interface	External antenna

Item	Specification
Antenna gain	BLE: 5 dBi
Maximum transmit power	<p>Mode 1:</p> <p>2.4 GHz:</p> <p>25 dBm/chain</p> <p>28 dBm (combined power)</p> <p>5 GHz:</p> <p>24 dBm/chain</p> <p>30 dBm (combined power)</p> <p>Mode 2:</p> <p>5 GHz-0:</p> <p>24 dBm/chain</p> <p>27 dBm (combined power)</p> <p>5 GHz-1:</p> <p>24 dBm/chain</p> <p>30 dBm (combined power)</p> <p>BLE: < 10 dBm</p>
Singal radio transmit power [dBm]	<p>Mode 1:</p> <p>2.4 GHz: -10 dBm to +25 dBm/chain</p> <p>5 GHz: -10 dBm to +24 dBm/chain</p> <p>Mode 2:</p> <p>5 GHz-0: -10 dBm to +24 dBm/chain</p> <p>5 GHz-1: -10 dBm to +24 dBm/chain</p>
MTBF [year]	123.6650971 year
MTTR [hour]	2 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	The power supply mode is negotiated to 802.3bt, and no function is restricted.
802.3at power supply description	When the power supply mode is negotiated to 802.3at and a 5 W USB module is used, the radio transmit power decreases by 3 dB.
802.3af power supply description	When the power supply mode is negotiated to 802.3af, the radio mode is limited to 2.4 GHz (2x2), the 5 GHz radio is disabled, and the radio transmit power decreases by 3 dB.
DC power supply description	No function is limited.

5.1.20 AirEngine 5776I-X6EH (50087923-002)

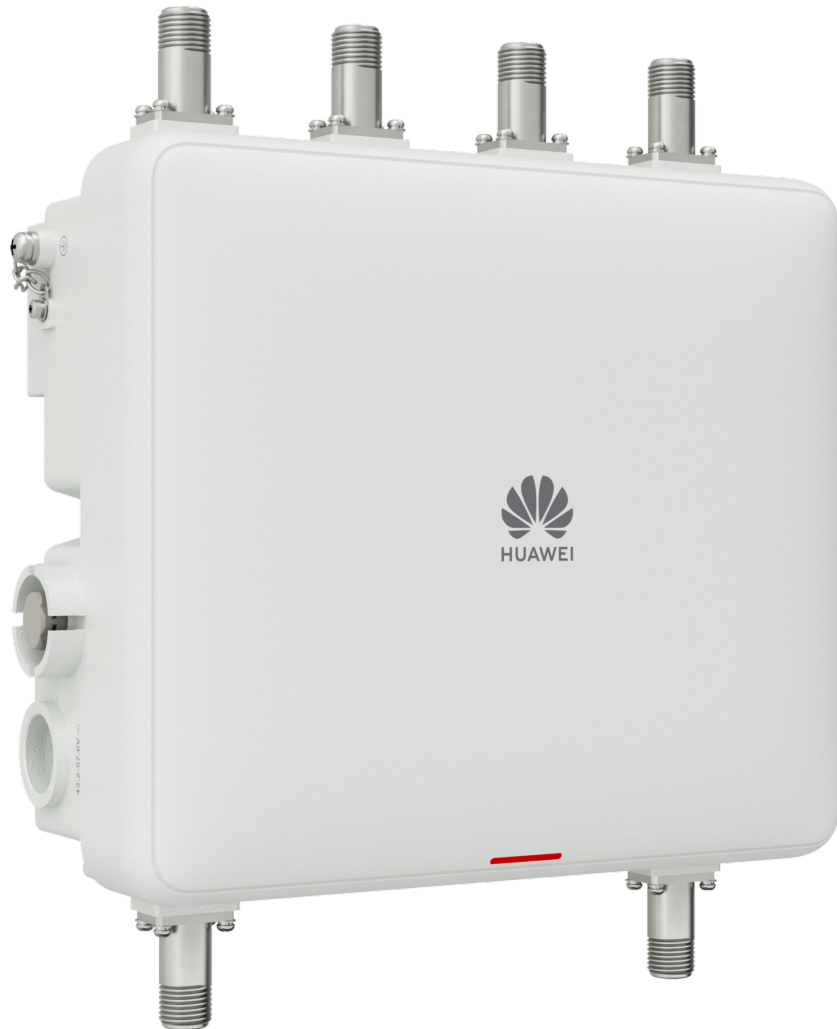
Overview

Table 5-96 Basic information about the AirEngine 5776I-X6EH

Item	Details
Description	AirEngine5776I-X6EH(11be outdoor,2+4 dual bands,external antenna,USB,BLE)
Part Number	50087923-002
Model	AirEngine 5776I-X6EH
First supported version	V600R024C10

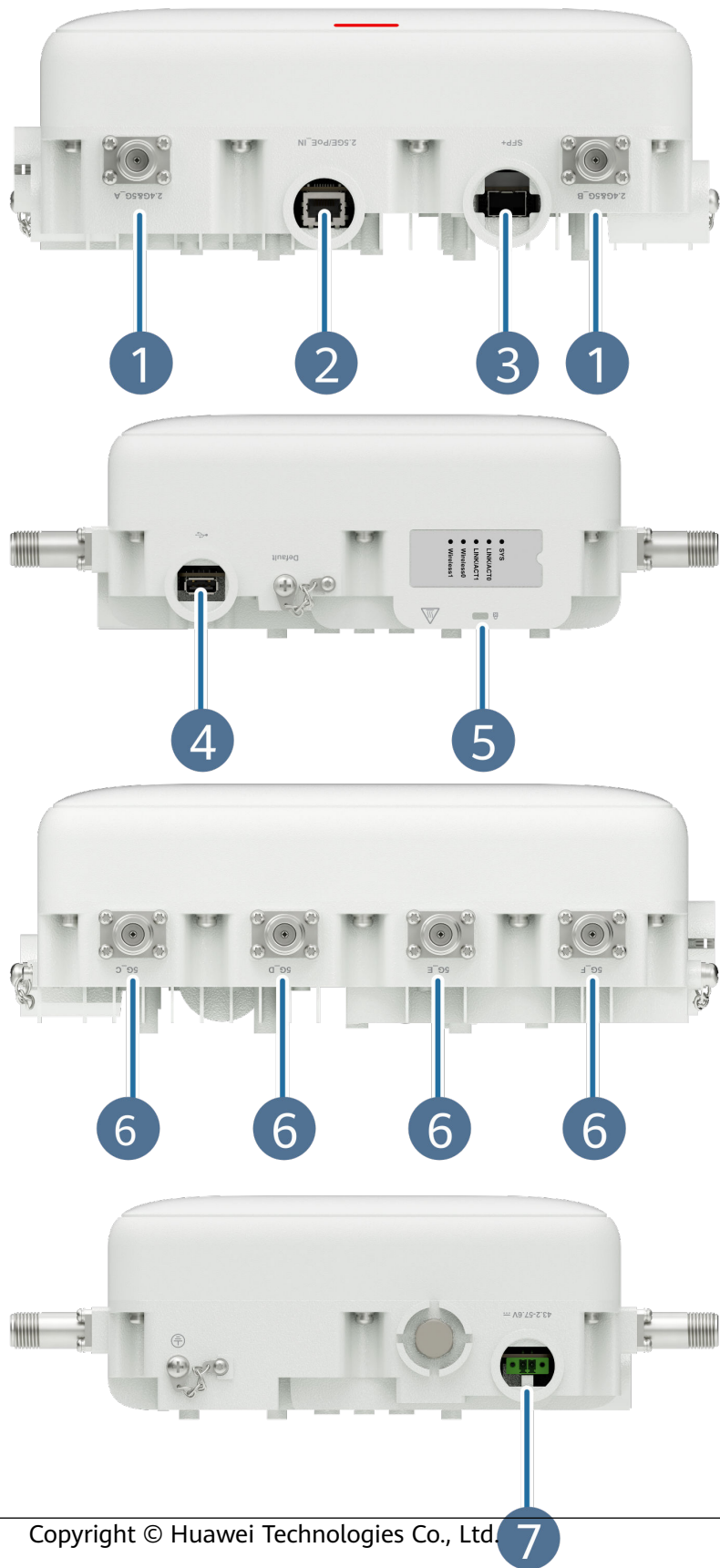
Appearance

Figure 5-58 Appearance of the AirEngine 5776I-X6EH



Ports

Figure 5-59 Ports on the AirEngine 5776I-X6EH



1	2.4G/5G_A~B	2	2.5GE/PoE_IN
3	SFP+	4	USB
5	Security slot	6	5G_C to 5G_F
7	DC port	-	-

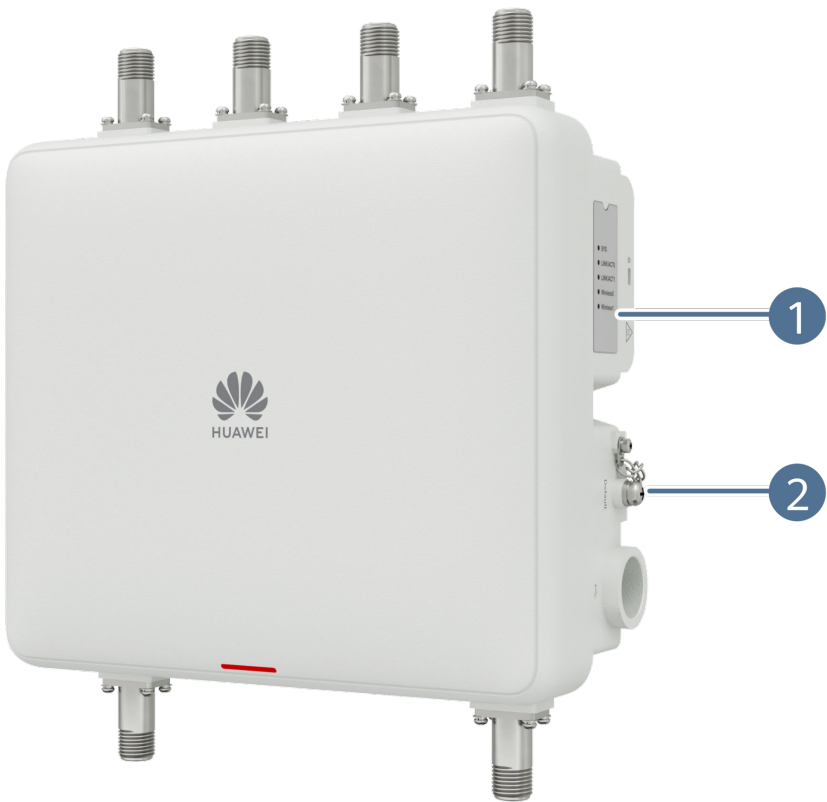
Table 5-97 Ports on the AirEngine 5776I-X6EH

Port	Connector Type	Description	Available Components
2.5GE/PoE_IN	RJ45	100M/1000M/2.5G auto-sensing Ethernet electrical port that connects to the wired Ethernet and supports PoE input.	Network cable
SFP+	SFP+	Ethernet optical port, supporting 1G/2.5G/10G auto-sensing and working with a matching optical module.	Optical module
DC 48V	Phoenix terminal block	DC power port, used in DC power supply scenarios and supporting a voltage range of 43.2 V to 57.6 V. (Easy installation with no restrictions on the positive and negative poles on the port side)	Phoenix terminal block
USB	USB 2.0 Type A	Connects to an IoT terminal to implement IoT applications.	IoT module

Port	Connector Type	Description	Available Components
2.4G/5G_A and 2.4G/5G_B	N-Type Female	Connects to a 2.4 GHz or 5 GHz antenna for transmitting and receiving service signals.	Antenna
5G_C to 5G_F	N-Type Female	Connects to a 5 GHz antenna for transmitting and receiving service signals.	Antenna

Indicators and Buttons

Figure 5-60 Indicators and buttons on the AirEngine 5776I-X6EH



1	Indicator	2	Default
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Table 5-98 Indicators on the AirEngine 5776I-X6EH

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP.
		Green	Slow blinking (0.2 Hz)	The AP is running properly, the Ethernet connection is normal, and no STA is associated with the AP.

Silkscreen	Name	Color	Status	Description
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings.
		Red	Steady on	The system is faulty.
LINK/ACT0 and LINK/ACT1	Port indicator	Green	Blinking	The Ethernet connection is normal.
		-	Off	The port is in link-down state.

Silkscreen	Name	Color	Status	Description
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.

Silkscreen	Name	Color	Status	Description
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Table 5-99 Buttons on the AirEngine 5776I-X6EH

Silkscreen	Name	Description
Default	Reset button	If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-100 Technical specifications of the AirEngine 5776I-X6EH

Item	Specification
Installation Type	<ul style="list-style-type: none"> Wall Pole
Dimensions without packaging (H x W x D) [mm(in.)]	220 mm x 250 mm x 77 mm (8.66 in. x 9.84 in. x 3.03 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	170 mm x 555 mm x 370 mm (6.69 in. x 21.85 in. x 14.57 in.)
Weight without packaging [kg(lb)]	2.97 kg (6.55 lb)

Item	Specification
Weight with packaging [kg(lb)]	5.78 kg (12.74 lb)
Storage	NAND Flash 512 MB
Console port	Bluetooth console
Maximum power consumption [W]	21.4 (excluding USB)
Maximum heat dissipation [BTU/hour]	73.02 BTU/hour
Power supply mode	<ul style="list-style-type: none"> PoE DC power adapter
Rated input voltage [V]	DC: 48 V PoE: 802.3bt/at/af
Input voltage range [V]	DC: 43.2 V to 57.6 V PoE: 802.3bt/at/af
Service port surge protection	<p>PoE port:</p> <p>Surge:</p> <p>Differential mode: 1.5 kV (D.1), 10/700 us, 15 ohms + 25 ohms, criterion B</p> <p>Differential mode: 1.5 kV (D.2), 10/700 us, 15 ohms + 25 ohms, criterion C</p> <p>Common mode: 6 kV (C.3), 10/700 us, 15 ohms + 25 ohms/wire, criterion B: 6)</p> <p>Differential mode: 1 kV (D.1), 1.2/50 us, 42 ohms, criterion B;</p> <p>Differential mode: 1 kV (D.2), 1.2/50 us, 42 ohms, criterion B;</p> <p>Common mode: 2 kV (C.3), 1.2/50 us, 2 ohms + 40 ohms x n/wire, criterion B</p> <p>Inrush current:</p> <p>Differential mode: 250 A (D.2), 8/20 μs, criterion C</p> <p>Common mode: 6 kA/8-wire, 8/20 us, criterion C</p>
PoE OUT	Not supported
Maximum number of physical ports on the entire device	2.5GE (RJ45) x 1, 100M/1000M/2500M auto-sensing 10GE optical (SFP+), GE/2.5GE/10GE auto-sensing

Item	Specification
Long-term operating temperature [°C(°F)]	–40°C to +70°C (–40°F to +158°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP68
Ground	Grounding
Antenna port surge protection [kA]	5 kA surge protection capability without external surge protection devices
Wind resistance	67 m/s
USB	USB 2.0, power supply: 2.5 W/5 W
IoT slot	Not supported
BLE	BLE5.2
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Mode 1: Radio 0 (2.4 GHz): 2x2 Radio 1 (5 GHz): 4x4 Mode 2: Radio 0 (5 GHz-1): 2x2 Radio 1 (5 GHz-2): 4x4
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax/be 5 GHz: 802.11a/n/ac/ac Wave 2/ax/be
Radio interface	External antenna

Item	Specification
Antenna gain	BLE: 5 dBi
Maximum transmit power	<p>Mode 1:</p> <p>2.4 GHz:</p> <p>25 dBm/chain</p> <p>28 dBm (combined power)</p> <p>5 GHz:</p> <p>24 dBm/chain</p> <p>30 dBm (combined power)</p> <p>Mode 2:</p> <p>5 GHz-0:</p> <p>24 dBm/chain</p> <p>27 dBm (combined power)</p> <p>5 GHz-1:</p> <p>24 dBm/chain</p> <p>30 dBm (combined power)</p> <p>BLE: < 10 dBm</p>
Singal radio transmit power [dBm]	<p>Mode 1:</p> <p>2.4 GHz: -10 dBm to +25 dBm/chain</p> <p>5 GHz: -10 dBm to +24 dBm/chain</p> <p>Mode 2:</p> <p>5 GHz-0: -10 dBm to +24 dBm/chain</p> <p>5 GHz-1: -10 dBm to +24 dBm/chain</p>
MTBF [year]	123.6650971 year
MTTR [hour]	2 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	The power supply mode is negotiated to 802.3bt, and no function is restricted.
802.3at power supply description	When the power supply mode is negotiated to 802.3at and a 5 W USB module is used, the radio transmit power decreases by 3 dB.
802.3af power supply description	When the power supply mode is negotiated to 802.3af, the radio mode is limited to 2.4 GHz (2x2), the 5 GHz radio is disabled, and the radio transmit power decreases by 3 dB.
DC power supply description	No function is limited.

5.1.21 AirEngine 5776I-X6EH (50087923-001)

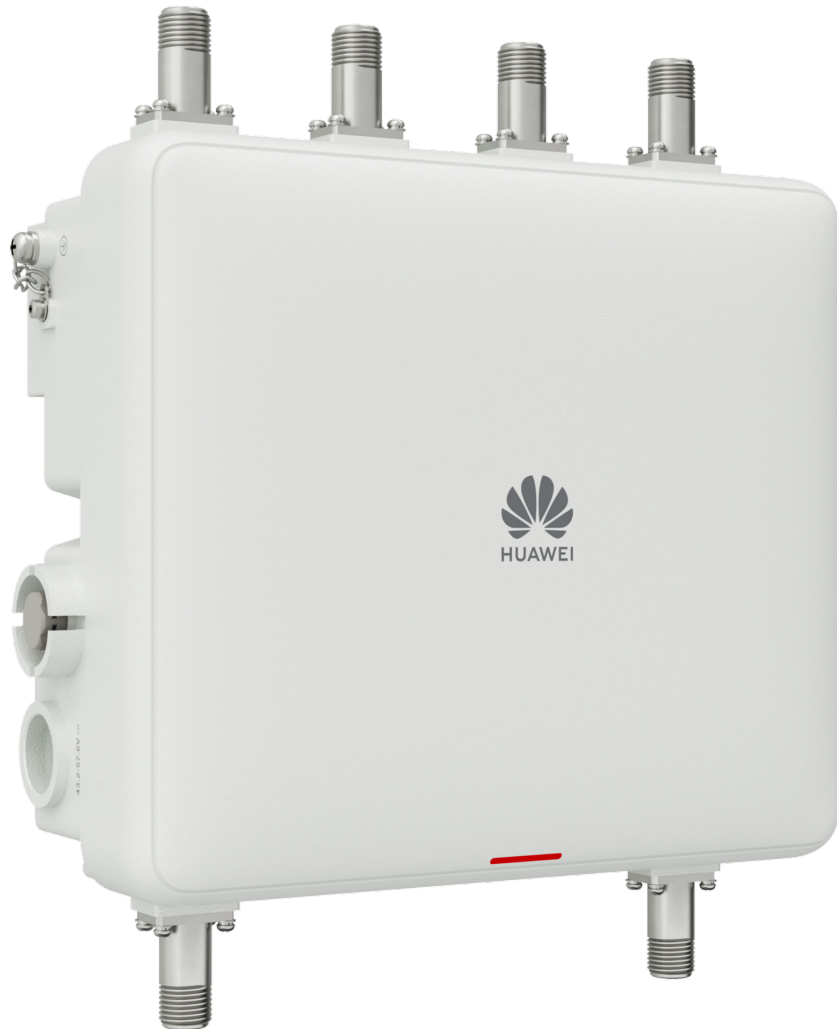
Overview

Table 5-101 Basic information about the AirEngine 5776I-X6EH

Item	Details
Description	AirEngine5776I-X6EH(11be outdoor,2+4 dual bands,external antenna,USB,BLE)
Part Number	50087923-001
Model	AirEngine 5776I-X6EH
First supported version	V600R024C10

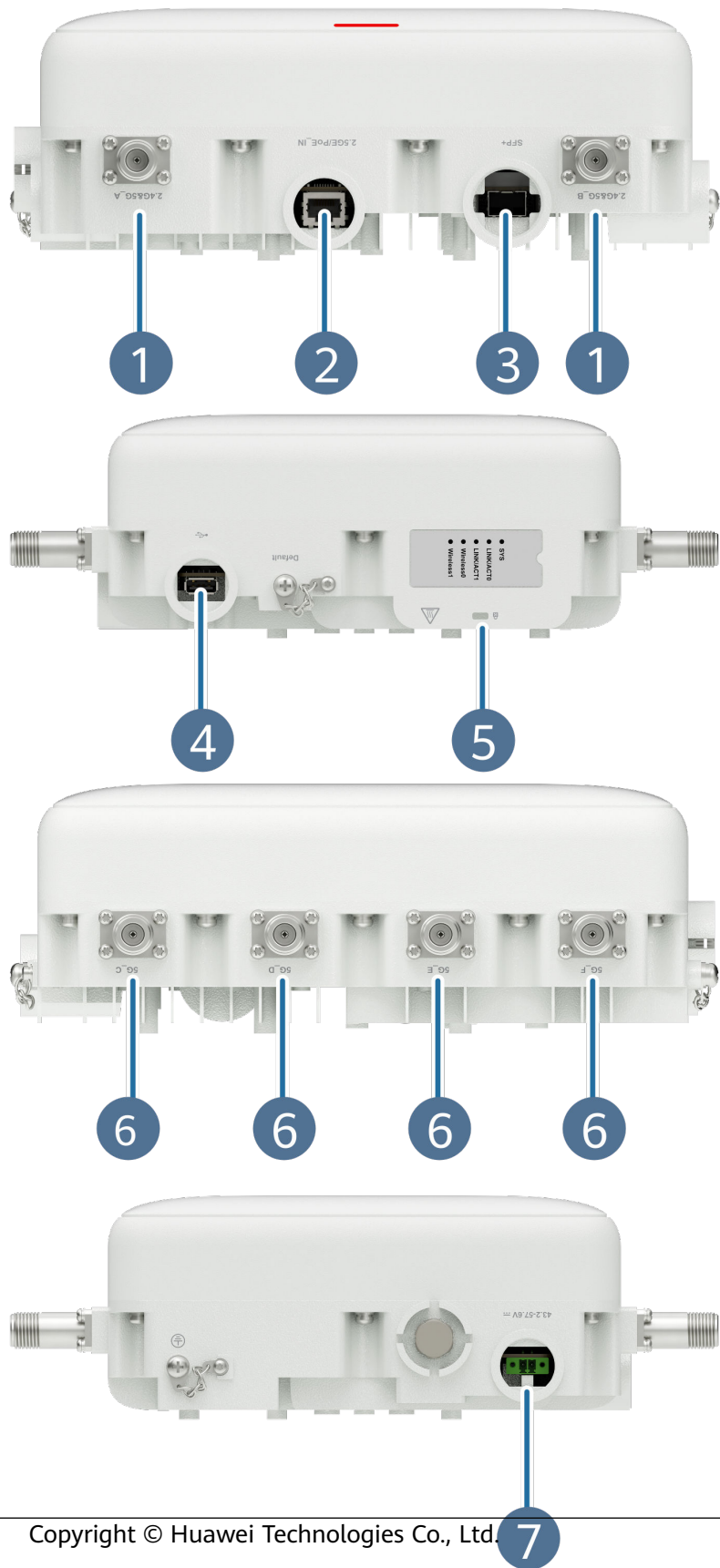
Appearance

Figure 5-61 Appearance of the AirEngine 5776I-X6EH



Ports

Figure 5-62 Ports on the AirEngine 5776I-X6EH



1	2.4G/5G_A~B	2	2.5GE/PoE_IN
3	SFP+	4	USB
5	Security slot	6	5G_C to 5G_F
7	DC port	-	-

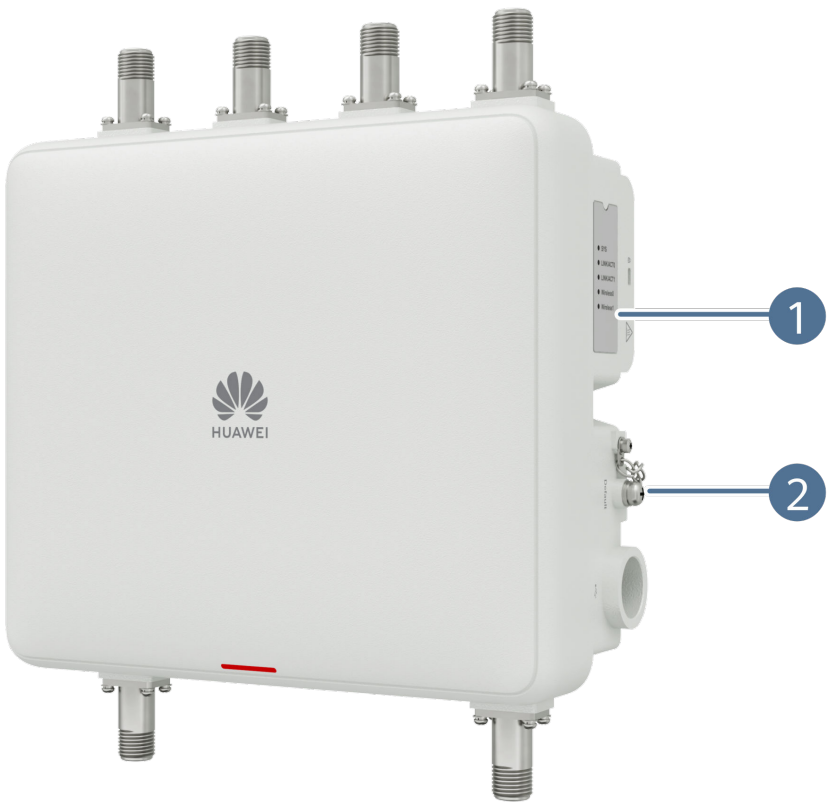
Table 5-102 Ports on the AirEngine 5776I-X6EH

Port	Connector Type	Description	Available Components
2.5GE/PoE_IN	RJ45	100M/1000M/2.5G auto-sensing Ethernet electrical port that connects to the wired Ethernet and supports PoE input.	Network cable
SFP+	SFP+	Ethernet optical port, supporting 1G/2.5G/10G auto-sensing and working with a matching optical module.	Optical module
DC 48V	Phoenix terminal block	DC power port, used in DC power supply scenarios and supporting a voltage range of 43.2 V to 57.6 V. (Easy installation with no restrictions on the positive and negative poles on the port side)	Phoenix terminal block
USB	USB 2.0 Type A	Connects to an IoT terminal to implement IoT applications.	IoT module

Port	Connector Type	Description	Available Components
2.4G/5G_A and 2.4G/5G_B	N-Type Female	Connects to a 2.4 GHz or 5 GHz antenna for transmitting and receiving service signals.	Antenna
5G_C to 5G_F	N-Type Female	Connects to a 5 GHz antenna for transmitting and receiving service signals.	Antenna

Indicators and Buttons

Figure 5-63 Indicators and buttons on the AirEngine 5776I-X6EH



1	Indicator	2	Default
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Table 5-103 Indicators on the AirEngine 5776I-X6EH

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP.
		Green	Slow blinking (0.2 Hz)	The AP is running properly, the Ethernet connection is normal, and no STA is associated with the AP.

Silkscreen	Name	Color	Status	Description
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings.
		Red	Steady on	The system is faulty.
LINK/ACT0 and LINK/ACT1	Port indicator	Green	Blinking	The Ethernet connection is normal.
		-	Off	The port is in link-down state.

Silkscreen	Name	Color	Status	Description
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.

Silkscreen	Name	Color	Status	Description
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Table 5-104 Buttons on the AirEngine 5776I-X6EH

Silkscreen	Name	Description
Default	Reset button	If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-105 Technical specifications of the AirEngine 5776I-X6EH

Item	Specification
Installation Type	<ul style="list-style-type: none">WallPole
Dimensions without packaging (H x W x D) [mm(in.)]	220 mm x 250 mm x 77 mm (8.66 in. x 9.84 in. x 3.03 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	170 mm x 555 mm x 370 mm (6.69 in. x 21.85 in. x 14.57 in.)
Weight without packaging [kg(lb)]	2.97 kg (6.55 lb)

Item	Specification
Weight with packaging [kg(lb)]	5.78 kg (12.74 lb)
Storage	NAND Flash 512 MB
Console port	Bluetooth console
Maximum power consumption [W]	21.4 (excluding USB)
Maximum heat dissipation [BTU/hour]	73.02 BTU/hour
Power supply mode	<ul style="list-style-type: none"> PoE DC power adapter
Rated input voltage [V]	DC: 48 V PoE: 802.3bt/at/af
Input voltage range [V]	DC: 43.2 V to 57.6 V PoE: 802.3bt/at/af
Service port surge protection	<p>PoE port:</p> <p>Surge:</p> <p>Differential mode: 1.5 kV (D.1), 10/700 us, 15 ohms + 25 ohms, criterion B</p> <p>Differential mode: 1.5 kV (D.2), 10/700 us, 15 ohms + 25 ohms, criterion C</p> <p>Common mode: 6 kV (C.3), 10/700 us, 15 ohms + 25 ohms/wire, criterion B: 6)</p> <p>Differential mode: 1 kV (D.1), 1.2/50 us, 42 ohms, criterion B;</p> <p>Differential mode: 1 kV (D.2), 1.2/50 us, 42 ohms, criterion B;</p> <p>Common mode: 2 kV (C.3), 1.2/50 us, 2 ohms + 40 ohms x n/wire, criterion B</p> <p>Inrush current:</p> <p>Differential mode: 250 A (D.2), 8/20 μs, criterion C</p> <p>Common mode: 6 kA/8-wire, 8/20 us, criterion C</p>
PoE OUT	Not supported
Maximum number of physical ports on the entire device	2.5GE (RJ45) x 1, 100M/1000M/2500M auto-sensing 10GE optical (SFP+), GE/2.5GE/10GE auto-sensing

Item	Specification
Long-term operating temperature [°C(°F)]	–40°C to +70°C (–40°F to +158°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP68
Ground	Grounding
Antenna port surge protection [kA]	5 kA surge protection capability without external surge protection devices
Wind resistance	67 m/s
USB	USB 2.0, power supply: 2.5 W/5 W
IoT slot	Not supported
BLE	BLE5.2
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Mode 1: Radio 0 (2.4 GHz): 2x2 Radio 1 (5 GHz): 4x4 Mode 2: Radio 0 (5 GHz-1): 2x2 Radio 1 (5 GHz-2): 4x4
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax/be 5 GHz: 802.11a/n/ac/ac Wave 2/ax/be
Radio interface	External antenna

Item	Specification
Antenna gain	BLE: 5 dBi
Maximum transmit power	<p>Mode 1:</p> <p>2.4 GHz:</p> <p>25 dBm/chain</p> <p>28 dBm (combined power)</p> <p>5 GHz:</p> <p>24 dBm/chain</p> <p>30 dBm (combined power)</p> <p>Mode 2:</p> <p>5 GHz-0:</p> <p>24 dBm/chain</p> <p>27 dBm (combined power)</p> <p>5 GHz-1:</p> <p>24 dBm/chain</p> <p>30 dBm (combined power)</p> <p>BLE: < 10 dBm</p>
Singal radio transmit power [dBm]	<p>Mode 1:</p> <p>2.4 GHz: -10 dBm to +25 dBm/chain</p> <p>5 GHz: -10 dBm to +24 dBm/chain</p> <p>Mode 2:</p> <p>5 GHz-0: -10 dBm to +24 dBm/chain</p> <p>5 GHz-1: -10 dBm to +24 dBm/chain</p>
MTBF [year]	123.6650971 year
MTTR [hour]	2 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	The power supply mode is negotiated to 802.3bt, and no function is restricted.
802.3at power supply description	When the power supply mode is negotiated to 802.3at and a 5 W USB module is used, the radio transmit power decreases by 3 dB.
802.3af power supply description	When the power supply mode is negotiated to 802.3af, the radio mode is limited to 2.4 GHz (2x2), the 5 GHz radio is disabled, and the radio transmit power decreases by 3 dB.
DC power supply description	No function is limited.

5.1.22 AirEngine 5776I-X7H

Overview

Table 5-106 Basic information about the AirEngine 5776I-X7H

Item	Details
Description	AirEngine5776I-X7H(11be outdoor,2+4 dual bands,omnidirectional antenna,USB,BLE)
Part Number	50088043
Model	AirEngine 5776I-X7H
First supported version	V600R024C10

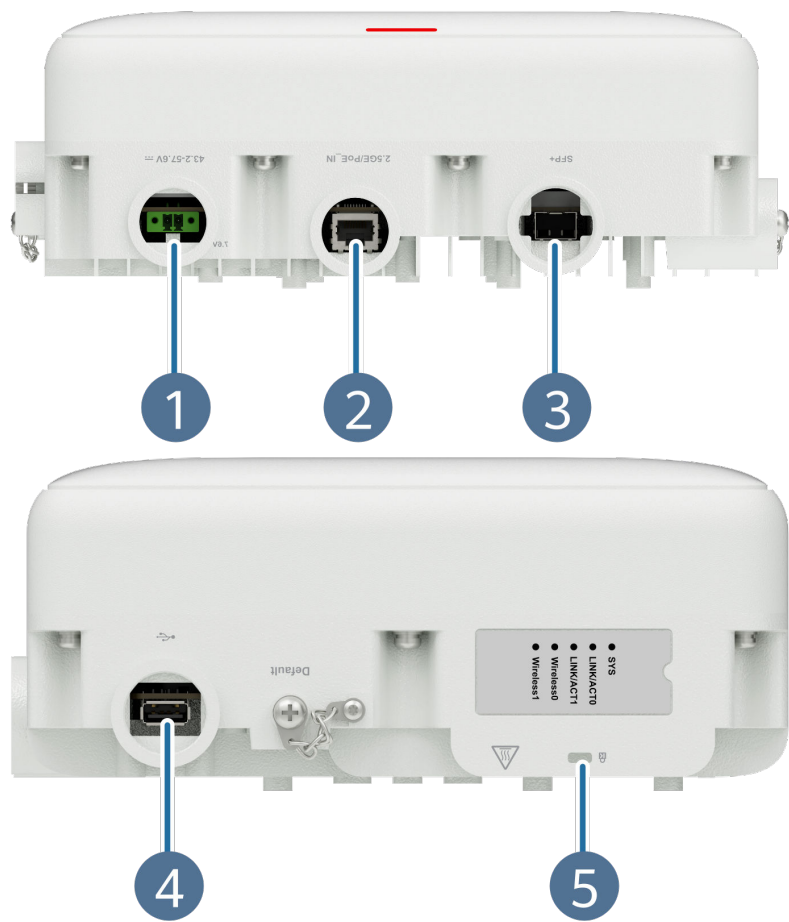
Appearance

Figure 5-64 Appearance of the AirEngine 5776I-X7H



Ports

Figure 5-65 Ports on the AirEngine 5776I-X7H



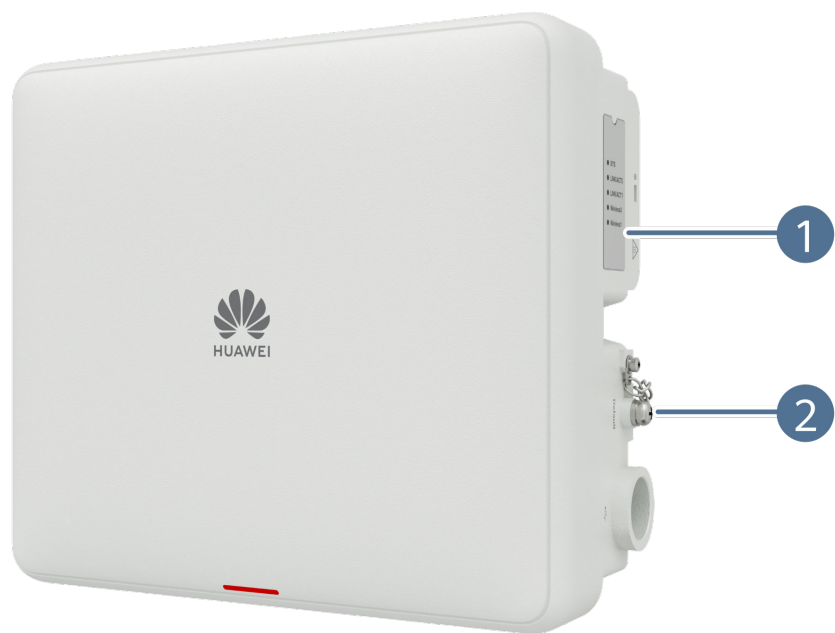
1	DC port	2	2.5GE/PoE_IN
3	SFP+	4	USB
5	Security slot	-	-

Table 5-107 Ports on the AirEngine 5776I-X7H

Port	Connector Type	Description	Available Components
2.5GE/PoE_IN	RJ45	100M/1000M/2.5G auto-sensing Ethernet electrical port that connects to the wired Ethernet and supports PoE input.	Network cable
SFP+	SFP+	Ethernet optical port, supporting 1G/2.5G/10G auto-sensing and working with a matching optical module.	Optical module
DC 48V	Phoenix terminal block	DC power port, used in DC power supply scenarios and supporting a voltage range of 43.2 V to 57.6 V. (Easy installation with no restrictions on the positive and negative poles on the port side)	Phoenix terminal block
USB	USB 2.0 Type A	Connects to an IoT terminal to implement IoT applications.	IoT module

Indicators and Buttons

Figure 5-66 Indicators and buttons on the AirEngine 5776I-X7H



1	Indicator	2	Default
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Table 5-108 Indicators on the AirEngine 5776I-X7H

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP.
		Green	Slow blinking (0.2 Hz)	The AP is running properly, the Ethernet connection is normal, and no STA is associated with the AP.

Silkscreen	Name	Color	Status	Description
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none"> The bottom-layer system is being started. The software is being upgraded. After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings.
		Red	Steady on	The system is faulty.
LINK/ACT0 and LINK/ACT1	Port indicator	Green	Blinking	The Ethernet connection is normal.
		-	Off	The port is in link-down state.

Silkscreen	Name	Color	Status	Description
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.

Silkscreen	Name	Color	Status	Description
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Table 5-109 Buttons on the AirEngine 5776I-X7H

Silkscreen	Name	Description
Default	Reset button	If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-110 Technical specifications of the AirEngine 5776I-X7H

Item	Specification
Installation Type	<ul style="list-style-type: none"> Wall (Facing Down) Pole (Facing Down)
Dimensions without packaging (H x W x D) [mm(in.)]	92 mm x 250 mm x 220 mm (3.62 in. x 9.84 in. x 8.66 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	185 mm x 555 mm x 370 mm (7.28 in. x 21.85 in. x 14.57 in.)
Weight without packaging [kg(lb)]	2.89 kg (6.37 lb)

Item	Specification
Weight with packaging [kg(lb)]	5.42 kg (11.95 lb)
Storage	NAND Flash 512 MB
Console port	Bluetooth console
Maximum power consumption [W]	20.4 (excluding USB)
Maximum heat dissipation [BTU/hour]	69.61 BTU/hour
Power supply mode	<ul style="list-style-type: none"> PoE DC power adapter
Rated input voltage [V]	DC: 48 V PoE: 802.3bt/at/af
Input voltage range [V]	DC: 43.2 V to 57.6 V PoE: 802.3bt/at/af
Service port surge protection	<p>PoE port:</p> <p>Surge:</p> <p>Differential mode: 1.5 kV (D.1), 10/700 us, 15 ohms + 25 ohms, criterion B</p> <p>Differential mode: 1.5 kV (D.2), 10/700 us, 15 ohms + 25 ohms, criterion C</p> <p>Common mode: 6 kV (C.3), 10/700 us, 15 ohms + 25 ohms/wire, criterion B: 6)</p> <p>Differential mode: 1 kV (D.1), 1.2/50 us, 42 ohms, criterion B;</p> <p>Differential mode: 1 kV (D.2), 1.2/50 us, 42 ohms, criterion B;</p> <p>Common mode: 2 kV (C.3), 1.2/50 us, 2 ohms + 40 ohms x n/wire, criterion B</p> <p>Inrush current:</p> <p>Differential mode: 250 A (D.2), 8/20 μs, criterion C</p> <p>Common mode: 6 kA/8-wire, 8/20 us, criterion C</p>
PoE OUT	Not supported
Maximum number of physical ports on the entire device	2.5GE (RJ45) x 1, 100M/1000M/2500M auto-sensing 10GE optical (SFP+), GE/2.5GE/10GE auto-sensing

Item	Specification
Long-term operating temperature [°C(°F)]	–40°C to +70°C (–40°F to +158°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP68
Ground	Grounding
Wind resistance	67 m/s
USB	USB 2.0, power supply: 2.5 W/5 W
IoT slot	Not supported
BLE	BLE5.2
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Radio 0 (2.4 GHz): 2x2 Radio 1 (5 GHz): 4x4
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax/be 5 GHz: 802.11a/n/ac/ac Wave 2/ax/be
Radio interface	Built-in omnidirectional antennas
Antenna gain	2.4 GHz: 5 dBi/chain (peak value) 3 dBi (combined gain) 5 GHz: 5 dBi/chain (peak value) 3 dBi (combined gain) BLE: 5 dBi

Item	Specification
Maximum transmit power	2.4 GHz: 25 dBm/chain 28 dBm (combined power) 5 GHz: 24 dBm/chain 30 dBm (combined power) BLE: < 10 dBm
Singal radio transmit power [dBm]	2.4 GHz: -10 dBm to 25 dBm/chain 5 GHz: -10 dBm to 24 dBm/chain
MTBF [year]	131.1375659 year
MTTR [hour]	2 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	The power supply mode is negotiated to 802.3bt, and no function is restricted.
802.3at power supply description	When the power supply mode is negotiated to 802.3at and a 5 W USB module is used, the radio transmit power decreases by 3 dB.
802.3af power supply description	When the power supply mode is negotiated to 802.3af, the radio mode is limited to 2.4 GHz (2x2), the 5 GHz radio is disabled, and the radio transmit power decreases by 3 dB.
DC power supply description	No function is limited.

5.1.23 AirEngine 5773I-21

Overview

Table 5-111 Basic information about the AirEngine 5773I-21

Item	Details
Description	AirEngine5773I-21(11be outdoor,2+2 dual-band,omnidirectional antenna,BLE)
Part Number	50089276

Item	Details
Model	AirEngine 5773I-21
First supported version	V600R025C00

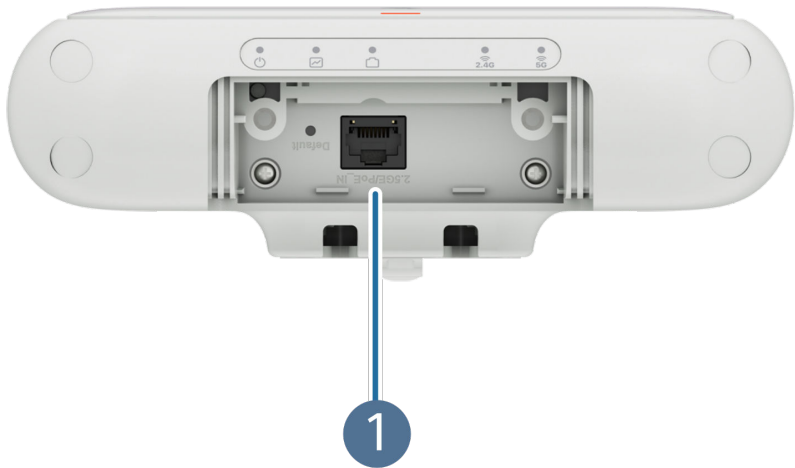
Appearance

Figure 5-67 Appearance of the AirEngine 5773I-21



Ports

Figure 5-68 Ports on the AirEngine 5773I-21



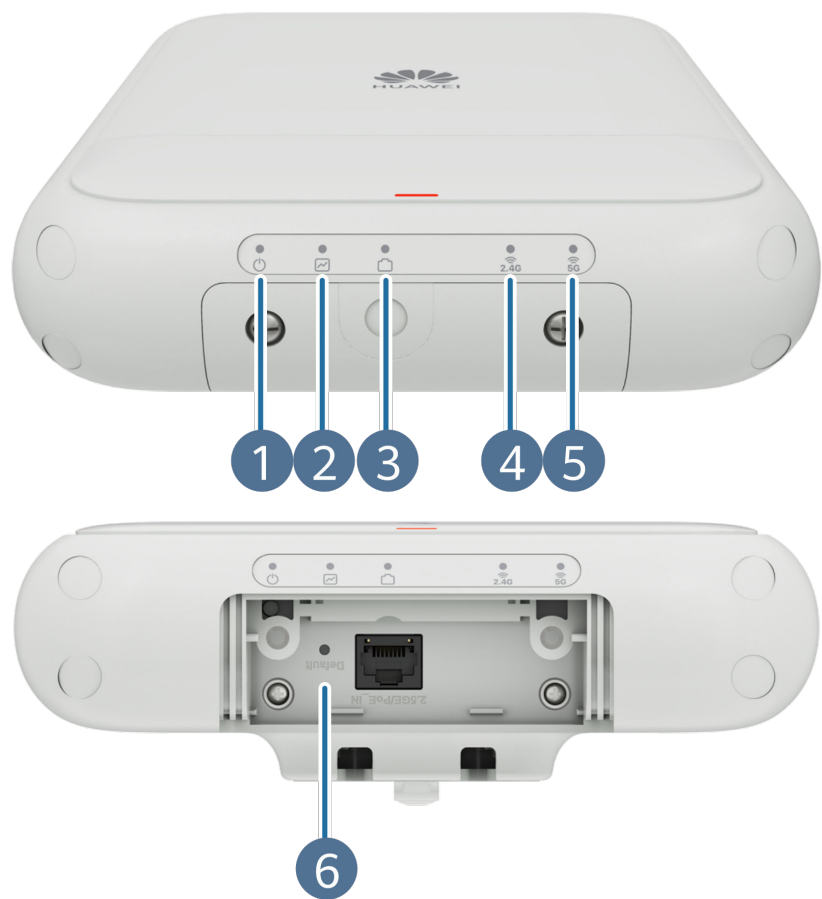
1	2.5GE/PoE_IN	-	-
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Table 5-112 Ports on the AirEngine 5773I-21

Port	Connector Type	Description	Available Components
2.5GE/PoE_IN	RJ45	100M/1000M/2.5G auto-sensing Ethernet electrical port that connects to the wired Ethernet and supports PoE input.	Network cable

Indicators and Buttons

Figure 5-69 Indicators and buttons on the AirEngine 5773I-21



1	PWR	2	SYS
3	LINK/ACT	4	WIRELESS0
5	WIRELESS1	6	Default

Table 5-113 Indicators on the AirEngine 5773I-21

Silkscreen	Name	Color	Status	Description
PWR	Power indicator	-	Off	The system is not powered on.
		Green	Steady on	The system is powered on properly.
SYS	System indicator	-	Off	The system is not running.
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Blinking once every 0.25s (4 Hz)	<p>The AP works in Fat or Fit mode.</p> <ul style="list-style-type: none">• The software is being upgraded.• In Fit mode, the AP is requesting to go online or fails to go online.
		Green	Slow blinking (0.5 Hz)	The AP runs in Fat, Fit, or cloud mode, the Ethernet connection is normal, and STAs are associated with the AP.

Silkscreen	Name	Color	Status	Description
		Green	Slow blinking (0.2 Hz)	The AP runs in Fat, Fit, or cloud mode, the Ethernet connection is normal, and no STA is associated with the AP.
		Red	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings.
		Red	Steady on	The system is faulty.
LINK/ACT	Port indicator	-	Off	The port is in link-down state.
		Green	Blinking	The Ethernet connection is normal.
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.

Silkscreen	Name	Color	Status	Description
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Table 5-114 Buttons on the AirEngine 5773I-21

Silkscreen	Name	Description
Default	Reset button	If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks red fast and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-115 Technical specifications of the AirEngine 5773I-21

Item	Specification
Installation Type	<ul style="list-style-type: none">WallPole
Dimensions without packaging (H x W x D) [mm(in.)]	270 mm x 196 mm x 51 mm (10.63 in. x 7.72 in. x 2.01 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	110 mm x 356 mm x 250 mm (4.33 in. x 14.02 in. x 9.84 in.)
Weight without packaging [kg(lb)]	1.14 kg (2.51 lb)
Weight with packaging [kg(lb)]	1.78 kg (3.92 lb)
Storage	NAND Flash 256 MB
Console port	None
Maximum power consumption [W]	18.8 W
Maximum heat dissipation [BTU/hour]	64.15 BTU/hour
Power supply mode	PoE
Rated input voltage [V]	PoE: 802.3at
Input voltage range [V]	PoE: 802.3at

Item	Specification
Service port surge protection	<p>PoE port:</p> <p>Surge:</p> <p>Differential mode: 1.5 kV (D.1), 10/700 us, 15 ohms + 25 ohms, criterion B</p> <p>Differential mode: 1.5 kV (D.2), 10/700 us, 15 ohms + 25 ohms, criterion C</p> <p>Common mode: 6 kV (C.3), 10/700 us, 15 ohms + 25 ohms/wire, criterion B: 6)</p> <p>Differential mode: 1 kV (D.1), 1.2/50 us, 42 ohms, criterion B;</p> <p>Differential mode: 1 kV (D.2), 1.2/50 us, 42 ohms, criterion B;</p> <p>Common mode: 2 kV (C.3), 1.2/50 us, 2 ohms + 40 ohms x n/wire, criterion B</p> <p>Inrush current:</p> <p>Differential mode: 250 A (D.2), 8/20 μs, criterion C</p> <p>Common mode: 6 kA/8-wire, 8/20 us, criterion C</p>
PoE OUT	Not supported
Maximum number of physical ports on the entire device	2.5GE (RJ45) x 1, 100M/1000M/2.5G auto-sensing
Long-term operating temperature [°C(°F)]	–30°C to +60°C (–22°F to +140°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +70°C (–40°F to +158°F)
Long-term operating relative humidity [RH]	<p>Operating humidity: 5% RH to 95% RH</p> <p>Storage humidity: 5% RH to 95% RH (non-condensing)</p>
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP65
Ground	Floating ground

Item	Specification
Wind resistance	77 m/s
USB	Not supported
IoT slot	Not supported
BLE	BLE5.2
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Radio 0 (2.4 GHz): 2x2 Radio 1 (5 GHz): 2x2
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax/be 5 GHz: 802.11a/n/ac/ac Wave 2/ax/be
Radio interface	Built-in omnidirectional antennas
Antenna gain	2.4 GHz: 4 dBi/chain (peak value) 2 dBi (combined gain) 5 GHz: 7 dBi/chain (peak value) 4 dBi (combined gain) BLE: 3 dBi
Maximum transmit power	2.4 GHz: 25 dBm/chain 28 dBm (combined power) 5 GHz: 24 dBm/chain 27 dBm (combined power) BLE: < 10 dBm
Singal radio transmit power [dBm]	2.4 GHz: 0 dBm to 25 dBm/chain 5 GHz: 0 dBm to 24 dBm/chain
MTBF [year]	171.23 year
MTTR [hour]	2 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	The power supply mode is negotiated to 802.3at, and no function is restricted.

Item	Specification
802.3at power supply description	The power supply mode is negotiated to 802.3at, and no function is restricted.
802.3af power supply description	Not supported.
DC power supply description	Not supported

5.1.24 AirEngine 5576I-X6EH

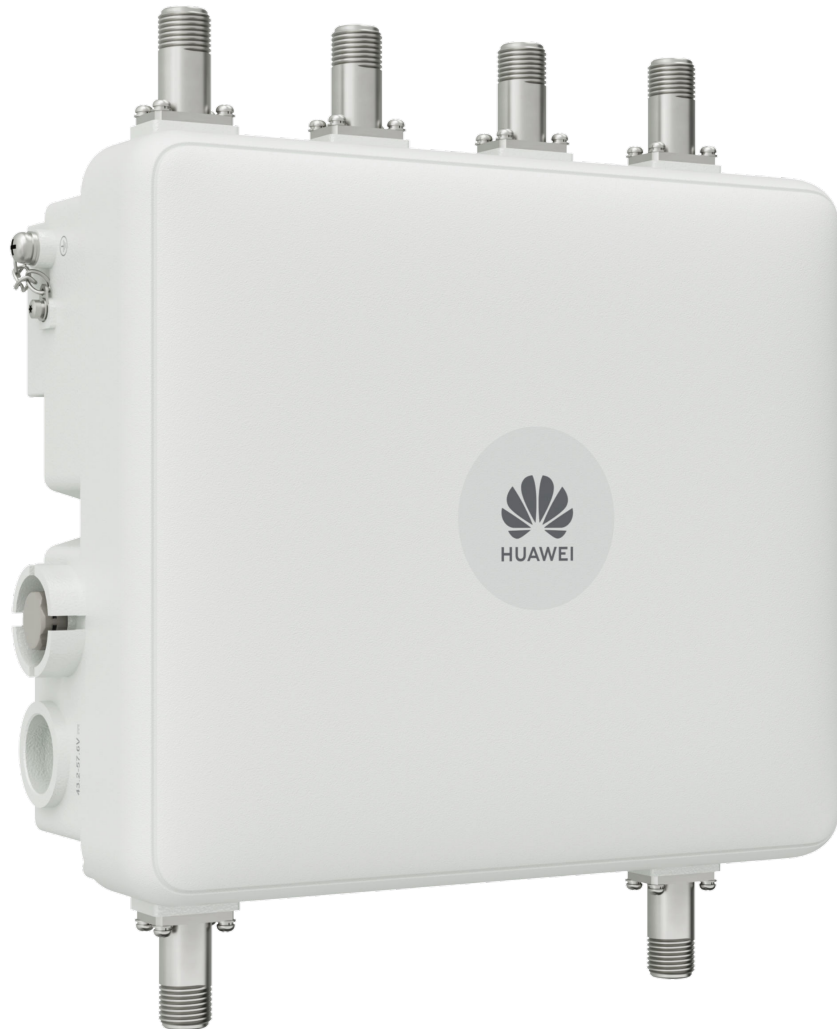
Overview

Table 5-116 Basic information about the AirEngine 5576I-X6EH

Item	Details
Description	AirEngine5576I-X6EH(11be outdoor,2+4 dual bands,external antenna,USB,BLE)
Part Number	50088010
Model	AirEngine 5576I-X6EH
First supported version	V600R024C10

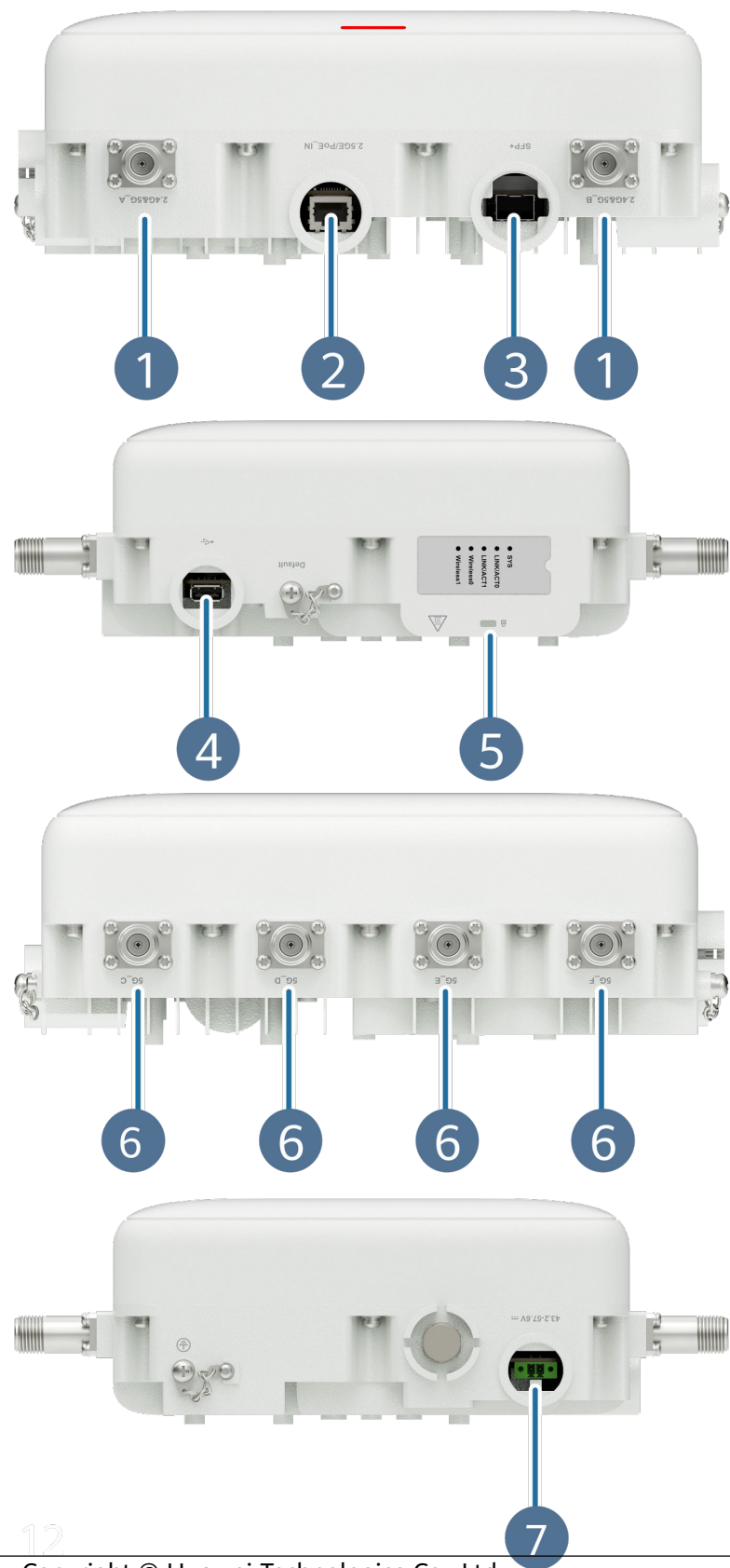
Appearance

Figure 5-70 Appearance of the AirEngine 5576I-X6EH



Ports

Figure 5-71 Ports on the AirEngine 5576I-X6EH



1	2.4G/5G_A~2.4G/5G_B	2	2.5GE/PoE_IN
3	SFP+	4	USB
5	Security slot	6	5G_C to 5G_F
7	DC port	-	-

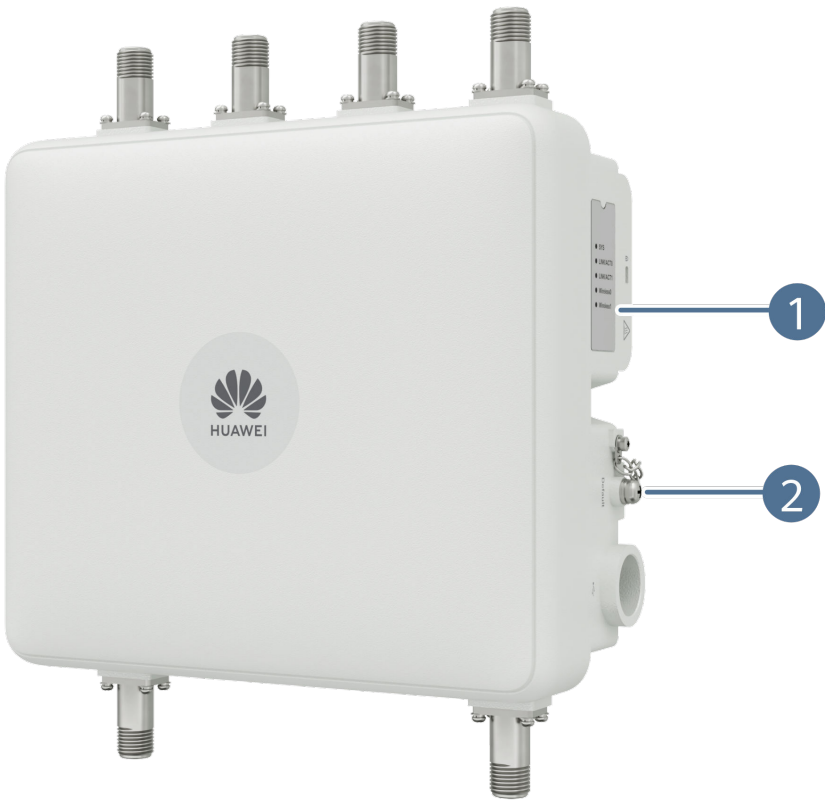
Table 5-117 Ports on the AirEngine 5576I-X6EH

Port	Connector Type	Description	Available Components
2.5GE/PoE_IN	RJ45	100M/1000M/2.5G auto-sensing Ethernet electrical port that connects to the wired Ethernet and supports PoE input.	Network cable
SFP+	SFP+	Ethernet optical port, supporting 1G/2.5G/10G auto-sensing and working with a matching optical module.	Optical module
DC 48V	Phoenix terminal block	DC power port, used in DC power supply scenarios and supporting a voltage range of 43.2 V to 57.6 V. (Easy installation with no restrictions on the positive and negative poles on the port side)	Phoenix terminal block
USB	USB 2.0 Type A	Connects to an IoT terminal to implement IoT applications.	IoT module

Port	Connector Type	Description	Available Components
2.4G/5G_A and 2.4G/5G_B	N-Type Female	Connects to a 2.4 GHz or 5 GHz antenna for transmitting and receiving service signals.	Antenna
5G_C to 5G_F	N-Type Female	Connects to a 5 GHz antenna for transmitting and receiving service signals.	Antenna

Indicators and Buttons

Figure 5-72 Indicators and buttons on the AirEngine 5576I-X6EH



The indicator is located inside the panel, which turns on after the AP is powered on.

1	Indicator	2	Default
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Table 5-118 Indicators on the AirEngine 5576I-X6EH

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP.
		Green	Slow blinking (0.2 Hz)	The AP is running properly, the Ethernet connection is normal, and no STA is associated with the AP.

Silkscreen	Name	Color	Status	Description
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none"> The bottom-layer system is being started. The software is being upgraded. After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings.
		Red	Steady on	The system is faulty.
LINK/ACT0 and LINK/ACT1	Port indicator	Green	Blinking	The Ethernet connection is normal.
		-	Off	The port is in link-down state.

Silkscreen	Name	Color	Status	Description
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.

Silkscreen	Name	Color	Status	Description
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Table 5-119 Buttons on the AirEngine 5576I-X6EH

Silkscreen	Name	Description
Default	Reset button	If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-120 Technical specifications of the AirEngine 5576I-X6EH

Item	Specification
Installation Type	<ul style="list-style-type: none">• Wall• Pole
Dimensions without packaging (H x W x D) [mm(in.)]	220 mm x 250 mm x 77 mm (8.66 in. x 9.84 in. x 3.03 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	170 mm x 555 mm x 370 mm (6.69 in. x 21.85 in. x 14.57 in.)
Weight without packaging [kg(lb)]	2.97 kg (6.55 lb)

Item	Specification
Weight with packaging [kg(lb)]	5.78 kg (12.74 lb)
Storage	NAND Flash 512 MB
Console port	Bluetooth console
Maximum power consumption [W]	21.4 (excluding USB)
Maximum heat dissipation [BTU/hour]	73.02 BTU/hour
Power supply mode	<ul style="list-style-type: none"> PoE DC power adapter
Rated input voltage [V]	DC: 48 V PoE: 802.3bt/at/af
Input voltage range [V]	DC: 43.2 V to 57.6 V PoE: 802.3bt/at/af
Service port surge protection	<p>PoE port:</p> <p>Surge:</p> <p>Differential mode: 1.5 kV (D.1), 10/700 us, 15 ohms + 25 ohms, criterion B</p> <p>Differential mode: 1.5 kV (D.2), 10/700 us, 15 ohms + 25 ohms, criterion C</p> <p>Common mode: 6 kV (C.3), 10/700 us, 15 ohms + 25 ohms/wire, criterion B: 6)</p> <p>Differential mode: 1 kV (D.1), 1.2/50 us, 42 ohms, criterion B;</p> <p>Differential mode: 1 kV (D.2), 1.2/50 us, 42 ohms, criterion B;</p> <p>Common mode: 2 kV (C.3), 1.2/50 us, 2 ohms + 40 ohms x n/wire, criterion B</p> <p>Inrush current:</p> <p>Differential mode: 250 A (D.2), 8/20 μs, criterion C</p> <p>Common mode: 6 kA/8-wire, 8/20 us, criterion C</p>
PoE OUT	Not supported
Maximum number of physical ports on the entire device	2.5GE (RJ45) x 1, 100M/1000M/2500M auto-sensing 10GE optical (SFP+), GE/2.5GE/10GE auto-sensing

Item	Specification
Long-term operating temperature [°C(°F)]	–40°C to +70°C (–40°F to +158°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP68
Ground	Grounding
Antenna port surge protection [kA]	5 kA surge protection capability without external surge protection devices
Wind resistance	67 m/s
USB	USB 2.0, power supply: 2.5 W/5 W
IoT slot	Not supported
BLE	BLE5.2
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Mode 1: Radio 0 (2.4 GHz): 2x2 Radio 1 (5 GHz): 4x4 Mode 2: Radio 0 (5 GHz-0): 2x2 Radio 1 (5 GHz-1): 4x4
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax/be 5 GHz: 802.11a/n/ac/ac Wave 2/ax/be
Radio interface	External antenna

Item	Specification
Antenna gain	BLE: 5 dBi
Maximum transmit power	<p>Mode 1:</p> <p>2.4 GHz:</p> <p>25 dBm/chain</p> <p>28 dBm (combined power)</p> <p>5 GHz:</p> <p>24 dBm/chain</p> <p>30 dBm (combined power)</p> <p>Mode 2:</p> <p>5 GHz-0:</p> <p>24 dBm/chain</p> <p>27 dBm (combined power)</p> <p>5 GHz-1:</p> <p>24 dBm/chain</p> <p>30 dBm (combined power)</p> <p>BLE: < 10 dBm</p>
Singal radio transmit power [dBm]	<p>Mode 1:</p> <p>2.4 GHz: -10 dBm to +25 dBm/chain</p> <p>5 GHz: -10 dBm to +24 dBm/chain</p> <p>Mode 2:</p> <p>5 GHz-0: -10 dBm to +24 dBm/chain</p> <p>5 GHz-1: -10 dBm to +24 dBm/chain</p>
MTBF [year]	123.6650971 year
MTTR [hour]	2 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	The power supply mode is negotiated to 802.3bt, and no function is restricted.
802.3at power supply description	When the power supply mode is negotiated to 802.3at and a 5 W USB module is used, the radio transmit power decreases by 3 dB.
802.3af power supply description	When the power supply mode is negotiated to 802.3af, the radio mode is limited to 2.4 GHz (2x2), the 5 GHz radio is disabled, and the radio transmit power decreases by 3 dB.
DC power supply description	No function is limited.

5.1.25 AP761

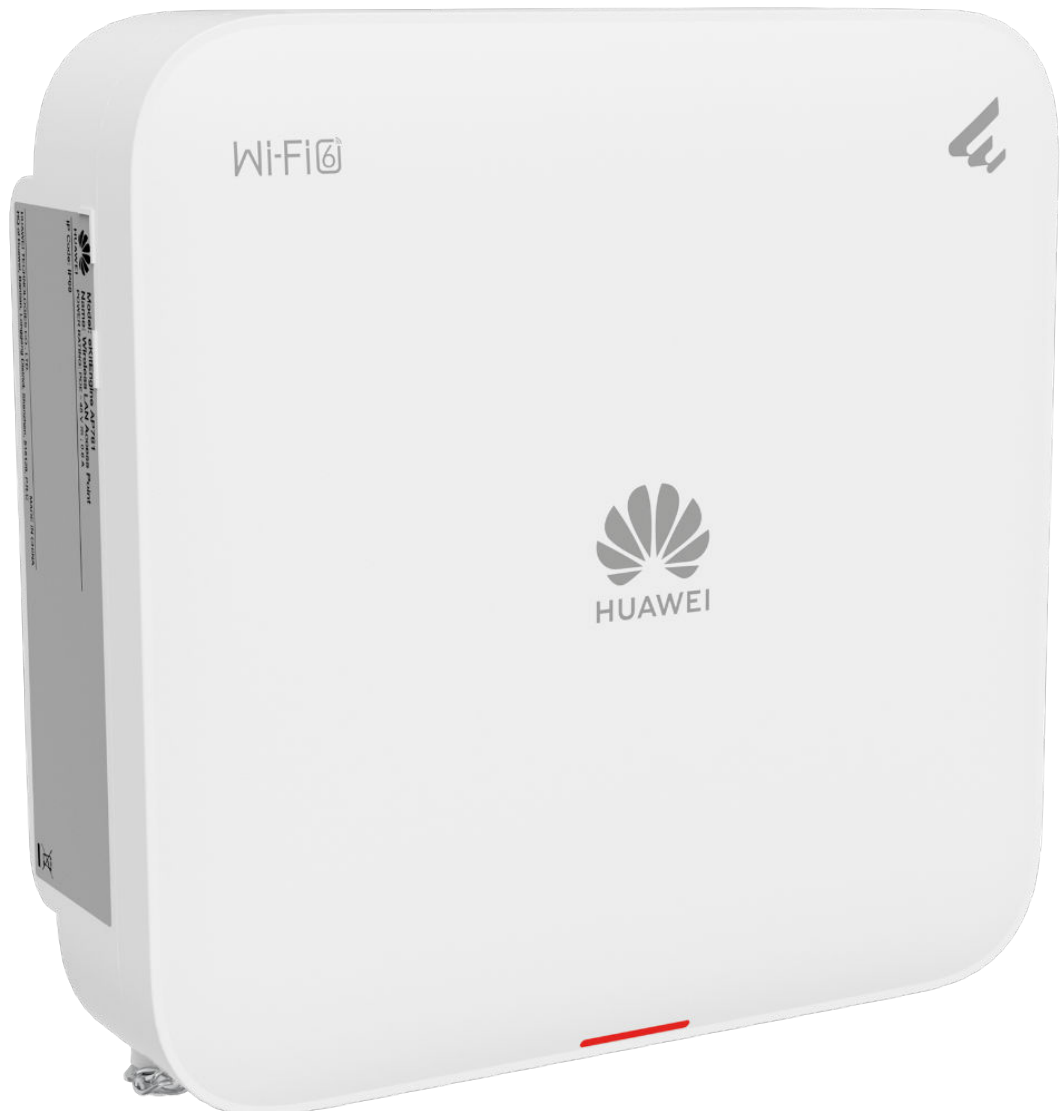
Overview

Table 5-121 Basic information about the AP761

Item	Details
Description	AP761 (11ax outdoor, 2+2 dual bands, built-in antenna, BLE)
Part Number	02355VFB
Model	AP761
First supported version	V200R023C10

Appearance

Figure 5-73 Appearance of the AP761



Indicators and Buttons

Figure 5-74 Indicators and buttons on the AP761

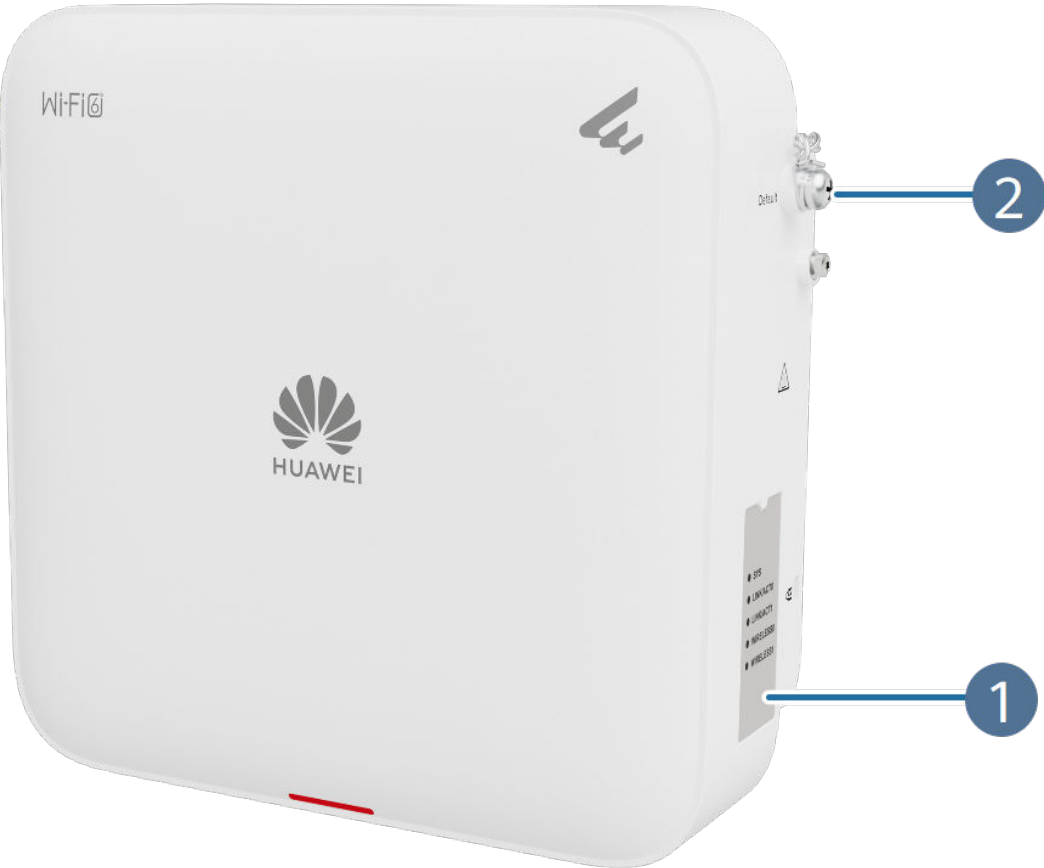


Table 5-122 Indicators on the AP761

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.
		Green	Steady on	<ul style="list-style-type: none">The system is just powered on.The system is starting after a reset.The upper-layer system is starting.

Silkscreen	Name	Color	Status	Description
		Green	Steady on after blinking once	After the hardware reset is cleared and the software starts, the indicator blinks once. Then, the indicator is steady on until the bottom-layer system starts.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP.
		Green	Slow blinking (0.2 Hz)	The AP is running properly, the Ethernet connection is normal, and no STA is associated with the AP.

Silkscreen	Name	Color	Status	Description
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The bottom-layer system is being started.• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V200R024C00 and later versions.
		Red	Steady on	The system is faulty.

Silkscreen	Name	Color	Status	Description
LINK/ACT0	GE electrical port indicator	Green	Blinking	The port is running properly and the Ethernet connection is normal.
		-	Off	The port is in link-down state.
LINK/ACT1	SFP optical port indicator	Green	Blinking	The port is running properly and the Ethernet connection is normal.
		-	Off	The port is in link-down state.
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Silkscreen	Name	Color	Status	Description
WIRELESS0	Radio 0 status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Green	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Green	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.
		Green	Steady on	The AP is connected to a Mesh network and has good signal strength.
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.

Silkscreen	Name	Color	Status	Description
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (signal strength mode)	-	Off	The AP is not connected to a Mesh network or has extremely poor signal strength.
		Yellow	Slow blinking (0.5 Hz)	The AP is connected to a Mesh network and has poor signal strength.
		Yellow	Blinking once every 0.25s (4 Hz)	The AP is connected to a Mesh network and has medium signal strength.
		Yellow	Steady on	The AP is connected to a Mesh network and has good signal strength.

Table 5-123 Buttons on the AP761

Silkscreen	Name	Description
Default	Reset button	<ul style="list-style-type: none">For V200R023C10: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the device restores the factory settings, switches to the cloud mode, and restarts.For V200R024C00 and later versions: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the cloud mode, and restarts.

Ports

Figure 5-75 Ports on the AP761

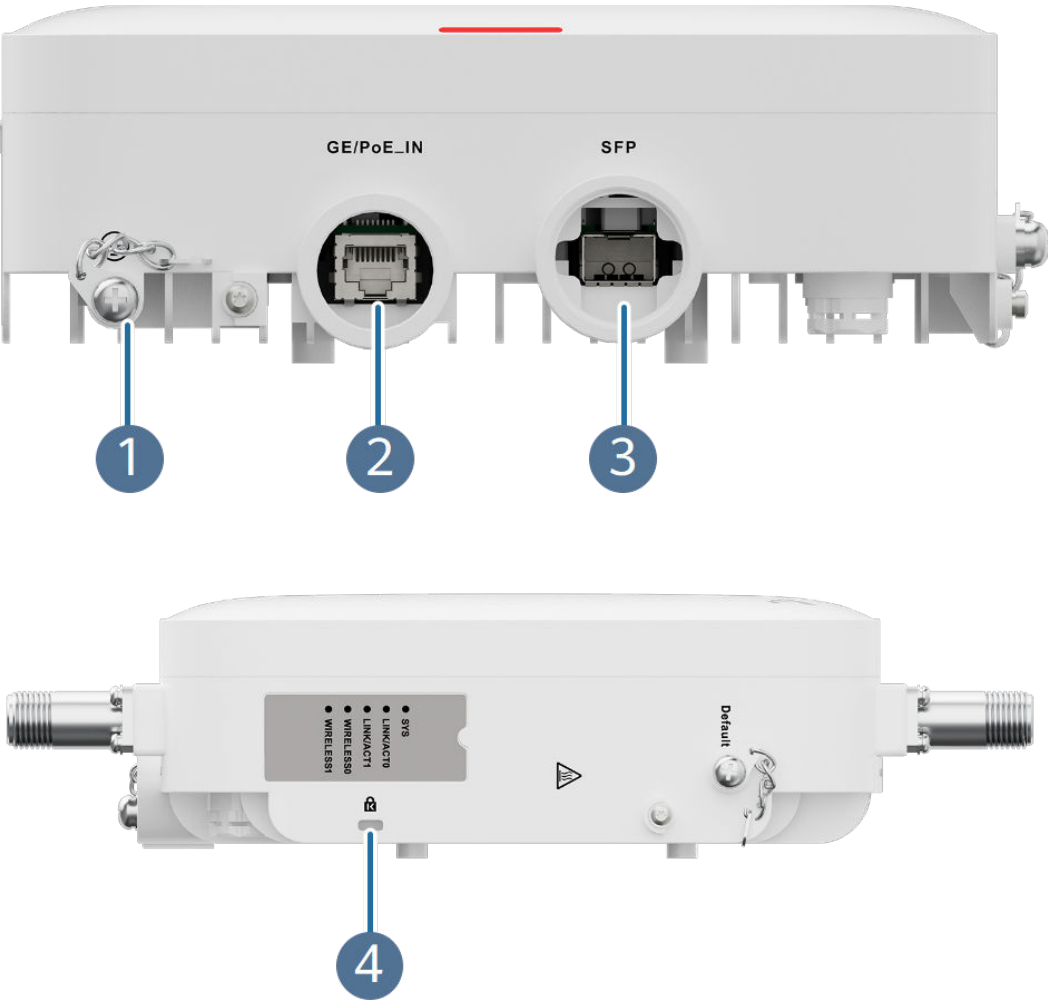


Table 5-124 Ports on the AP761

Port	Connector Type	Description	Available Components
GE/PoE_IN	RJ45	Ethernet electrical port that supports 10/100/1000M auto-sensing, connects to the wired Ethernet, and supports PoE input	Network cable

Port	Connector Type	Description	Available Components
SFP	SFP	Ethernet optical port, supporting 1000 Mbit/s and working with a matching optical transceiver.	Optical module

Technical Specifications

Table 5-125 Technical specifications of the AP761

Item	Specification
Installation Type	<ul style="list-style-type: none"> Wall Pole
Dimensions without packaging (H x W x D) [mm(in.)]	69 mm x 200 mm x 200 mm (2.72 in. x 7.87 in. x 7.87 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	160 mm x 470 mm x 390 mm (6.30 in. x 18.50 in. x 15.35 in.)
Weight without packaging [kg(lb)]	1.91 kg (4.21 lb)
Weight with packaging [kg(lb)]	3.73 kg (8.22 lb)
Storage	NAND Flash 512 MB
Console port	None
Maximum power consumption [W]	17.7 W
Maximum heat dissipation [BTU/hour]	60.4 BTU/hour
Power supply mode	PoE
Input voltage range [V]	PoE: 802.3at/af
Service port surge protection	6 kA in common mode
PoE OUT	Not supported
Maximum number of physical ports on the entire device	GE (RJ45) x 1, 10M/100M/1000M auto-sensing GE optical port (SFP)

Item	Specification
Long-term operating temperature [°C(°F)]	–40°C to +65°C (–40°F to +149°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	0% RH to 100% RH
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP68
Ground	Grounding
Antenna port surge protection [kA]	N/A
Wind resistance	67 m/s
USB	Not supported
IoT slot	Not supported
BLE	BLE5.2
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> • 2.4GHz • 5GHz
MIMO spatial streams	Radio 0 (2.4 GHz): 2x2 Radio 1 (5 GHz): 2x2
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax 5 GHz: 802.11a/n/ac/ac Wave 2/ax
Radio interface	Built-in directional antennas
Antenna gain	2.4G: 10 dBi 5G: 11 dBi BLE: 5 dBi

Item	Specification
Beamwidth of the built-in antenna [degrees]	2.4 GHz: <ul style="list-style-type: none"> Horizontal plane: 65° Vertical plane: 40° 5 GHz: <ul style="list-style-type: none"> Horizontal plane: 65° Vertical plane: 20°
Maximum transmit power	2.4G: 28 dBm (Max) 5G: 27 dBm (Max) NOTE This is the total MIMO radio power, which is the same as: 2.4G: 25 dBm/chain (Max) 5G: 24 dBm/chain (Max) BLE: < 10 dBm
Singal radio transmit power [dBm]	2.4G: -10 dBm to 25 dBm/chain 5G: -10 dBm to 24 dBm/chain
MTBF [year]	123 year
MTTR [hour]	0.5 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	No function is limited.
802.3at power supply description	No function is limited.
802.3af power supply description	Wi-Fi: 2.4 GHz (2x2) + 5 GHz (2x2). The maximum combined power is adjusted to 23 dBm (2.4 GHz) and 23 dBm (5 GHz). Wired network port: The SFP optical port and GE/PoE_IN work as combo ports, and only one of them is working at a time. If both of them are enabled, the optical port takes effect preferentially.

5.1.26 AP771

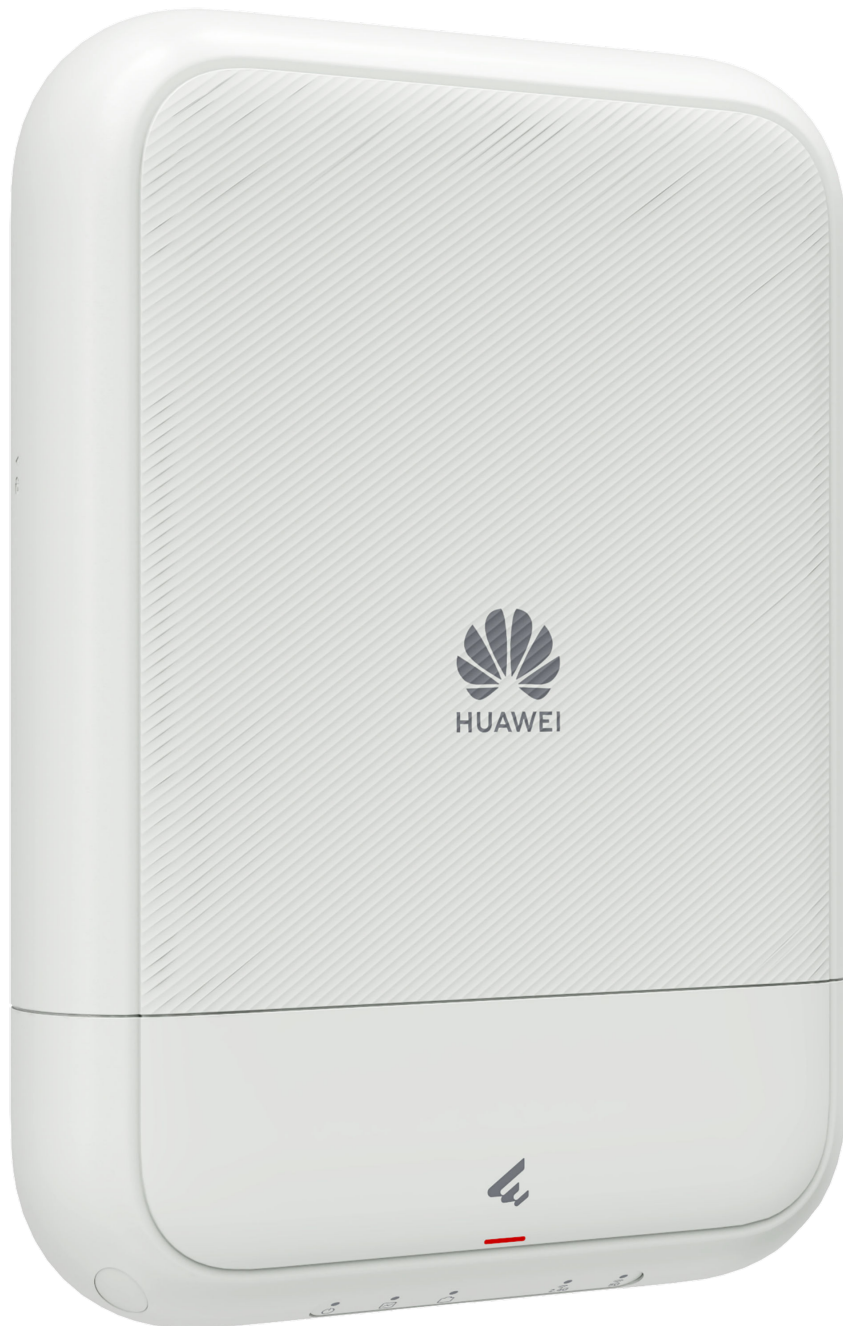
Overview

Table 5-126 Basic information about the AP771

Item	Details
Description	AP771(11be outdoor,2+2 dual-band,omnidirectional antenna)
Part Number	50088525
Model	AP771
First supported version	V600R025C00

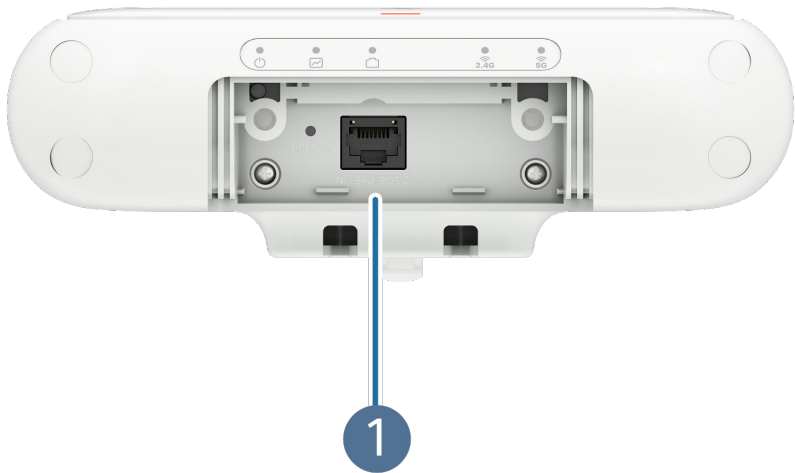
Appearance

Figure 5-76 Appearance of the AP771



Ports

Figure 5-77 Ports on the AP771



1	2.5GE/PoE_IN	-	-
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Table 5-127 Ports on the AP771

Port	Connector Type	Description	Available Components
2.5GE/PoE_IN	RJ45	100M/1000M/2.5G auto-sensing Ethernet electrical port that connects to the wired Ethernet and supports PoE input.	Network cable

Indicators and Buttons

Figure 5-78 Indicators and buttons on the AP771



1	PWR	2	SYS
3	LINK/ACT	4	WIRELESS0
5	WIRELESS1	6	Default

Table 5-128 Indicators on the AP771

Silkscreen	Name	Color	Status	Description
PWR	Power indicator	-	Off	The system is not powered on.
		Green	Steady on	The system is powered on properly.
SYS	System indicator	-	Off	The system is not running.
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Blinking once every 0.25s (4 Hz)	<p>The AP works in Fat or Fit mode.</p> <ul style="list-style-type: none">• The software is being upgraded.• In Fit mode, the AP is requesting to go online or fails to go online.
		Green	Slow blinking (0.5 Hz)	The AP runs in Fat or Fit mode, the Ethernet connection is normal, and STAs are associated with the AP.

Silkscreen	Name	Color	Status	Description
		Green	Slow blinking (0.2 Hz)	The AP runs in Fat or Fit mode, the Ethernet connection is normal, and no STA is associated with the AP.
		Blue	Blinking once every 0.25s (4 Hz)	The AP works in cloud mode and is connecting to the cloud management controller (including reconnection after disconnection).
		Blue	Slow blinking (0.5 Hz)	The AP works in cloud mode, has gone online on the cloud management controller, and is running properly.
		Red	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings.
		Red	Steady on	The system is faulty.
LINK/ACT	Port indicator	-	Off	The port is in link-down state.
		Green	Blinking	The Ethernet connection is normal.

Silkscreen	Name	Color	Status	Description
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.

Silkscreen	Name	Color	Status	Description
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Table 5-129 Buttons on the AP771

Silkscreen	Name	Description
Default	Reset button	If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks red fast and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-130 Technical specifications of the AP771

Item	Specification
Installation Type	<ul style="list-style-type: none">WallPole
Dimensions without packaging (H x W x D) [mm(in.)]	270 mm x 196 mm x 51 mm (10.63 in. x 7.72 in. x 2.01 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	110 mm x 356 mm x 250 mm (4.33 in. x 14.02 in. x 9.84 in.)
Weight without packaging [kg(lb)]	1.14 kg (2.51 lb)
Weight with packaging [kg(lb)]	1.78 kg (3.92 lb)
Storage	NAND Flash 256 MB

Item	Specification
Console port	None
Maximum power consumption [W]	18.8 W
Maximum heat dissipation [BTU/hour]	64.15 BTU/hour
Power supply mode	PoE
Rated input voltage [V]	PoE: 802.3at/af
Input voltage range [V]	PoE: 802.3at/af
Service port surge protection	<p>PoE port:</p> <p>Surge:</p> <p>Differential mode: 1.5 kV (D.1), 10/700 us, 15 ohms + 25 ohms, criterion B</p> <p>Differential mode: 1.5 kV (D.2), 10/700 us, 15 ohms + 25 ohms, criterion C</p> <p>Common mode: 6 kV (C.3), 10/700 us, 15 ohms + 25 ohms/wire, criterion B: 6)</p> <p>Differential mode: 1 kV (D.1), 1.2/50 us, 42 ohms, criterion B;</p> <p>Differential mode: 1 kV (D.2), 1.2/50 us, 42 ohms, criterion B;</p> <p>Common mode: 2 kV (C.3), 1.2/50 us, 2 ohms + 40 ohms x n/wire, criterion B</p> <p>Inrush current:</p> <p>Differential mode: 250 A (D.2), 8/20 μs, criterion C</p> <p>Common mode: 6 kA/8-wire, 8/20 us, criterion C</p>
PoE OUT	Not supported
Maximum number of physical ports on the entire device	2.5GE (RJ45) x 1, 100M/1000M/2.5G auto-sensing
Long-term operating temperature [°C(°F)]	<p>–30°C to +60°C (–22°F to +140°F)</p> <p>(From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)</p>
Storage temperature [°C(°F)]	–40°C to +70°C (–40°F to +158°F)

Item	Specification
Long-term operating relative humidity [RH]	Operating humidity: 5% RH to 95% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	-60 m to +5000 m (-196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP65
Ground	Floating ground
Wind resistance	77 m/s
USB	Not supported
IoT slot	Not supported
BLE	Not supported
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Radio 0 (2.4 GHz): 2x2 Radio 1 (5 GHz): 2x2
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax/be 5 GHz: 802.11a/n/ac/ac Wave 2/ax/be
Radio interface	Built-in omnidirectional antennas
Antenna gain	2.4 GHz: 4 dBi/chain (peak value) 2 dBi (combined gain) 5 GHz: 7 dBi/chain (peak value) 4 dBi (combined gain)
Maximum transmit power	2.4 GHz: 25 dBm/chain 28 dBm (combined power) 5 GHz: 24 dBm/chain 27 dBm (combined power)

Item	Specification
Singal radio transmit power [dBm]	2.4 GHz: 0 dBm to 25 dBm/chain 5 GHz: 0 dBm to 24 dBm/chain
MTBF [year]	171.23 year
MTTR [hour]	2 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	The power supply mode is negotiated to 802.3at, and no function is restricted.
802.3at power supply description	The power supply mode is negotiated to 802.3at, and no function is restricted.
802.3af power supply description	If the power supply mode is negotiated to 802.3af, the ambient temperature range is -10°C to +60°C (14°F to 140°F), and the radio transmit power decreases by 3 dB.
DC power supply description	Not supported

5.1.27 AP761E

Overview

Table 5-131 Basic information about the AP761E

Item	Details
Description	AP761E(11ax outdoor,2+4 dual bands,directional antenna,USB)
Part Number	50088136
Model	AP761E
First supported version	V600R024C10

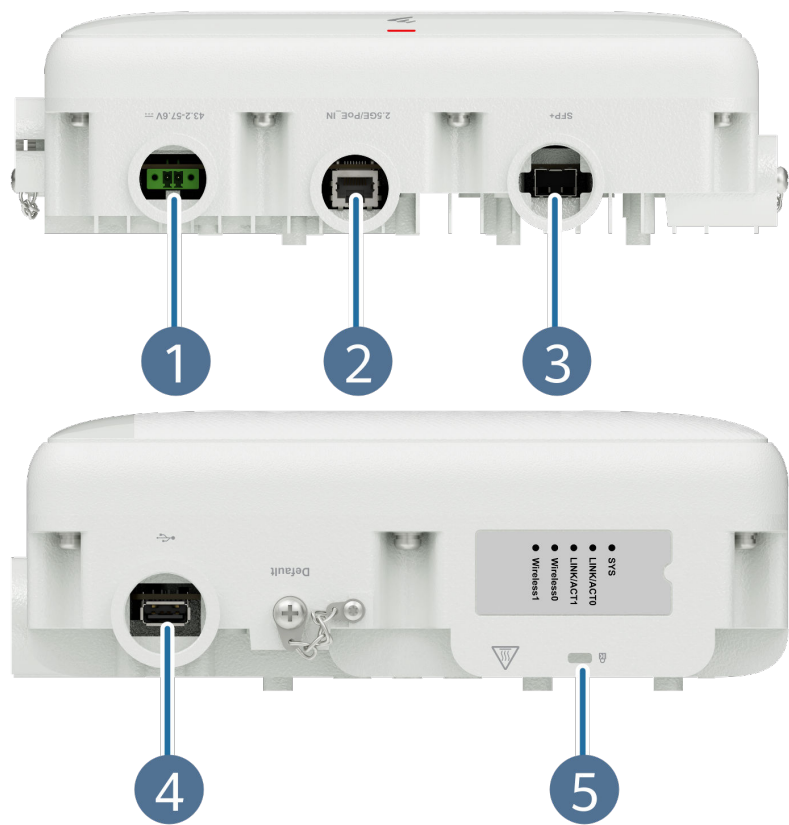
Appearance

Figure 5-79 Appearance of the AP761E



Ports

Figure 5-80 Ports on the AP761E



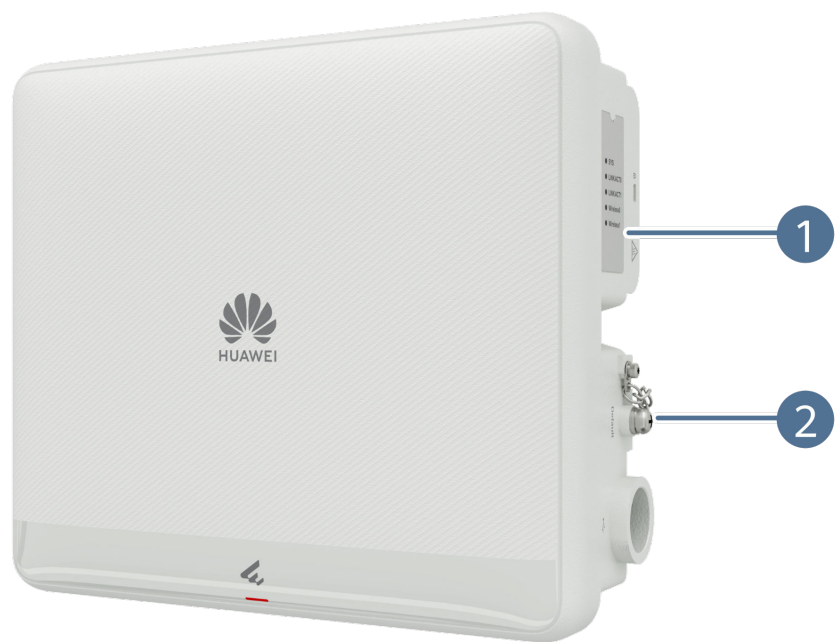
1	DC port	2	2.5GE/PoE_IN
3	SFP+	4	USB
5	Security slot	-	-

Table 5-132 Ports on the AP761E

Port	Connector Type	Description	Available Components
2.5GE/PoE_IN	RJ45	100M/1000M/2.5G auto-sensing Ethernet electrical port that connects to the wired Ethernet and supports PoE input.	Network cable
SFP+	SFP+	Ethernet optical port, supporting 1G/2.5G/10G auto-sensing and working with a matching optical module.	Optical module
DC 48V	Phoenix terminal block	DC power port connected to a 48 V power adapter. (Easy installation with no restrictions on the positive and negative poles on the port side)	48 V power adapter
USB	USB Type A	Provides 2.5 W or 5 W power supply.	-

Indicators and Buttons

Figure 5-81 Indicators and buttons on the AP761E



1	Indicator	2	Default
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Table 5-133 Indicators on the AP761E

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP.
		Green	Slow blinking (0.2 Hz)	The AP is running properly, the Ethernet connection is normal, and no STA is associated with the AP.

Silkscreen	Name	Color	Status	Description
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V600R024C10.

Silkscreen	Name	Color	Status	Description
		Red	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V600R25C00 or later.
		Red	Steady on	The system is faulty.
LINK/ACT0 and LINK/ACT1	Port indicator	Green	Blinking	The Ethernet connection is normal.
		-	Off	The port is in link-down state.
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Silkscreen	Name	Color	Status	Description
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Table 5-134 Buttons on the AP761E

Silkscreen	Name	Description
Default	Reset button	<ul style="list-style-type: none"> For V600R024C10: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts. For V600R025C00 and later versions: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks red fast and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-135 Technical specifications of the AP761E

Item	Specification
Installation Type	<ul style="list-style-type: none"> Wall Pole
Dimensions without packaging (H x W x D) [mm(in.)]	220 mm x 250 mm x 77 mm (8.66 in. x 9.84 in. x 3.03 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	170 mm x 555 mm x 370 mm (6.69 in. x 21.85 in. x 14.57 in.)
Weight without packaging [kg(lb)]	2.76 kg (6.08 lb)
Weight with packaging [kg(lb)]	5.65 kg (12.46 lb)

Item	Specification
Storage	NAND Flash 512 MB
Console port	None
Maximum power consumption [W]	20.4 (excluding USB)
Maximum heat dissipation [BTU/hour]	69.61 BTU/hour
Power supply mode	<ul style="list-style-type: none"> PoE DC power adapter
Rated input voltage [V]	DC: 48 V PoE: 802.3bt/at/af
Input voltage range [V]	DC: 43.2 V to 57.6 V PoE: 802.3bt/at/af
Service port surge protection	PoE port: Surge: Differential mode: 1.5 kV (D.1), 10/700 us, 15 ohms + 25 ohms, criterion B Differential mode: 1.5 kV (D.2), 10/700 us, 15 ohms + 25 ohms, criterion C Common mode: 6 kV (C.3), 10/700 us, 15 ohms + 25 ohms/wire, criterion B: 6) Differential mode: 1 kV (D.1), 1.2/50 us, 42 ohms, criterion B; Differential mode: 1 kV (D.2), 1.2/50 us, 42 ohms, criterion B; Common mode: 2 kV (C.3), 1.2/50 us, 2 ohms + 40 ohms x n/wire, criterion B Inrush current: Differential mode: 250 A (D.2), 8/20 μs, criterion C Common mode: 6 kA/8-wire, 8/20 us, criterion C
PoE OUT	Not supported
Maximum number of physical ports on the entire device	2.5GE (RJ45) x 1, 100M/1000M/2500M auto-sensing 10GE optical (SFP+), GE/2.5GE/10GE auto-sensing

Item	Specification
Long-term operating temperature [°C(°F)]	–40°C to +70°C (–40°F to +158°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP68
Ground	Grounding
Wind resistance	67 m/s
USB	Supplies power of 2.5 W or 5 W.
IoT slot	Not supported
BLE	Not supported
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Radio 0 (2.4 GHz): 2x2 Radio 1 (5 GHz): 4x4
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax 5 GHz: 802.11a/n/ac/ac Wave 2/ax
Radio interface	Built-in directional antennas
Antenna gain	2.4 GHz: 10 dBi/chain (peak value) 10 dBi (combined gain) 5 GHz: 11 dBi/chain (peak value) 10 dBi (combined gain)

Item	Specification
Beamwidth of the built-in antenna [degrees]	2.4 GHz: <ul style="list-style-type: none"> Horizontal plane: 70° Vertical plane: 35° 5 GHz: <ul style="list-style-type: none"> Horizontal plane: 60° Vertical plane: 20°
Maximum transmit power	2.4 GHz: 25 dBm/chain 28 dBm (combined power) 5 GHz: 24 dBm/chain 30 dBm (combined power)
Singal radio transmit power [dBm]	2.4 GHz: -10 dBm to 25 dBm/chain 5 GHz: -10 dBm to 24 dBm/chain
MTBF [year]	132.7633643 year
MTTR [hour]	2 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	The power supply mode is negotiated to 802.3bt, and no function is restricted.
802.3at power supply description	When the power supply mode is negotiated to 802.3at and 5 W USB power supply is used, the radio transmit power decreases by 3 dB.
802.3af power supply description	When the power supply mode is negotiated to 802.3af, the radio mode is limited to 2.4 GHz (2x2), the 5 GHz radio is disabled, and the radio transmit power decreases by 3 dB.
DC power supply description	No function is limited.

5.1.28 AP772

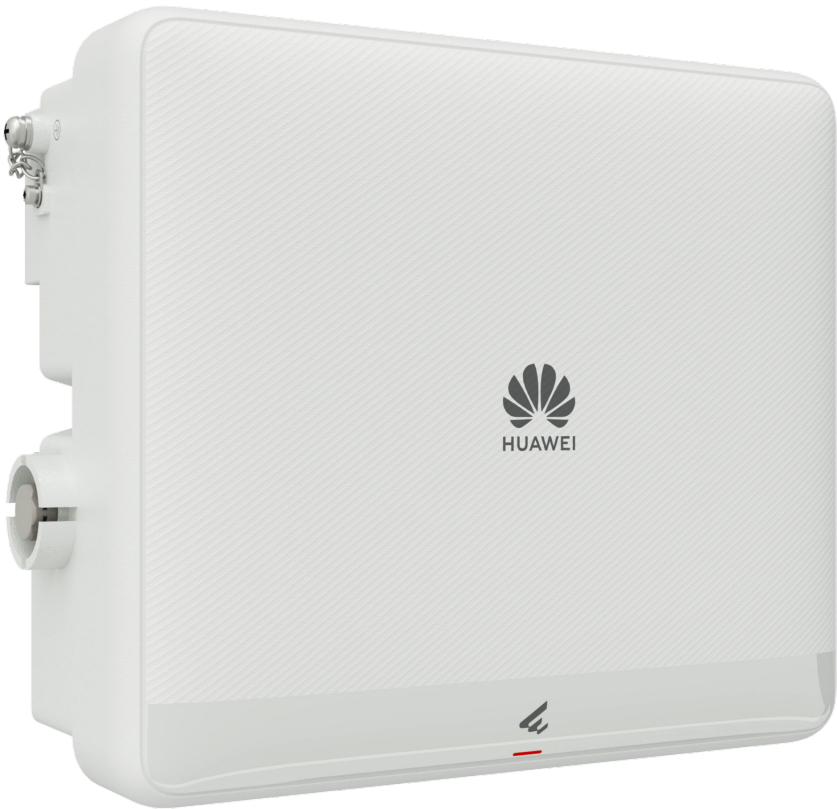
Overview

Table 5-136 Basic information about the AP772

Item	Details
Description	AP772(11be outdoor,2+4 dual bands,omnidirectional antenna,USB)
Part Number	50088137
Model	AP772
First supported version	V600R024C10

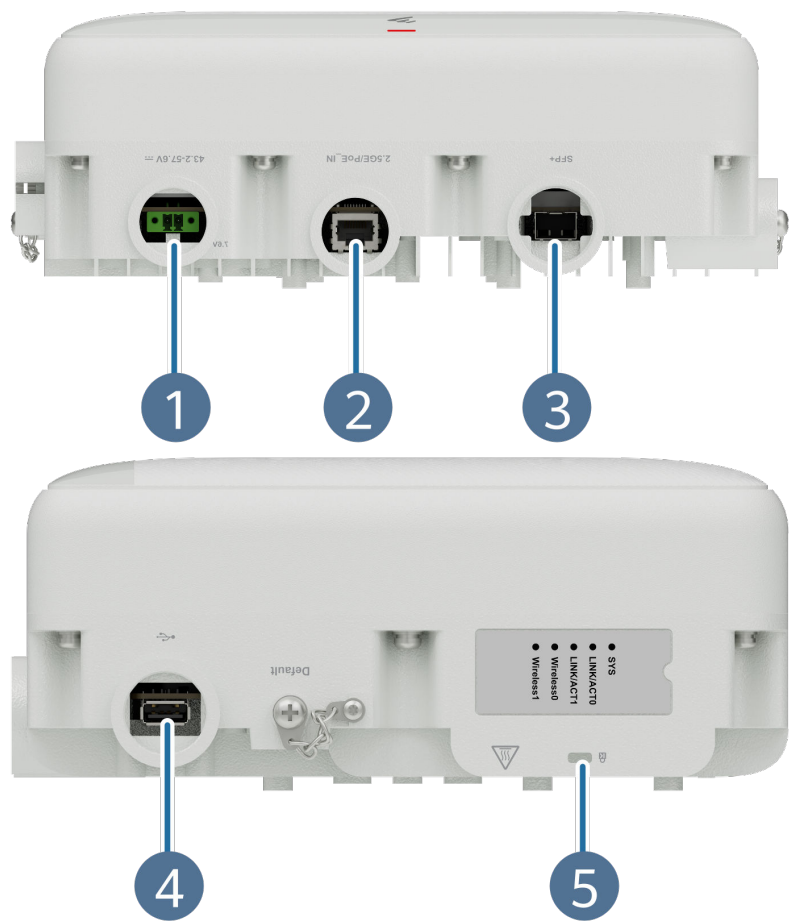
Appearance

Figure 5-82 Appearance of the AP772



Ports

Figure 5-83 Ports on the AP772



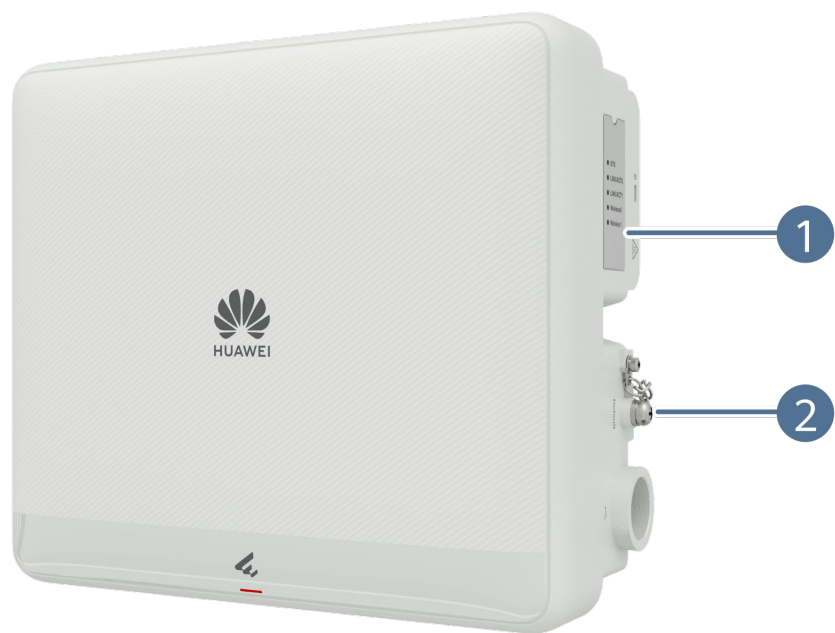
1	DC port	2	2.5GE/PoE_IN
3	SFP+	4	USB
5	Security slot	-	-

Table 5-137 Ports on the AP772

Port	Connector Type	Description	Available Components
2.5GE/PoE_IN	RJ45	100M/1000M/2.5G auto-sensing Ethernet electrical port that connects to the wired Ethernet and supports PoE input.	Network cable
SFP+	SFP+	Ethernet optical port, supporting 1G/2.5G/10G auto-sensing and working with a matching optical module.	Optical module
DC 48V	Phoenix terminal block	DC power port, used in DC power supply scenarios and supporting a voltage range of 43.2 V to 57.6 V. (Easy installation with no restrictions on the positive and negative poles on the port side)	Phoenix terminal block
USB	USB Type A	Provides 2.5 W or 5 W power supply.	-

Indicators and Buttons

Figure 5-84 Indicators and buttons on the AP772



1	Indicator	2	Default
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Table 5-138 Indicators on the AP772

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP.
		Green	Slow blinking (0.2 Hz)	The AP is running properly, the Ethernet connection is normal, and no STA is associated with the AP.

Silkscreen	Name	Color	Status	Description
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V600R024C10.

Silkscreen	Name	Color	Status	Description
		Red	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V600R25C00 or later.
		Red	Steady on	The system is faulty.
LINK/ACT0 and LINK/ACT1	Port indicator	Green	Blinking	The Ethernet connection is normal.
		-	Off	The port is in link-down state.
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Silkscreen	Name	Color	Status	Description
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Table 5-139 Buttons on the AP772

Silkscreen	Name	Description
Default	Reset button	<ul style="list-style-type: none"> For V600R024C10: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts. For V600R025C00 and later versions: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks red fast and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-140 Technical specifications of the AP772

Item	Specification
Installation Type	<ul style="list-style-type: none"> Wall Pole
Dimensions without packaging (H x W x D) [mm(in.)]	92 mm x 250 mm x 220 mm (3.62 in. x 9.84 in. x 8.66 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	185 mm x 555 mm x 370 mm (7.28 in. x 21.85 in. x 14.57 in.)
Weight without packaging [kg(lb)]	2.89 kg (6.37 lb)
Weight with packaging [kg(lb)]	5.42 kg (11.95 lb)

Item	Specification
Storage	NAND Flash 512 MB
Console port	None
Maximum power consumption [W]	20.4 (excluding USB)
Maximum heat dissipation [BTU/hour]	69.61 BTU/hour
Power supply mode	<ul style="list-style-type: none"> PoE DC power adapter
Rated input voltage [V]	DC: 48 V PoE: 802.3bt/at/af
Input voltage range [V]	DC: 43.2 V to 57.6 V PoE: 802.3bt/at/af
Service port surge protection	PoE port: Surge: Differential mode: 1.5 kV (D.1), 10/700 us, 15 ohms + 25 ohms, criterion B Differential mode: 1.5 kV (D.2), 10/700 us, 15 ohms + 25 ohms, criterion C Common mode: 6 kV (C.3), 10/700 us, 15 ohms + 25 ohms/wire, criterion B: 6) Differential mode: 1 kV (D.1), 1.2/50 us, 42 ohms, criterion B; Differential mode: 1 kV (D.2), 1.2/50 us, 42 ohms, criterion B; Common mode: 2 kV (C.3), 1.2/50 us, 2 ohms + 40 ohms x n/wire, criterion B Inrush current: Differential mode: 250 A (D.2), 8/20 μs, criterion C Common mode: 6 kA/8-wire, 8/20 us, criterion C
PoE OUT	Not supported
Maximum number of physical ports on the entire device	2.5GE (RJ45) x 1, 100M/1000M/2500M auto-sensing 10GE optical (SFP+), GE/2.5GE/10GE auto-sensing

Item	Specification
Long-term operating temperature [°C(°F)]	–40°C to +70°C (–40°F to +158°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/waterproof)	IP68
Ground	Grounding
Wind resistance	67 m/s
USB	Supplies power of 2.5 W or 5 W.
IoT slot	Not supported
BLE	Not supported
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Radio 0 (2.4 GHz): 2x2 Radio 1 (5 GHz): 4x4
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax/be 5 GHz: 802.11a/n/ac/ac Wave 2/ax/be
Radio interface	Built-in omnidirectional antennas
Antenna gain	2.4 GHz: 5 dBi/chain (peak value) 3 dBi (combined gain) 5 GHz: 5 dBi/chain (peak value) 3 dBi (combined gain)

Item	Specification
Maximum transmit power	2.4 GHz: 25 dBm/chain 28 dBm (combined power) 5 GHz: 24 dBm/chain 30 dBm (combined power)
Singal radio transmit power [dBm]	2.4 GHz: -10 dBm to 25 dBm/chain 5 GHz: -10 dBm to 24 dBm/chain
MTBF [year]	131.1375659 year
MTTR [hour]	2 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	The power supply mode is negotiated to 802.3bt, and no function is restricted.
802.3at power supply description	When the power supply mode is negotiated to 802.3at and 5 W USB power supply is used, the radio transmit power decreases by 3 dB.
802.3af power supply description	When the power supply mode is negotiated to 802.3af, the radio mode is limited to 2.4 GHz (2x2), the 5 GHz radio is disabled, and the radio transmit power decreases by 3 dB.
DC power supply description	No function is limited.

5.1.29 AP772E

Overview

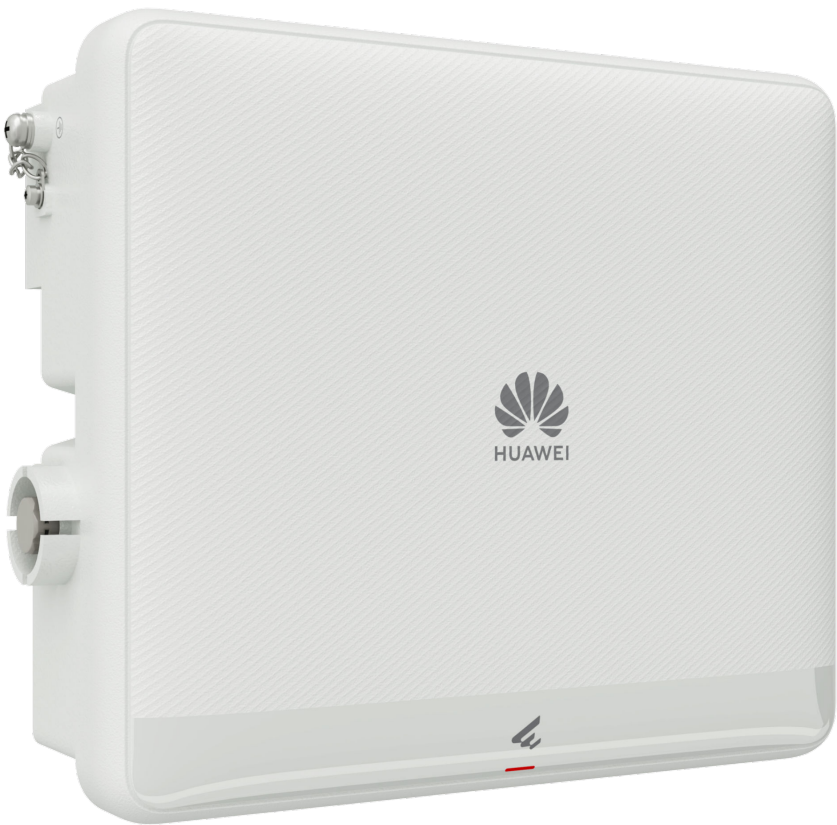
Table 5-141 Basic information about the AP772E

Item	Details
Description	AP772E(11be outdoor,2+4 dual bands,directional antenna,USB)
Part Number	50088138
Model	AP772E

Item	Details
First supported version	V600R024C10

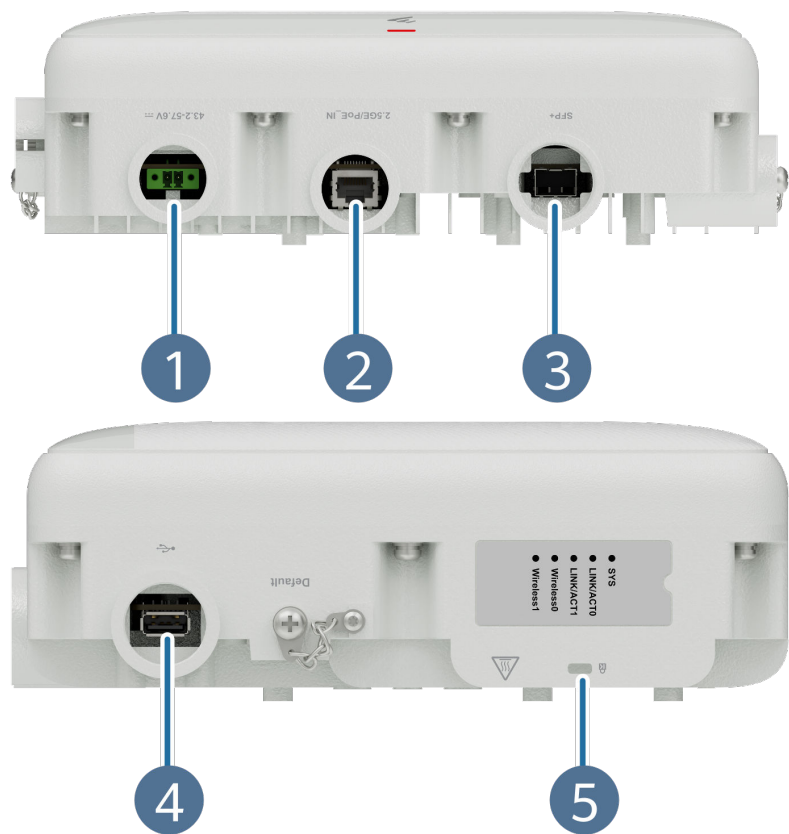
Appearance

Figure 5-85 Appearance of the AP772E



Ports

Figure 5-86 Ports on the AP772E



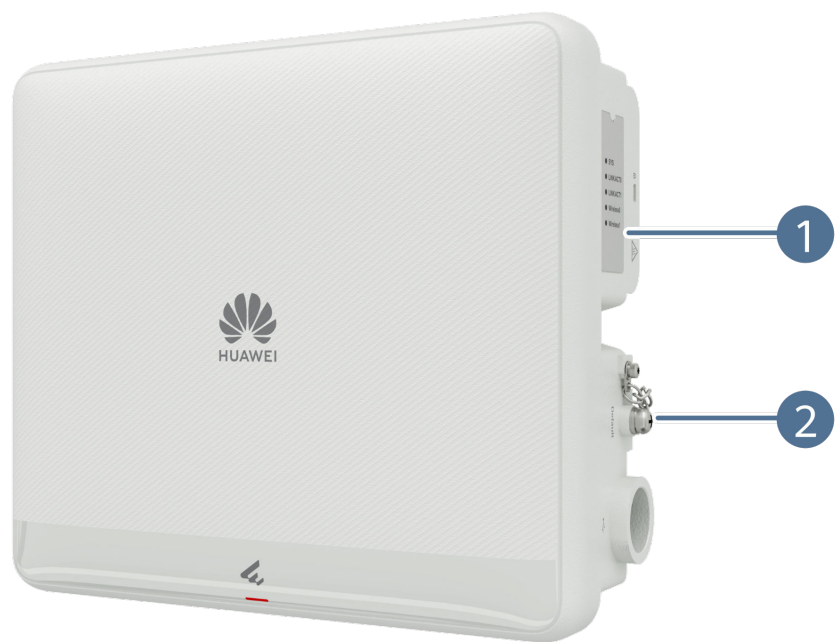
1	DC port	2	2.5GE/PoE_IN
3	SFP+	4	USB
5	Security slot	-	-

Table 5-142 Ports on the AP772E

Port	Connector Type	Description	Available Components
2.5GE/PoE_IN	RJ45	100M/1000M/2.5G auto-sensing Ethernet electrical port that connects to the wired Ethernet and supports PoE input.	Network cable
SFP+	SFP+	Ethernet optical port, supporting 1G/2.5G/10G auto-sensing and working with a matching optical module.	Optical module
DC 48V	Phoenix terminal block	DC power port, used in DC power supply scenarios and supporting a voltage range of 43.2 V to 57.6 V. (Easy installation with no restrictions on the positive and negative poles on the port side)	Phoenix terminal block
USB	USB Type A	Provides 2.5 W or 5 W power supply.	-

Indicators and Buttons

Figure 5-87 Indicators and buttons on the AP772E



1	Indicator	2	Default
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Table 5-143 Indicators on the AP772E

Silkscreen	Name	Color	Status	Description
SYS	System indicator	-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
		Green	Steady on	<ul style="list-style-type: none">• The system is just powered on.• The system is starting after a reset.• The upper-layer system is starting.
		Green	Slow blinking (0.5 Hz)	The AP is running properly, the Ethernet connection is normal, and STAs are associated with the AP.
		Green	Slow blinking (0.2 Hz)	The AP is running properly, the Ethernet connection is normal, and no STA is associated with the AP.

Silkscreen	Name	Color	Status	Description
		Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none">• The software is being upgraded.• After the software is loaded and started, the AP requests to go online in Fit or cloud management mode. The indicator remains in this state till the AP successfully goes online.
		Yellow (blinking red and green at the same time, causing color deviation)	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V600R024C10.

Silkscreen	Name	Color	Status	Description
		Red	Blinking once every 0.25s (4 Hz)	Hold down the Default button for more than 6 seconds to restore the factory settings. This function is supported in V600R25C00 or later.
		Red	Steady on	The system is faulty.
LINK/ACT0 and LINK/ACT1	Port indicator	Green	Blinking	The Ethernet connection is normal.
		-	Off	The port is in link-down state.
WIRELESS0	Radio 0 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Green	Steady on	The AP has STAs connected, but no data is being transmitted.
		Green	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Silkscreen	Name	Color	Status	Description
WIRELESS1	Radio 1 status indicator (service traffic mode)	-	Off	Radios or all associated VAPs are disabled, and no STA is connected to the AP.
		Yellow	Steady on	The AP has STAs connected, but no data is being transmitted.
		Yellow	Blinking	The AP has STAs connected and is transmitting data traffic. The indicator blinks more quickly when more data is being transmitted.

Table 5-144 Buttons on the AP772E

Silkscreen	Name	Description
Default	Reset button	<ul style="list-style-type: none"> For V600R024C10: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks yellow (blinking red and green fast at the same time, causing color deviation), and the device restores the factory settings, switches to the Fit mode, and restarts. For V600R025C00 and later versions: If you press the button, the device resets. If you hold down the button for more than 6 seconds, the SYS indicator blinks red fast and the device restores the factory settings, switches to the Fit mode, and restarts.

Technical Specifications

Table 5-145 Technical specifications of the AP772E

Item	Specification
Installation Type	<ul style="list-style-type: none"> Wall Pole
Dimensions without packaging (H x W x D) [mm(in.)]	220 mm x 250 mm x 77 mm (8.66 in. x 9.84 in. x 3.03 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	170 mm x 555 mm x 370 mm (6.69 in. x 21.85 in. x 14.57 in.)
Weight without packaging [kg(lb)]	2.76 kg (6.08 lb)
Weight with packaging [kg(lb)]	5.65 kg (12.46 lb)

Item	Specification
Storage	NAND Flash 512 MB
Console port	None
Maximum power consumption [W]	20.4 (excluding USB)
Maximum heat dissipation [BTU/hour]	69.61 BTU/hour
Power supply mode	<ul style="list-style-type: none"> PoE DC power adapter
Rated input voltage [V]	DC: 48 V PoE: 802.3bt/at/af
Input voltage range [V]	DC: 43.2 V to 57.6 V PoE: 802.3bt/at/af
Service port surge protection	PoE port: Surge: Differential mode: 1.5 kV (D.1), 10/700 us, 15 ohms + 25 ohms, criterion B Differential mode: 1.5 kV (D.2), 10/700 us, 15 ohms + 25 ohms, criterion C Common mode: 6 kV (C.3), 10/700 us, 15 ohms + 25 ohms/wire, criterion B: 6) Differential mode: 1 kV (D.1), 1.2/50 us, 42 ohms, criterion B; Differential mode: 1 kV (D.2), 1.2/50 us, 42 ohms, criterion B; Common mode: 2 kV (C.3), 1.2/50 us, 2 ohms + 40 ohms x n/wire, criterion B Inrush current: Differential mode: 250 A (D.2), 8/20 μs, criterion C Common mode: 6 kA/8-wire, 8/20 us, criterion C
PoE OUT	Not supported
Maximum number of physical ports on the entire device	2.5GE (RJ45) x 1, 100M/1000M/2500M auto-sensing 10GE optical (SFP+), GE/2.5GE/10GE auto-sensing

Item	Specification
Long-term operating temperature [°C(°F)]	–40°C to +70°C (–40°F to +158°F) (From 1800 m to 5000 m [5905.51 ft. to 16404.20 ft.], the maximum ambient temperature decreases by 1°C [1.8°F] for every 300 m [984.25 ft.] increase in altitude.)
Storage temperature [°C(°F)]	–40°C to +85°C (–40°F to +185°F)
Long-term operating relative humidity [RH]	Operating humidity: 0% RH to 100% RH Storage humidity: 5% RH to 95% RH (non-condensing)
Long-term operating altitude [m(ft.)]	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
Atmospheric pressure [kPa]	53kPa - 106kPa ETSI 300 019-2-3
Ingress protection level (dustproof/ waterproof)	IP68
Ground	Grounding
Wind resistance	67 m/s
USB	Supplies power of 2.5 W or 5 W.
IoT slot	Not supported
BLE	Not supported
Radio number	2
Operating frequency band	<ul style="list-style-type: none"> 2.4GHz 5GHz
MIMO spatial streams	Radio 0 (2.4 GHz): 2x2 Radio 1 (5 GHz): 4x4
Wi-Fi standard	2.4 GHz: 802.11b/g/n/ax/be 5 GHz: 802.11a/n/ac/ac Wave 2/ax/be
Radio interface	Built-in directional antennas
Antenna gain	2.4 GHz: 10 dBi/chain (peak value) 10 dBi (combined gain) 5 GHz: 11 dBi/chain (peak value) 10 dBi (combined gain)

Item	Specification
Beamwidth of the built-in antenna [degrees]	2.4 GHz: <ul style="list-style-type: none"> Horizontal plane: 70° Vertical plane: 35° 5 GHz: <ul style="list-style-type: none"> Horizontal plane: 60° Vertical plane: 20°
Maximum transmit power	2.4 GHz: 25 dBm/chain 28 dBm (combined power) 5 GHz: 24 dBm/chain 30 dBm (combined power)
Singal radio transmit power [dBm]	2.4 GHz: -10 dBm to 25 dBm/chain 5 GHz: -10 dBm to 24 dBm/chain
MTBF [year]	132.7633643 year
MTTR [hour]	2 hour
Frequency stability [ppm]	+/-20
802.3bt power supply description	The power supply mode is negotiated to 802.3bt, and no function is restricted.
802.3at power supply description	When the power supply mode is negotiated to 802.3at and 5 W USB power supply is used, the radio transmit power decreases by 3 dB.
802.3af power supply description	When the power supply mode is negotiated to 802.3af, the radio mode is limited to 2.4 GHz (2x2), the 5 GHz radio is disabled, and the radio transmit power decreases by 3 dB.
DC power supply description	No function is limited.

5.2 Installing Outdoor APs

5.2.1 Preparing for Installation

5.2.1.1 Safety Precautions

- Take proper measures to prevent injuries and device damage.
- Place the device in a dry and flat position away from any liquid and prevent the device from slipping.
- Keep the device clean.
- Do not put the device and tools in the aisles.

 CAUTION

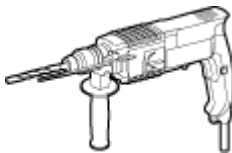
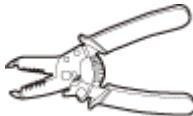
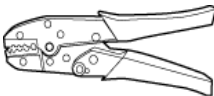
Only the qualified personnel are permitted to install and remove the device and its accessories. Before installation and operation, read the safety precautions carefully.

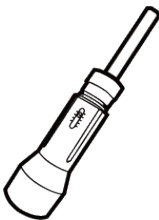
5.2.1.2 Preparing Installation Tools and Accessories

Tool Preparation

Table 5-146 lists the tools that may be used during installation.

Table 5-146 Installation tools

Phillips screwdriver 	Flat-head screwdriver (tip width: 8 mm) 	Electrostatic discharge (ESD) gloves 
Slip-proof gloves 	Marker 	Hammer drill 
Claw hammer 	Diagonal pliers 	Wire stripper 
RJ45 crimping tool 	Crimping tool 	Network cable tester 

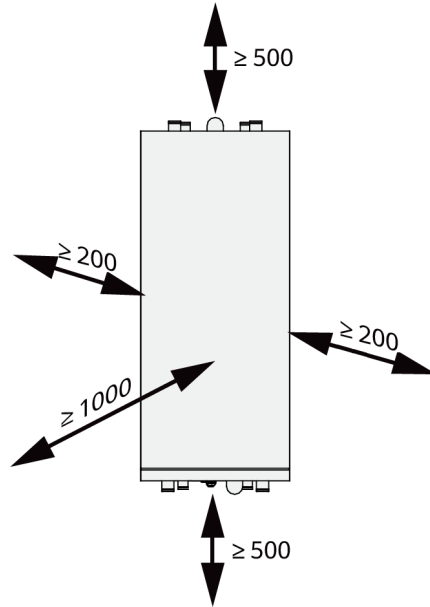
Multimeter 	Ladder 	Utility knife 
Level 	Long measuring tape 	Adjustable wrench (maximum jaw width ≥ 33 mm) 
Torque wrench 	Safety belt 	Safety helmet 
Anti-skid shoes 	Waterproof tape 	Insulation tape 
Scissors 	Inner hexagon wrench (M4 and M6; length: ≥ 200 mm) 	Optical power meter 
Torque screwdriver 	-	-

5.2.1.3 Determining the Installation Position

Outdoor APs can be installed on a wall or pole. The APs must be installed by professional installation personnel, and the installation position is determined according to the site survey.

Figure 5-88 shows the recommended installation clearances based on the default configuration.

Figure 5-88 Recommended clearance requirements for installing an outdoor AP (unit: mm)



- Do not install the AP in an environment with high temperature, dust, poisonous gases, flammable or explosive objects, electromagnetic interference (from a radar station, radio station, or substation), unstable voltage, violent shakes, or strong noise.
- The device cannot be installed in Class D environments (within 500 m away from the seaside or salt lakes).
- Do not place the shell, mounting bracket, screws, Ethernet cables, or power cables in contact with high-voltage conductors to avoid damage to the device or even injury to the human body.
- Keep the AP far away from electronic devices that may cause radio interference, such as other APs and antennas.
- Install the AP in a hidden place and ensure that it does not disturb daily work and life of residents.
- During the engineering design, consider climate, hydrology, geography, earthquake, electric power, and transportation conditions according to the technical requirements for communications network planning and communication devices.
- In outdoor coverage scenarios, the recommended installation height is 3 m to 5 m. In outdoor backhaul scenarios or high-density stadiums, the installation position needs to be determined based on the network planning.
- If the IP rating is not IP68, ensure that the AP is vertically installed to prevent water from entering the AP.

Table 5-147 General requirements for the antenna anti-interference deployment distance

Scenario	Deployment Distance Requirement
Outdoor installation	<ul style="list-style-type: none"> • If antennas are mounted to different poles in back-to-back mode, the horizontal distance between them should be at least 1.5 m. • If antennas are mounted to the same pole facing the same direction, the vertical distance between them should be at least 5 m. • The antennas should be placed at least 2 km away from the carrier's signal towers.
High-density stadiums	Regardless of restrictions of EIRP and FCC standards and the number of channels: <ul style="list-style-type: none"> • If the antennas are installed at a height less than 20 m, you are advised to leave at least 12 m between 2.4 GHz antennas and 4 m between 5 GHz antennas. • If the antennas are installed 20 m or higher from the ground, you are advised to leave at least 16 m between 2.4 GHz antennas and 4 m between 5 GHz antennas.
	Considering restrictions of EIRP and ETSI standards but not the number of 5 GHz channels: <ul style="list-style-type: none"> • If the antennas are installed at a height less than 20 m, you are advised to leave at least 12 m between 2.4 GHz antennas and 3 m between 5 GHz antennas. • If the antennas are installed 20 m or higher from the ground, you are advised to leave at least 16 m between 2.4 GHz antennas and 3 m between 5 GHz antennas.

 NOTE

If antennas are embedded into APs, the deployment distance requirements on the antennas are those on APs.

5.2.1.4 Unpacking the Equipment

Before unpacking the carton, ensure that the packing carton is intact and not damaged or soaked. Stop unpacking if the equipment is rusted or soggy. Then, investigate causes and contact the supplier.

Usually, the packing list contains the following items.

- AP
- Mounting bracket
- PG connector x 1
- Expansion bolt x 2
- Screw x 4

- Hose clamp x 2
- OT terminal x 4
- Quick Start Guide
- SN/MAC label

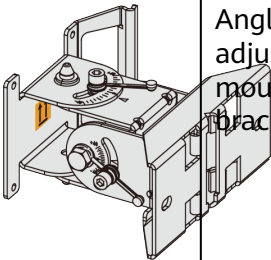
 NOTE

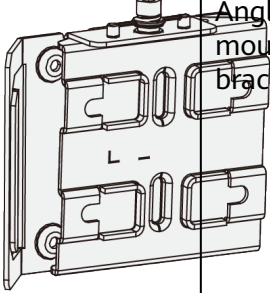
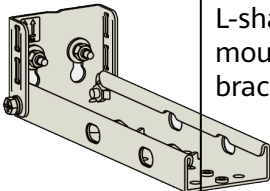
- Specific items are subject to the actual delivery.
- To use a PoE adapter, purchase one that complies with related safety standards or is CCC certified.
- To use optical modules, purchase Huawei-certified ones.
- The port availability may vary according to the power supply standard. For details, query the specifications based on the device model using Info-Finder([Enterprise Network](#) or [Carrier](#)).

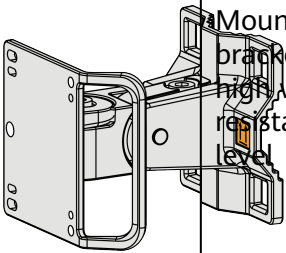
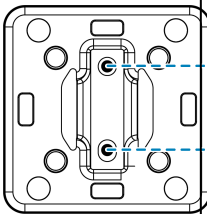
5.2.2 Understanding Mounting Brackets and Installation Scenarios

The following table lists the types of available mounting brackets for outdoor APs.

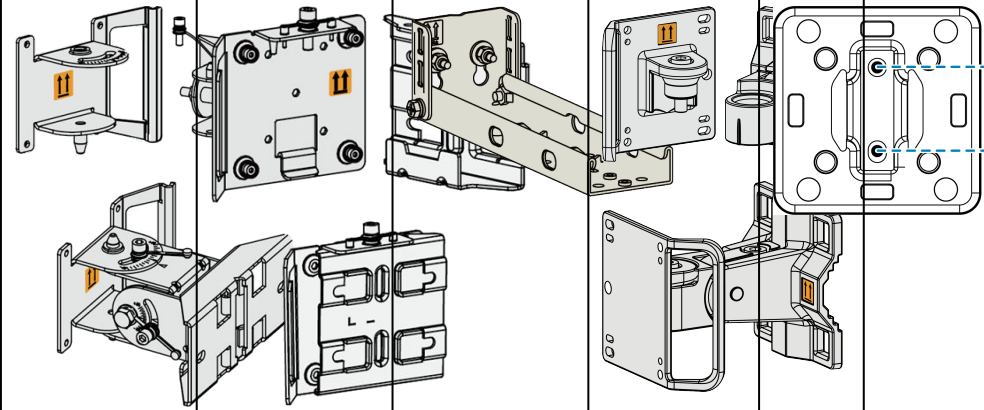
Table 5-148 Outdoor AP mounting brackets

Mounting Bracket Appearance	Name	Standard/Optional	Part Number	Matching AP Model
	Angle-adjustable mounting bracket	Standard	21150933+21150934	AirEngine 8760R-X1 AirEngine 6760R-51 AirEngine 5761R-11 AirEngine 5776I-X6H eKitEngine 5776RS-X6 AP761 AP761E AP772E MAP6000P-Cla AirEngine 6776I-X6TH

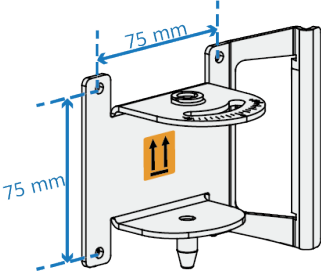
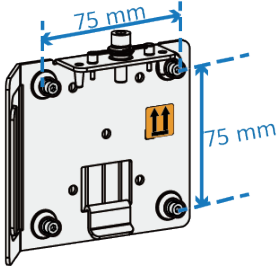
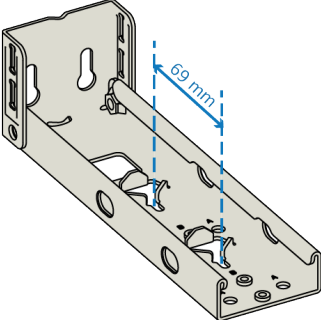
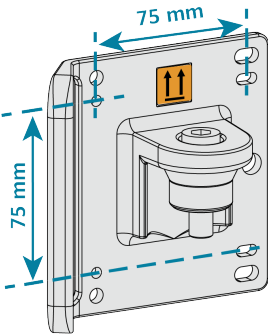
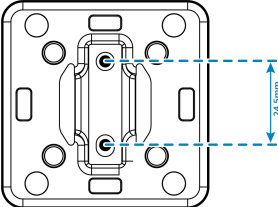
Mounting Bracket Appearance	Name	Standard/Optional	Part Number	Matching AP Model
	Angle-fixed mounting bracket	Standard	21152157	AirEngine 8760R-X1E AirEngine 6760R-51E AirEngine 5776I-X6EH AirEngine 5761R-11E AirEngine 5576I-X6EH AirEngine 5561R-11E AirEngine 6776I-X6ETH
	L-shaped mounting bracket	Standard	21155293-001	AirEngine 6776I-X7TH AirEngine 5776I-X7TH AirEngine 5776I-X7H AP772

Mounting Bracket Appearance	Name	Standard/Optional	Part Number	Matching AP Model
	Mounting bracket with a high wind resistance level	Optional	21154340	AirEngine 8760R-X1 AirEngine 6760R-51 AirEngine 5761R-11 AP761 MAP6000P-Cla AirEngine 8760R-X1E AirEngine 6760R-51E AirEngine 5761R-11E AirEngine 5561R-11E AirEngine 6776I-X6TH AirEngine 5776I-X6EH AirEngine 5776I-X6H AirEngine 6776I-X6ETH AirEngine 6776I-X6ETH-K AP761E AP772E eKitEngine 5776RS-X6
	Small angle-fixed mounting bracket	Standard	21155210	AP771 AirEngine 5773I-21

The following table lists the installation scenarios supported by different types of mounting brackets. For details about installation methods, see the corresponding installation guide.

Installation Scenario	Mounting Bracket Applicability (Angle-Adjustable Mounting Bracket)	Mounting Bracket Applicability (Angle-Fixed Mounting Bracket)	Mounting Bracket Applicability (L-shaped Mounting Bracket)	Mounting Bracket Applicability (Mounting Bracket with a High Wind Resistance Level)	Mounting Bracket Applicability (Small Angle-Fixed Mounting Bracket)
-					
Wall mounting	Supported	Supported	Supported	Supported	Supported
Pole mounting	Supported	Supported	Supported	Supported	Supported

The following table lists the hole spacings on mounting brackets for outdoor APs.

Mounting Bracket Type	Fixed Hole Spacing
Angle-adjustable mounting bracket	
Angle-fixed mounting bracket	
L-shaped mounting bracket	
Mounting bracket with a high wind resistance level	
Small angle-fixed mounting bracket	

 NOTE

Huawei's mounting brackets are recommended, instead of customized mounting brackets, to ensure heat dissipation, secure installation, and security and reliability.

In scenarios with high mechanical stress and high vibration sources (such as sites alongside railway transportation and large construction sites), select the mounting bracket (part number: 21154340).

Related Videos

Visit [hardware installation videos](#) to view the AP installation methods in typical installation scenarios.

5.2.3 Installing an AP (Cylinder-Shaped) on an Angle-Adjustable Mounting Bracket

This section uses an AP model as an example to describe how to install an outdoor AP on an angle-adjustable mounting bracket.

5.2.3.1 Wall Mounting

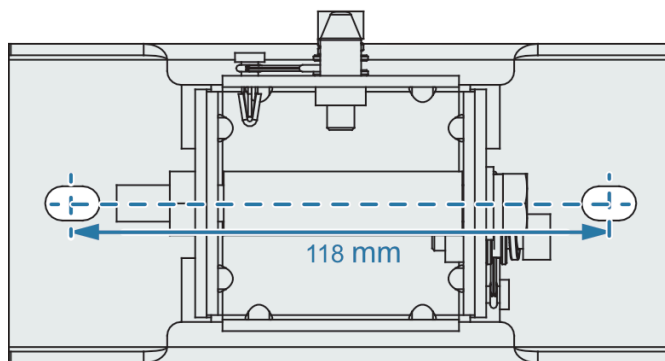
A wall for installing the device needs to meet the following requirements:

- The wall can bear the weight of four times the total weight of the device and mounting bracket without damage. When the total weight of the device and mounting bracket is less than 1.25 kg, the load-bearing capability of the wall must be greater than or equal to 5 kg.
- When the tightening torque of a screw reaches 12 N·m, the screw still properly works, without crack or damage on the wall.

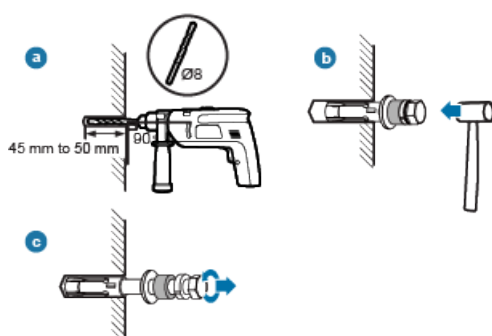
Mounting brackets and expansion bolts are required to install the AP on a wall.

 NOTE

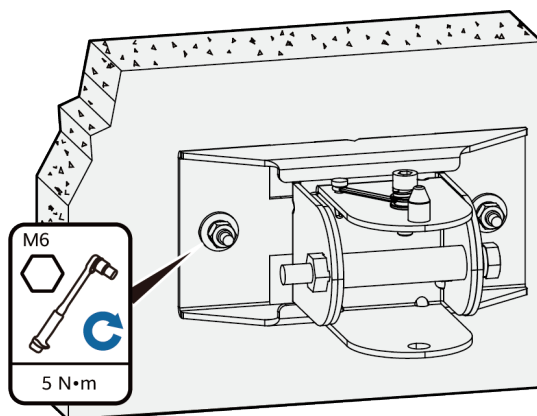
- When fixing the mounting bracket, ensure that the arrows of  point upwards.
 - When installing the device on the mounting bracket, ensure that the device logo is upside up.
 - The length of the M6 inner hexagon screwdrivers must be greater than or equal to 200 mm.
 - The adjustment range of the angle-adjustable mounting bracket for the AirEngine 8760R-X1 is as follows:
 - Without enclosures: The adjustment range of the vertical angle is $\pm 30^\circ$, and that of the horizontal angle is $\pm 40^\circ$.
 - With enclosures: The adjustment range of the vertical angle is -20° to $+30^\circ$, and that of the horizontal angle is $\pm 40^\circ$.
 - If enclosures are required, install them by referring to [5.2.12 Installing Enclosures](#).
1. Attach the wall mounting bracket against the wall and adjust its position properly. Mark positions of the mounting holes with a marker, as shown in the following figure.



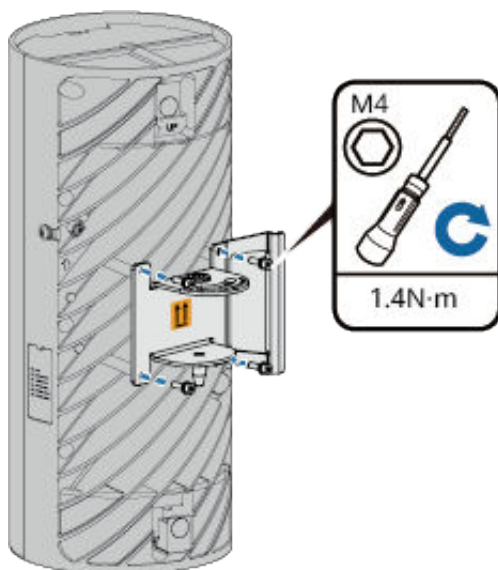
2. Use an 8 mm drill bit to drill 45 mm to 50 mm deep holes in the drilling positions and hammer the expansion bolts into the installation holes until the flat washers are completely attached to the wall. Then, remove the nut, spring washer, and flat washer in order.



3. Hang the wall mounting bracket on the expansion bolts and use a wrench to fasten the flat washers, spring washers, and nuts in order.



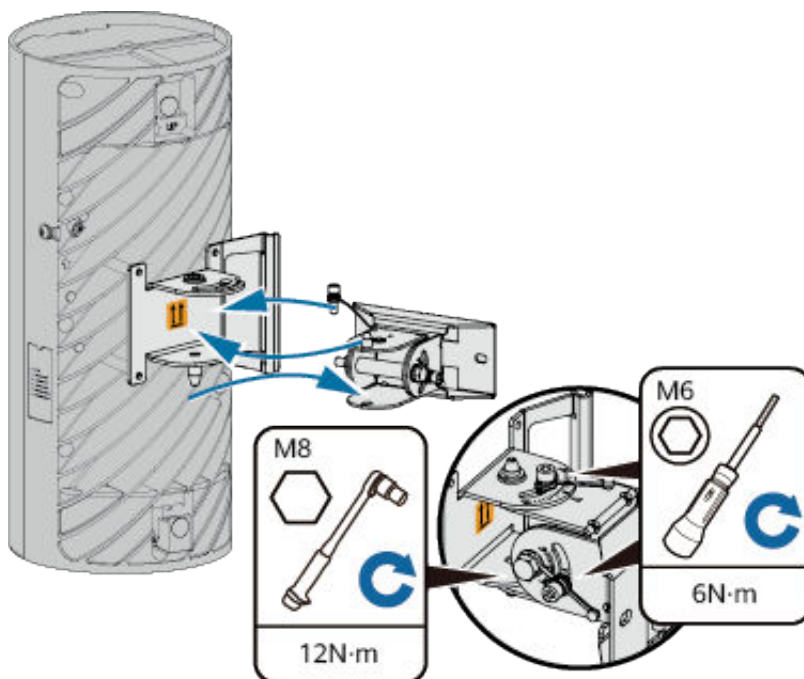
4. Use four M4x14 hexagon socket head cap screws (part number: 26020227, delivered with the device) to fasten the AP mounting bracket to the AP.



 NOTE

It is recommended that this step be performed within the package.

5. Remove the topmost screw from the wall mounting bracket, hang the AP mounting bracket onto the topmost screw, and tighten the screw until the screw passes through the hole of the horizontal scale plate (the screw should not be too tight).



6. Loosen the M6 screw in the vertical direction, adjust the horizontal and vertical angles of the device using the scale plate, and tighten all M6 and M8 screws.

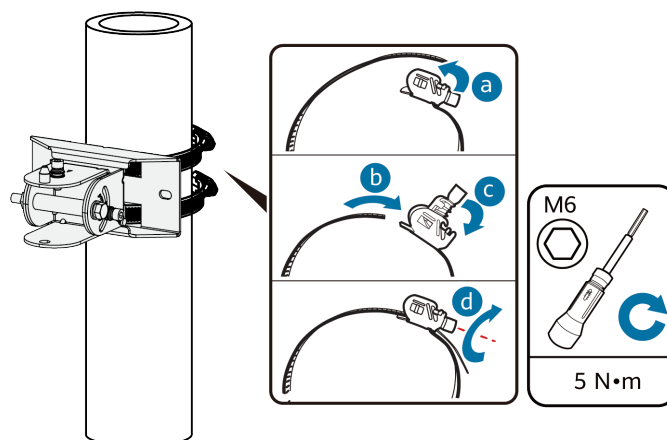
5.2.3.2 Pole Mounting

An outdoor AP must be installed on a pole with a diameter of 48 mm to 114 mm and the difference between the outer and inner diameters should be at least 2.5 mm.

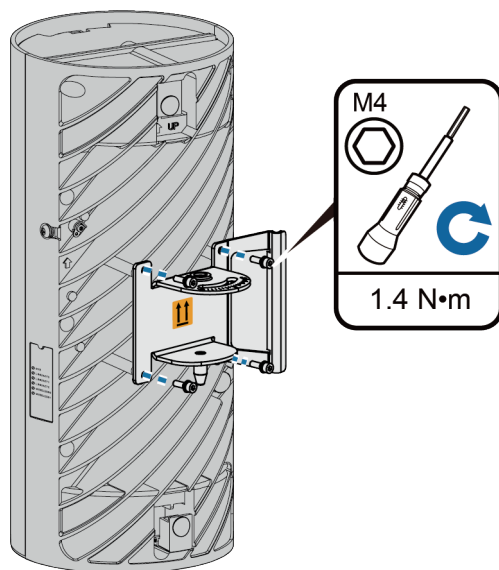
In this mounting mode, a pole for installing the device must be able to bear the weight four times the total weight of the device and mounting bracket without damage. When the total weight of the device and mounting bracket is less than 1.25 kg, the load-bearing capability of the pole must be greater than or equal to 5 kg.

NOTE

- When fixing the mounting bracket, ensure that the arrows of  point upwards.
 - When installing the device on the mounting bracket, ensure that the device logo is upside up.
 - The length of the M6 inner hexagon screwdrivers must be greater than or equal to 200 mm.
 - The adjustment range of the angle-adjustable mounting bracket for the AirEngine 8760R-X1 is as follows:
 - Without enclosures: The adjustment range of the vertical angle is $\pm 30^\circ$, and that of the horizontal angle is $\pm 40^\circ$.
 - With enclosures: The adjustment range of the vertical angle is -20° to $+30^\circ$, and that of the horizontal angle is $\pm 40^\circ$.
 - If enclosures are required, install them by referring to [5.2.12 Installing Enclosures](#).
1. Determine the AP installation position and attach the pole mounting bracket to the pole using the hose clamp.
 - a. Use an M6 inner hex torque screwdriver to loosen the screw on the hose clamp to open it.
 - b. Lead the hose clamp through the square holes on the mounting bracket and secure the mounting bracket to the pole.
 - c. Tighten and close the hose clamp.
 - d. Use an M6 inner hex torque screwdriver to tighten the screw.



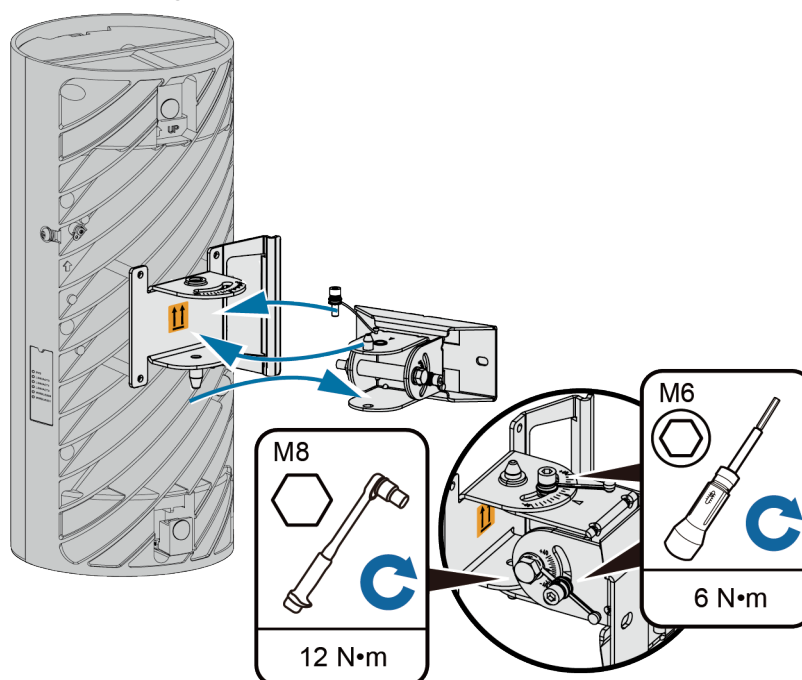
2. Use four M4x14 hexagon socket head cap screws (part number: 26020227, delivered with the device) to fasten the AP mounting bracket to the AP.



 NOTE

It is recommended that this step be performed within the package.

3. Remove the topmost screw from the pole mounting bracket, hang the AP mounting bracket onto the topmost screw, and tighten the screw until the screw passes through the hole of the horizontal scale plate (the screw should not be too tight).



4. Loosen the M6 screw in the vertical direction, adjust the horizontal and vertical angles of the device using the scale plate, and tighten all M6 and M8 screws.

5.2.4 Installing an AP (Square-Shaped) on an Angle-Adjustable Mounting Bracket

This section uses an AP model as an example to describe how to install an outdoor AP on an angle-adjustable mounting bracket.

5.2.4.1 Wall Mounting

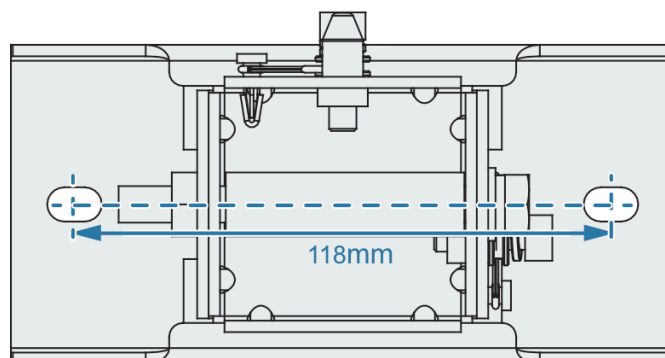
A wall for installing a device needs to meet the following requirements:

- The wall can bear the weight of four times the total weight of the device and mounting bracket without damage. When the total weight of the device and mounting bracket is less than 1.25 kg (2.76 lb.), the load-bearing capability of the wall must be greater than or equal to 5 kg (11.02 lb).
- When the tightening torque of a screw reaches 12 N·m, the screw still properly works, without cracking or damaging the wall.

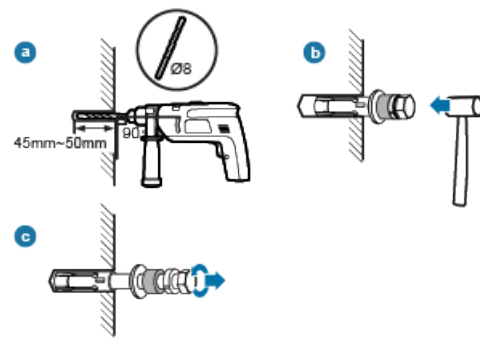
This mounting mode requires the use of a mounting bracket and expansion tubes.

NOTE

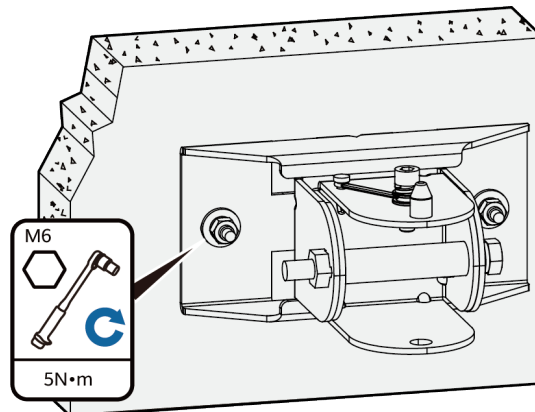
- When fixing a mounting bracket, ensure that the arrows of  point upwards.
 - When installing the device on the mounting bracket, ensure that the device logo is the right way up.
 - The length of the M6 inner hexagon screwdriver used for installation must be greater than or equal to 200 mm.
 - The angle-adjustable mounting bracket for the AirEngine 6760R-51, AirEngine 5761R-11, and AirEngine 5761RS-11 supports a vertical and horizontal angle-adjustable range of $\pm 40^\circ$.
 - The angle-adjustable mounting bracket for the AP761 supports a vertical and horizontal angle-adjustable range of $\pm 40^\circ$.
1. Place the base plate against the wall and adjust its position properly. Mark positions of the mounting holes with a marker, as shown in the following figure.



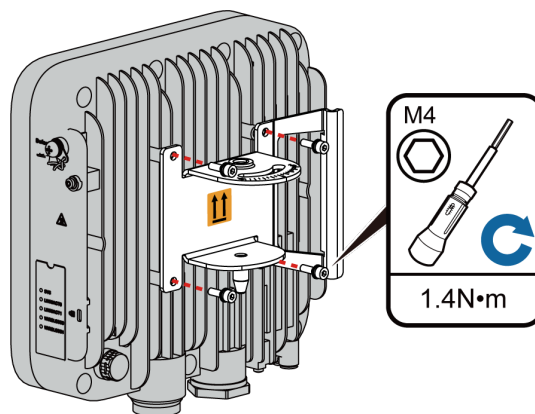
2. Use an 8 mm drill bit to drill 45 mm to 50 mm deep holes in the drilling positions, and hammer the expansion bolts into the installation holes until the flat washers are completely attached to the wall. Then, remove the nut, spring washer, and flat washer in order.



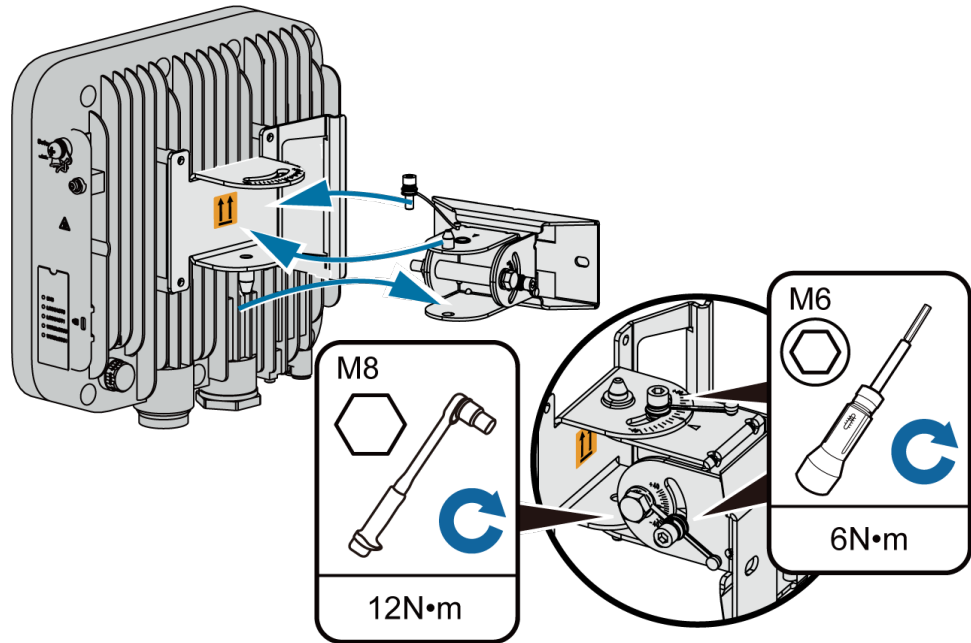
3. Hang the base plate on the expansion bolts and use a wrench to fasten the flat washers, spring washers, and nuts in order.



4. Use four M4x14 hexagon socket head cap screws (part number: 26020227, delivered with the device) to fasten the AP mounting bracket to the AP.



5. Remove the topmost screw from the base plate, hang the AP mounting bracket onto the topmost screw, and tighten the screw until the screw passes through the hole of the horizontal scale plate (the screw should not be too tight).



6. Loosen the vertical M6 screw, adjust the AP's angle at the horizontal and vertical directions based on the scale plate, and then tighten the M6 and M8 screws.

5.2.4.2 Pole Mounting

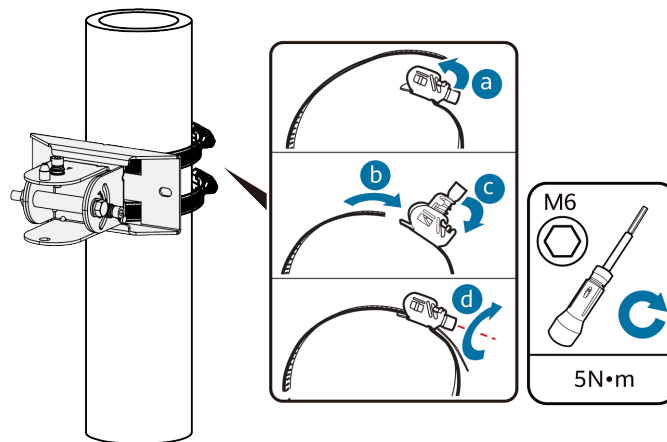
A pole for mounting a device needs to have a diameter of 48 mm to 114 mm, and a pole wall thickness of no less than 2.5 mm.

This mounting mode requires that the pole be able to bear at least four times the total weight of the device and mounting bracket, without being damaged. When the total weight of the device and mounting bracket is less than 1.25 kg (2.76 lb.), the load-bearing capability of the pole must be greater than or equal to 5 kg (11.02 lb).

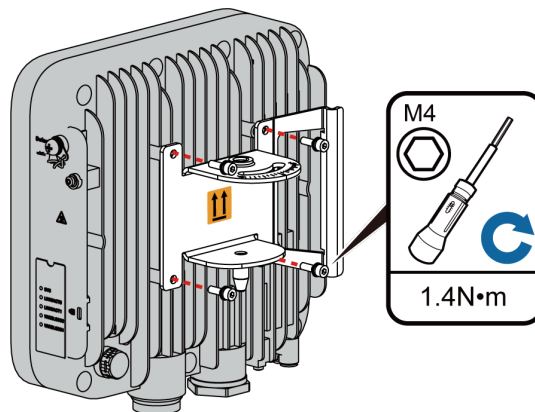
NOTE

- When fixing a mounting bracket, ensure that the arrows of  point upwards.
 - When installing the device on the mounting bracket, ensure that the device logo is the right way up.
 - The length of the M6 inner hexagon screwdriver used for installation must be greater than or equal to 200 mm.
 - The angle-adjustable mounting bracket for the AirEngine 6760R-51, AirEngine 5761R-11, and AirEngine 5761RS-11 supports a vertical and horizontal angle-adjustable range of $\pm 40^\circ$.
 - The angle-adjustable mounting bracket for the AP761 supports a vertical and horizontal angle-adjustable range of $\pm 40^\circ$.
1. Determine the AP installation position and attach the base plate to the pole using the hose clamp.
 - a. Use an M6 inner hex torque screwdriver to loosen the screws on the hose clamps to open them.
 - b. Lead the hose clamp through the square holes on the base plate and secure the plate to the pole.

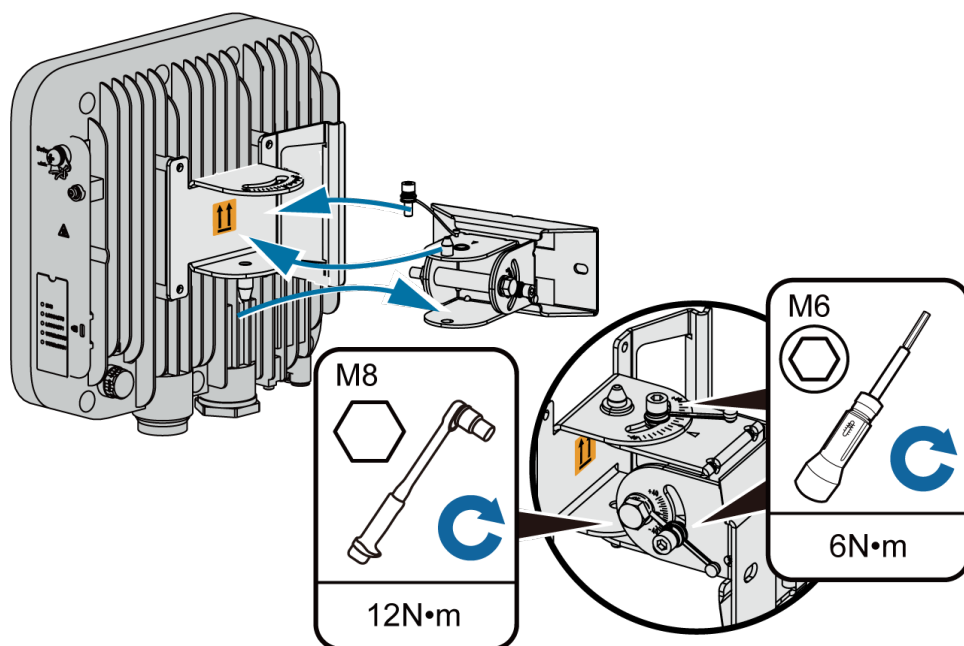
- c. Tighten and close the hose clamps.
- d. Use an inner hex torque screwdriver to tighten the screws.



- 2. Use four M4x14 hexagon socket head cap screws (part number: 26020227, delivered with the device) to fasten the AP mounting bracket to the AP.



- 3. Remove the topmost screw from the base plate, hang the AP mounting bracket onto the topmost screw, and tighten the screw until the screw passes through the hole of the horizontal scale plate (the screw should not be too tight).



4. Loosen the vertical M6 screw, adjust the AP's angle at the horizontal and vertical directions based on the scale plate, and then tighten the M6 and M8 screws.

5.2.5 Installing an AP on an Angle-Fixed Mounting Bracket

This section uses an AP model as an example to describe how to install an outdoor AP on an angle-fixed mounting bracket.

5.2.5.1 Wall Mounting

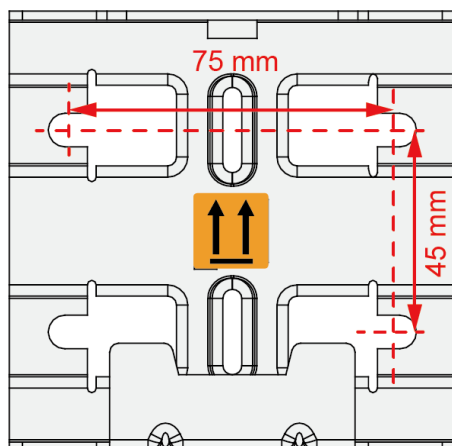
A wall for installing the device needs to meet the following requirements:

- The wall can bear the weight of four times the total weight of the device and mounting bracket without damage.
- When the tightening torque of a screw reaches 12 N·m, the screw still properly works, without crack or damage on the wall.

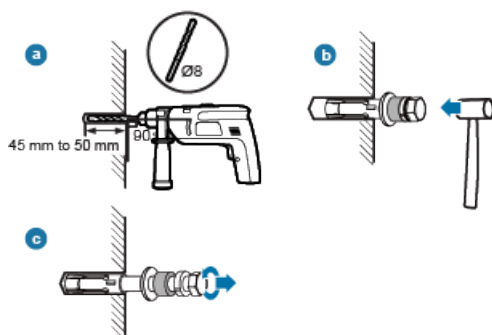
Mounting brackets and expansion bolts are required to install the AP on a wall.

NOTE

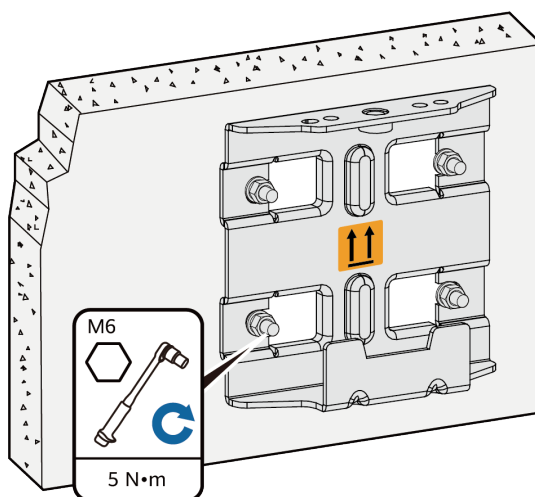
- When fixing the mounting bracket, ensure that the arrows of  point upwards.
 - When installing the device on the mounting bracket, ensure that the device logo is upside up.
 - The length of the M6 inner hexagon screwdrivers must be greater than or equal to 200 mm.
 - If enclosures are required, install them by referring to **Installing Enclosures**.
1. Attach the wall mounting bracket against the wall and adjust its position properly. Mark positions of the mounting holes with a marker, as shown in the following figure.



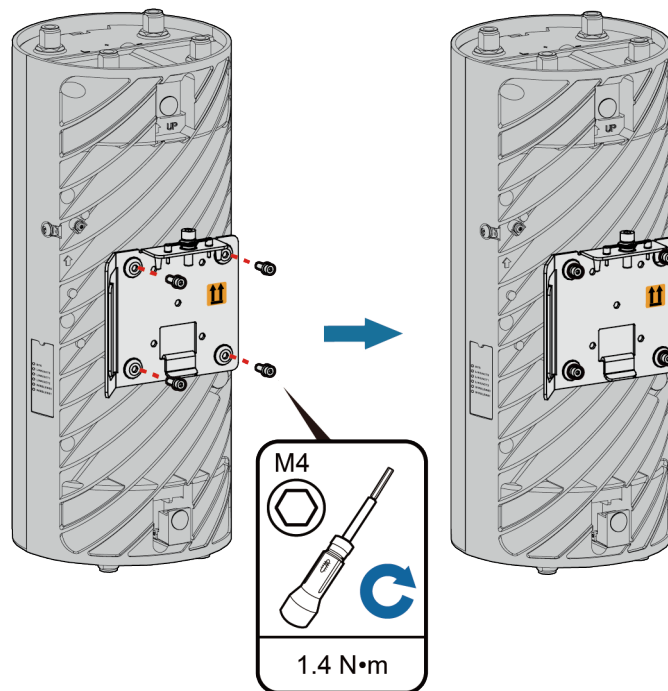
2. Use an 8 mm drill bit to drill 45 mm to 50 mm deep holes in the drilling positions and hammer the expansion bolts into the installation holes until the flat washers are completely attached to the wall. Then, remove the nut, spring washer, and flat washer in order.



3. Hang the wall mounting bracket on the expansion bolts and use a wrench to fasten the flat washers, spring washers, and nuts in order.



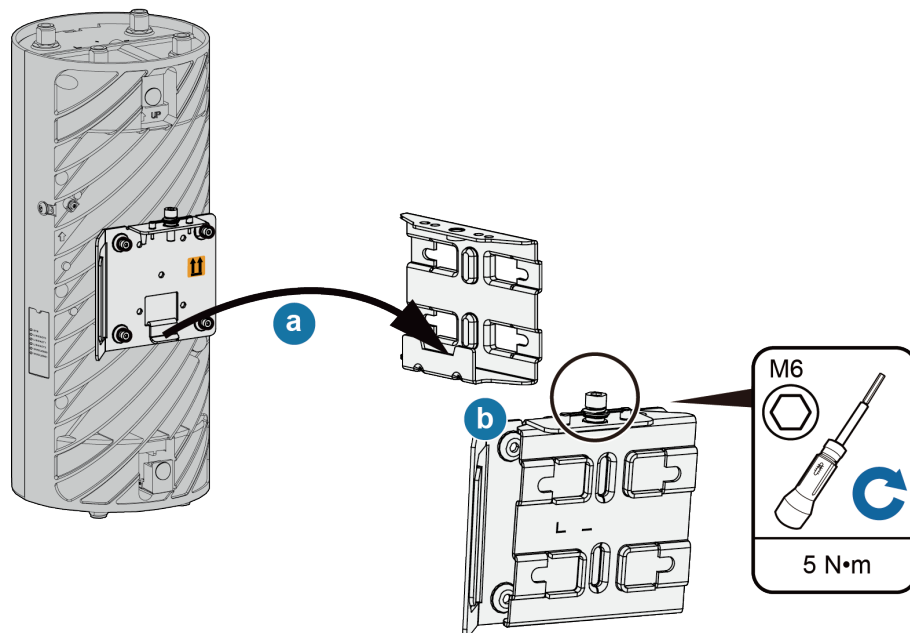
4. Use four M4x14 hexagon socket head cap screws (part number: 26020227, delivered with the device) to fasten the AP mounting bracket to the AP.



NOTE

If the AP is of the cylinder shape, it is recommended that this step be performed in the package.

5. Hang the AP with the AP mounting bracket to the wall mounting bracket and tighten the screws to secure the AP.



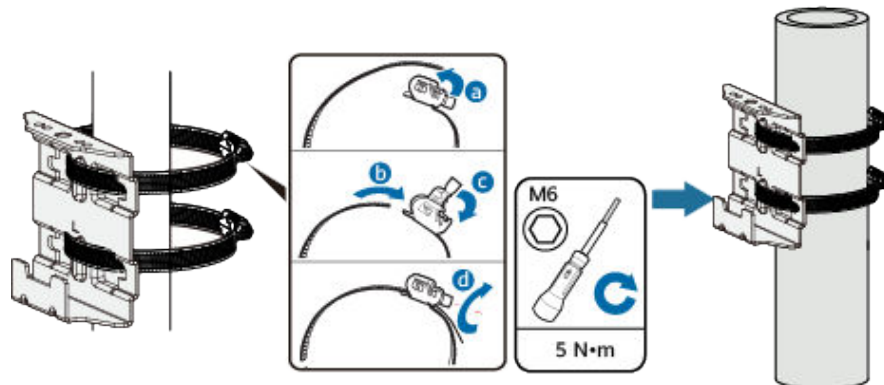
5.2.5.2 Pole Mounting

An outdoor AP must be installed on a pole with a diameter of 48 mm to 114 mm and the difference between the outer and inner diameters should be at least 2.5 mm.

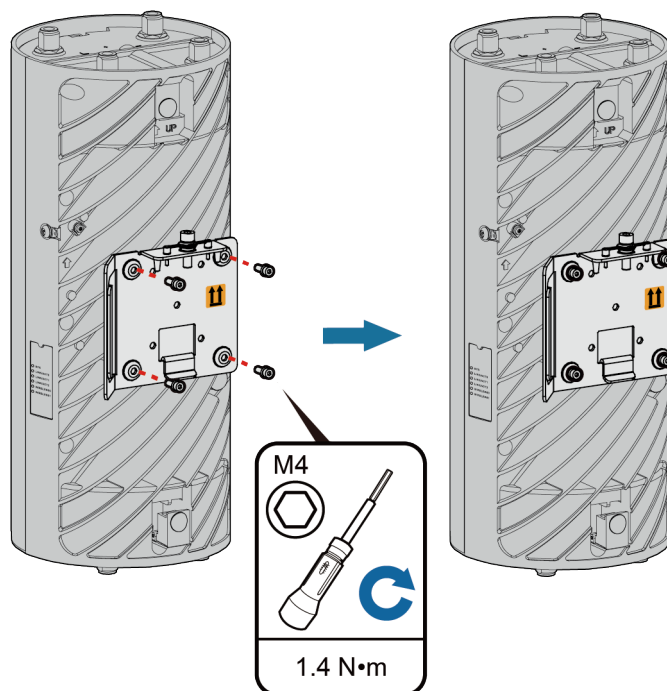
In this mounting mode, a pole for installing the device must be able to bear the weight four times the total weight of the device and mounting bracket without damage. When the total weight of the device and mounting bracket is less than 1.25 kg, the load-bearing capability of the pole must be greater than or equal to 5 kg.

 NOTE

- When fixing the mounting bracket, ensure that the arrows of  point upwards.
 - When installing the device on the mounting bracket, ensure that the device logo is upside up.
 - The length of the M6 inner hexagon screwdrivers must be greater than or equal to 200 mm.
 - If enclosures are required, install them by referring to **Installing Enclosures**.
1. Determine the AP installation position and attach the pole mounting bracket to the pole using the hose clamp.
 - a. Use an M6 inner hex torque screwdriver to loosen the screw on the hose clamp to open it.
 - b. Lead the hose clamp through the square holes on the mounting bracket and secure the mounting bracket to the pole.
 - c. Tighten and close the hose clamp.
 - d. Use an inner hex torque screwdriver to tighten the screw.



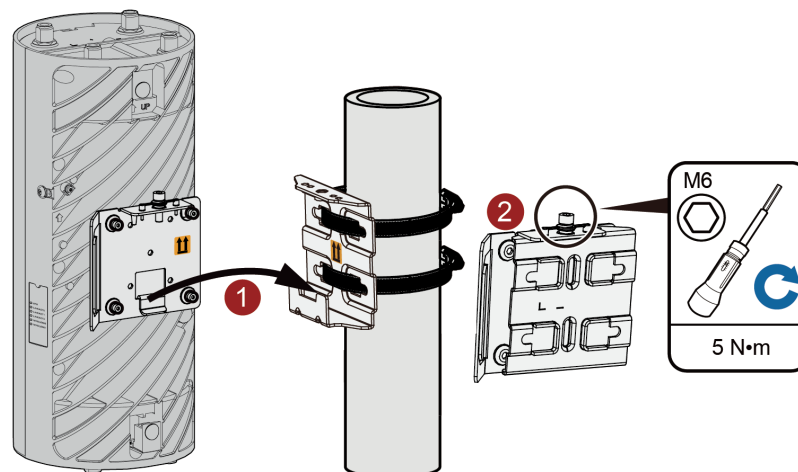
2. Use four M4x14 hexagon socket head cap screws (part number: 26020227, delivered with the device) to fasten the AP mounting bracket to the AP.



NOTE

If the AP is of the cylinder shape, it is recommended that this step be performed in the package.

3. Hang the AP with the AP mounting bracket to the wall mounting bracket and tighten the screws to secure the AP.



5.2.6 Installing an AP on an L-Shaped Mounting Bracket

This section uses an AP model as an example to describe how to install an outdoor AP on an L-shaped mounting bracket.

5.2.6.1 Wall Mounting

A wall for installing a device needs to meet the following requirements:

- The wall can bear four times the total weight of the device and mounting bracket without being damaged. When the total weight of the device and

mounting bracket is less than 1.25 kg (2.76 lb.), the load-bearing capability of the wall must be greater than or equal to 5 kg (11.02 lb).

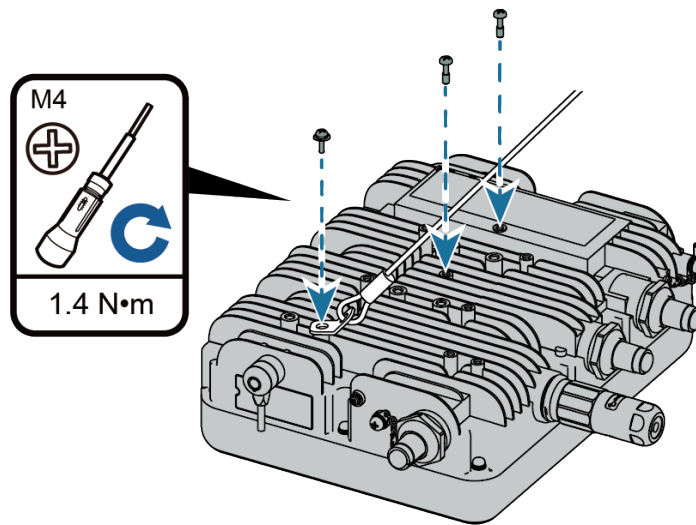
- When the tightening torque of a screw reaches 12 N·m, the screw still properly works, without cracking or damaging the wall.

This mounting mode requires the use of a mounting bracket and expansion tubes.

 NOTE

- When fixing a mounting bracket, ensure that the arrows of  point upwards.
- The length of the M6 inner hexagon screwdriver used for installation must be greater than or equal to 200 mm.

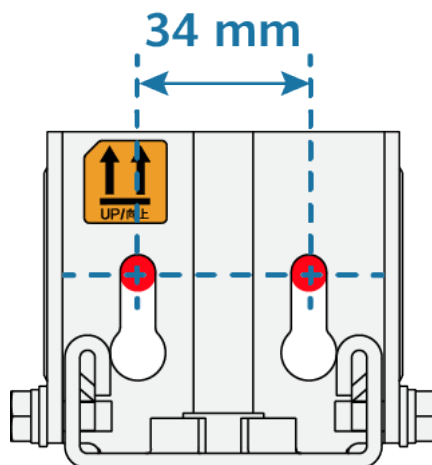
1. Secure two M4 screws and one end of a safety rope to an AP.



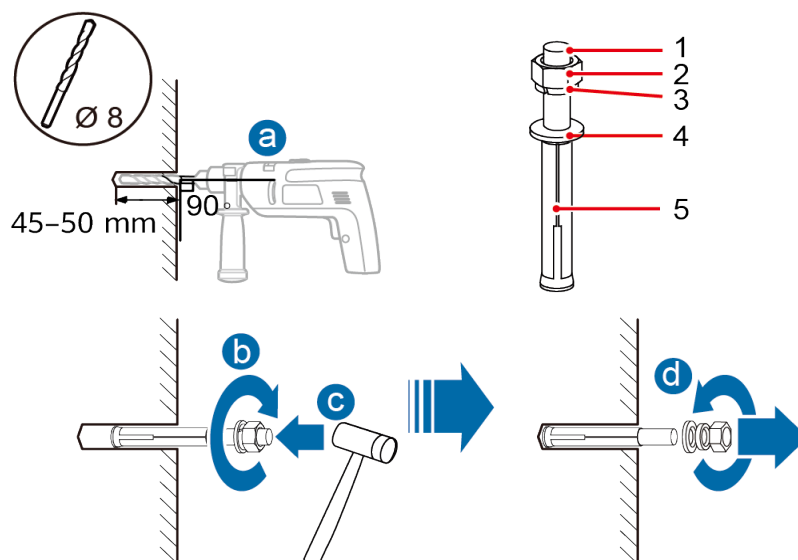
 CAUTION

Installation personnel should attach the other end (the buckle end) of the safety rope to the hook of their safety harness, preventing the AP from falling when they climb up the ladder to mount the AP to a mounting bracket.

2. Place a mounting bracket against the wall and adjust its position properly. Mark positions of the mounting holes with a marker, as shown in the following figure.

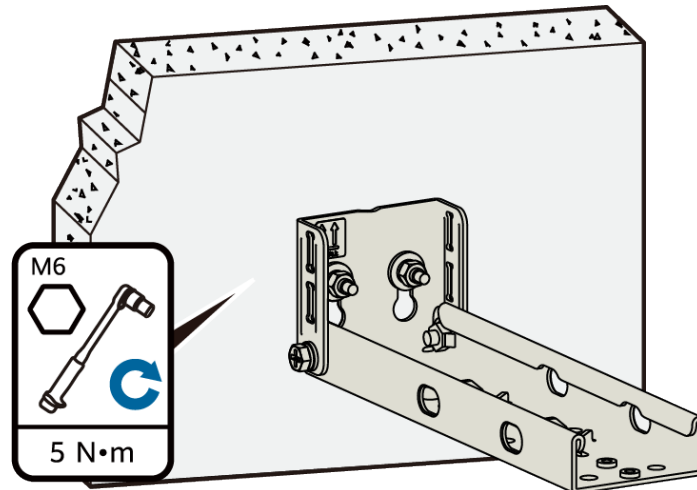


3. Use a drill bit with a diameter of 8 mm to drill 45 mm to 50 mm deep holes at the drilling positions. Hammer two expansion bolts into the installation holes until the flat washers are firmly attached to the wall. Then, remove the nut, spring washer, and flat washer of each expansion bolt, in that order.

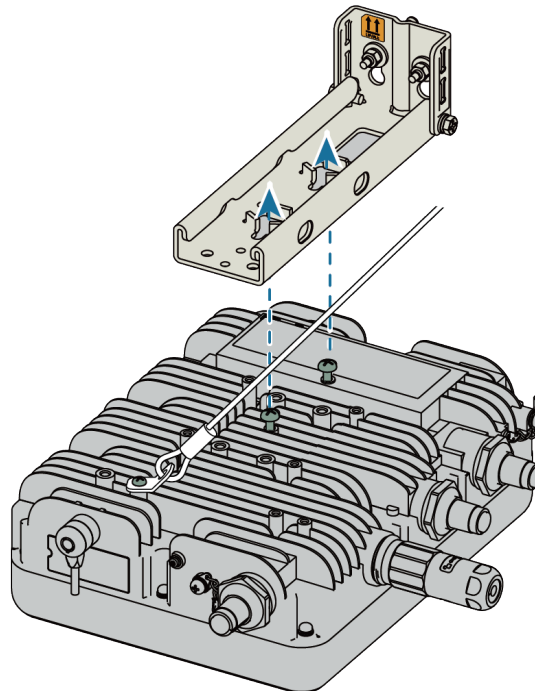


1. M6x60 bolt	2. Nut	3. Spring washer	4. Flat washer	5. Expansion tube
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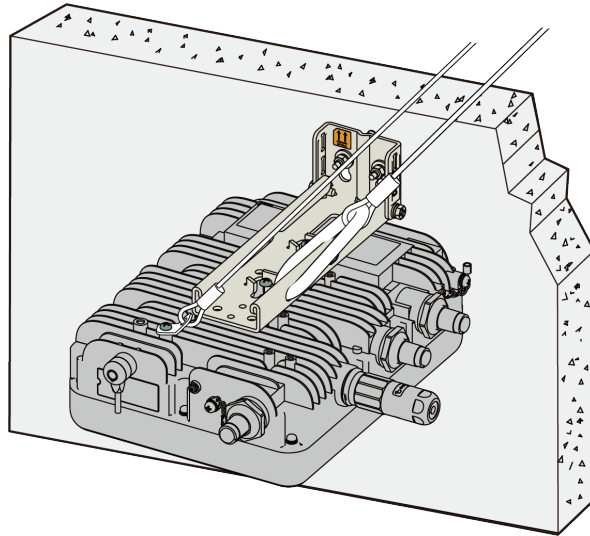
4. Hang the mounting bracket on the expansion bolts and use a wrench to fasten the flat washers, spring washers, and nuts, in that order.



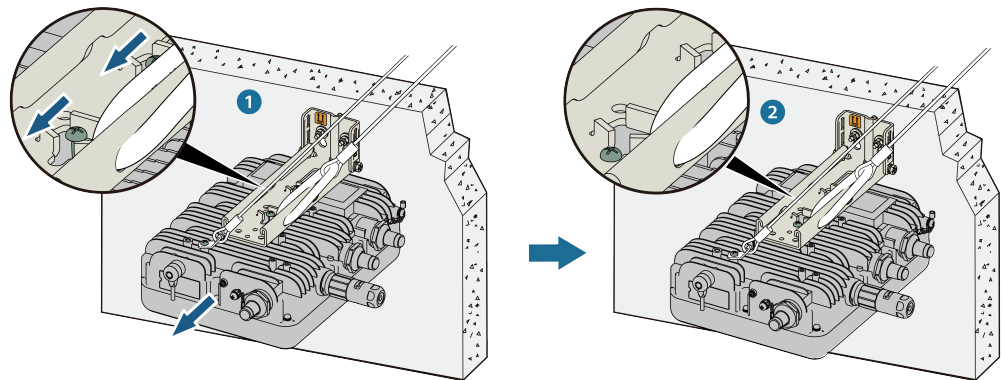
5. Hang the M4 screws on the AP into the mounting bracket holes.



6. Detach the safety rope from the safety harness and then fasten the buckle end of the safety rope to the lifting eye on the mounting bracket.



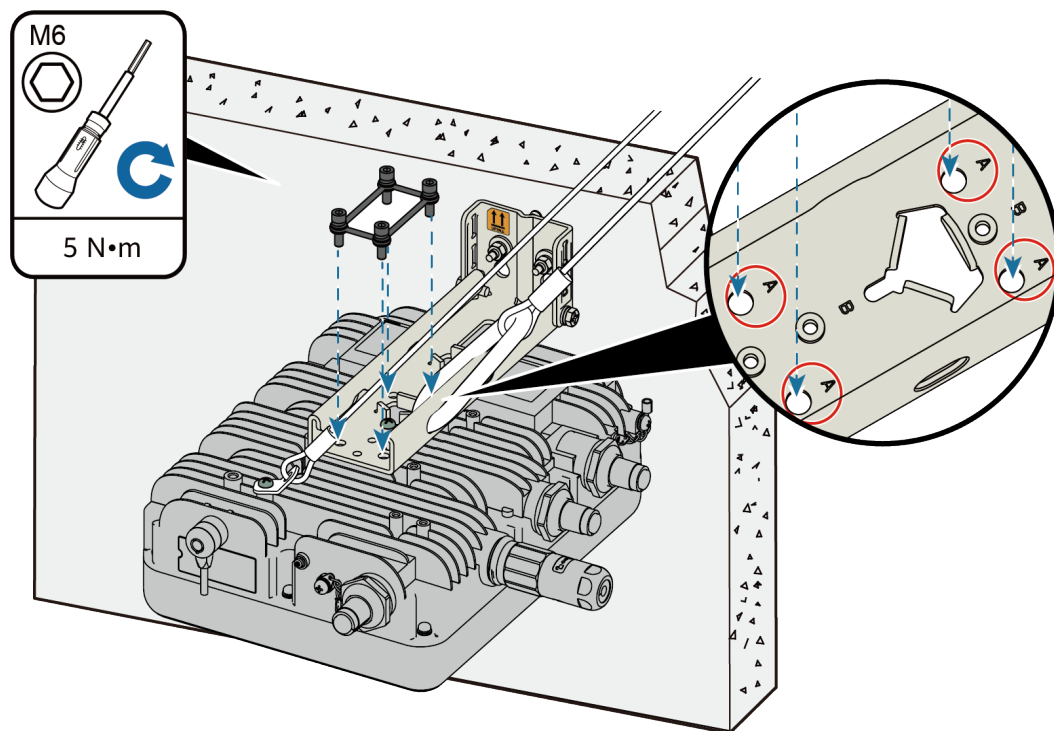
7. Slide the AP away from the wall until the two screws snap into the holes.



 NOTE

Ensure that the screws properly snap into the holes before you release the AP, as shown in the figure above. Avoid placing them above the bent flanges.

8. Use the M6 screw assembly delivered with the AP to secure the AP to the mounting bracket through the group A holes in a diagonal sequence.



5.2.6.2 Pole Mounting

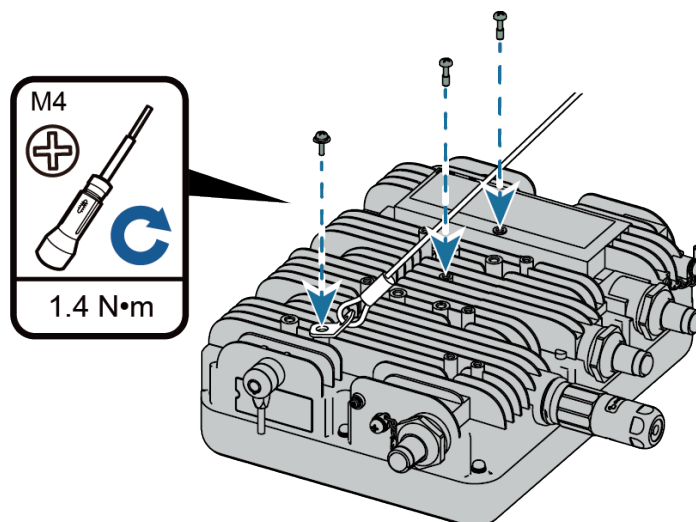
A pole for mounting a device needs to have a diameter of 48 mm to 114 mm, and a pole wall thickness of no less than 2.5 mm.

This mounting mode requires that the pole be able to bear at least four times the total weight of the device and mounting bracket, without being damaged. When the total weight of the device and mounting bracket is less than 1.25 kg (2.76 lb.), the load-bearing capability of the pole must be greater than or equal to 5 kg (11.02 lb).

NOTE

- When fixing a mounting bracket, ensure that the arrows of  point upwards.
- The length of the M6 inner hexagon screwdriver used for installation must be greater than or equal to 200 mm.

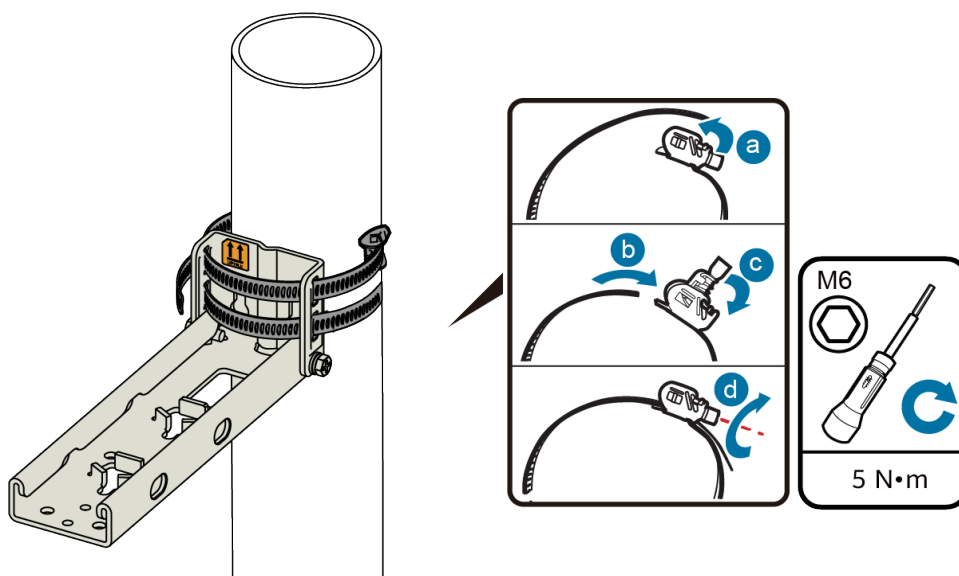
1. Secure two M4 screws and one end of a safety rope to an AP.



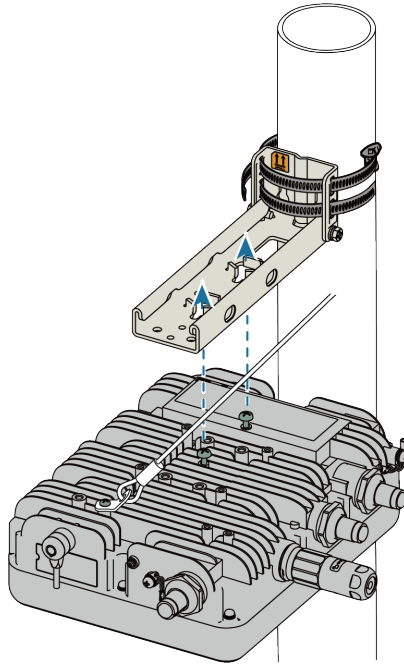
CAUTION

Installation personnel should attach the other end (the buckle end) of the safety rope to the hook of their safety harness, preventing the AP from falling when they climb up the ladder to mount the AP to a mounting bracket.

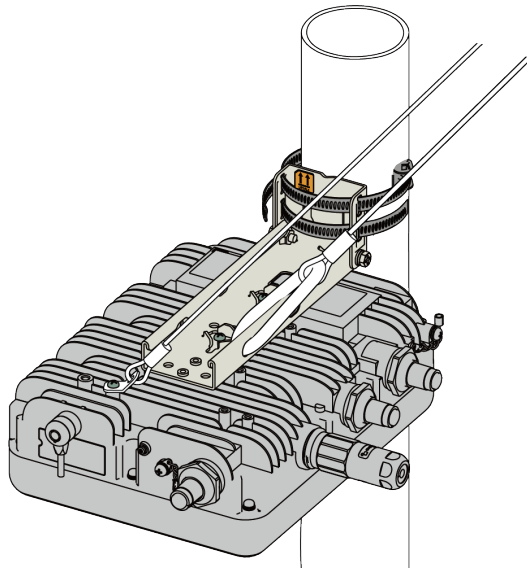
2. Determine the AP installation position and attach a pole mounting bracket to the pole using hose clamps.
 - a. Use an M6 inner hex torque screwdriver to loosen the screws on the hose clamps to open them.
 - b. Lead the hose clamps through the square holes on the mounting bracket and secure the mounting bracket to the pole.
 - c. Tighten and close the hose clamps.
 - d. Use an inner hex torque screwdriver to tighten the screws on the hose clamps.



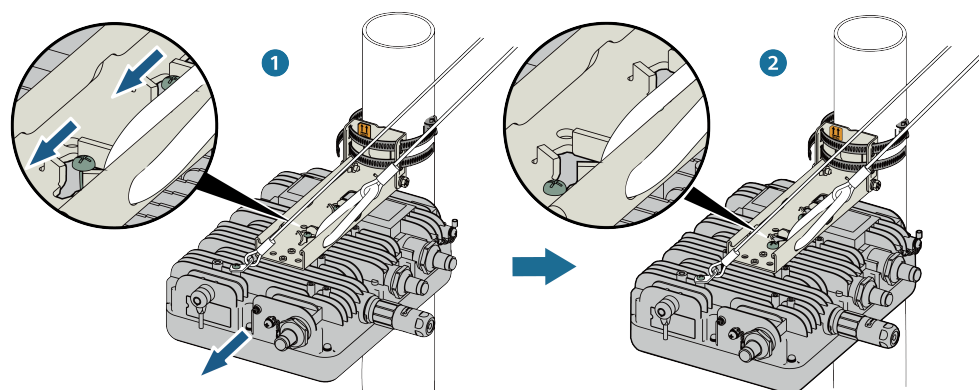
3. Hang the M4 screws on the AP into the mounting bracket holes.



4. Detach the safety rope from the safety harness and then fasten the buckle end of the safety rope to the lifting eye on the mounting bracket.



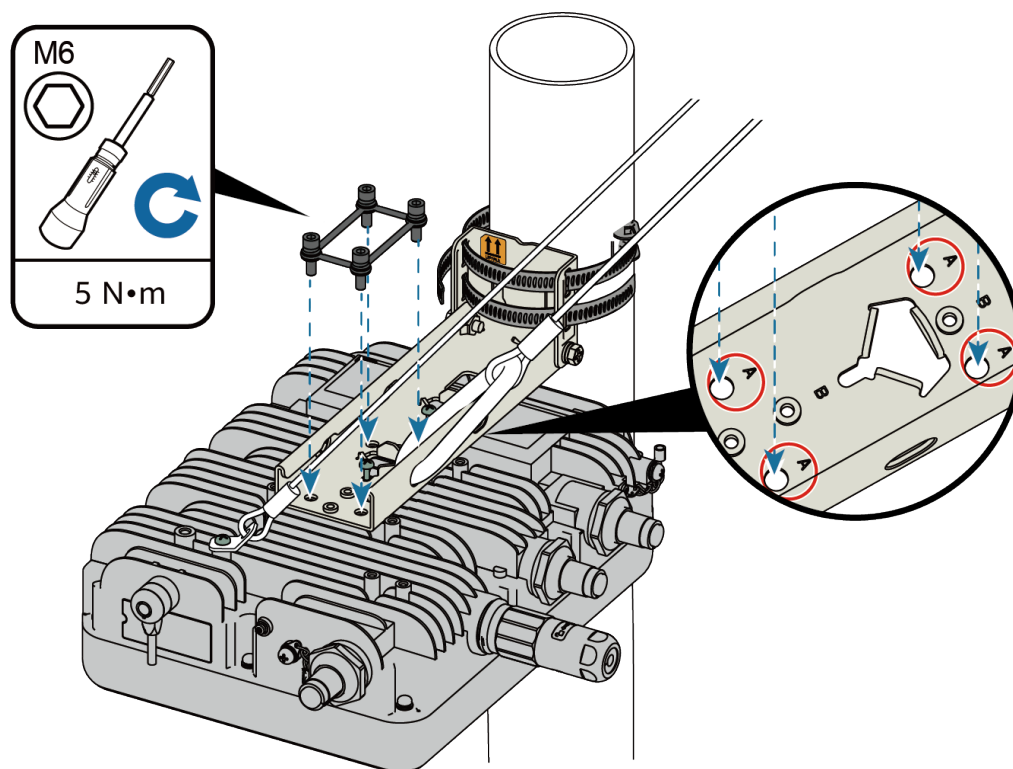
5. Slide the AP away from the pole until the two screws snap into the holes.



 NOTE

Ensure that the screws properly snap into the holes before you release the AP, as shown in the figure above. Avoid placing them above the bent flanges.

6. Use the M6 screw assembly delivered with the AP to secure the AP to the mounting bracket through the group A holes in a diagonal sequence.



5.2.7 Installing an AP (Cylinder-Shaped) on a Mounting Bracket with a High Wind Resistance Level

The standard mounting bracket for outdoor APs meets the wind resistance requirement of 67 m/s. In some scenarios requiring a wind resistance level of 74 m/s, the mounting bracket with a high wind resistance level (21154340) can be used to install the device.

This section uses an AP model as an example to describe how to install an outdoor AP on a mounting bracket with a high wind resistance level.

5.2.7.1 Wall Mounting

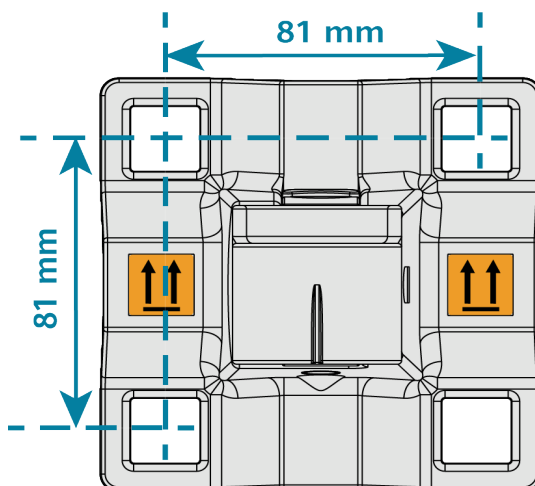
A wall for installing the device needs to meet the following requirements:

- The wall can bear the weight of four times the total weight of the device and mounting bracket without damage.
- When the tightening torque of a screw reaches 28 N·m, the screw still properly works, without crack or damage on the wall.

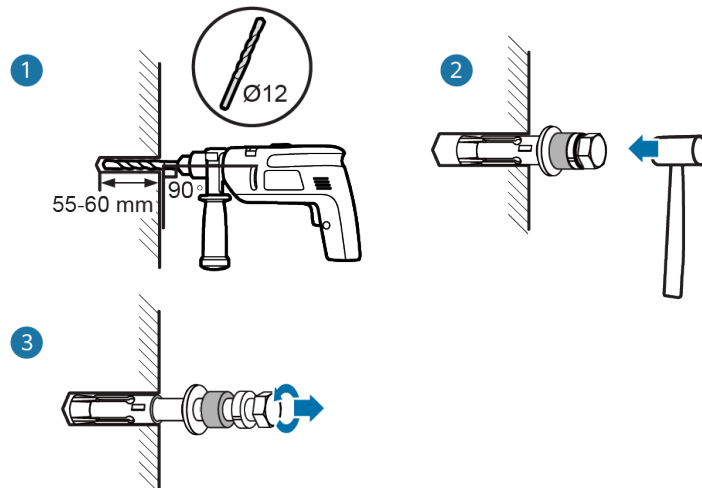
Mounting brackets and expansion bolts are required to install the AP on a wall.

NOTE

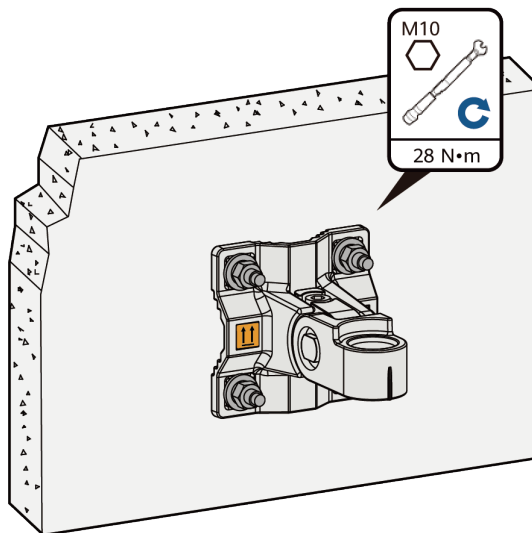
- When fixing the mounting bracket, ensure that the arrows of  point upwards.
 - When installing the device on the mounting bracket, ensure that the device logo is upside up.
 - The angle of a mounting bracket with a high wind resistance level can be adjusted by $\pm 30^\circ$ in the vertical and horizontal directions.
1. Attach the mounting bracket against the wall and adjust its position properly. Mark positions of the mounting holes with a marker, as shown in the following figure.



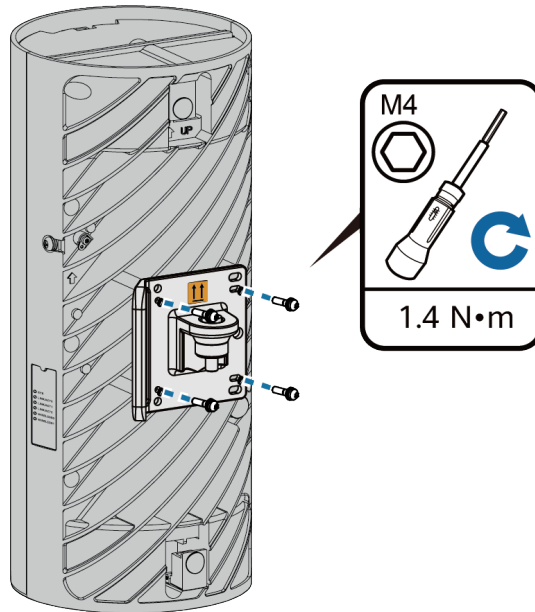
2. Use a hammer drill to drill holes on the marked positions, and install expansion bolts. Hammer the M10 expansion bolts delivered with the mounting bracket into the installation holes until the flat washers are completely attached to the wall. Then, remove the nuts, spring washers, and flat washers in order.



3. Hang the mounting bracket on the expansion bolts and use a wrench to fasten the flat washers, spring washers, and nuts in order.



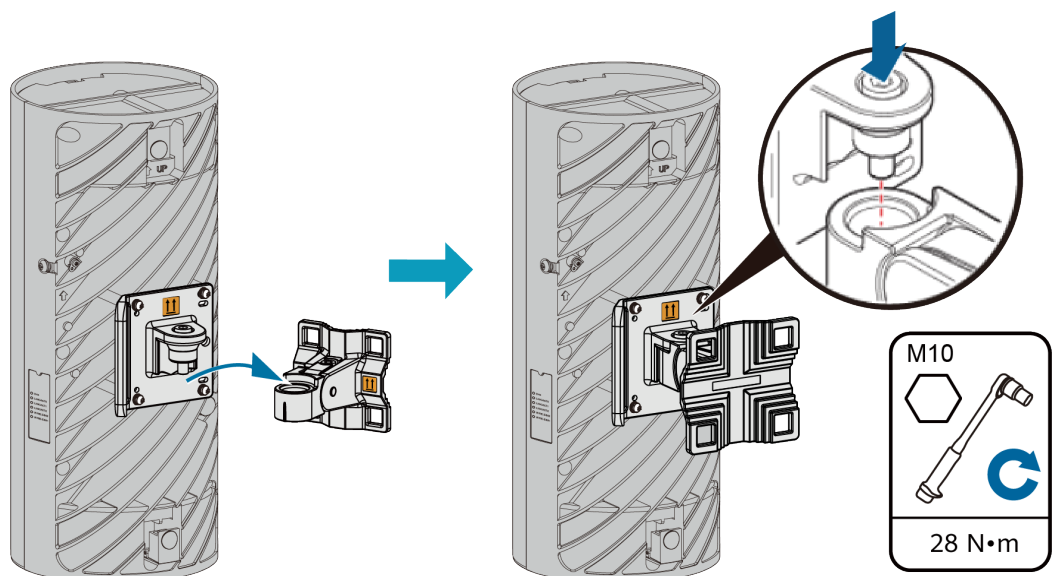
4. Use four M4x14 hexagon socket head cap screws (part number: 26020227, delivered with the device) to fasten the AP mounting bracket to the AP.



 NOTE

It is recommended that this step be performed within the package.

5. Vertically mount the AP on the mounting bracket with a high wind resistance level, and tighten the positioning screw, as shown in the following figure.



6. Loosen the M10 screw in the vertical direction, adjust the horizontal and vertical angles of the device, and tighten all screws, as shown in [Figure 5-89](#) and [Figure 5-90](#).

Figure 5-89 Adjusting the horizontal angle

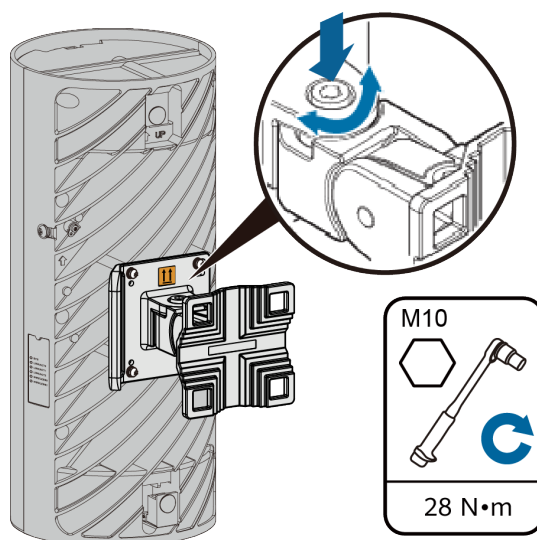
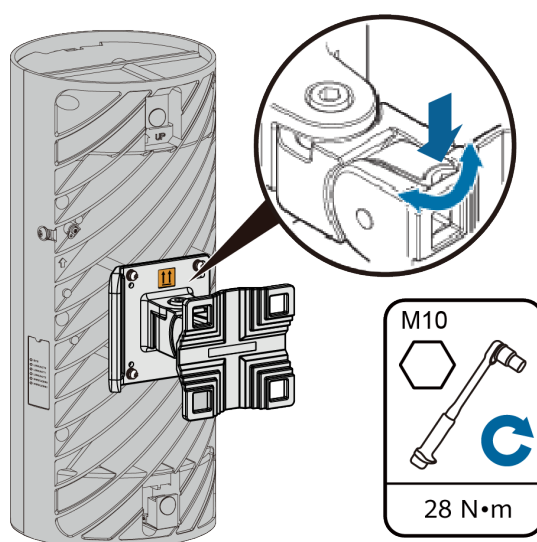


Figure 5-90 Adjusting the vertical angle



NOTE

You are not advised to adjust the horizontal angle and vertical angle at the same time.

5.2.7.2 Pole Mounting

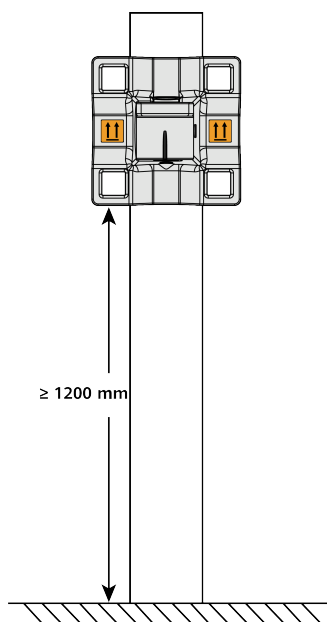
An outdoor AP must be installed on a pole with a diameter of 48 mm to 114 mm and the difference between the outer and inner diameters should be at least 2.5 mm.

In this mounting mode, a pole for installing the device must be able to bear the weight four times the total weight of the device and mounting bracket without damage. When the total weight of the device and mounting bracket is less than 1.25 kg, the load-bearing capability of the pole must be greater than or equal to 5 kg.

 NOTE

- When fixing the mounting bracket, ensure that the arrows of  point upwards.
 - When installing the device on the mounting bracket, ensure that the device logo is upside up.
 - The angle of a mounting bracket with a high wind resistance level can be adjusted by $\pm 30^\circ$ in the vertical and horizontal directions.
1. Mark the position for installing the mounting bracket with a high wind resistance level, as shown in [Figure 5-91](#).

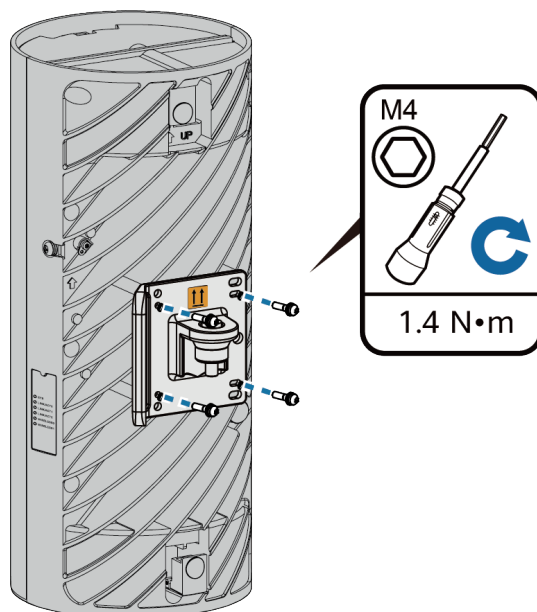
Figure 5-91 Distance between the mounting bracket with a high wind resistance level and the ground



 NOTE

It is recommended that the distance between the mounting bracket and the ground be greater than or equal to 1200 mm. You are advised to determine the installation height based on the actual coverage requirements.

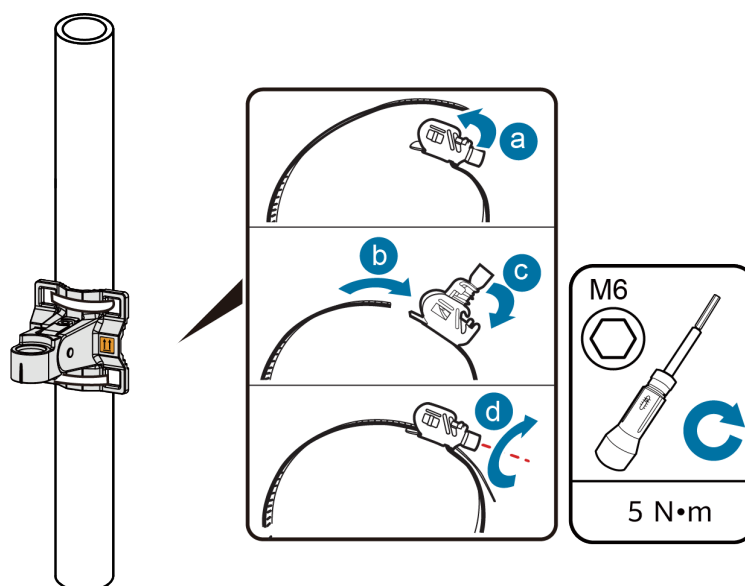
2. Use four M4x14 hexagon socket head cap screws (part number: 26020227, delivered with the device) to fasten the AP mounting bracket to the AP.



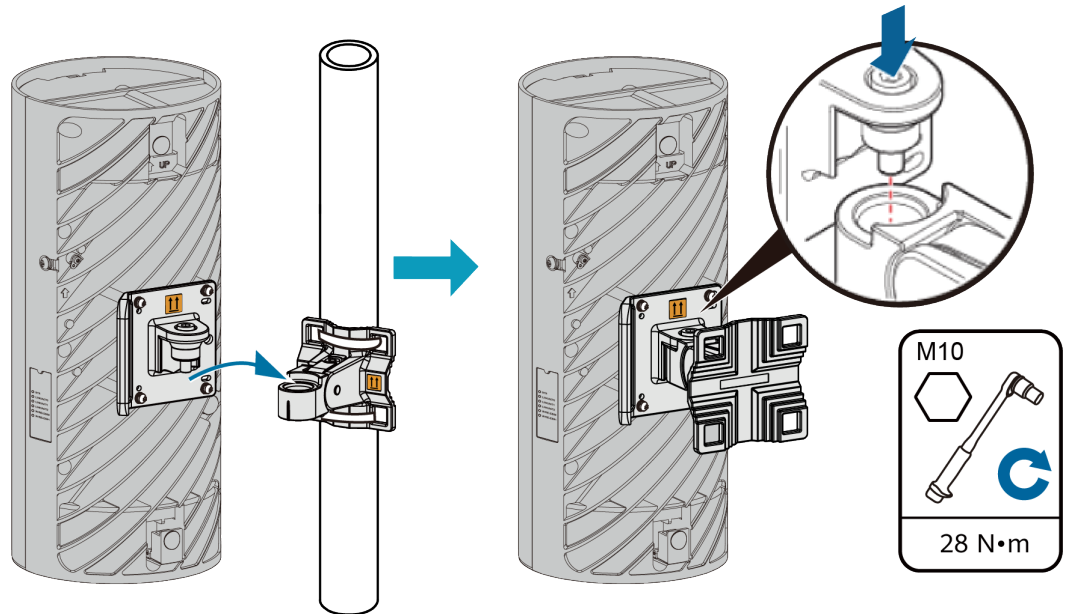
 NOTE

It is recommended that this step be performed within the package.

3. Determine the AP installation position and attach the mounting bracket to the pole using the hose clamp.
 - a. Use an M6 inner hex torque screwdriver to loosen the screw on the hose clamp to open it.
 - b. Lead the hose clamp through the square holes on the mounting bracket and secure the mounting bracket to the pole.
 - c. Tighten and close the hose clamp.
 - d. Use an inner hex torque screwdriver to tighten the screw.



4. Mount the AP on the mounting bracket, and use an M10 inner hexagon torque socket to tighten the angle-adjusting screw on the top using a tightening torque of 28 N·m, as shown in the following figure.



5. Loosen the M10 screw in the vertical direction, adjust the horizontal and vertical angles of the device, and tighten all screws, as shown in [Figure 5-92](#) and [Figure 5-93](#).

Figure 5-92 Adjusting the horizontal angle

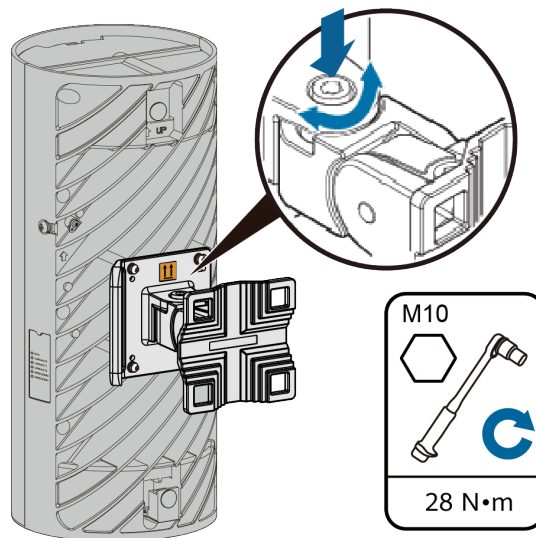
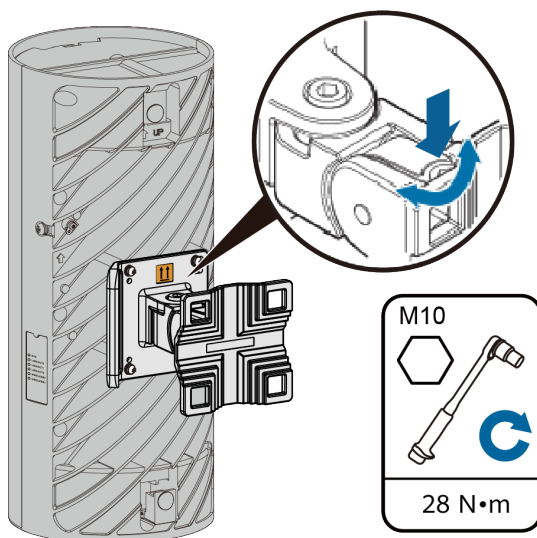


Figure 5-93 Adjusting the vertical angle



NOTE

You are not advised to adjust the horizontal angle and vertical angle at the same time.

5.2.8 Installing an AP (Square-Shaped) on a Mounting Bracket with a High Wind Resistance Level

The standard mounting bracket for outdoor APs meets the wind resistance requirement of 67 m/s. In some scenarios requiring a wind resistance level of 74 m/s, the mounting bracket with a high wind resistance level (21154340) can be used to install the device.

This section uses an AP model as an example to describe how to install an outdoor AP on a mounting bracket with a high wind resistance level.

5.2.8.1 Wall Mounting

A wall for installing a device needs to meet the following requirements:

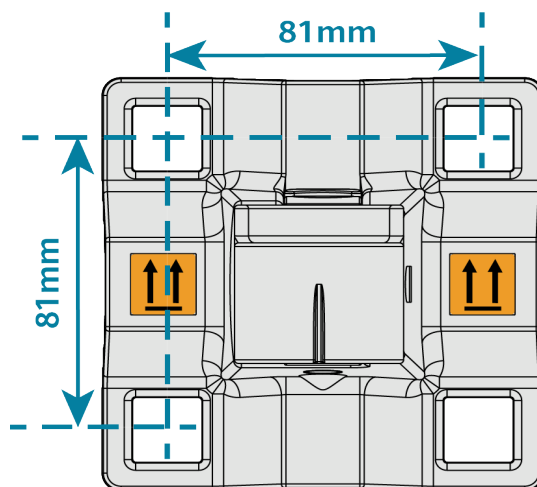
- The wall can bear the weight of four times the total weight of the device and mounting bracket without damage.
- When the tightening torque of a screw reaches 28 N·m, the screw still properly works, without crack or damage on the wall.

This mounting mode requires the use of a mounting bracket and expansion tubes.

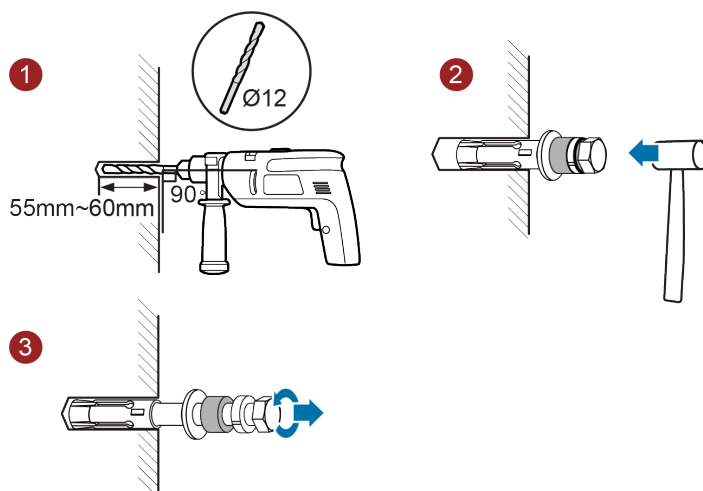
NOTE

- When fixing the mounting bracket, ensure that the arrows of  point upwards.
- When installing the device on the mounting bracket, ensure that the device logo is the right way up.
- The angle of a mounting bracket with a high wind resistance level can be adjusted by $\pm 30^\circ$ in the vertical and horizontal directions.

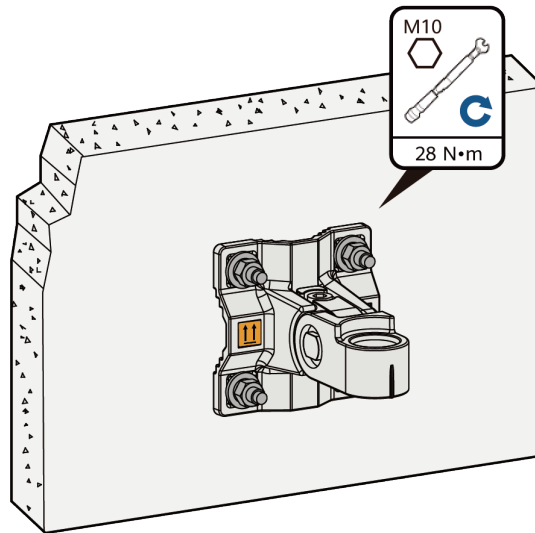
1. Place the base plate against the wall and adjust its position properly. Mark positions of the mounting holes with a marker, as shown in the following figure.



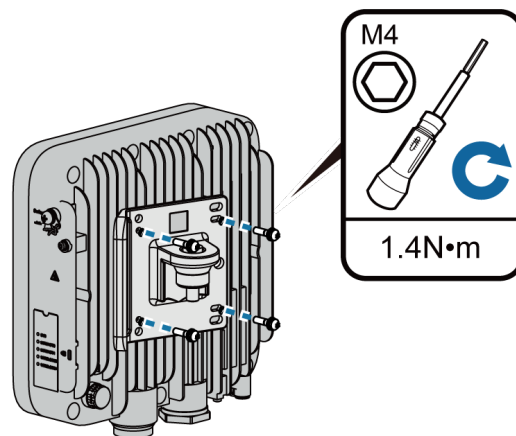
2. Use a hammer drill to drill holes on the marked positions, and install expansion bolts. Hammer the M10 expansion bolts delivered with the mounting bracket into the installation holes until the flat washers are completely attached to the wall. Then, remove the nuts, spring washers, and flat washers in order.



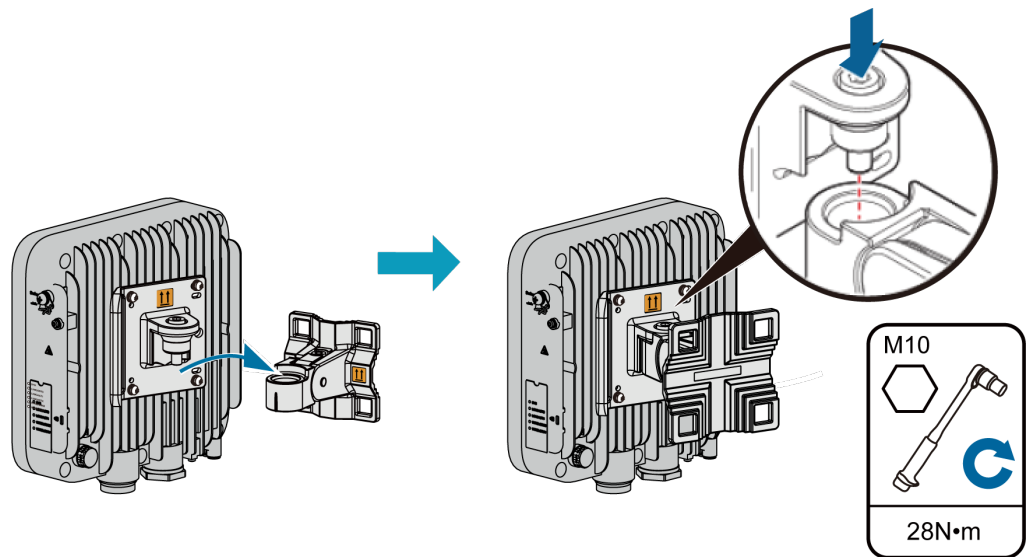
3. Hang the base plate on the expansion bolts and use a wrench to fasten the flat washers, spring washers, and nuts in order.



4. Use four M4x14 hexagon socket head cap screws (part number: 26020227, delivered with the device) to fasten the AP mounting bracket to the AP.



5. Vertically mount the AP on the mounting bracket with a high wind resistance level, and tighten the positioning screw, as shown in the following figure.



6. Loosen the M10 screw in the vertical direction, adjust the AP's angle in the horizontal and vertical directions, and tighten all screws, as shown in [Figure 5-94](#) and [Figure 5-95](#).

Figure 5-94 Adjusting the horizontal angle

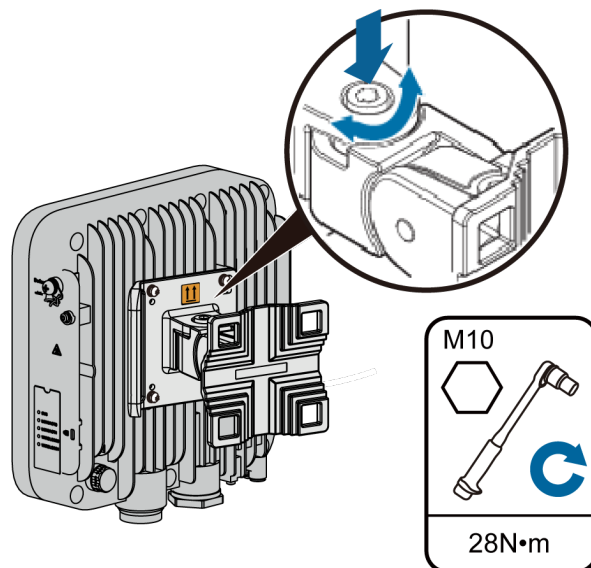
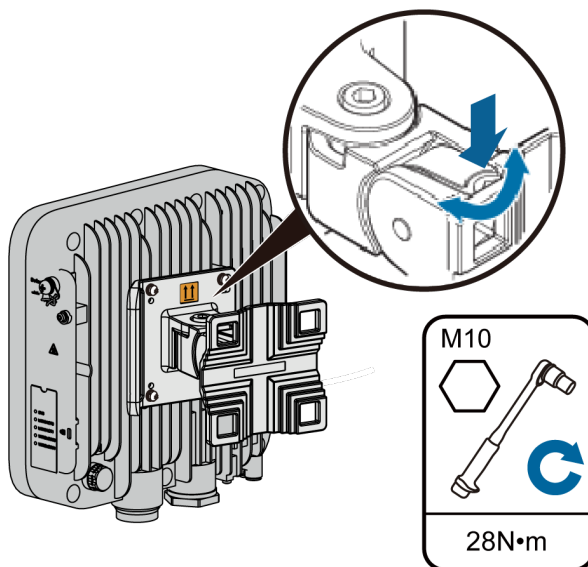


Figure 5-95 Adjusting the vertical angle



5.2.8.2 Pole Mounting

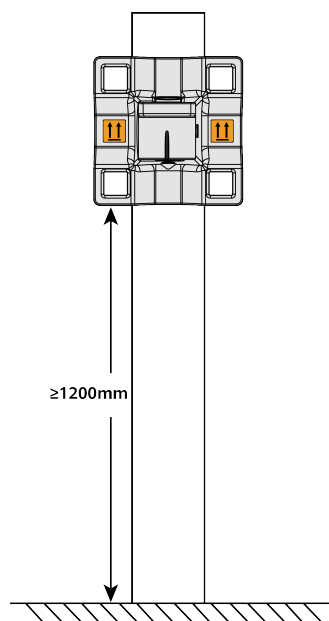
A pole for mounting a device needs to have a diameter of 48 mm to 114 mm, and a pole wall thickness of no less than 2.5 mm.

This mounting mode requires that the pole be able to bear at least four times the total weight of the device and mounting bracket, without being damaged. When the total weight of the device and mounting bracket is less than 1.25 kg (2.76 lb.), the load-bearing capability of the pole must be greater than or equal to 5 kg (11.02 lb).

NOTE

- When fixing the mounting bracket, ensure that the arrows of  point upwards.
 - When installing the device on the mounting bracket, ensure that the device logo is the right way up.
 - The angle of a mounting bracket with a high wind resistance level can be adjusted by $\pm 30^\circ$ in the vertical and horizontal directions.
1. Mark the position for installing the mounting bracket with a high wind resistance level, as shown in [Figure 5-96](#).

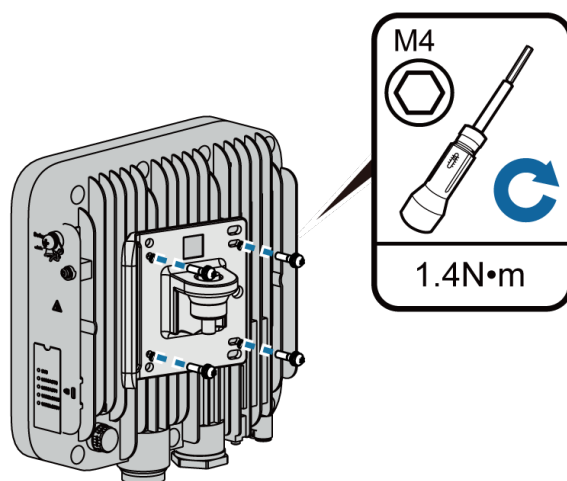
Figure 5-96 Distance between the mounting bracket with a high wind resistance level and the ground



NOTE

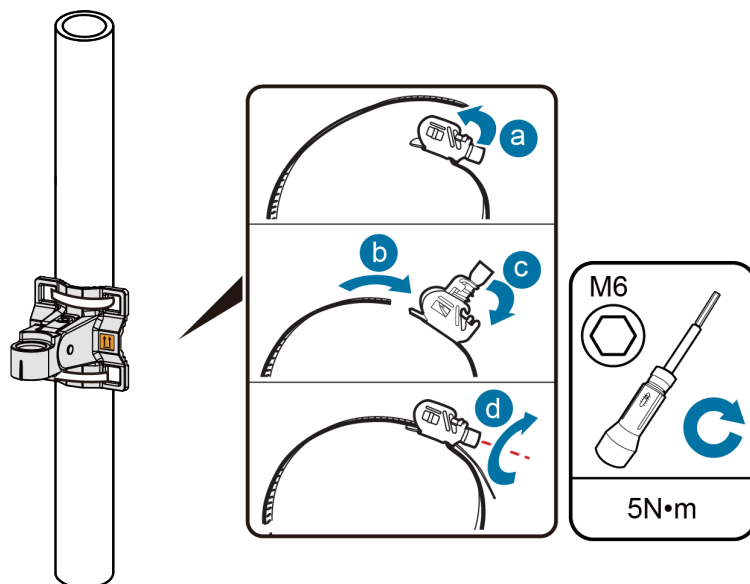
It is recommended that the distance between the mounting bracket and the ground be greater than or equal to 1200 mm. You are advised to determine the installation height based on the actual coverage requirements.

2. Use four M4x14 hexagon socket head cap screws (part number: 26020227, delivered with the device) to fasten the AP mounting bracket to the AP.

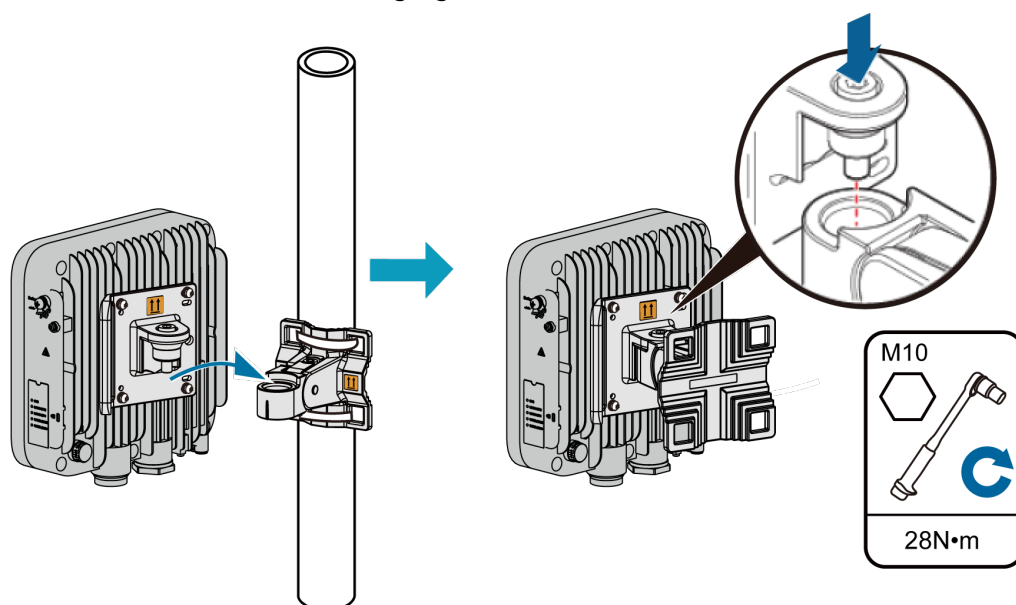


3. Determine the AP installation position and attach the base plate to the pole using the hose clamp.

- a. Use an M6 inner hex torque screwdriver to loosen the screws on the hose clamps to open them.
- b. Lead the hose clamps through the square holes on the base plate and secure it to the pole.
- c. Tighten and close the hose clamps.
- d. Use an inner hex torque screwdriver to tighten the screws.



4. Mount the AP on the mounting bracket, and use an M10 hex torque socket to tighten the angle-adjustable screw on the top using a tightening torque of 28 N·m, as shown in the following figure.



5. Loosen the M10 screw in the vertical direction, adjust the AP's angle in the horizontal and vertical directions, and tighten all screws, as shown in [Figure 5-97](#) and [Figure 5-98](#).

Figure 5-97 Adjusting the horizontal angle

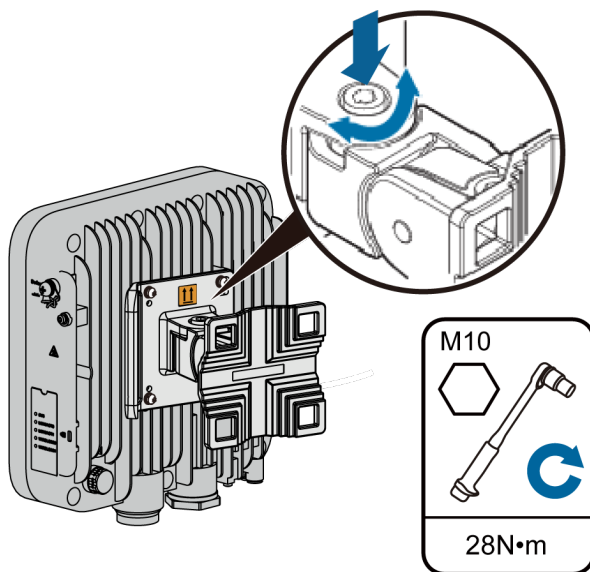
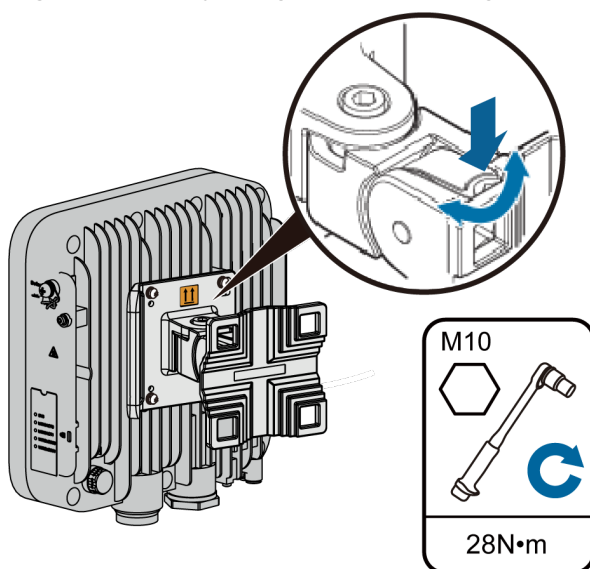


Figure 5-98 Adjusting the vertical angle



NOTE

You are not advised to adjust the horizontal and vertical angles at the same time.

5.2.9 Installing a Waterproof Connection Kit for an AP Hybrid Cable

A waterproof connection kit (part number: 50086896) is an optional set for an AP hybrid cable. This kit is used for connecting the optical fiber and network cable on an outdoor AP to a hybrid cable on an indoor switch.

NOTE

This waterproof connection kit can be used only with Huawei's hybrid optical-electrical switches.

Table 5-149 lists the materials in a waterproof connection kit.

Table 5-149 Materials in a waterproof connection kit

Material	Quantity	Description
Top cover of the waterproof box	1	-
Underside of the waterproof box	1	-
PG connector for housing an optical fiber and a network cable	1	Two-hole PG connector supporting a cable diameter of 6.4–7.8 mm.
PG connector for housing a hybrid cable	1	Single-hole PG connector supporting a cable diameter of 5.9–11.0 mm.
Outdoor armored fiber pigtail	1	On one end, the insulation layer needs to be stripped off for splicing with the optical fiber in a hybrid cable. On the other end, the optical fiber connector can be directly inserted into the optical port of an AP.
Outdoor CAT6A shielded network cable	1	Used only for power supply but not for communication.
Fiber spool	1	It supports splicing and coiling for four optical fibers.
Auxiliary materials for fiber splicing and connection	3	Auxiliary materials for connecting optical fibers, including Fusion splice protection sleeves and heat-shrink protective sleeves. In practice, two sets of the auxiliary materials are provided, with one set as the backup.
Bare crimp terminal	2	Used to crimp the two power cables in a hybrid cable and the two power cables in a network cable.
Wall-mounting expansion screw	2	Used to secure the mounting bracket of the waterproof box to the wall.
Pole hose clamp	2	Pole hose clamp supporting a pole diameter of 48–114 mm and a wall thickness of greater than or equal to 2.5 mm.
Mounting bracket	1	Used to mount a waterproof box on a wall or pole.

Material	Quantity	Description
Installation guide	1	Quick installation guide
Auxiliary materials	1	Screws for securing internal components, adhesive tape, labels, cable ties, insulation clips, and shielded RJ45 connectors.

Figure 5-99 shows the exploded view of an outdoor waterproof connector kit. Figure 5-100 and Figure 5-101 show the exploded views of PG connectors.

Figure 5-99 Exploded view of an outdoor waterproof connection kit

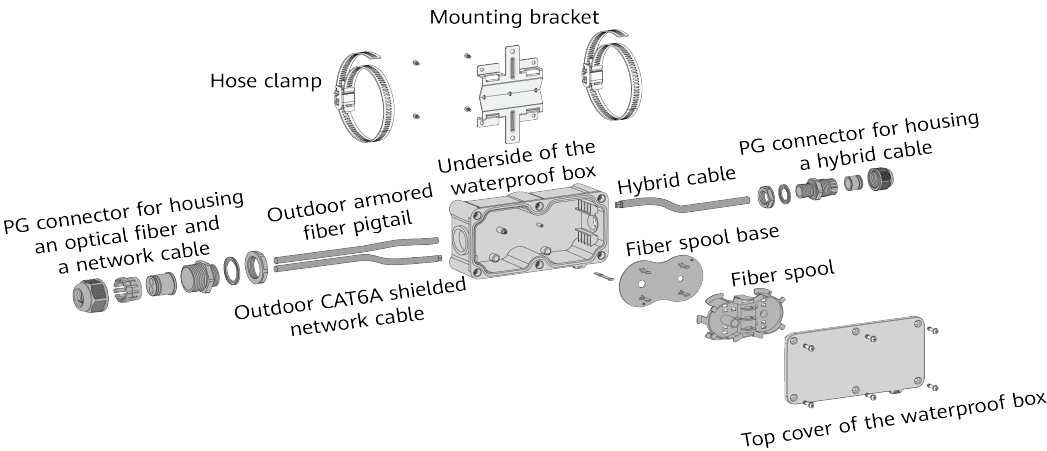


Figure 5-100 Exploded view of a PG connector for housing an optical fiber and a network cable

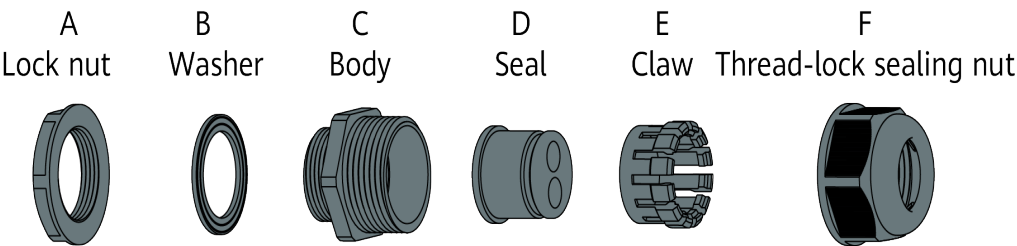
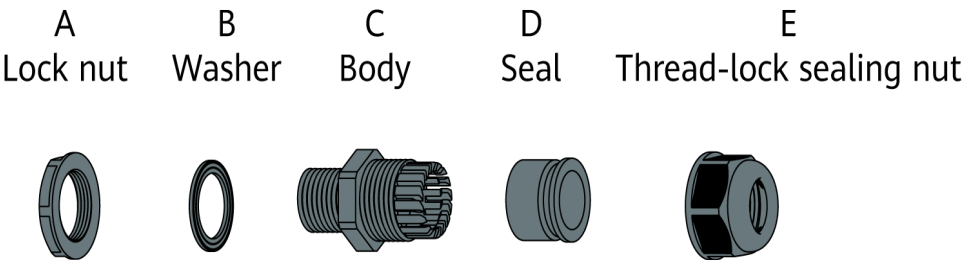
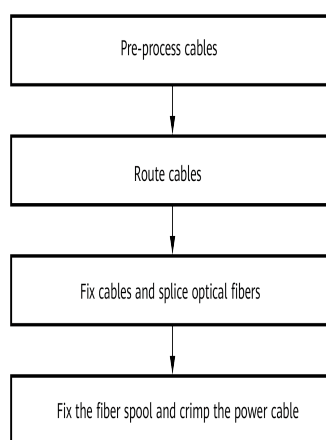


Figure 5-101 Exploded view of a PG connector for housing a hybrid cable



5.2.9.1 Assembling a Waterproof Box

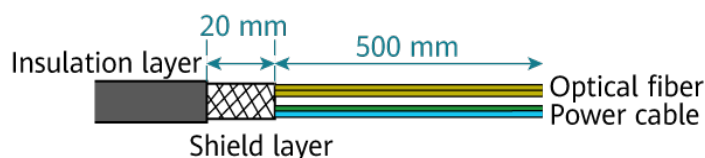
The following figure shows the flowchart for assembling a waterproof box.



Pre-processing Cables

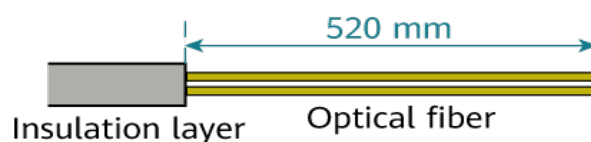
Step 1 Pre-process the hybrid cable passing through the one-hole PG connector.

1. Strip off the black insulation layer by 520 mm to expose the shield layer with a braided mesh.
2. Strip off the shield layer and reserve 20 mm to expose two power cables and two optical fibers.



Step 2 Pre-process the outdoor armored pigtail passing through the two-hole PG connector.

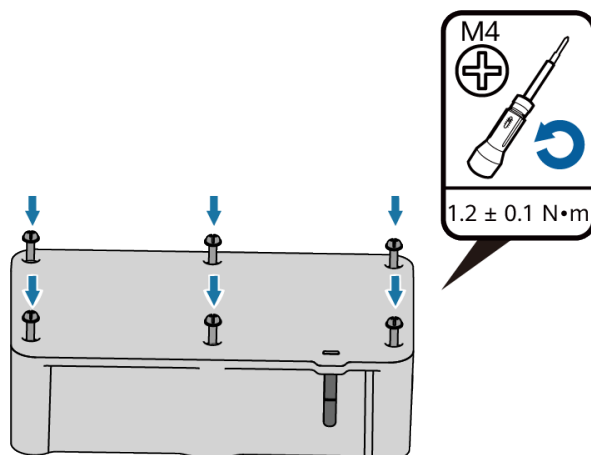
Strip 520 mm of the outermost black insulation layer to expose two optical fibers and two fillers. Cut off the fillers.



----End

Routing Cables

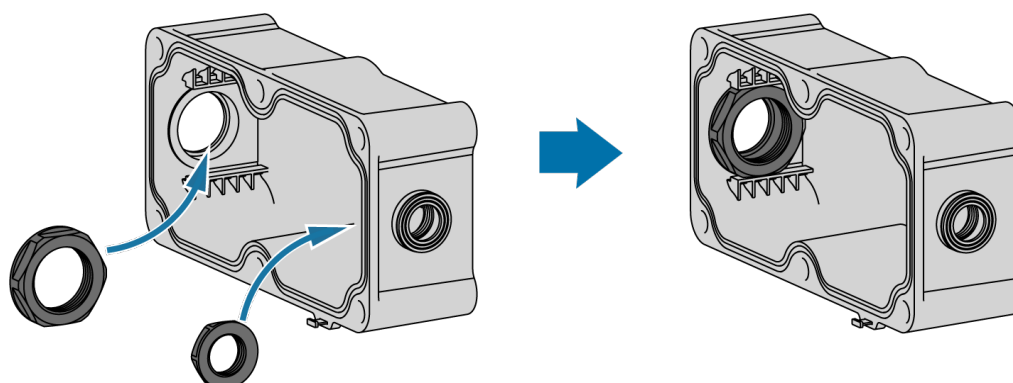
Step 1 Loosen the M4x14 screws on the top cover of the waterproof box to open it.



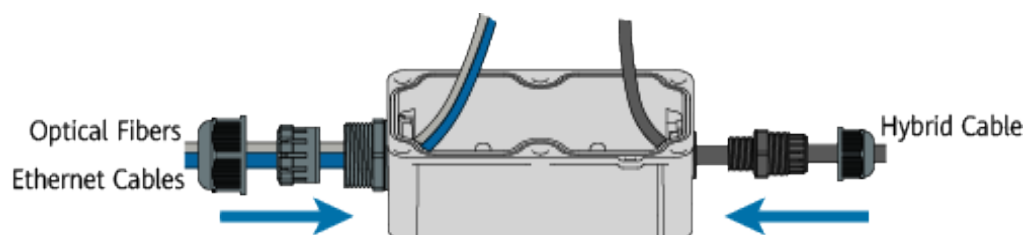
NOTE

The top cover is connected to the body through a silicone pin on one side. For easy operation, it is recommended that the top cover not be totally removed.

Step 2 Install the screw caps inside the waterproof box.



Step 3 Route an optical cable and a network cable through the two-hole PG connector, and route a hybrid cable (part number: 25090079 or 25090117) through the one-hole PG connector.



----End

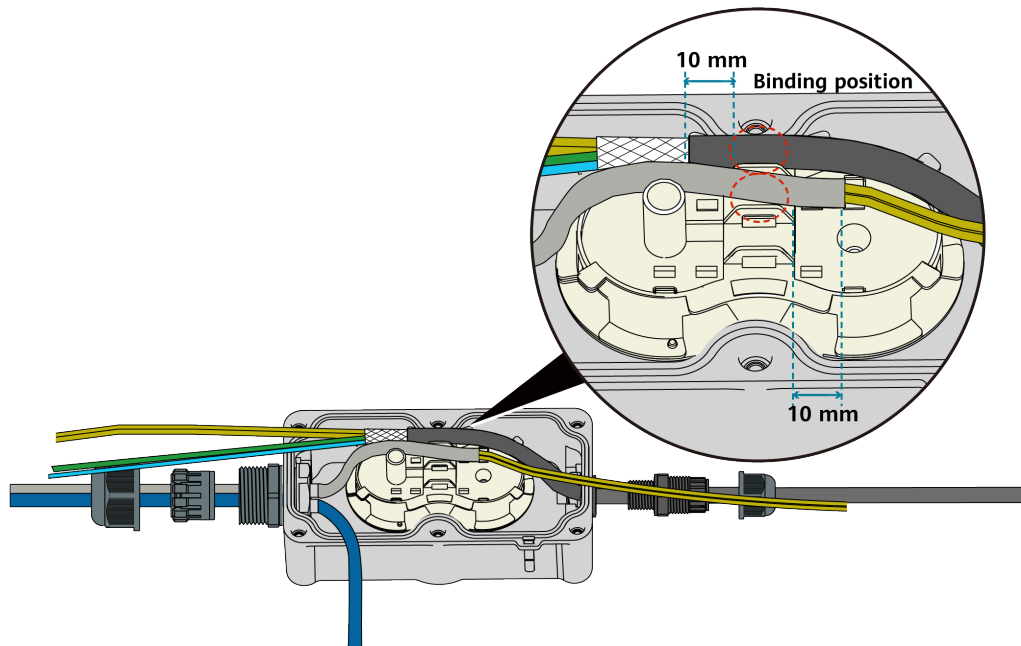
Fixing Cables and Splicing Optical Fibers

Step 1 Fusion splice the optical fiber.

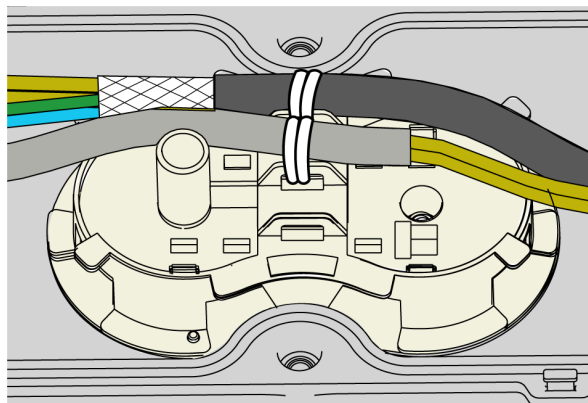
NOTE

For single-core LC optical fibers, the wire sequence does not need to be distinguished. For DLC optical fibers, ensure that the optical fibers with the same color in the main cable and pigtail are spliced.

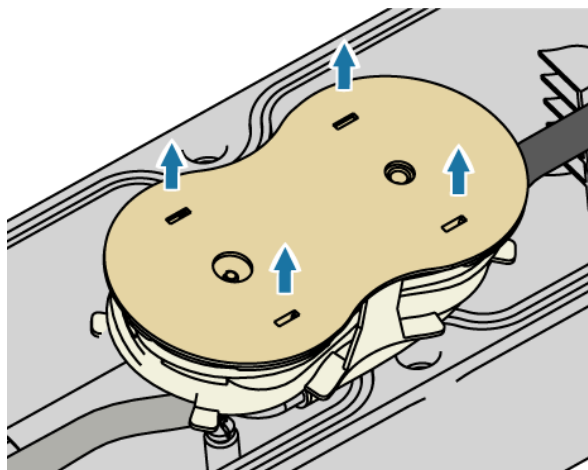
- Step 2** Reserve 10 mm of the black insulation layer away from the binding position, and secure the cables to the fiber spool.



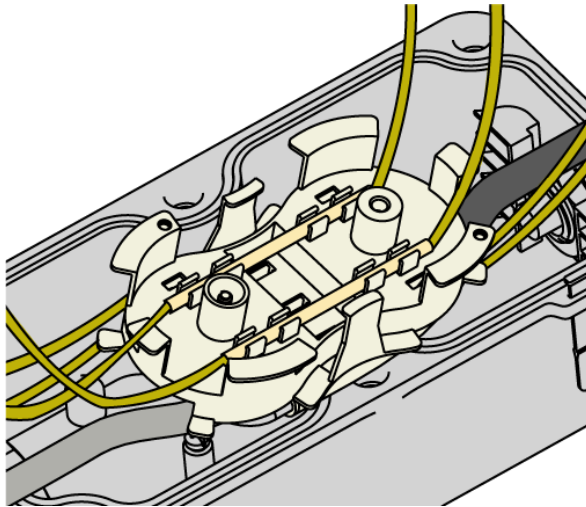
- Step 3** Bind the hybrid cable and optical cable to the binding position on the fiber spool.



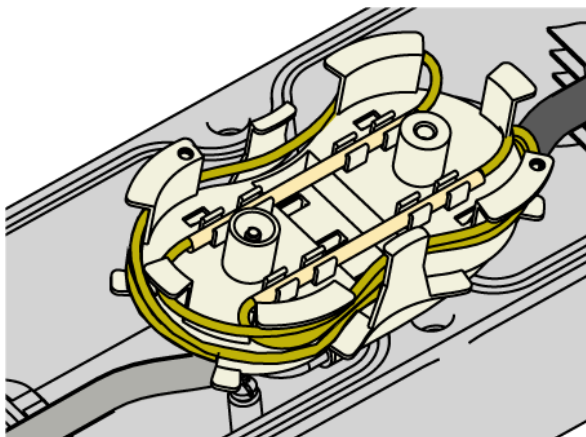
- Step 4** Turn over the fiber spool 180° inside the waterproof box and remove the fiber spool base.



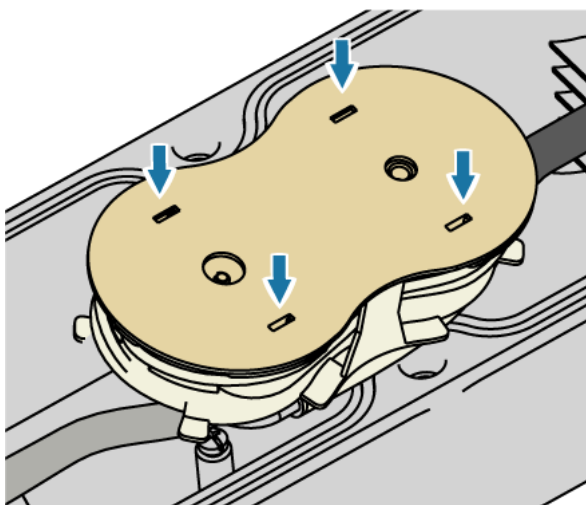
Step 5 Secure the heat-shrink protective sleeves to the buckles.



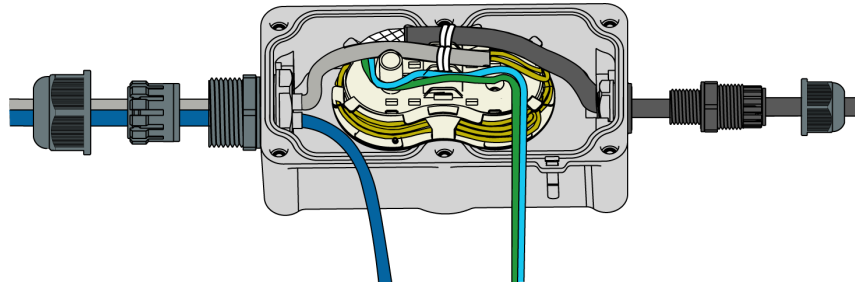
Step 6 Coil the optical fiber around the fiber spool in compliance with the bending radius required for an optical fiber (≥ 10 mm). After the optical fiber is coiled, arrange it properly.



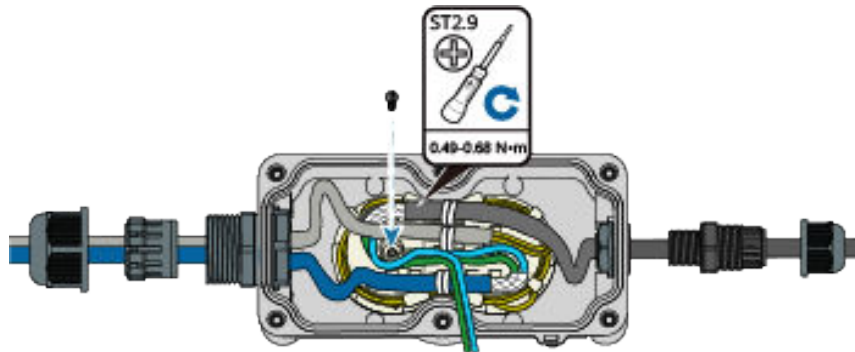
Step 7 Close the fiber spool base by aligning with the buckles.



Step 8 Turn over the fiber spool 180° and make it front facing upwards in the waterproof box.



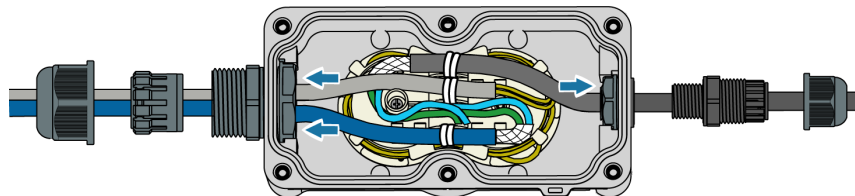
Step 9 Bind the network cable and tighten the screw on the fiber spool.



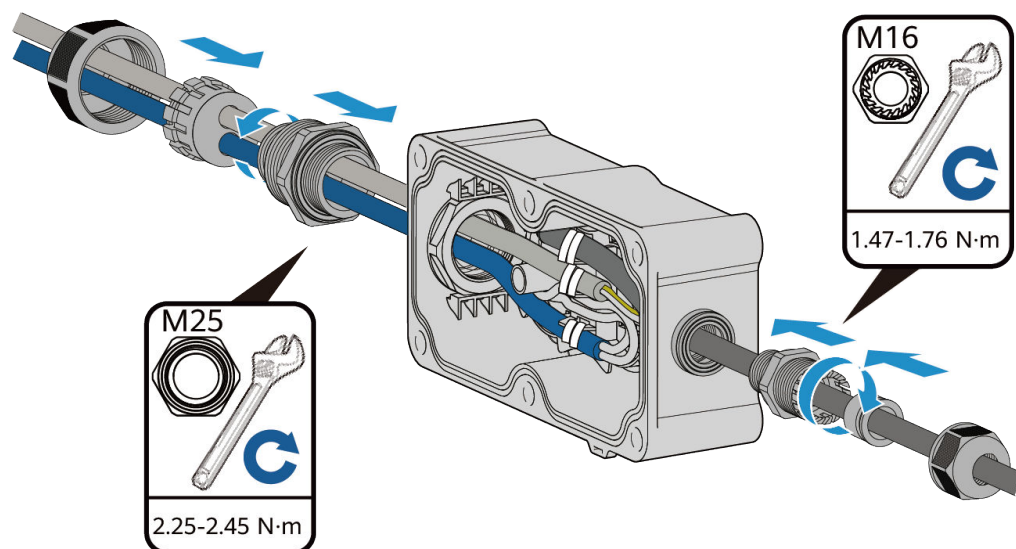
----End

Fixing the Fiber Spool and Crimping the Power Cable

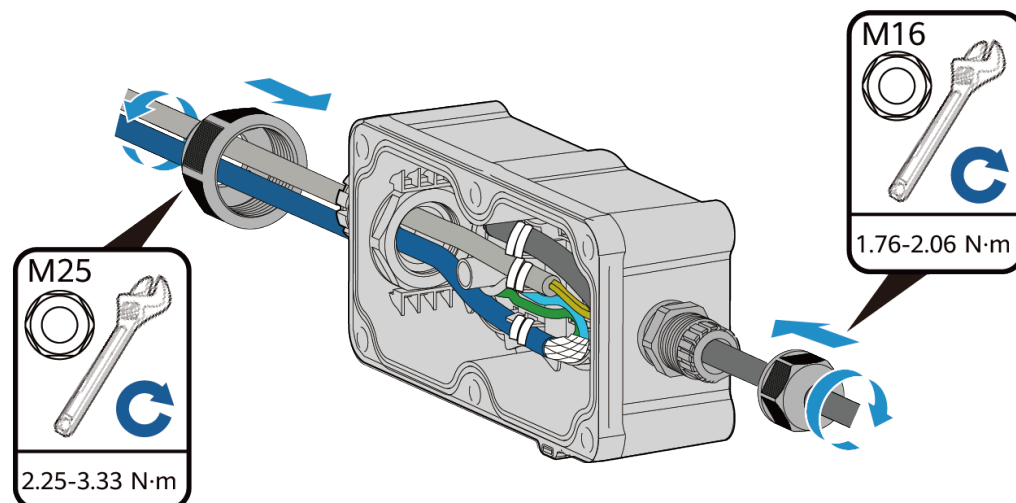
Step 1 Pull out the redundant cables from the waterproof box.



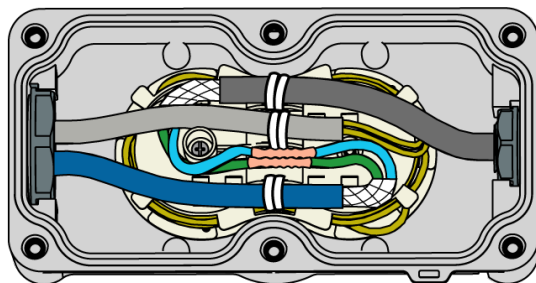
Step 2 Screw the body of the PG connector (M25) over the optical fiber and network cable, and route the cables through the claw and seal. Screw the body of the PG connector (M16) over the hybrid cable, and install the claw.



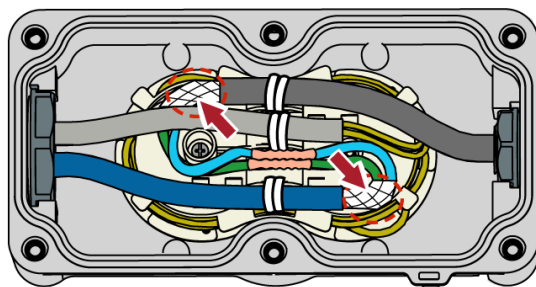
Step 3 Use a wrench to fix the screw caps inside the waterproof box, and then tighten the PG connector screw caps outside the waterproof box.



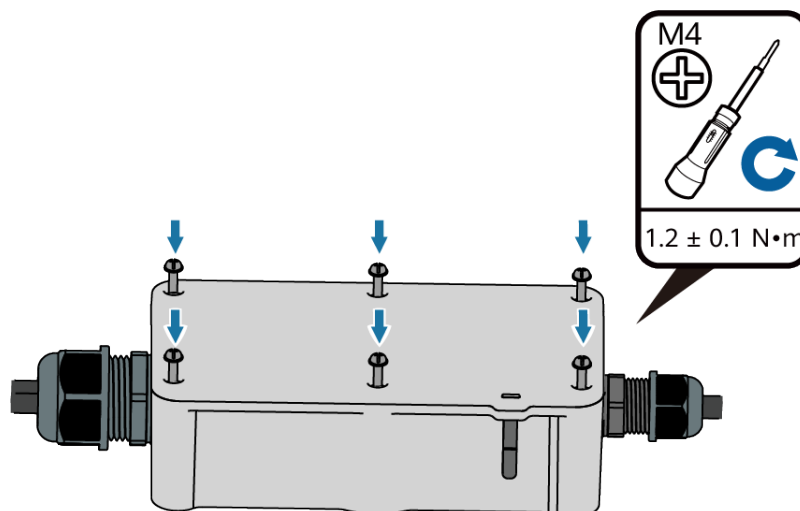
Step 4 Adjust the length of the power cable in the hybrid cable (with the excess part cut off), and crimp the power cable in the hybrid cable and the power cable in the network cable (without the need to distinguish the positive and negative poles).



Step 5 Clamp one end of the insulation clip to the shield layer of the hybrid cable and the other end to the shield layer of the network cable, and bind the redundant cables properly.



Step 6 Close the top cover of the waterproof box and tighten the screws.



-----End

5.2.9.2 Installing a Waterproof Box

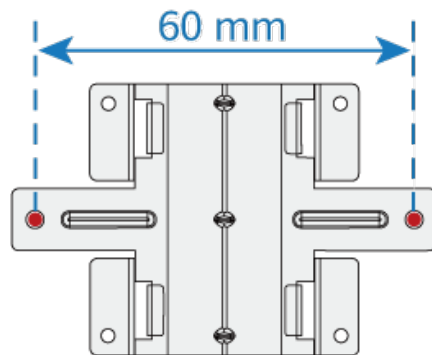
5.2.9.2.1 Wall Mounting

A wall for installing a waterproof box needs to meet the following requirements:

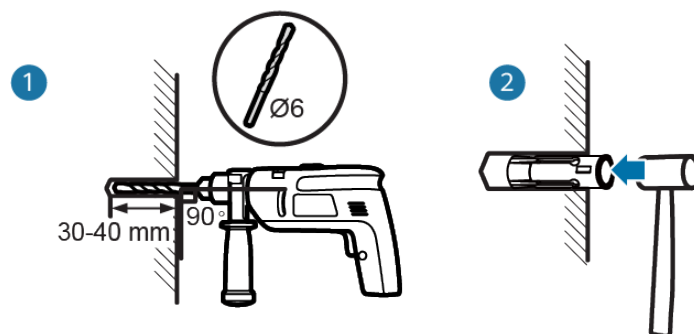
- The wall can bear at least four times the total weight of the waterproof box and mounting bracket, without being damaged. When the total weight of the waterproof box and mounting bracket is less than 1.25 kg, the load-bearing capability of the wall must be greater than or equal to 5 kg.
- When the tightening torque of a screw reaches 12 N·m, the screw still properly works, without any crack or damage on the wall.

The wall mounting mode requires the use of a mounting bracket and expansion bolts.

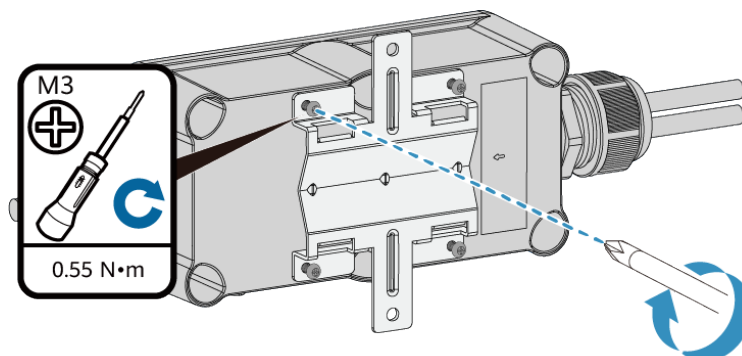
1. Attach the mounting bracket against the wall and adjust its position properly (within half a meter from the AP). Mark positions of the mounting holes with a marker.



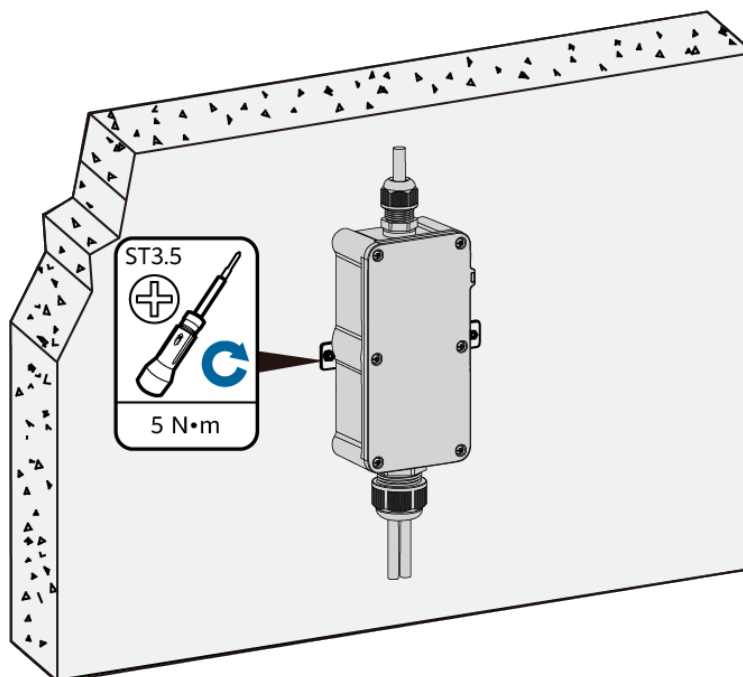
2. Use a 6 mm drill bit to drill 30 mm to 40 mm deep holes in the drilling positions, and then hammer expansion bolts vertically into the holes.



3. Fix the mounting bracket to the waterproof box using four screws delivered with the mounting bracket.



4. Hang the mounting bracket on the expansion bolts and use a Phillips screwdriver to secure the mounting bracket to the wall.

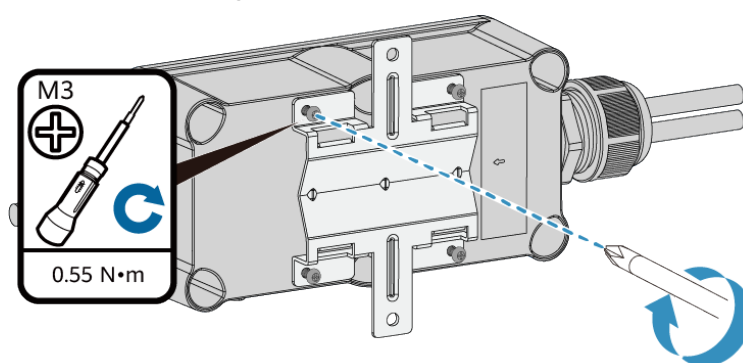


5.2.9.2.2 Pole Mounting

A pole for mounting a waterproof box needs to have a diameter of 48 mm to 114 mm, and a pole wall thickness of no less than 2.5 mm.

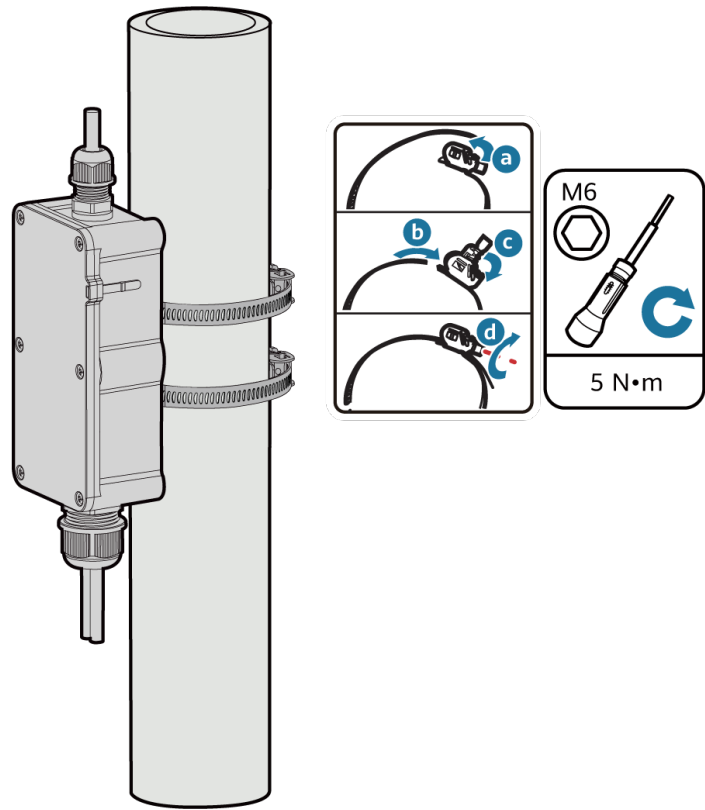
This mounting mode requires that the pole be able to bear at least four times the total weight of the waterproof box and mounting bracket, without being damaged. When the total weight of the waterproof box and mounting bracket is less than 1.25 kg, the load-bearing capability of the pole must be greater than or equal to 5 kg.

1. Fix the mounting bracket to the waterproof box using four screws delivered with the mounting bracket.



2. Determine the position for installing the waterproof box on the pole (within half a meter from the AP), and use a hose clamp to fasten the mounting bracket with the waterproof box mounted onto the pole.
 - a. Use an M6 inner hex torque screwdriver to loosen the screws on the hose clamp to open it.
 - b. Lead the hose clamp through the square holes on the mounting bracket and secure the mounting bracket to the pole.

- c. Tighten and close the hose clamp.
- d. Use an inner hex torque screwdriver to tighten the screws.



5.2.10 Installing an AP on a Small Angle-Fixed Mounting Bracket

This section uses an AP model as an example to describe how to install an outdoor AP on a small angle-adjustable mounting bracket.

5.2.10.1 Wall Mounting

Context

A wall for installing the device needs to meet the following requirements:

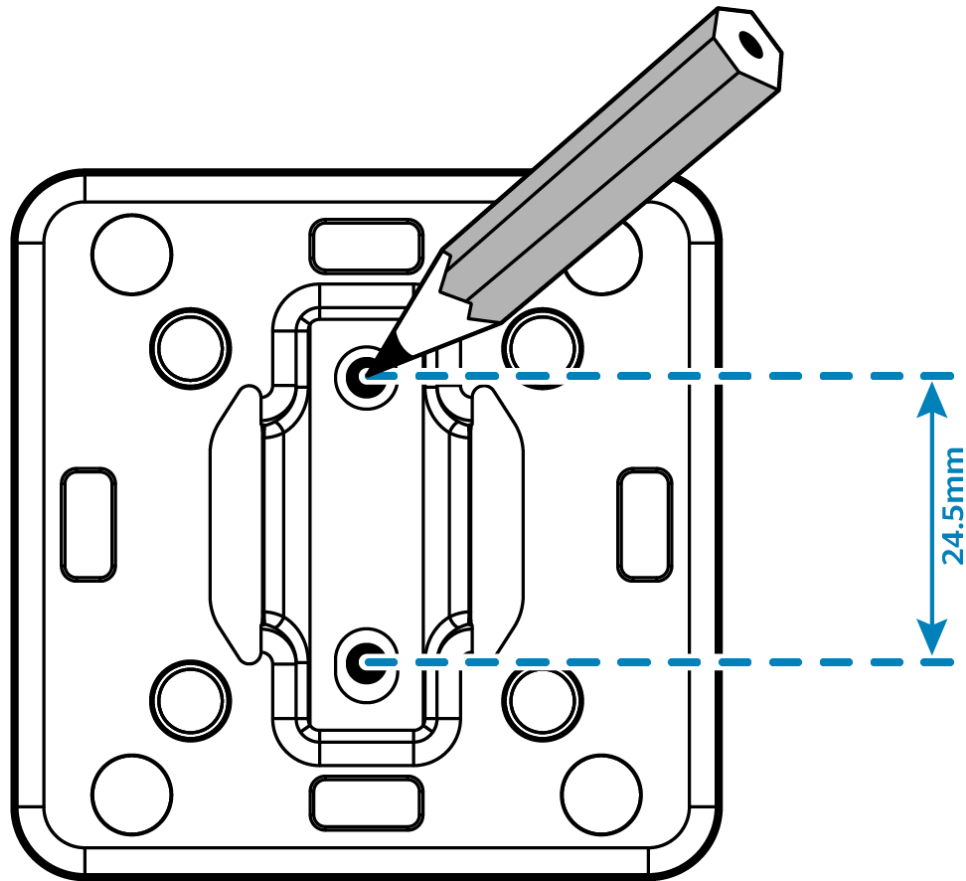
- The wall can bear the weight of four times the total weight of the device and mounting bracket without damage. When the total weight of the device and mounting bracket is less than 1.25 kg (2.76 lb.), the load-bearing capability of the wall must be greater than or equal to 5 kg (11.02 lb).

The following table lists the screws to be used.

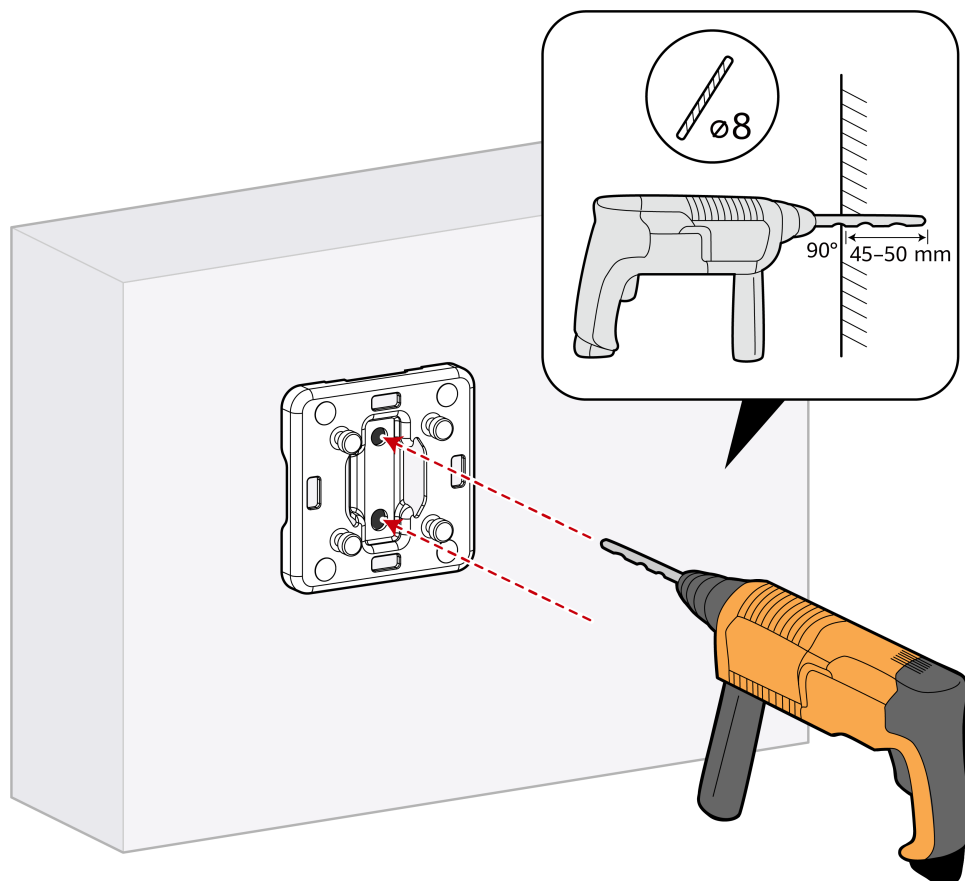
Screw (Delivered with the Device)	Quantity	Description
ST4.8 expansion screw + expansion tube	2	Secures a mounting bracket to the wall.

Procedure

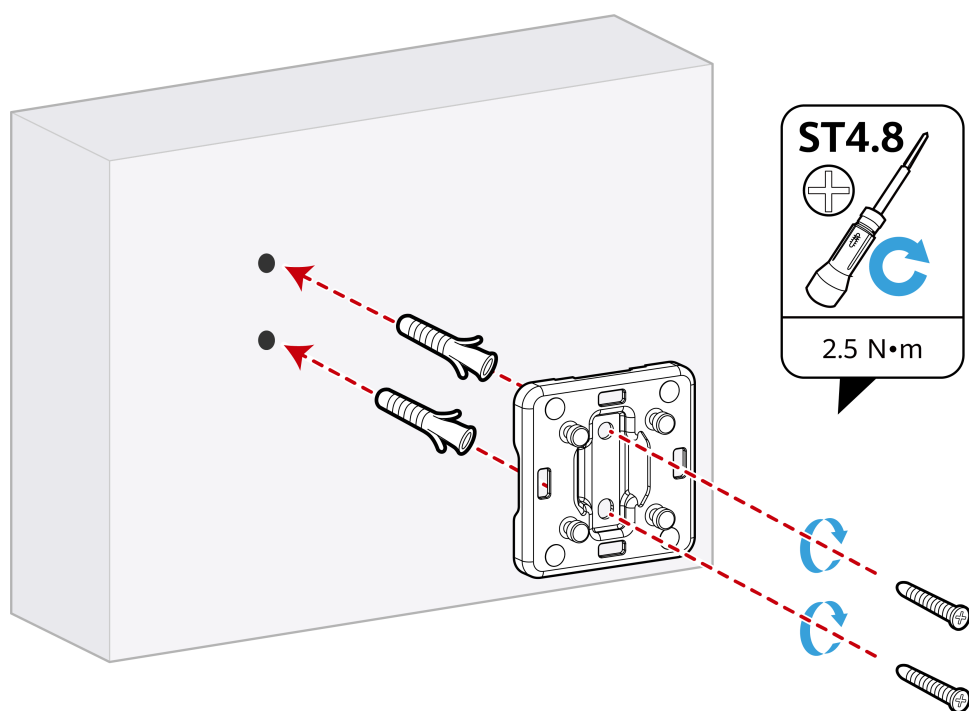
- Step 1** Place a mounting bracket against the wall and adjust its position properly. Mark positions of the mounting holes with a marker, as shown in the following figure.



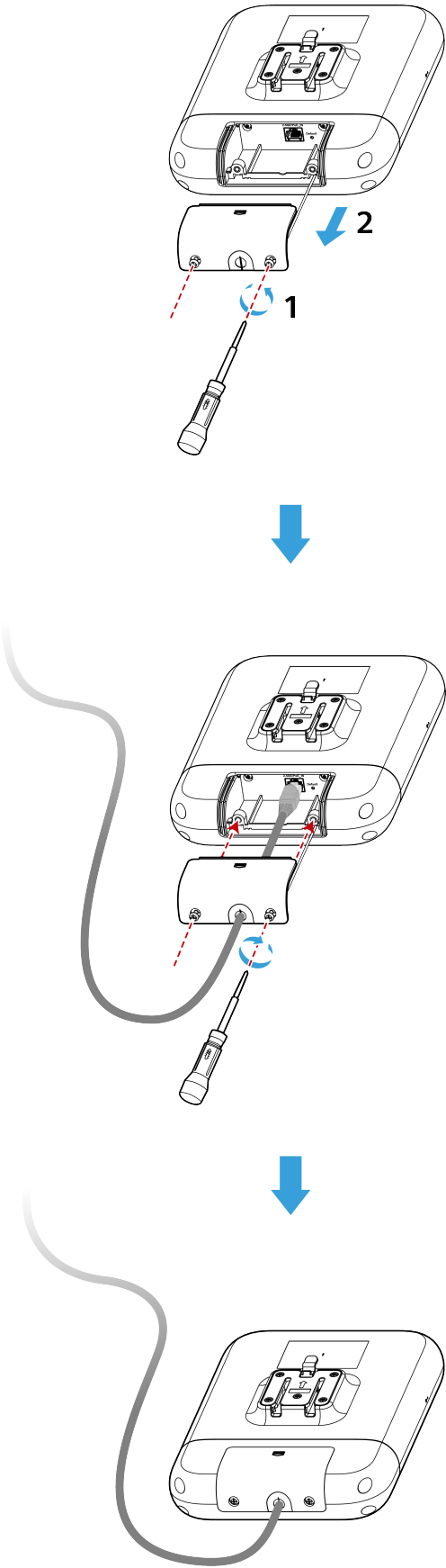
- Step 2** Use an 8 mm drill bit to drill 45 mm to 50 mm deep holes in the marked positions. Hammer the expansion tubes into the holes until the expansion tubes are flush with the wall.



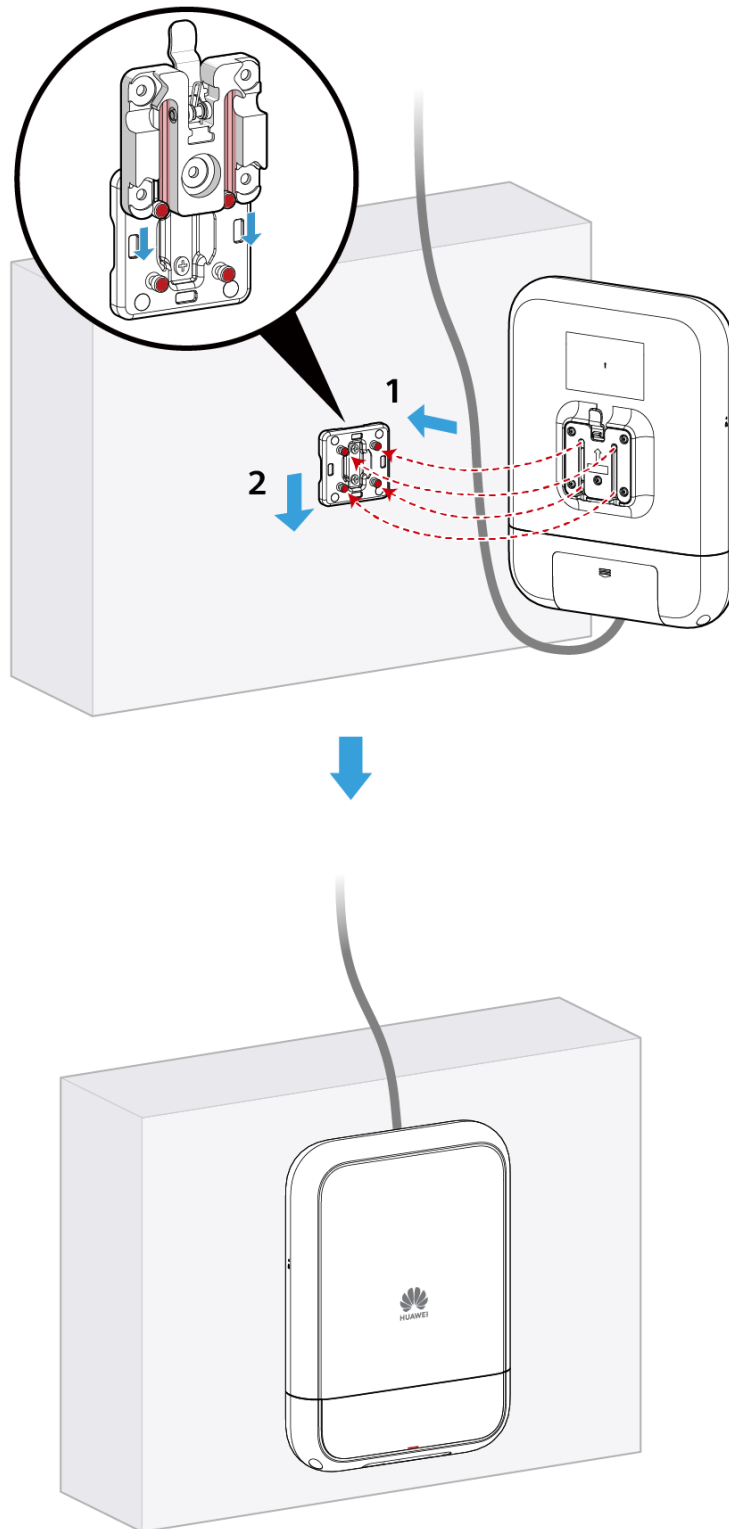
Step 3 Hang the mounting bracket on the expansion tubes and use a torque screwdriver to tighten the screws to secure the mounting bracket to the wall.



Step 4 Remove the decorative cover, connect an Ethernet cable to the corresponding port on the AP, install the decorative cover, and tighten the screws.



- Step 5** Secure the AP to the mounting bracket. Slide the AP downwards. When you hear a click, the AP is secured to the lock position.



----End

5.2.10.2 Pole Mounting

Context

An outdoor AP must be installed on a pole with a diameter of 48 mm to 114 mm and the difference between the outer and inner diameters should be at least 2.5 mm.

In this mounting mode, a pole for installing the device must be able to bear the weight four times the total weight of the device and mounting bracket without damage. When the total weight of the device and mounting bracket is less than 1.25 kg (2.76 lb.), the load-bearing capability of the pole must be greater than or equal to 5 kg (11.02 lb).

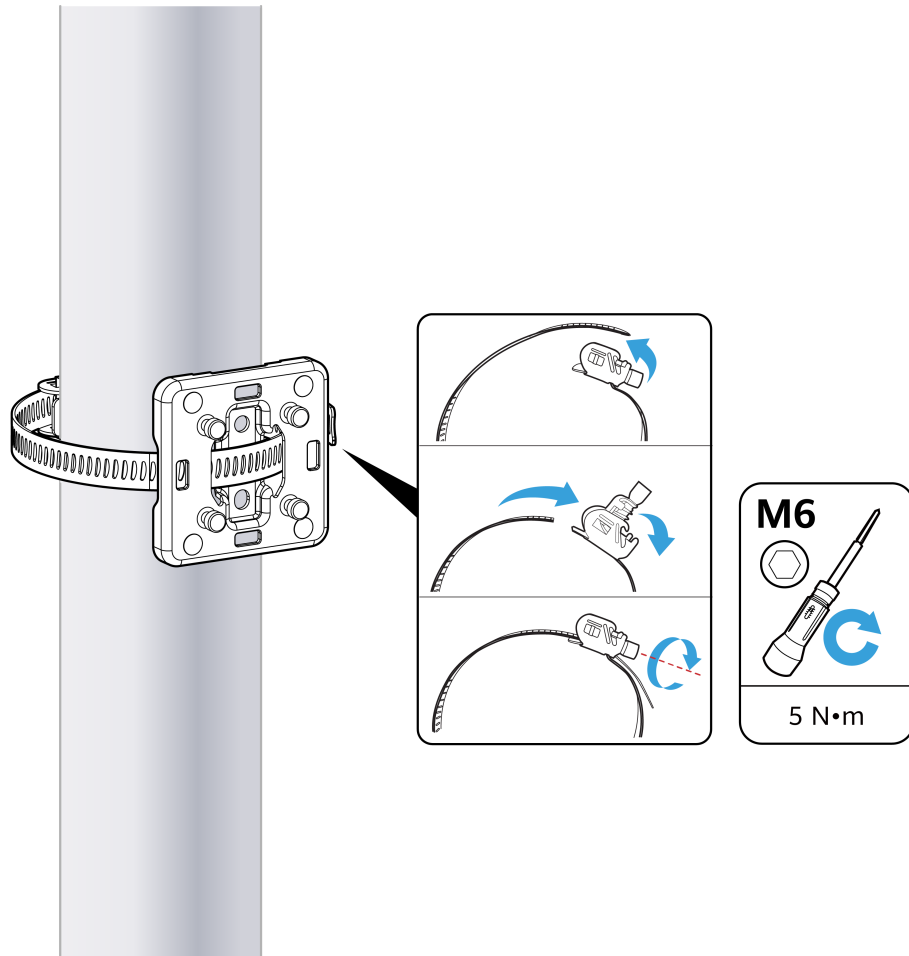
NOTE

- When installing the device on the mounting bracket, ensure that the device logo is the right way up.
- The length of the M6 inner hexagon screwdriver used for installation must be greater than or equal to 200 mm.

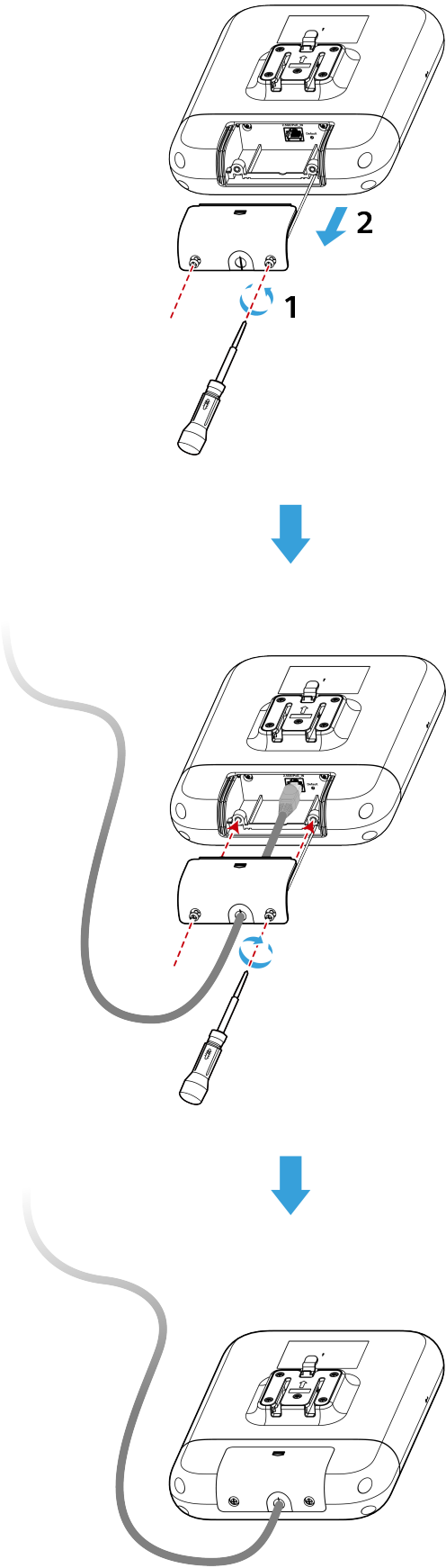
Procedure

Step 1 Determine the installation position of the AP on the pole and use hose clamps to secure the mounting bracket on the pole.

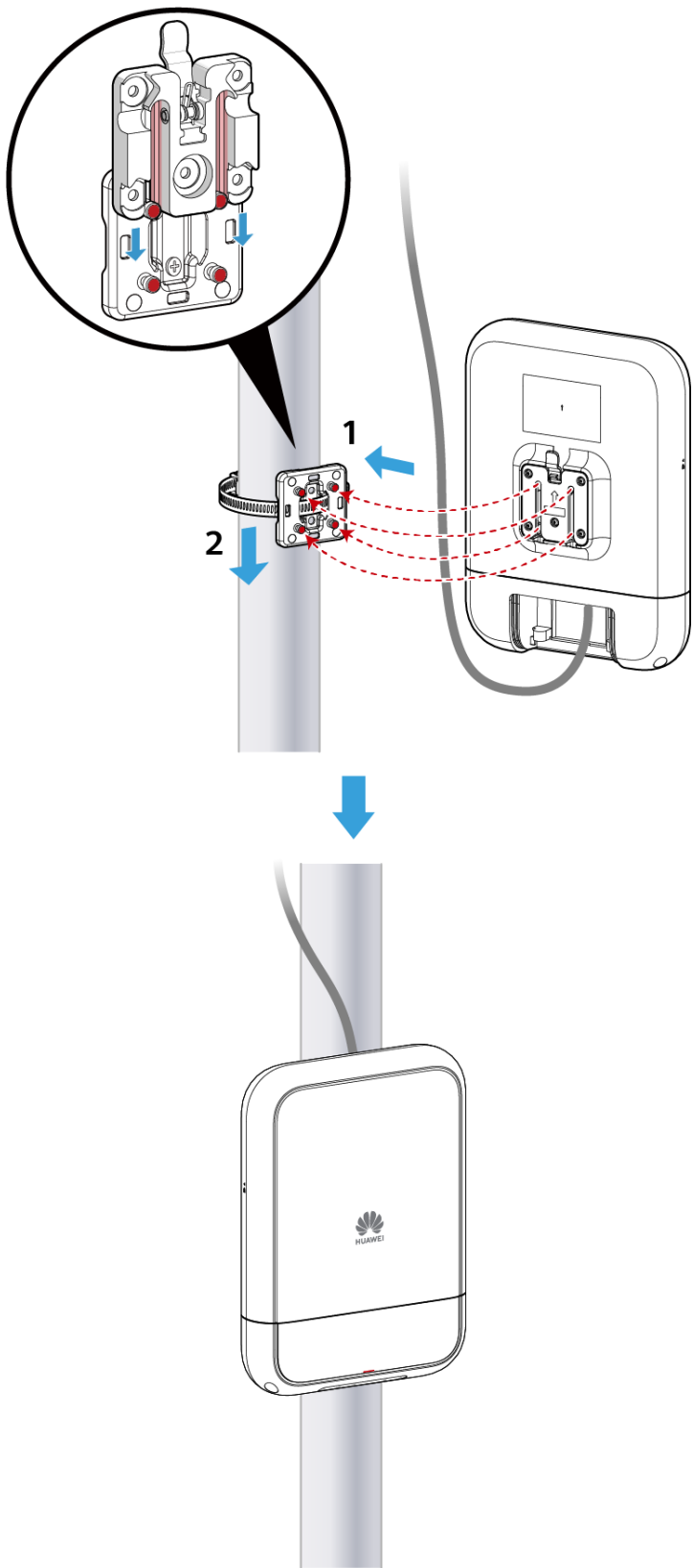
1. Use an M6 inner hex torque screwdriver to loosen the screw on the hose clamp to open it.
2. Lead the hose clamp through the square holes on the mounting bracket and secure the mounting bracket to the pole.
3. Tighten and close the hose clamp.
4. Use an M6 inner hex torque screwdriver to tighten the screw.



Step 2 Remove the decorative cover, connect an Ethernet cable to the corresponding port on the AP, install the decorative cover, and tighten the screws.



- Step 3** Secure the AP to the mounting bracket. When you hear a click, the AP is secured to the lock position.



Step 4 After the assembly is complete, check whether the module is skewed or symmetrically aligned with the vertical rod. If not, adjust the module to ensure that it is symmetrically aligned with the vertical rod.

----End

5.2.11 Connecting Cables

NOTE

- When connecting cables, take waterproof measures on the following parts: (See the corresponding cable installation guide for the detailed procedure.)
 - Connection joints of the feeder cable connectors
 - Ethernet cables and optical fibers
- To power an AP using a non-standard PoE adapter, ensure that the output power of the adapter supports the maximum power consumption of the AP. Otherwise, the AP may restart due to insufficient power.
- Do not insert a PoE input cable into the GE/PoE_OUT port.
- To simplify cable installation, install Ethernet cables before installing ground cables and antennas.
- When installing a cable, you must make a drip loop to prevent water from flowing into devices along the cable. For the method of making a drip loop, see [17.7 Guide to Making Drip Loops](#).

5.2.11.1 Connecting RF Cables

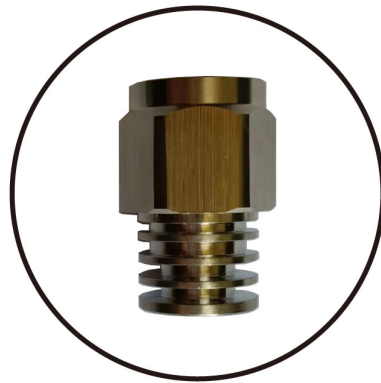
5.2.11.1.1 RF Cable Deployment Requirements

- All idle RF ports are connected with 50-ohm RF loads and properly wrapped with insulation tapes and waterproof tapes. Huawei offers 50-ohm RF loads (part number: 27110001 or 27110231) for you to purchase.

Figure 5-102 27110001



Figure 5-103 27110231



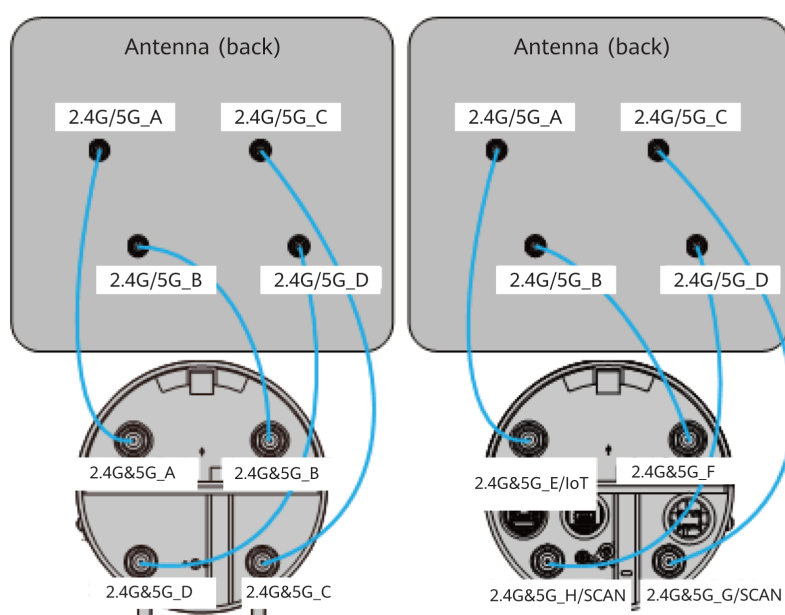
- Wrap the RF cable in single-layer PVC insulation tape, triple-layer waterproof tape, and then triple-layer PVC insulation tape.
- When connecting to RF cables, the requirements of bend radius are (1 inch = 25.4 mm):
 - RG-8U RF cable: > 150 mm
 - 1/2" RF cable: > 50 mm
 - 7/8" RF cable: > 250 mm

NOTICE

Tighten the nut of the AP's RF connector with a torque of no more than 1.2 N·m.

5.2.11.1.2 RF Cable Connections (AirEngine 8760R-X1E)

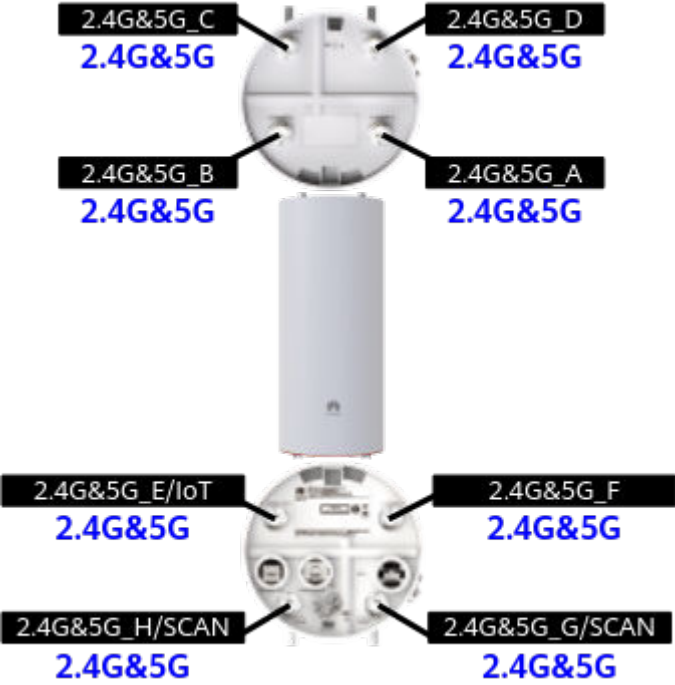
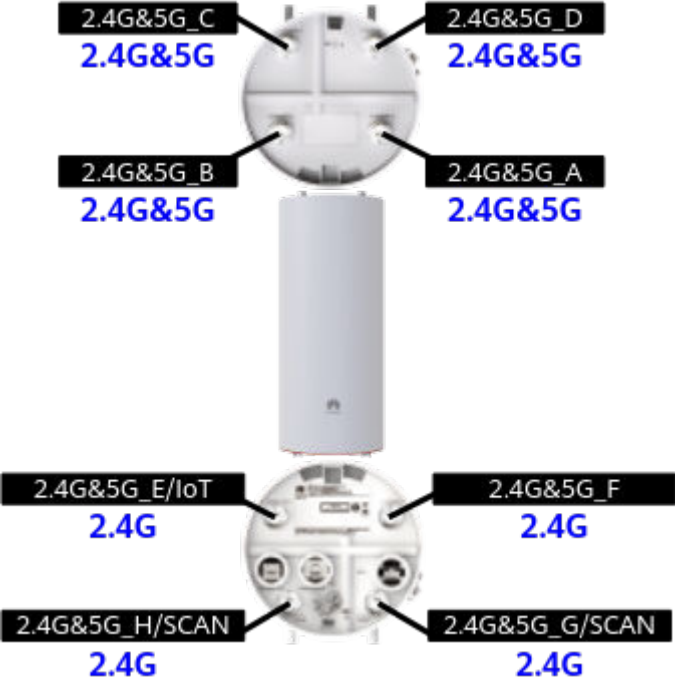
RF Cable Connections

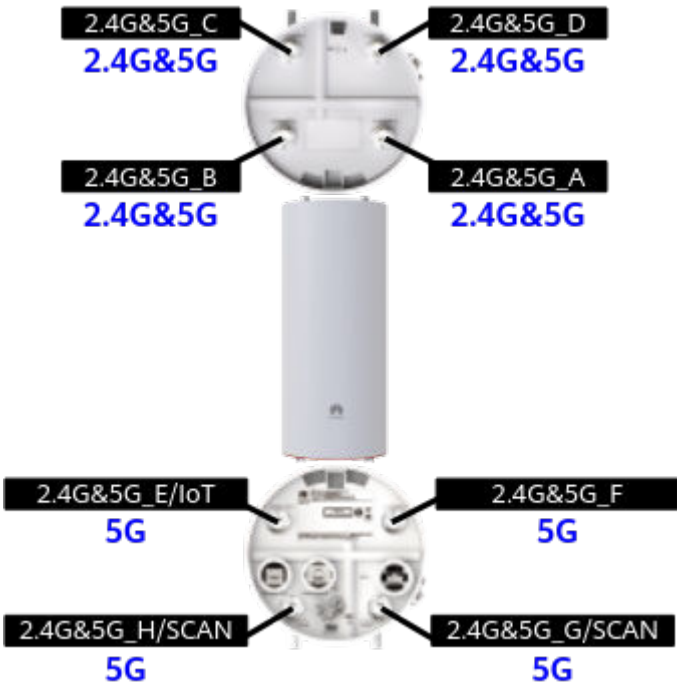
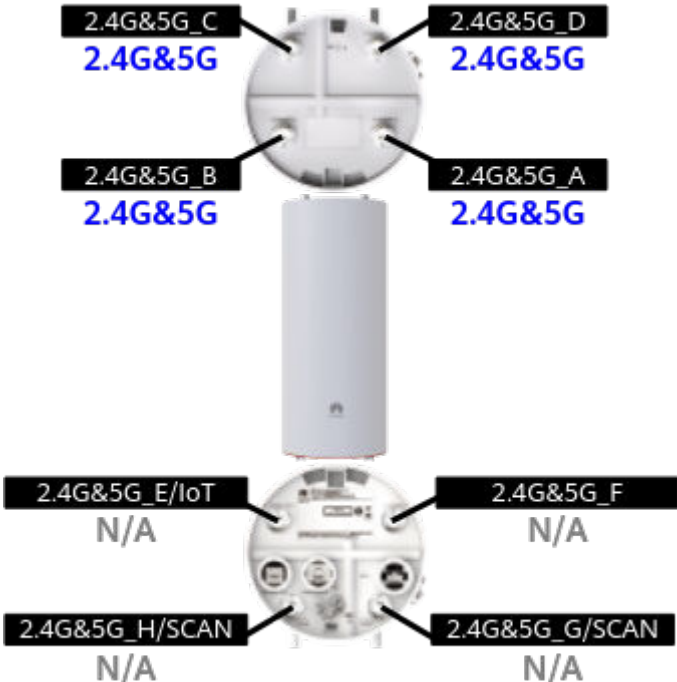


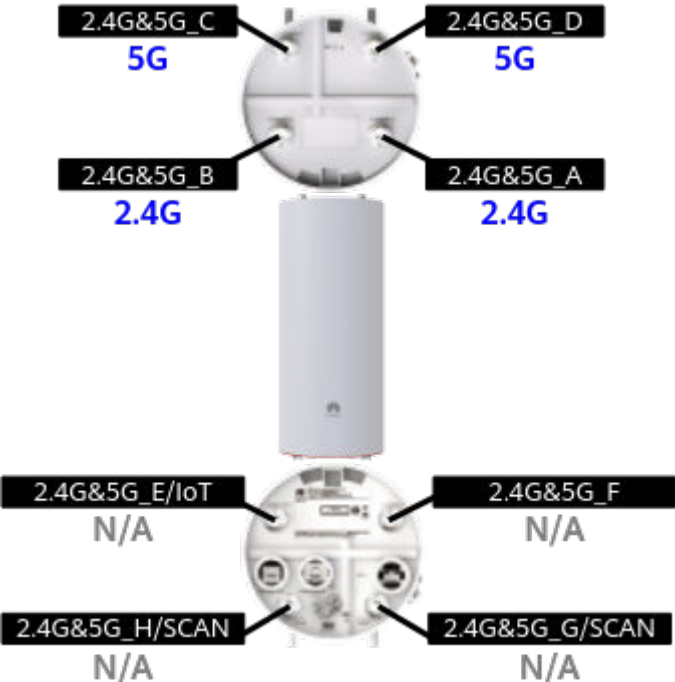
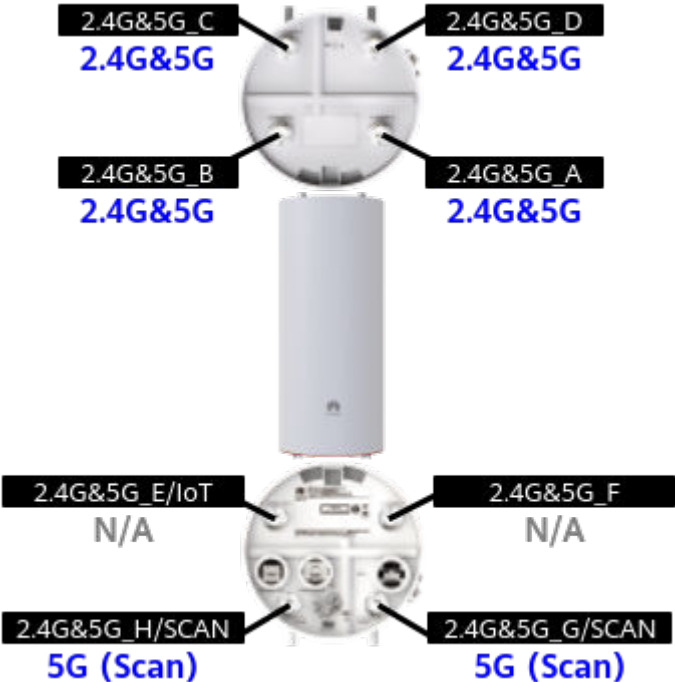
 NOTE

- Before installing or replacing an antenna, power off the AP.
- When pole antennas are used, it is recommended that a maximum of eight antennas be configured. If antennas are not fully configured, connect the antennas to RF ports in the sequence of A to H.
- If panel antennas with four RF ports are used, it is recommended that two such antennas be configured. In this full configuration, connect RF ports A to D of the AP to one antenna and RF ports E to H to the other. If only one such antenna is used, connect the antenna to RF ports A to D. Install RF loads on the idle RF ports.
- To use the independent scanning radio, ensure that RF ports G and H are connected to an antenna.
- In 802.3bt Class 6 + PoE_OUT or 802.3at power supply mode, to use the triple-radio mode, ensure that RF ports A, B, E, and F are connected to antennas. If 2x2 antennas are used, connect RF ports A and B to one antenna and RF ports E and F to the other.
- All RF ports must be tightly wrapped with insulation tape and waterproof tape after they are connected to antennas or RF loads.
- The grounding requirements of antennas are the same as the AP where the antennas are installed. You can check the grounding requirements of an AP on Info-Finder ([Enterprise Network](#) or [Carrier](#)).
- When connecting the antennas, evaluate radio modes based on the power supply of the AP. For details, see [Table 5-150](#).
- The 2.4 GHz radios of an AirEngine 8760R-X1E support a maximum of four antennas, which can transmit and receive 802.11b packets. The RF ports in effect vary depending on the radio mode:
 - 8+x mode: A, B, E, F
 - 4+x mode: A, B, C, D
 - 2+x mode: A and B
- Check how to install antennas by referring to [WLAN Antenna Quick Start](#).

Table 5-150 Signal frequency bands supported by each RF port

Radio Mode	Effective Radio on Each RF Port (Note: White Words on Black Background and Blue Words Indicate Silk Screen and Signals, Respectively.)
8+8	 <p>The diagram shows an outdoor AP with eight RF ports. The top antenna has four ports labeled 2.4G&5G_C, 2.4G&5G_D, 2.4G&5G_B, and 2.4G&5G_A. The bottom antenna has four ports labeled 2.4G&5G_E/IoT, 2.4G&5G_F, 2.4G&5G_H/SCAN, and 2.4G&5G_G/SCAN. In the 8+8 mode, all ports support both 2.4G and 5G bands.</p>
8+4	 <p>The diagram shows the same outdoor AP as above. In the 8+4 mode, the top four ports (C, D, B, A) still support both 2.4G and 5G bands. However, the bottom four ports (E/IoT, F, H/SCAN, G/SCAN) only support the 2.4G band, as indicated by the blue text.</p>

Radio Mode	Effective Radio on Each RF Port (Note: White Words on Black Background and Blue Words Indicate Silk Screen and Signals, Respectively.)																																							
4+8	 <p>Diagram illustrating the effective radio configuration for the 4+8 mode. The device has 12 RF ports (A-L) arranged in two rows of six. The top row (A-F) and bottom row (G-L) each have four active ports (A, B, C, D and G, H, I, J) and two inactive ports (E, F and K, L). The active ports are labeled with 2.4G&5G and 5G. The inactive ports are labeled with 2.4G&5G.</p> <table><tr><th>Port</th><th>Label</th><th>Effective Radio</th></tr><tr><td>A</td><td>2.4G&5G_A</td><td>2.4G&5G</td></tr><tr><td>B</td><td>2.4G&5G_B</td><td>2.4G&5G</td></tr><tr><td>C</td><td>2.4G&5G_C</td><td>2.4G&5G</td></tr><tr><td>D</td><td>2.4G&5G_D</td><td>2.4G&5G</td></tr><tr><td>E</td><td>2.4G&5G_E/IoT</td><td>5G</td></tr><tr><td>F</td><td>2.4G&5G_F</td><td>5G</td></tr><tr><td>G</td><td>2.4G&5G_G/SCAN</td><td>5G</td></tr><tr><td>H</td><td>2.4G&5G_H/SCAN</td><td>5G</td></tr><tr><td>I</td><td>2.4G&5G_I</td><td>2.4G&5G</td></tr><tr><td>J</td><td>2.4G&5G_J</td><td>2.4G&5G</td></tr><tr><td>K</td><td>2.4G&5G_K</td><td>2.4G&5G</td></tr><tr><td>L</td><td>2.4G&5G_L</td><td>2.4G&5G</td></tr></table>	Port	Label	Effective Radio	A	2.4G&5G_A	2.4G&5G	B	2.4G&5G_B	2.4G&5G	C	2.4G&5G_C	2.4G&5G	D	2.4G&5G_D	2.4G&5G	E	2.4G&5G_E/IoT	5G	F	2.4G&5G_F	5G	G	2.4G&5G_G/SCAN	5G	H	2.4G&5G_H/SCAN	5G	I	2.4G&5G_I	2.4G&5G	J	2.4G&5G_J	2.4G&5G	K	2.4G&5G_K	2.4G&5G	L	2.4G&5G_L	2.4G&5G
Port	Label	Effective Radio																																						
A	2.4G&5G_A	2.4G&5G																																						
B	2.4G&5G_B	2.4G&5G																																						
C	2.4G&5G_C	2.4G&5G																																						
D	2.4G&5G_D	2.4G&5G																																						
E	2.4G&5G_E/IoT	5G																																						
F	2.4G&5G_F	5G																																						
G	2.4G&5G_G/SCAN	5G																																						
H	2.4G&5G_H/SCAN	5G																																						
I	2.4G&5G_I	2.4G&5G																																						
J	2.4G&5G_J	2.4G&5G																																						
K	2.4G&5G_K	2.4G&5G																																						
L	2.4G&5G_L	2.4G&5G																																						
4+4	 <p>Diagram illustrating the effective radio configuration for the 4+4 mode. The device has 12 RF ports (A-L) arranged in two rows of six. The top row (A-F) and bottom row (G-L) each have four active ports (A, B, C, D and G, H, I, J) and two inactive ports (E, F and K, L). The active ports are labeled with 2.4G&5G. The inactive ports are labeled with 2.4G&5G.</p> <table><tr><th>Port</th><th>Label</th><th>Effective Radio</th></tr><tr><td>A</td><td>2.4G&5G_A</td><td>2.4G&5G</td></tr><tr><td>B</td><td>2.4G&5G_B</td><td>2.4G&5G</td></tr><tr><td>C</td><td>2.4G&5G_C</td><td>2.4G&5G</td></tr><tr><td>D</td><td>2.4G&5G_D</td><td>2.4G&5G</td></tr><tr><td>E</td><td>2.4G&5G_E/IoT</td><td>N/A</td></tr><tr><td>F</td><td>2.4G&5G_F</td><td>N/A</td></tr><tr><td>G</td><td>2.4G&5G_G/SCAN</td><td>N/A</td></tr><tr><td>H</td><td>2.4G&5G_H/SCAN</td><td>N/A</td></tr><tr><td>I</td><td>2.4G&5G_I</td><td>2.4G&5G</td></tr><tr><td>J</td><td>2.4G&5G_J</td><td>2.4G&5G</td></tr><tr><td>K</td><td>2.4G&5G_K</td><td>2.4G&5G</td></tr><tr><td>L</td><td>2.4G&5G_L</td><td>2.4G&5G</td></tr></table>	Port	Label	Effective Radio	A	2.4G&5G_A	2.4G&5G	B	2.4G&5G_B	2.4G&5G	C	2.4G&5G_C	2.4G&5G	D	2.4G&5G_D	2.4G&5G	E	2.4G&5G_E/IoT	N/A	F	2.4G&5G_F	N/A	G	2.4G&5G_G/SCAN	N/A	H	2.4G&5G_H/SCAN	N/A	I	2.4G&5G_I	2.4G&5G	J	2.4G&5G_J	2.4G&5G	K	2.4G&5G_K	2.4G&5G	L	2.4G&5G_L	2.4G&5G
Port	Label	Effective Radio																																						
A	2.4G&5G_A	2.4G&5G																																						
B	2.4G&5G_B	2.4G&5G																																						
C	2.4G&5G_C	2.4G&5G																																						
D	2.4G&5G_D	2.4G&5G																																						
E	2.4G&5G_E/IoT	N/A																																						
F	2.4G&5G_F	N/A																																						
G	2.4G&5G_G/SCAN	N/A																																						
H	2.4G&5G_H/SCAN	N/A																																						
I	2.4G&5G_I	2.4G&5G																																						
J	2.4G&5G_J	2.4G&5G																																						
K	2.4G&5G_K	2.4G&5G																																						
L	2.4G&5G_L	2.4G&5G																																						

Radio Mode	Effective Radio on Each RF Port (Note: White Words on Black Background and Blue Words Indicate Silk Screen and Signals, Respectively.)																		
2+2	 <p>Diagram illustrating the effective radio configuration for the 2+2 radio mode. The configuration shows two active radios (2.4G and 5G) on ports C and D, and two active radios (2.4G and 5G) on ports B and A. Ports E/IoT, F, H/SCAN, and G/SCAN are marked as N/A.</p> <table border="1"><thead><tr><th>RF Port</th><th>Effective Radio</th></tr></thead><tbody><tr><td>2.4G&5G_C</td><td>5G</td></tr><tr><td>2.4G&5G_D</td><td>5G</td></tr><tr><td>2.4G&5G_B</td><td>2.4G</td></tr><tr><td>2.4G&5G_A</td><td>2.4G</td></tr><tr><td>2.4G&5G_E/IoT</td><td>N/A</td></tr><tr><td>2.4G&5G_F</td><td>N/A</td></tr><tr><td>2.4G&5G_H/SCAN</td><td>N/A</td></tr><tr><td>2.4G&5G_G/SCAN</td><td>N/A</td></tr></tbody></table>	RF Port	Effective Radio	2.4G&5G_C	5G	2.4G&5G_D	5G	2.4G&5G_B	2.4G	2.4G&5G_A	2.4G	2.4G&5G_E/IoT	N/A	2.4G&5G_F	N/A	2.4G&5G_H/SCAN	N/A	2.4G&5G_G/SCAN	N/A
RF Port	Effective Radio																		
2.4G&5G_C	5G																		
2.4G&5G_D	5G																		
2.4G&5G_B	2.4G																		
2.4G&5G_A	2.4G																		
2.4G&5G_E/IoT	N/A																		
2.4G&5G_F	N/A																		
2.4G&5G_H/SCAN	N/A																		
2.4G&5G_G/SCAN	N/A																		
4+4+5G scanning	 <p>Diagram illustrating the effective radio configuration for the 4+4+5G scanning radio mode. The configuration shows two active radios (2.4G and 5G) on ports C and D, and two active radios (2.4G and 5G) on ports B and A. Ports E/IoT, F, H/SCAN, and G/SCAN are marked as N/A.</p> <table border="1"><thead><tr><th>RF Port</th><th>Effective Radio</th></tr></thead><tbody><tr><td>2.4G&5G_C</td><td>2.4G&5G</td></tr><tr><td>2.4G&5G_D</td><td>2.4G&5G</td></tr><tr><td>2.4G&5G_B</td><td>2.4G&5G</td></tr><tr><td>2.4G&5G_A</td><td>2.4G&5G</td></tr><tr><td>2.4G&5G_E/IoT</td><td>N/A</td></tr><tr><td>2.4G&5G_F</td><td>N/A</td></tr><tr><td>2.4G&5G_H/SCAN</td><td>5G (Scan)</td></tr><tr><td>2.4G&5G_G/SCAN</td><td>5G (Scan)</td></tr></tbody></table>	RF Port	Effective Radio	2.4G&5G_C	2.4G&5G	2.4G&5G_D	2.4G&5G	2.4G&5G_B	2.4G&5G	2.4G&5G_A	2.4G&5G	2.4G&5G_E/IoT	N/A	2.4G&5G_F	N/A	2.4G&5G_H/SCAN	5G (Scan)	2.4G&5G_G/SCAN	5G (Scan)
RF Port	Effective Radio																		
2.4G&5G_C	2.4G&5G																		
2.4G&5G_D	2.4G&5G																		
2.4G&5G_B	2.4G&5G																		
2.4G&5G_A	2.4G&5G																		
2.4G&5G_E/IoT	N/A																		
2.4G&5G_F	N/A																		
2.4G&5G_H/SCAN	5G (Scan)																		
2.4G&5G_G/SCAN	5G (Scan)																		

Radio Mode	Effective Radio on Each RF Port (Note: White Words on Black Background and Blue Words Indicate Silk Screen and Signals, Respectively.)
2+2+5G scanning	<p>The diagram shows two antenna modules. The top module has four ports labeled: 2.4G&5G_C (5G), 2.4G&5G_D (5G), 2.4G&5G_B (2.4G), and 2.4G&5G_A (2.4G). The bottom module has four ports labeled: 2.4G&5G_E/IoT (N/A), 2.4G&5G_F (N/A), 2.4G&5G_H/SCAN (5G (Scan)), and 2.4G&5G_G/SCAN (5G (Scan)).</p>
8+4+4	<p>The diagram shows two antenna modules. The top module has four ports labeled: 2.4G&5G_C (2.4G&5G1), 2.4G&5G_D (2.4G&5G1), 2.4G&5G_B (2.4G&5G1), and 2.4G&5G_A (2.4G&5G1). The bottom module has four ports labeled: 2.4G&5G_E/IoT (2.4G&5G2), 2.4G&5G_F (2.4G&5G2), 2.4G&5G_H/SCAN (2.4G&5G2), and 2.4G&5G_G/SCAN (2.4G&5G2).</p>

Radio Mode	Effective Radio on Each RF Port (Note: White Words on Black Background and Blue Words Indicate Silk Screen and Signals, Respectively.)
4+4+4	<p>Diagram illustrating the effective radio configuration for the 4+4+4 mode. The top antenna has four ports: 2.4G&5G_C (5G2), 2.4G&5G_D (5G2), 2.4G&5G_B (5G2), and 2.4G&5G_A (5G2). The bottom antenna has four ports: 2.4G&5G_E/IoT (5G2), 2.4G&5G_F (5G2), 2.4G&5G_H/SCAN (5G2), and 2.4G&5G_G/SCAN (5G2).</p>
2+2+2	<p>Diagram illustrating the effective radio configuration for the 2+2+2 mode. The top antenna has two active ports: 2.4G&5G_B (5G2) and 2.4G&5G_A (5G2). Ports 2.4G&5G_C and 2.4G&5G_D are N/A. The bottom antenna has two active ports: 2.4G&5G_E/IoT (5G2) and 2.4G&5G_F (5G2). Ports 2.4G&5G_H/SCAN and 2.4G&5G_G/SCAN are N/A.</p>

RF ports of the AP provide a 5 kA surge protection capability. RF cables are directly connected to RF ports with a tightening torque of 0.8 N·m.



NOTE

If directional antennas are connected to an AirEngine X760 series AP requiring external antennas, ensure that the number of antennas used to cover the same area is not less than half of the total number of antennas on a single radio of the AP. Otherwise, issues such as a long service delay will occur. For example, to use 5 GHz directional antennas on an AirEngine 6760-X1E in 4+8 radio mode to cover multiple areas, ensure that at least four 5 GHz antennas are used to cover the same area.

The following figures show the correct and incorrect connections between antennas and RF ports (eight 5 GHz antennas as an example). In the correct example, every four RF ports are connected to a directional antenna through feeders, and the antennas are used to cover two areas. In the incorrect example, every two RF ports are connected to a directional antenna through feeders, and the antennas are used to cover four areas.

Figure 5-104 Correct example

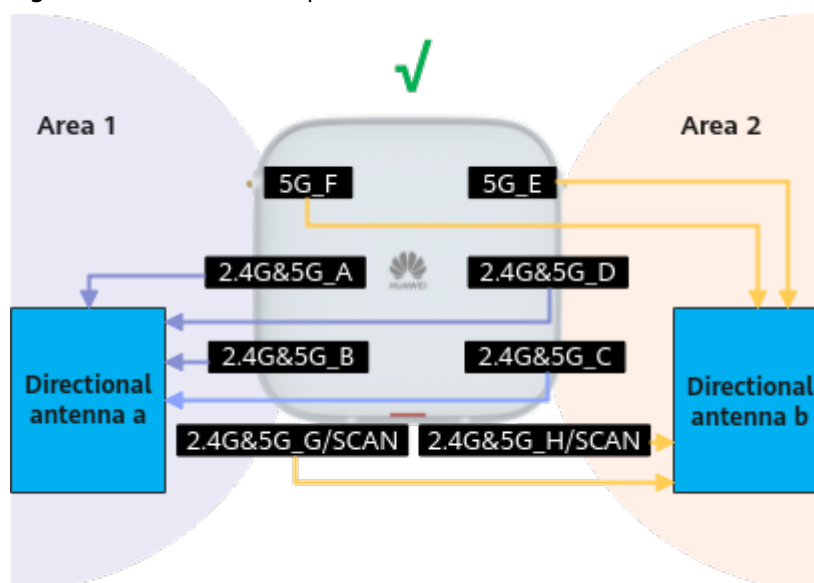
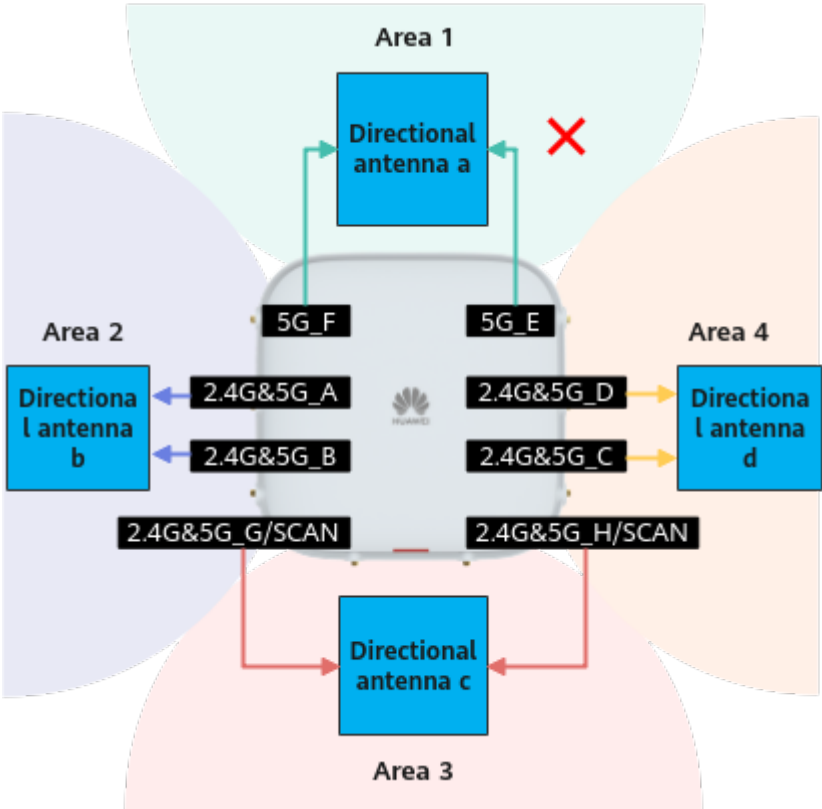
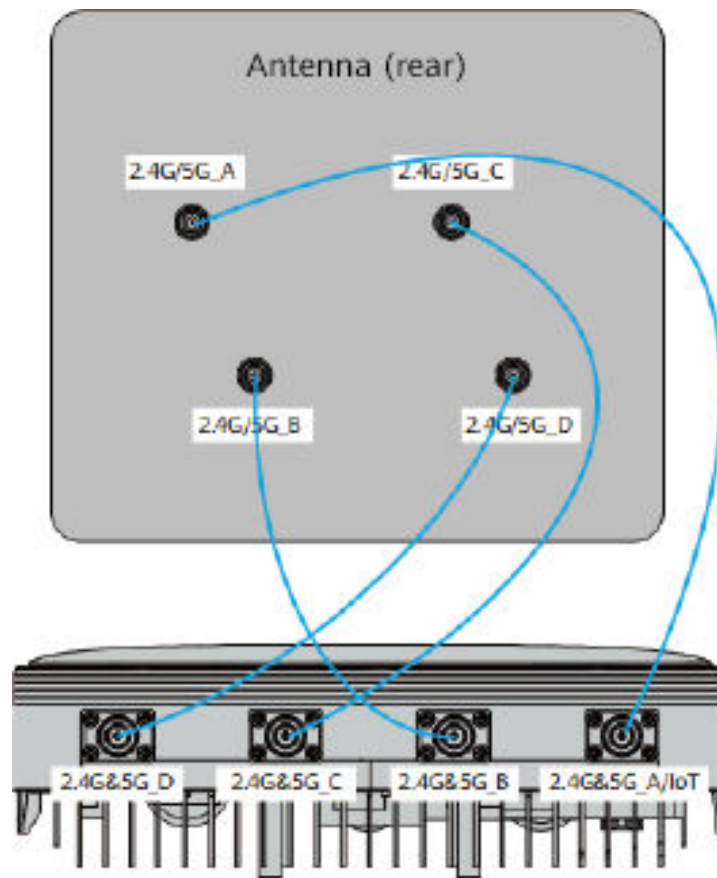


Figure 5-105 Incorrect example



5.2.11.1.3 RF Cable Connections (AirEngine 6760R-51E)

RF Cable Connections



RF ports of the AP provide a 5 kA surge protection capability. RF cables are directly connected to RF ports with a tightening torque of 0.8 N·m.



 NOTE

- Before installing or replacing an antenna, power off the AP.
- The AirEngine 6760R-51E can be connected to rod antennas or panel antennas. If antennas are not fully configured, connect the antennas to RF ports in the sequence of D to A. When connecting the antennas, evaluate radio modes based on the power supply of the AP. For details, see [Table 5-151](#).
- In 802.3at power supply mode, connect RF ports C and D to antennas.
- Install RF loads on the idle RF ports.
- All RF ports must be tightly wrapped with insulation tape and waterproof tape after they are connected to antennas or RF loads.
- The grounding requirements of antennas are the same as the AP where the antennas are installed. Determine whether grounding is required for an AP on Info-Finder([Enterprise Network](#) or [Carrier](#)).
- Check how to install antennas by referring to [WLAN Antenna Quick Start](#).

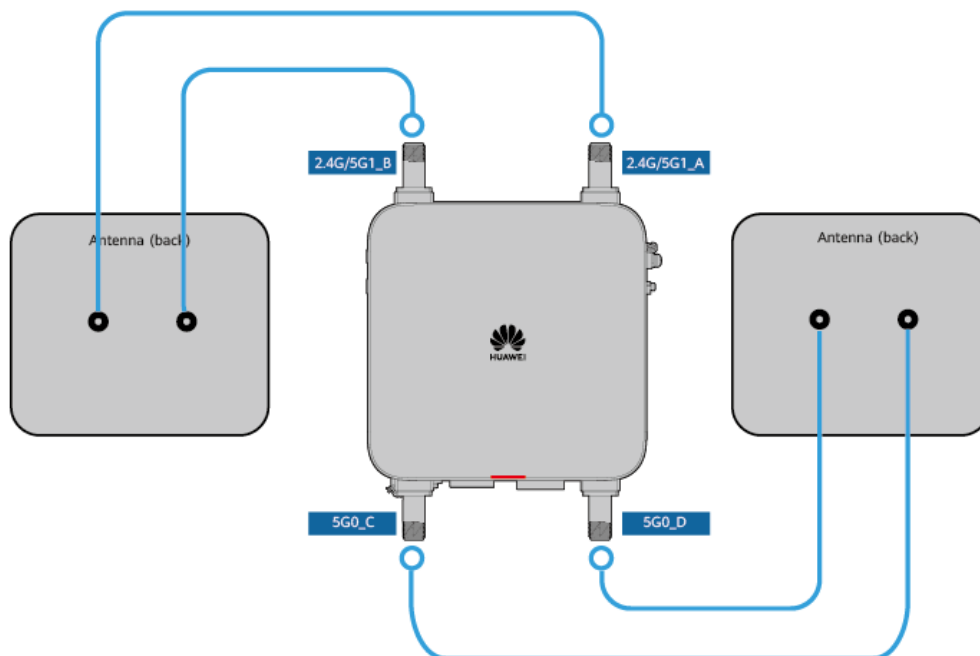
Table 5-151 Signal frequency bands supported by each RF port

Radio Mode	Effective Radio on Each RF Port (Note: White Words on Black Background and Blue Words Indicate Silk Screen and Signals, Respectively.)
4+4	<div><div>2.4G&5G_A/IoT2.4G&5G_C</div><div>2.4G&5G2.4G&5G_B2.4G&5G2.4G&5G_D</div><div>2.4G&5G2.4G&5G</div></div>
2+2	<div><div>2.4G&5G_A/IoT2.4G&5G_C</div><div>N/A2.4G&5G_B2.4G&5G2.4G&5G_D</div><div>N/AN/A2.4G&5G</div></div>

Radio Mode	Effective Radio on Each RF Port (Note: White Words on Black Background and Blue Words Indicate Silk Screen and Signals, Respectively.)
2+2	<div><div>2.4G&5G_A/IoT</div><div>2.4G&5G_C</div><div>2.4G&5G</div><div>2.4G&5G_B</div><div>N/A</div><div>2.4G&5G_D</div><div>N/A</div><div>2.4G&5G</div><div>N/A</div></div>  <p>The image shows a white Huawei outdoor access point with four RF ports at the top. Above the ports, labels indicate the radio modes: 2.4G&5G_A/IoT, 2.4G&5G_C, 2.4G&5G_B, and 2.4G&5G_D. Below these, blue text indicates the active modes: 2.4G&5G for ports A and B, and N/A for ports C and D. The Huawei logo is visible on the front of the device.</p>
2+2	<div><div>2.4G&5G_A/IoT</div><div>2.4G&5G_C</div><div>2.4G</div><div>2.4G&5G_B</div><div>5G</div><div>2.4G&5G_D</div><div>2.4G</div><div>5G</div></div>  <p>The image shows a white Huawei outdoor access point with four RF ports at the top. Above the ports, labels indicate the radio modes: 2.4G&5G_A/IoT, 2.4G&5G_C, 2.4G&5G_B, and 2.4G&5G_D. Below these, blue text indicates the active modes: 2.4G for ports A and B, and 5G for ports C and D. The Huawei logo is visible on the front of the device.</p>

5.2.11.1.4 RF Cable Connections (AirEngine 5761R-11E and AirEngine 5561R-11E)

RF Cable Connections



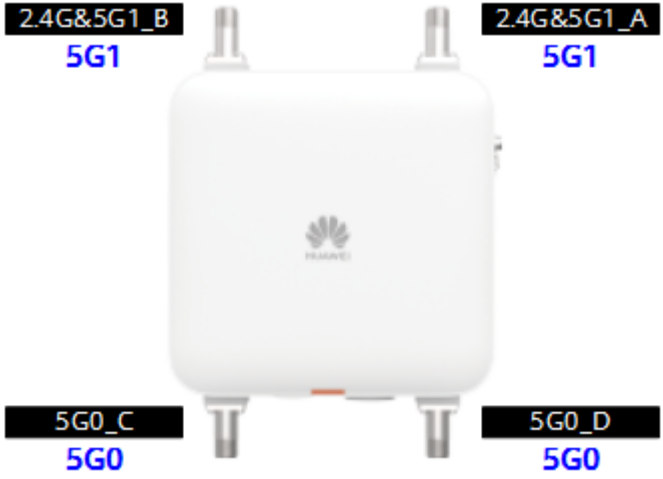
RF ports of the AP provide a 5 kA surge protection capability. RF cables are directly connected to RF ports with a tightening torque of 0.8 N·m.



NOTE

- Before installing or replacing an antenna, power off the AP.
- When pole antennas are used, you need to configure a maximum of four antennas. When panel antennas with two RF ports are used, you need to configure two such antennas. For details about how to connect cables, see [Table 5-152](#).
- Install RF loads on the idle RF ports.
- All RF ports must be tightly wrapped with insulation tape and waterproof tape after they are connected to antennas or RF loads.
- The grounding requirements of antennas are the same as the AP where the antennas are installed. Determine whether grounding is required for an AP on Info-Finder([Enterprise Network](#) or [Carrier](#)).
- Check how to install antennas by referring to [WLAN Antenna Quick Start](#).

Table 5-152 Signal frequency bands supported by each RF port

Radio Mode	Effective Radio on Each RF Port (Note: White Words on Black Background and Blue Words Indicate Silk Screen and Signals, Respectively.)
2+2 (common mode)	 <p>The diagram shows a white Huawei outdoor AP with four N-type connectors. The top-left connector is labeled '2.4G&5G1_B' (white) and '2.4G' (blue). The top-right connector is labeled '2.4G&5G1_A' (white) and '2.4G' (blue). The bottom-left connector is labeled '5G0_C' (white) and '5G' (blue). The bottom-right connector is labeled '5G0_D' (white) and '5G' (blue).</p>
2+2 (dual-5G mode)	 <p>The diagram shows a white Huawei outdoor AP with four N-type connectors. The top-left connector is labeled '2.4G&5G1_B' (white) and '5G1' (blue). The top-right connector is labeled '2.4G&5G1_A' (white) and '5G1' (blue). The bottom-left connector is labeled '5G0_C' (white) and '5G0' (blue). The bottom-right connector is labeled '5G0_D' (white) and '5G0' (blue).</p>

5.2.11.1.5 RF Cable Connections (AirEngine 5776I-X6EHAirEngine 5576I-X6EH)

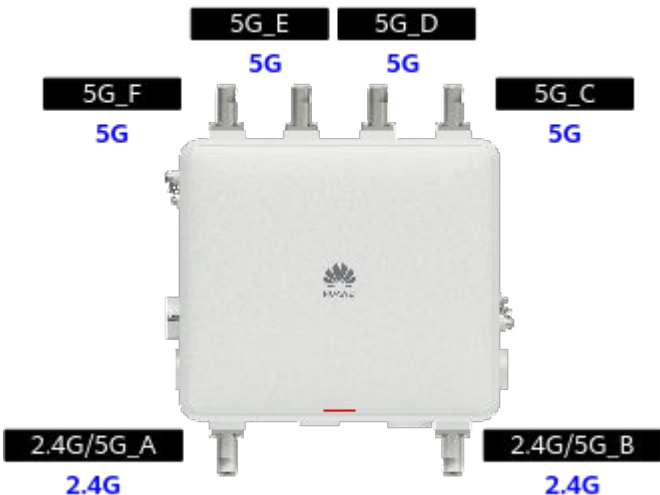
RF Cable Connections

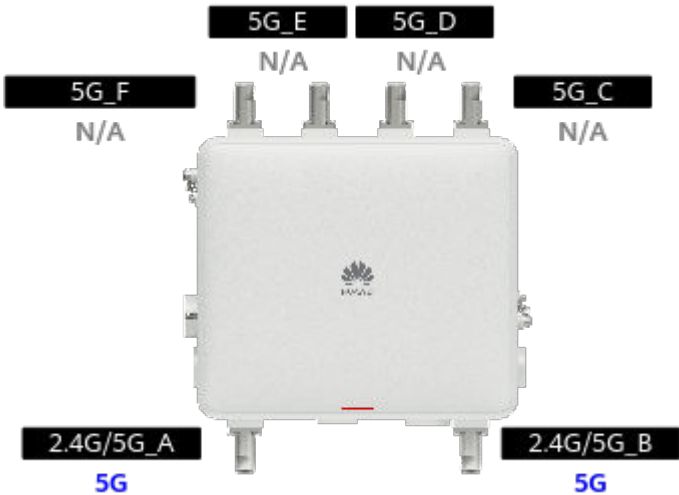
RF ports of the AP provide a 5 kA surge protection capability. RF cables are directly connected to RF ports with a tightening torque of 0.8 N·m.

 NOTE

- Before installing or replacing an antenna, power off the AP.
- When pole antennas are used, you need to configure a maximum of six antennas. When panel antennas with multiple RF ports are used, see [Table 5-153](#).
- Install RF loads on the idle RF ports.
- All RF ports must be tightly wrapped with insulation tape and waterproof tape after they are connected to antennas or RF loads.
- The grounding requirements of antennas are the same as the AP where the antennas are installed. You can check the grounding requirements of an AP on Info-Finder ([Enterprise Network](#) or [Carrier](#)).
- Check how to install antennas by referring to [WLAN Antenna Quick Start](#).

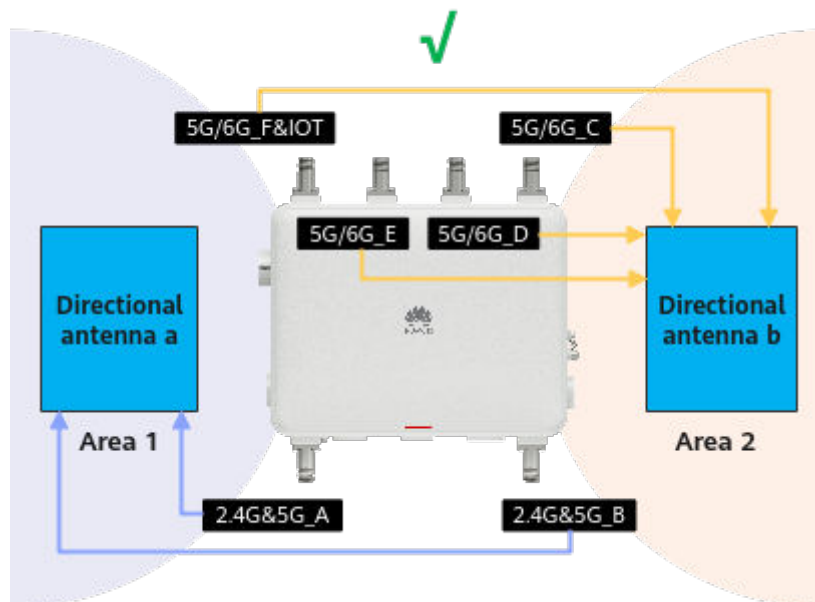
Table 5-153 Signal frequency bands supported by each RF port

Radio Mode	Effective Radio on Each RF Port (Note: White Words on Black Background and Blue Words Indicate Silk Screen and Signals, Respectively.)
2+4 (2.4 GHz + 5 GHz mode)	
2+4 (dual-5G mode)	

Radio Mode	Effective Radio on Each RF Port (Note: White Words on Black Background and Blue Words Indicate Silk Screen and Signals, Respectively.)
2+0 (2.4 GHz mode)	
2+0 (5 GHz mode)	

 NOTE

- If directional antennas are connected to an AP requiring external antennas, ensure that an antenna is used for the radio channels of the same cell. That is, RF ports A and B of the AP are connected to the same antenna, and RF ports C to F are connected to the same antenna. Mixed connection is not recommended.



5.2.11.1.6 RF Cable Connections (AirEngine 6776I-X6ETH)

RF Cable Connections

RF ports of the AP provide a 5 kA surge protection capability. RF cables are directly connected to RF ports with a tightening torque of 0.8 N·m.



 NOTE

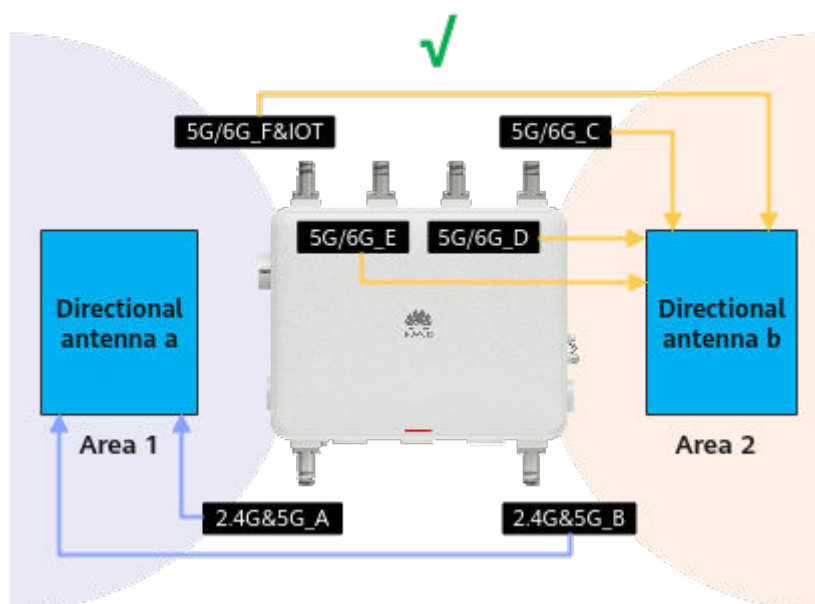
- Before installing or replacing an antenna, power off the AP.
- When pole antennas are used, you need to configure a maximum of six antennas. When panel antennas with multiple RF ports are used, see [Table 5-154](#).
- Install RF loads on the idle RF ports.
- All RF ports must be tightly wrapped with insulation tape and waterproof tape after they are connected to antennas or RF loads.
- The grounding requirements of antennas are the same as the AP where the antennas are installed. You can check the grounding requirements of an AP on Info-Finder ([Enterprise Network](#) or [Carrier](#)).
- Check how to install antennas by referring to [WLAN Antenna Quick Start](#).

Table 5-154 Signal frequency bands supported by each RF port

Radio Mode	Effective Radio on Each RF Port (Note: White Words on Black Background and Blue Words Indicate Silk Screen and Signals, Respectively.)
2+2+4 (2.4 GHz + dual-5G mode)	
2+2+4 (2.4 GHz + 5 GHz + 6 GHz mode)	
2+2 (2.4 GHz + 5 GHz mode)	

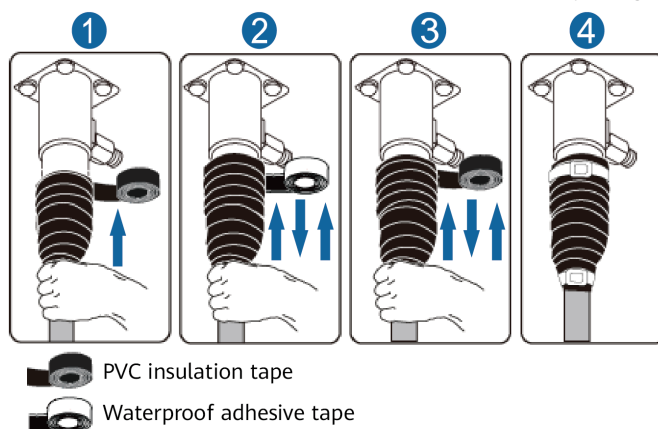
NOTE

- If directional antennas are connected to an AP requiring external antennas, ensure that an antenna is used for the radio channels of the same cell. That is, RF ports A and B of the AP are connected to the same antenna, and RF ports C to F are connected to the same antenna. Mixed connection is not recommended.



5.2.11.1.7 Waterproofing RF Cables

1. Wrap a layer of PVC insulation tape around the feeder connector from bottom to top. The tape must cover the entire feeder connector.
2. Wrap three layers of waterproof tape outside the PVC insulation tape. Wrap the waterproof tape layer upon layer in the following sequence: from bottom to top, then from top to bottom, and finally from bottom to top. After wrapping each layer of tape, pinch tightly the end of the tape.
3. Wrap the waterproof tape with three layers of PVC insulation tape. Wrap the PVC insulation tape layer upon layer in the following sequence: from bottom to top, then from top to bottom, and finally from bottom to top. After wrapping each layer of tape, pinch tightly the end of the tape.
4. Use cable ties to bind the two ends of the tape tightly.



 NOTE

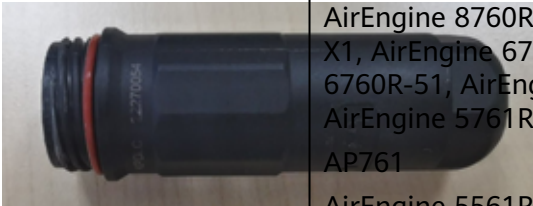
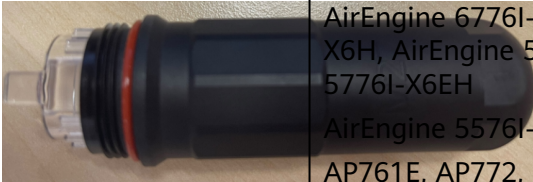
- When wrapping the waterproof tape, stretch the tape evenly until it turns twice its original length. Do not stretch the PVC insulation tape excessively when wrapping it.
- Ensure that each layer of the tape overlaps about 50% of the previous layer. Slightly stretch the tape and press it firmly to avoid wrinkles or air pockets so that the tape is tightly wrapped and stuck and will not fall off.
- Ensure that the adhesive side of the tape is covered on the wrapped tape.
- Reserve a length of 3 mm to 5 mm when cutting the extra part of a cable tie.

5.2.11.2 Connecting Optical Fibers and Ethernet Cables

Connecting Optical Fibers

The device can transmit upstream data over optical fibers. Optical fiber connectors (also called optical fiber tubes, which need to be purchased separately) must be used when you connect optical fibers. [Table 5-155](#) describes the mapping between optical fiber connectors and devices.

Table 5-155 Mapping between APs and optical fiber connectors

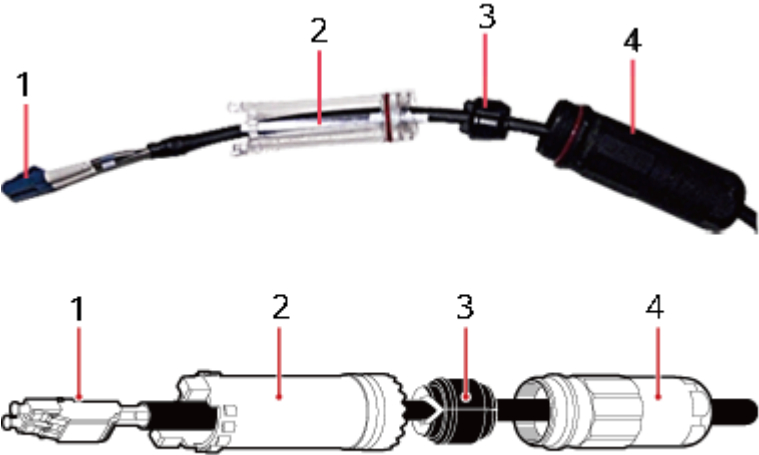
Part Number	Appearance of the Optical Fiber Connector	Matching AP Model
14990224		AirEngine 8760R-X1E, AirEngine 8760R-X1, AirEngine 6760R-51E, AirEngine 6760R-51, AirEngine 5761R-11, and AirEngine 5761R-11E AP761 AirEngine 5561R-11E AirEngine 6776I-X6TH, AirEngine 5776I-X7TH, and AirEngine 6776I-X7TH
14130CRB		AirEngine 6776I-X6ETH, AirEngine 5776I-X6H, AirEngine 5776I-X7H, and AirEngine 5776I-X6EH AirEngine 5576I-X6EH AP761E, AP772, and AP772E
14130EPY		AirEngine 6776I-X6ETH, AirEngine 5776I-X6H, AirEngine 5776I-X7H, and AirEngine 5776I-X6EH AirEngine 5576I-X6EH AP761E, AP772, and AP772E

 NOTE

The following uses 14130EPY as an example to describe the components and connection procedure of an optical fiber connector.

The following figures show the components of an optical fiber connector.

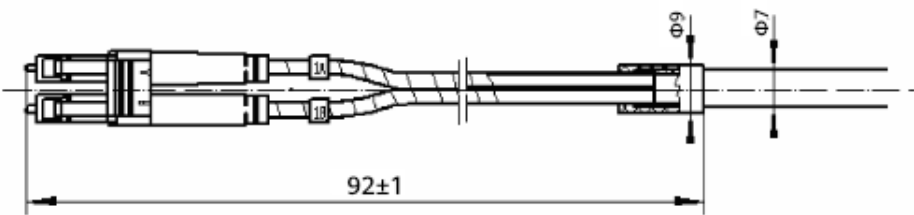
Figure 5-106 Components of an optical fiber connector



1. Optical fiber	2. Support	3. Rubber ring	4. External connector shell
------------------	------------	----------------	-----------------------------

For the waterproof purpose, use a distribution fiber with the length of 92±1 mm.

Figure 5-107 Length of a distribution fiber



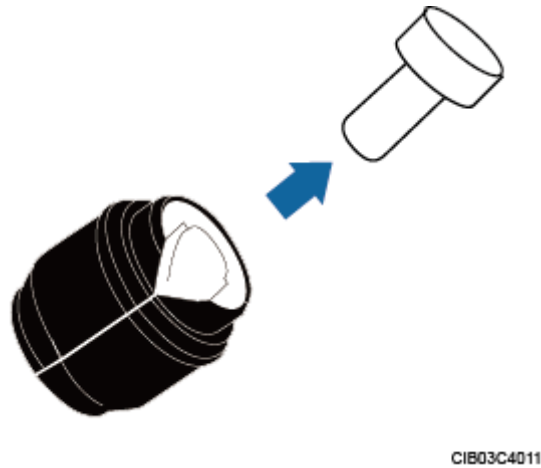
1. Select an optical cable of a proper length based on onsite cabling.

NOTICE

During construction, the minimum dynamic bending radius for optical fibers is 20D and the minimum static bending radius for optical fibers is 10D. Here, D represents the cable diameter. In addition, ensure that the axial twist does not exceed 180°.

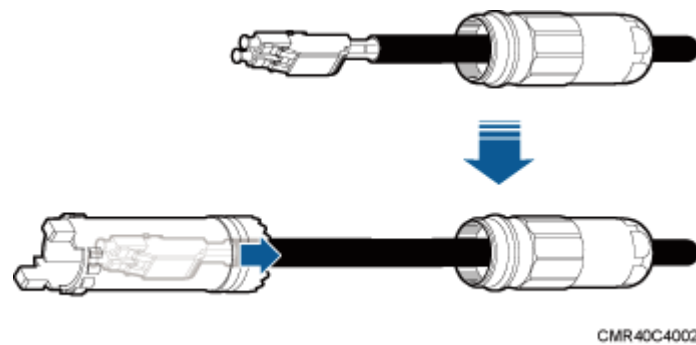
2. Remove the waterproof block from the rubber ring of the connector, as shown in the following figure.

Figure 5-108 Removing the waterproof block



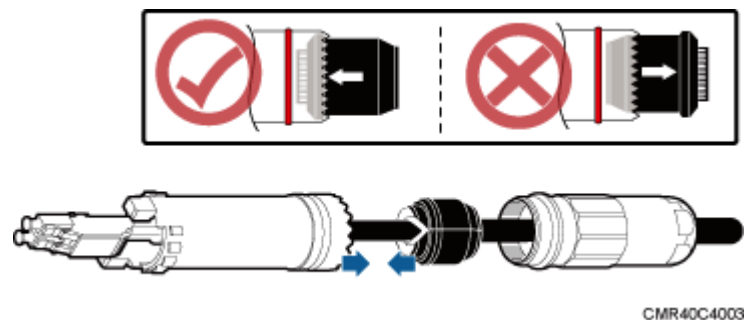
3. Assemble the connector on the optical fiber.
 - a. Assemble the external connector shell and support, as shown in the following figure.

Figure 5-109 Assembling a connector (1)



- b. Slide the rubber ring onto the optical fiber and insert it into the support in compliance with the direction indicated on the ring, as shown in the following figure.

Figure 5-110 Assembling a connector (2)



 NOTE

Ensure that the arrow on the rubber ring points to the support.

4. Use an adjustable wrench (tip width ≥ 33 mm) to loosen the sealing cover of the optical fiber socket on the device, and insert the optical fiber connector into the socket. Turn the support to find the correct optical fiber installation slot and push the support forward (together with the rubber ring) until the optical fiber is installed to the correct position. Rotate the external connector shell clockwise (maximum torque: 2.5 N·m) until the red ring is not visible.

NOTICE

- Do not install the optical fiber reversely; otherwise, the optical fiber may be damaged.
 - Bundle the optical fibers with binding tapes every 1 m.
 - If the handle of an optical module cannot be pulled out, use auxiliary tools.
-
5. Wrap a layer of PVC insulation tape around the joint of the optical fiber and the optical fiber connector from bottom to top. Ensure that the tape fully covers the joint.
 6. Wrap three layers of waterproof tape outside the PVC insulation tape. Wrap the waterproof tape layer upon layer in the following sequence: from bottom to top, then from top to bottom, and finally from bottom to top. After wrapping each layer of tape, pinch tightly the end of the tape.
 7. Wrap the waterproof tape with three layers of PVC insulation tape. Wrap the PVC insulation tape layer upon layer in the following sequence: from bottom to top, then from top to bottom, and finally from bottom to top. After wrapping each layer of tape, pinch tightly the end of the tape.
 8. Tighten cable ties at the two ends of the tape wrapped around the joint.

 NOTE

- When wrapping the waterproof tape, stretch the tape evenly until it turns twice its original length. Do not stretch the PVC insulation tape excessively when wrapping it.
- Ensure that each layer of the tape overlaps about 50% of the previous layer. Slightly stretch the tape and press it firmly to avoid wrinkles or air pockets. Wrap each layer of tape tightly.
- Ensure that the adhesive side of the tape is covered on the wrapped tape.
- Reserve a length of 3 mm to 5 mm when cutting the extra part of a cable tie.

Connecting Ethernet Cables

1. Cut the Ethernet cable into a proper length based on the distance between the AP and the PSE, strip the cable sheath at both ends, and crimp the wires into RJ45 connectors.

Use **outdoor shielded pass-through Ethernet cables** (diameter of 6 mm, CAT5E or higher, working with **shielded RJ45 connectors**) for outdoor APs.

Table 5-156 Ethernet cable types supported by Ethernet interfaces and their maximum transmission distances

Interface Rate Type	Ethernet Cable Type	Maximum Transmission Distance
GE	CAT5E or higher	100 m
2.5GE	CAT5E or higher	100 m
5GE	CAT5E or higher	100 m*
10GE	CAT6	55 m
	CAT6A or higher	100 m

 NOTE

- * For 5GE interfaces, the maximum length of an unshielded CAT5E cable is 55 m if the 6-a-1 bundling mode is used for the entire cable or 100 m if the 6-a-1 bundling mode is used only for the first 30 m of the cable.
- Connecting unshielded Ethernet cables to 5GE interfaces poses high risks and is not recommended. The causes are as follows:
 - 802.3bz requires that the ALSNR value for alien crosstalk between Ethernet cables be greater than 0, but the standards for CAT5E and CAT6 unshielded Ethernet cables do not specify the required ALSNR value. As a result, the CAT5E and CAT6 unshielded Ethernet cables purchased by the customer may not meet the 5G crosstalk requirement in 802.3bz, causing severe problems such as continuous packet loss.
 - According the cabling specification TIA TSB-5021, using CAT5E and CAT6 cables for 5G poses medium or high risks.
 - Currently, no clear onsite testing or evaluation method is available for checking whether ALSNR of cables conforms to 802.3bz.
- If a network cable does not meet the preceding requirements, replace it with a compliant one or reduce the interface speed.
 - It is recommended that the rate decrease auto-negotiation function be enabled on a Huawei switch that supports this function using the **set ethernet speed down-grade** command.
 - For a switch that does not support rate decrease auto-negotiation, it is recommended that a fixed port rate be configured based on the network cable type.
- 6-a-1 stands for the six-around-one cable bundle mode. In this mode, six cables are bundled evenly around the cable in the center.

Make an Ethernet cable onsite according to pin assignment in [Table 5-157](#) so as to ensure good communication quality.

Table 5-157 Pin assignment

X1 Pin	Wire Color	X2 Pin
1	White and orange	1
2	Orange	2

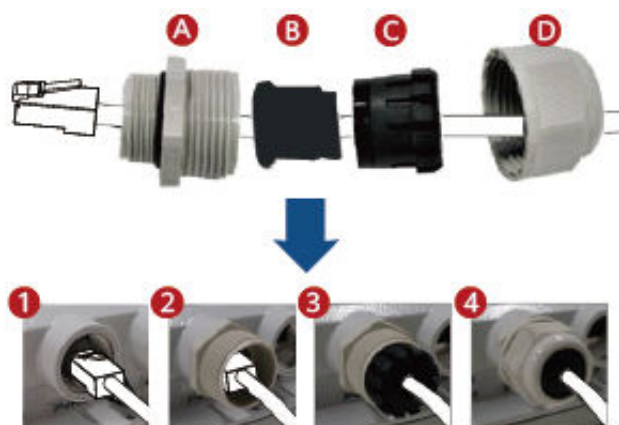
X1 Pin	Wire Color	X2 Pin
3	White and green	3
4	Blue	4
5	White and blue	5
6	Green	6
7	White and brown	7
8	Brown	8

NOTE

In actual installation scenarios, outdoor APs use **outdoor shielded pass-through Ethernet cables**, which are connected in the same way as unshielded Ethernet cables.

2. Route the Ethernet cable through the waterproof PG connector. Connect the RJ45 connector to the Ethernet port on the AP, and secure the waterproof PG connector by referring to steps 1 to 4 in the following figure.

Figure 5-111 Connecting an Ethernet cable



NOTE

- Ensure that the RJ45 connector is correctly connected to the AP. Otherwise, the Ethernet cable may be damaged. Before removing the Ethernet cable, remove the waterproof PG connector and then remove the RJ45 connector.
- The cable length cannot exceed 100 meters.
- If a PoE adapter is used outdoors, it must be installed in a waterproof box.
- Tighten component A of the PG connector to the AP with a tightening torque of 2.5 N·m, and component D to component A with a tightening torque of 1.8 N·m.
- PG connectors are applicable to Ethernet cables with a diameter of 6 mm, and do not support Ethernet cables with a jacket or flat Ethernet cables.
- Use an adjustable wrench (maximum jaw width ≥ 33 mm) to loosen the sealing cover of the Ethernet port on the device.

3. Wrap a layer of PVC insulation tape around the joint between the PG connector and the Ethernet cable from bottom to top. Ensure that the tape fully covers the joint.
4. Wrap three layers of waterproof tape outside the PVC insulation tape. Wrap the waterproof tape layer upon layer in the following sequence: from bottom to top, then from top to bottom, and finally from bottom to top. After wrapping each layer of tape, pinch tightly the end of the tape.
5. Wrap the waterproof tape with three layers of PVC insulation tape. Wrap the PVC insulation tape layer upon layer in the following sequence: from bottom to top, then from top to bottom, and finally from bottom to top. After wrapping each layer of tape, pinch tightly the end of the tape.
6. Tighten cable ties at the two ends of the tape wrapped around the joint.

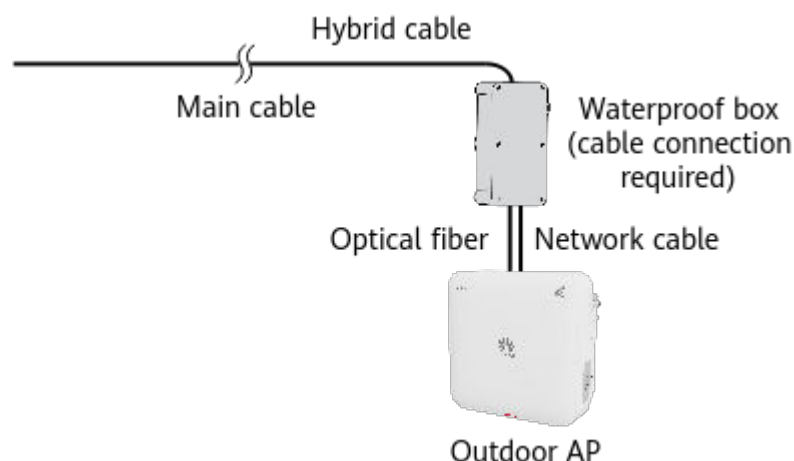
 NOTE

- When wrapping the waterproof tape, stretch the tape evenly until it turns twice its original length. Do not stretch the PVC insulation tape excessively when wrapping it.
- Ensure that each layer of the tape overlaps about 50% of the previous layer. Slightly stretch the tape and press it firmly to avoid wrinkles or air pockets. Wrap each layer of tape tightly.
- Ensure that the adhesive side of the tape is covered on the wrapped tape.
- Reserve a length of 3 mm to 5 mm when cutting the extra part of a cable tie.

5.2.11.3 Connecting a Hybrid Cable

A hybrid cable is composed of optical fibers and copper wires. It can be used to connect a switch and an AP for PoE power supply and data transmission. During construction, onsite cable connection through a waterproof box is required. For details, see [5.2.9 Installing a Waterproof Connection Kit for an AP Hybrid Cable](#).

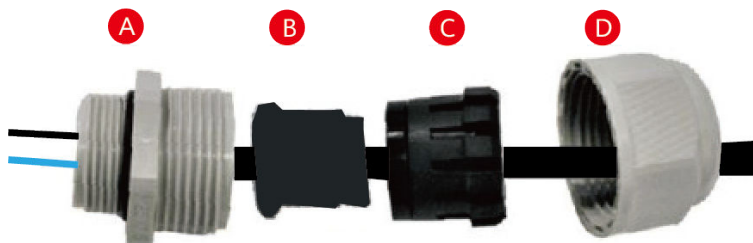
Figure 5-112 Cable connection diagram



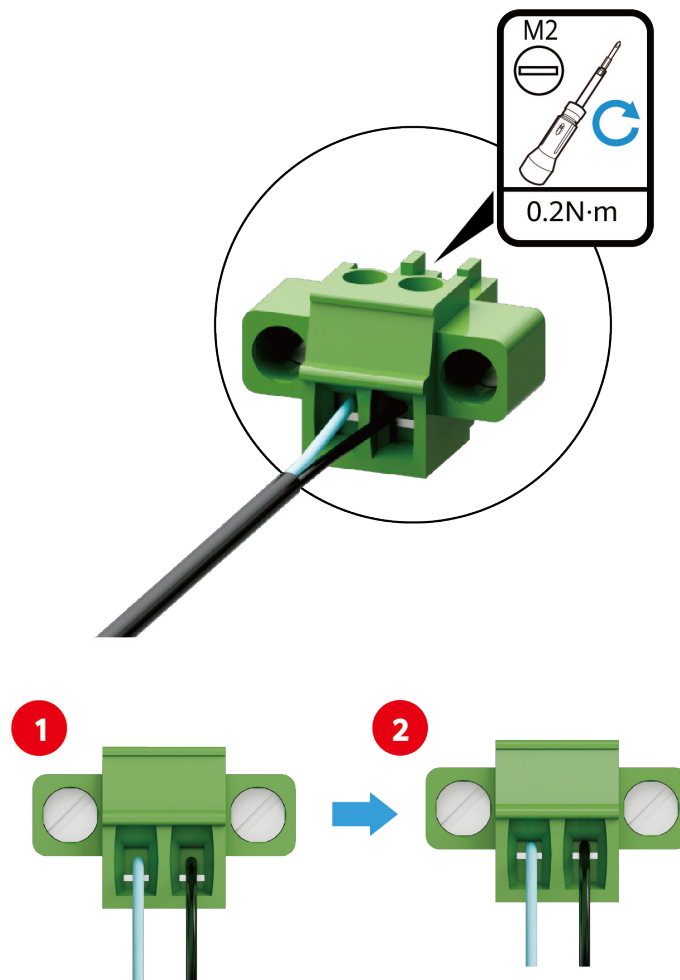
5.2.11.4 Connecting a DC Cable

 NOTE

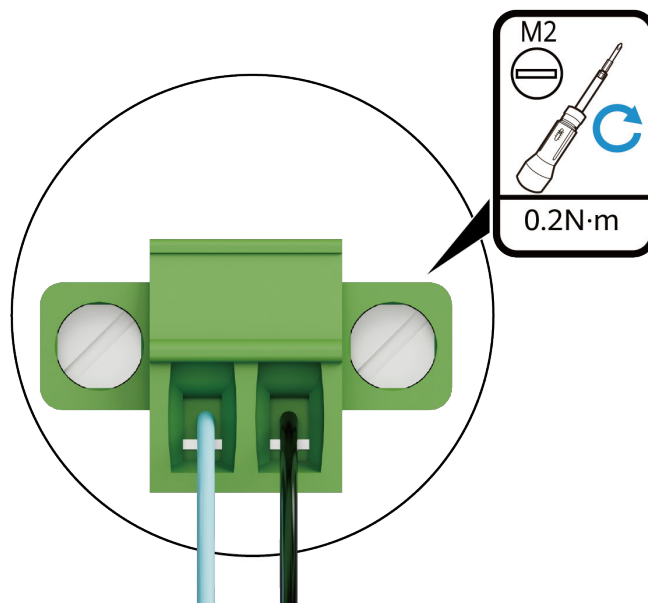
- When the DC power supply is used, a non-waterproof phoenix connector (configured by default, part number: 14180178) works with a waterproof box and a power cable with the cross-sectional area of core wire being 0.2–2 mm². If a waterproof phoenix connector is required, you are advised to purchase a waterproof male/female connector for the DC cable.
 - The outdoor waterproof cable (part number: 25030394) for connecting to a DC port can be purchased as required. The cable must be a dual-wire cable with a diameter of 4–7.8 mm and the cross-sectional area of at least 0.5 mm². Additionally, the cable must meet the requirements of local laws and regulations for the corresponding scenarios.
 - If the DC power port needs to be used with a Huawei power adapter, place the power adapter in a waterproof box, which is co-sited with the AP.
1. Cut a power cable to a proper length based on the distance between the AP and PSE. Strip the sheath at both ends of the power cable, cut the power wires stripped from the power cable, and reserve a length of 4–5 cm.
 2. Route the cable through the waterproof PG connector, as shown in the following figure.



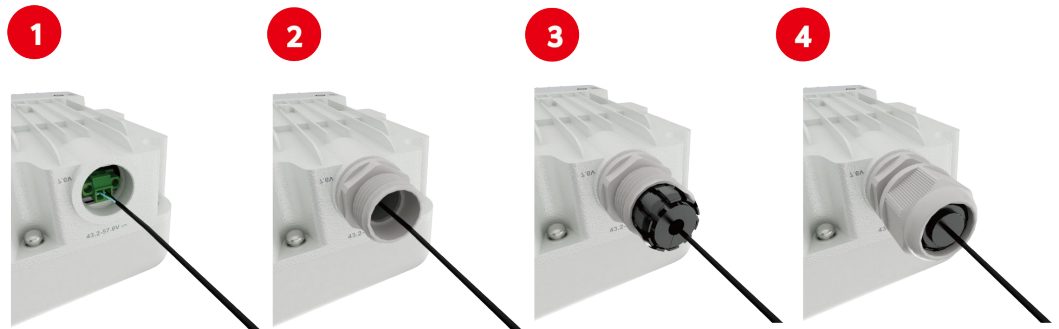
3. Expose the copper wires each with a length of 6 mm to 7 mm from the two power cables. Insert the two copper wires into a phoenix connector delivered with the device, without the need of distinguishing the positive and negative poles. Tighten the screws on the top of the phoenix connector. As the screws are tightened, the metal clamp inside the phoenix connector clamps the copper wires upwards. The assembly process is completed.



4. Insert the phoenix connector into the AP's DC power port and tighten the screws.



5. Tighten the waterproof PG connector in the sequence from 1 to 4, as shown in the following figure, to complete the installation of the DC power cable.



 NOTE

- Tighten component A of the PG connector to the AP with a tightening torque of 2.5 N·m, and component D to component A with a tightening torque of 1.8 N·m.
 - The waterproof PG connector is applicable to a power cable with a diameter of 4–7.8 mm.
 - Use an adjustable wrench (maximum jaw width ≥ 33 mm) to loosen the sealing cover of the DC port on the device.
6. Wrap a layer of PVC insulation tape around the joint between the PG connector and the power cable from bottom to top. Ensure that the tape fully covers the joint.
7. Wrap three layers of waterproof tape outside the PVC insulation tape. Wrap the waterproof tape layer upon layer in the following sequence: from bottom to top, then from top to bottom, and finally from bottom to top. After wrapping each layer of tape, pinch tightly the end of the tape.
8. Wrap the waterproof tape with three layers of PVC insulation tape. Wrap the PVC insulation tape layer upon layer in the following sequence: from bottom to top, then from top to bottom, and finally from bottom to top. After wrapping each layer of tape, pinch tightly the end of the tape.
9. Tighten cable ties at the two ends of the tape wrapped around the joint.

 NOTE

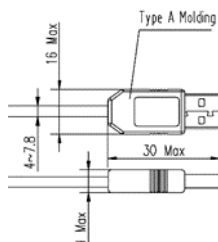
- When wrapping the waterproof tape, stretch the tape evenly until it turns twice its original length. Do not stretch the PVC insulation tape excessively when wrapping it.
- Ensure that each layer of the tape overlaps about 50% of the previous layer. Slightly stretch the tape and press it firmly to avoid wrinkles or air pockets. Wrap each layer of tape tightly.
- Ensure that the adhesive side of the tape is covered on the wrapped tape.
- Reserve a length of 3 mm to 5 mm when cutting the extra part of a cable tie.

5.2.11.5 Connecting a USB Cable

NOTE

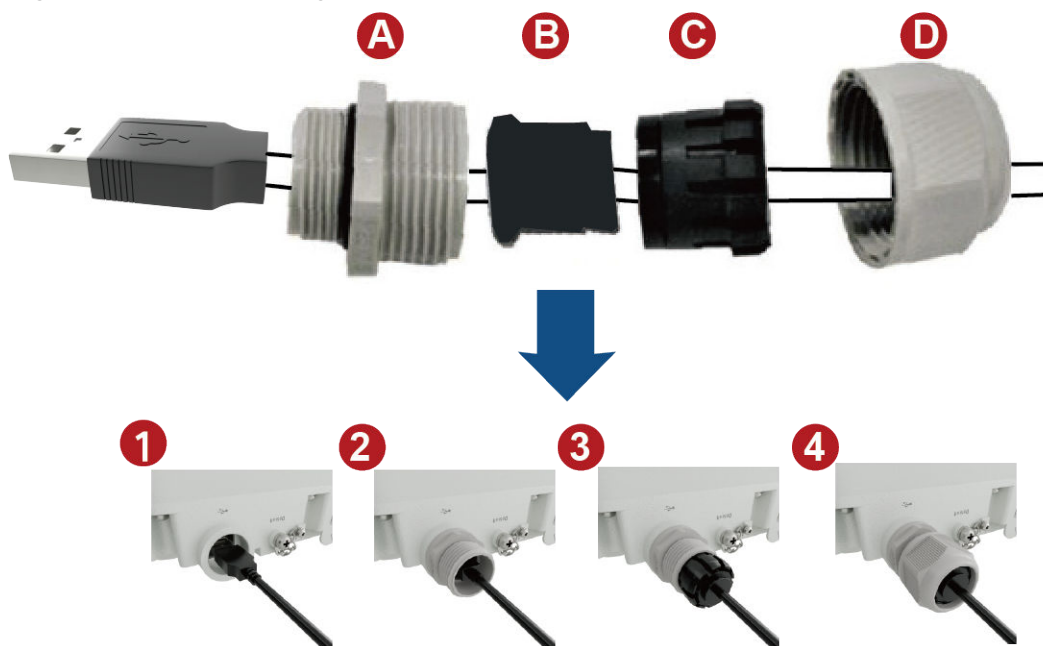
To connect to a third-party device to an AP through a USB cable, ensure that the cable is insulated and its length is less than 2 m. In this scenario, use a waterproof cable connector (part number: 21205455). The USB cable needs to be purchased separately. The cable specifications are described as follows:

- The following figure shows the size restrictions.



- The cable diameter ranges from 4 mm to 7.8 mm.
 - The PE material is recommended.
- Route the cable through the waterproof PG connector, as shown in the following figure. Connect the USB connector to the USB interface on the AP and secure the waterproof PG connector. See steps 1 to 4 in the following figure.

Figure 5-113 Connecting a USB cable



NOTE

- Tighten component A of the PG connector to the AP with a tightening torque of 2.5 N·m, and component D to component A with a tightening torque of 1.8 N·m.
- The waterproof PG connector is applicable to a USB cable with a diameter of 4–7.8 mm.
- Use an adjustable wrench (maximum jaw width ≥ 33 mm) to loosen the sealing cover of the USB port on the device.

2. Wrap a layer of PVC insulation tape around the joint between the PG connector and the USB cable from bottom to top. Ensure that the tape fully covers the joint.
3. Wrap three layers of waterproof tape outside the PVC insulation tape. Wrap the waterproof tape layer upon layer in the following sequence: from bottom to top, then from top to bottom, and finally from bottom to top. After wrapping each layer of tape, pinch tightly the end of the tape.
4. Wrap the waterproof tape with three layers of PVC insulation tape. Wrap the PVC insulation tape layer upon layer in the following sequence: from bottom to top, then from top to bottom, and finally from bottom to top. After wrapping each layer of tape, pinch tightly the end of the tape.
5. Tighten cable ties at the two ends of the tape wrapped around the joint.

 NOTE

- When wrapping the waterproof tape, stretch the tape evenly until it turns twice its original length. Do not stretch the PVC insulation tape excessively when wrapping it.
- Ensure that each layer of the tape overlaps about 50% of the previous layer. Slightly stretch the tape and press it firmly to avoid wrinkles or air pockets. Wrap each layer of tape tightly.
- Ensure that the adhesive side of the tape is covered on the wrapped tape.
- Reserve a length of 3 mm to 5 mm when cutting the extra part of a cable tie.

5.2.11.6 Connecting Ground Cables

Grounding is a key step in device installation. The ground cable of a device must be correctly connected to protect the device from lightning, electromagnetic interference, and electrostatic charges. Outdoor APs support built-in surge protection on all ports, but the surge protection works only when the outdoor APs are grounded.

Requirements for Laying Out Ground Cables

- Connect the ground cables to the same ground bar.
- Ensure that the bend radius of a ground cable is greater than or equal to five times the cable diameter.
- Bury ground cables underground or arrange them indoors. Do not route ground cables overhead outdoors.
- Ensure that the external conductor of the coaxial cable and both ends of the shield layer of the shielded cable are in good electric contact with the metal shell of the connected device.
- Separate the ground cable from signal cables to reduce interference between them.
- Do not add any switch or fuse on the ground cable.
- Do not use another device for an electrical connection with the ground cable.
- Ensure that all conductive metal components inside the enclosure properly connect to protection ground terminals.

Ground Cable Connections

1. Cut the ground cable into a proper length and use an M4 OT terminal for the device. The OT terminal used to connect to the ground terminal depends on site requirements. Cut the cables into the required length based on site requirements.

NOTE

Torque on the ground bar:

- M5: 3 N·m
 - M6: 4.8 N·m
 - M8: 12 N·m
2. After the ground cable is connected, verify that the electrical resistance between the ground terminal and ground point is less than 5 ohms on a multimeter. The grounding resistance in a communication bureau (site) with a high earth resistance rate should be less than 10 ohms.

Figure 5-114 Grounding of a cylinder-shaped AP

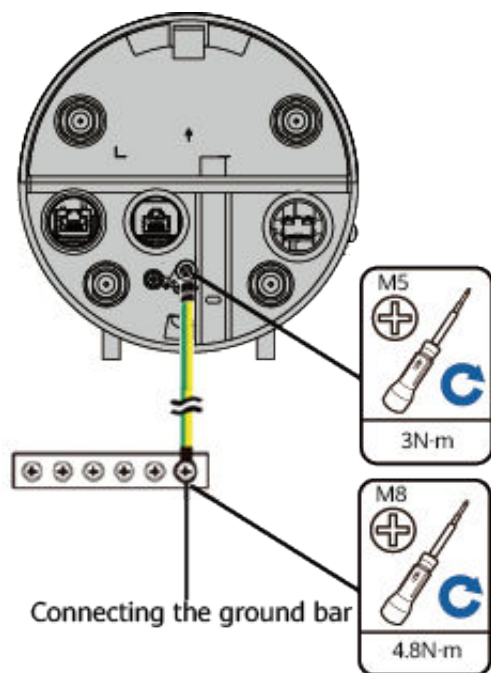
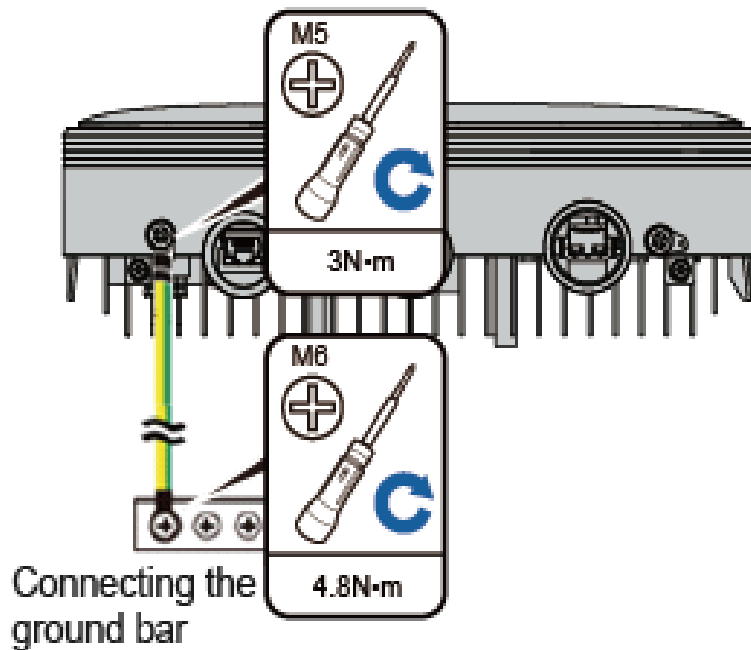


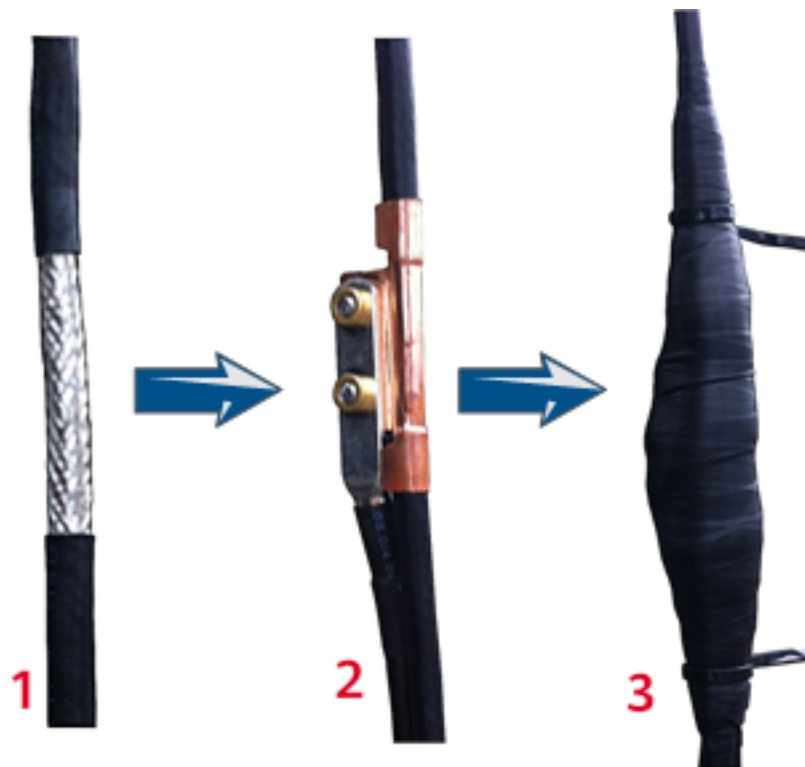
Figure 5-115 Grounding of a square-shaped AP



Grounding Shielded Ethernet Cables

Using shielded Ethernet cables can improve surge protection performance of an AP. To ground a shielded Ethernet cable, perform the following operations:

1. Remove the shield layer of a shielded Ethernet cable.
2. Connect the cable to the ground clip.
3. Wrap the cable with waterproof and ESD tapes.



 NOTE

- When wrapping the waterproof tape, stretch the tape evenly until it turns twice its original length.
- Ensure that each layer of the tape overlaps about 50% of the previous layer. Slightly stretch the tape and press it firmly to avoid wrinkles or air pockets. Wrap each layer of tape tightly.
- Ensure that the adhesive side of the tape is covered on the wrapped tape.
- Reserve a length of 3 mm to 5 mm when cutting the extra part of a cable tie.

5.2.11.7 Installing an Outdoor Antenna

Two types of outdoor antennas are available: directional outdoor antenna and omnidirectional outdoor antenna. Omnidirectional antennas can be directly installed on APs.

 NOTE

Before installing or replacing an antenna, power off the AP.

Installing a Directional Outdoor Antenna on a Pole

Pay attention to the following points when installing a directional outdoor antenna:

1. An outdoor antenna must be installed on a pole with a diameter of 30 mm to 50 mm and a thickness of at least 2.5 mm. A 50 mm diameter pole made of round steel is usually used.
2. Weld the lightning rod to the top of the pole.
3. Install the antenna pole on a parapet or concrete bed on the roof of the building.
4. Use a 40 mm x 4 mm flat steel to connect the antenna pole to an earth mat.
5. Secure the directional outdoor antenna on the pole with an antenna support.
6. Keep the pole vertical to the ground during the installation.

Figure 5-116 shows how to install a directional outdoor antenna on a pole.

- If the roof of the building is surrounded by parapets of no less than 1.2 m high, fix the pole on a parapet with expansion screws, and then fix the directional outdoor antenna on the pole with an antenna support.
- If the roof of the building is surrounded by parapets of less than 1.2 m high, fix the pole on a parapet and on the building surface with expansion screws, and then fix the directional outdoor antenna on the pole with an antenna support.
- If there is no parapet around the roof, fix the pole on the ground or a concrete bed with expansion screws and steel wires, and then fix the directional outdoor antenna on the pole with an antenna support.

Figure 5-116 Installing a directional outdoor antenna on a pole

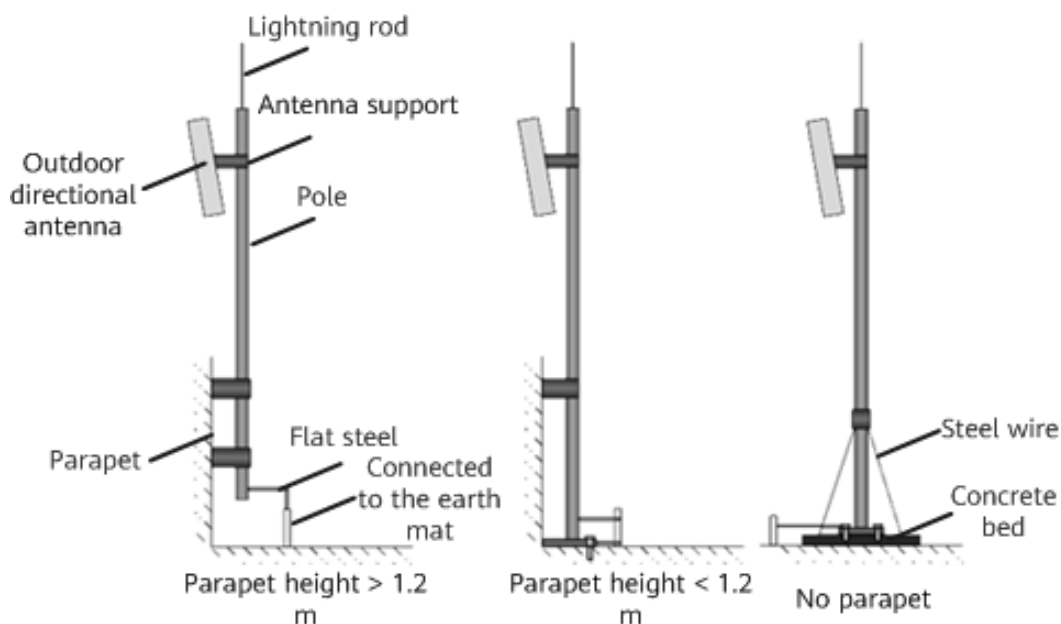
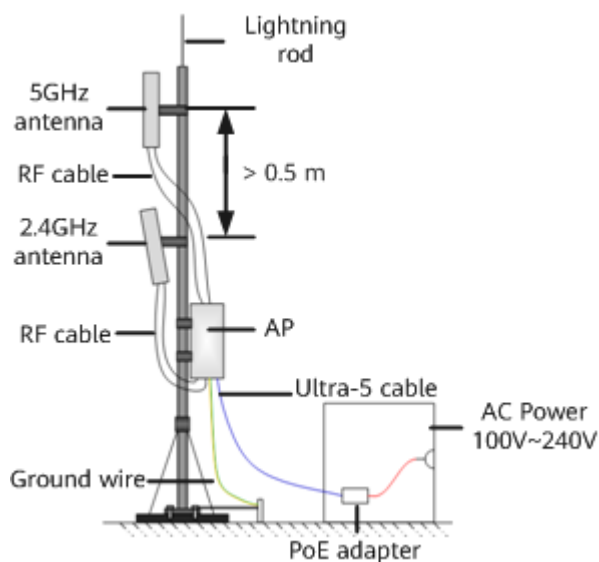


Figure 5-117 shows outdoor AP installation scenarios. The distance between a 5 GHz antenna and a 2.4 GHz antenna should be more than 0.5 m.

Figure 5-117 Outdoor AP installation scenarios



Installing an Omnidirectional Outdoor Antenna on a Pole

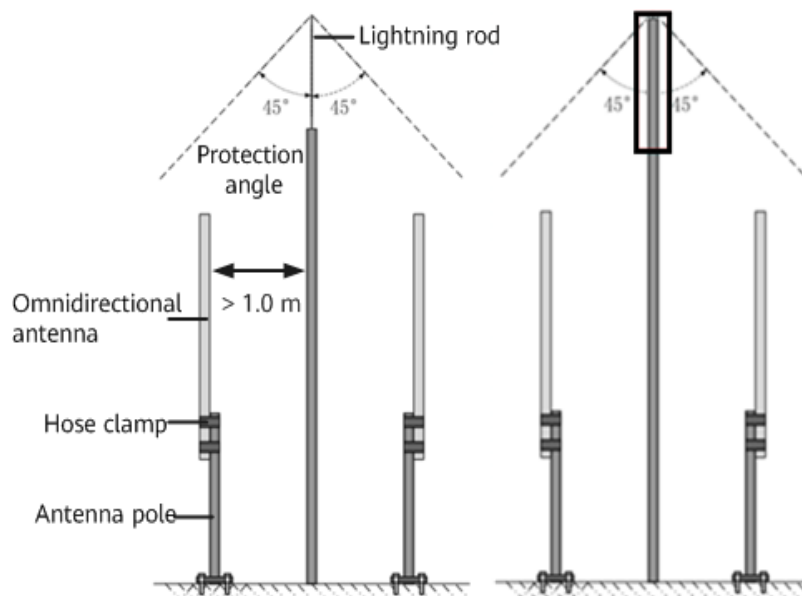
Pay attention to the following points when installing an omnidirectional outdoor antenna:

1. An outdoor antenna must be installed on a pole with a diameter of 30 mm to 50 mm and a thickness of at least 2.5 mm. A 50 mm diameter pole made of round steel is usually used.

2. The top of the pole must be aligned with the hose clamp at the bottom of the antenna.
3. After the installation is complete, the antenna must be installed at a proper height to provide sufficient signal coverage, and the top of the antenna must be within the 45-degree protection angle of the lightning rod.
4. Do not weld a lightning rod directly on the antenna pole (no metal subject allowed within 1 m around an omnidirectional antenna). Instead, install an independent lightning rod between two omnidirectional antenna poles. Adjust the height of the lightning rod to ensure that the omnidirectional antennas are covered in the protection angle.
5. It is recommended that the distance between two omnidirectional antennas be more than 0.5 m.

Figure 5-118 shows installation of an omnidirectional outdoor antenna.

Figure 5-118 Installing omnidirectional outdoor antennas on an AP



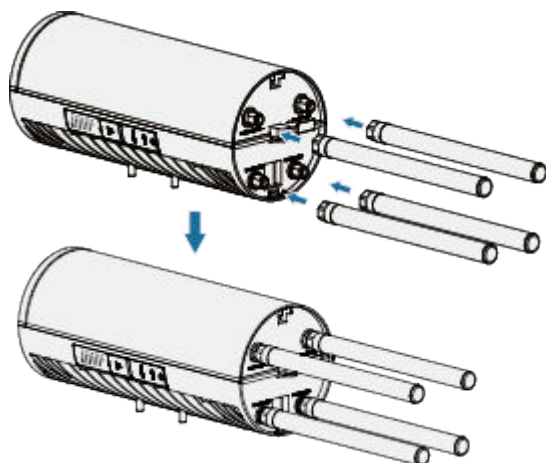
NOTE

If antennas are installed on a metal pole such as a steel pole, you do not need to install a lightning rod, as shown on the right in **Figure 5-118**.

Installing Omnidirectional Outdoor Antennas on an AP

Figure 5-119 shows how to install omnidirectional outdoor antennas on an AP.

Figure 5-119 Installing omnidirectional outdoor antennas on an AP



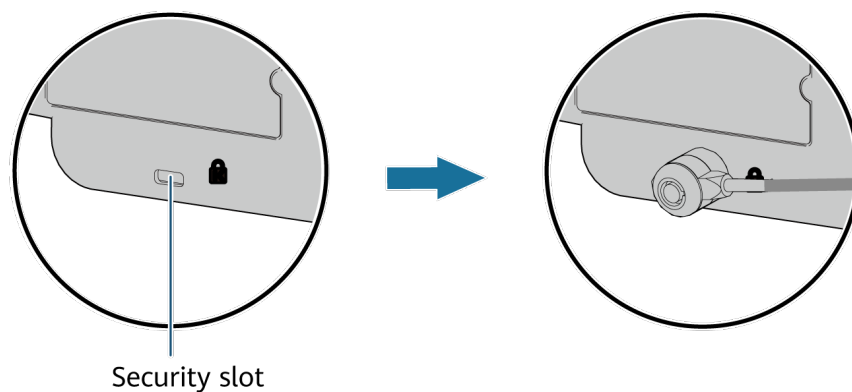
NOTE

- In the preceding figure, the AP is placed horizontally. In practice, the AP should be vertically placed so that the antennas point upwards.
- When installing an antenna, tightly hold the antenna connector and tighten it using a torque wrench. The recommended tightening torque is 0.8 N·m to 1.0 N·m.
- After the antenna is secured, it is normal that some screw threads are left out.

5.2.11.8 Installing a Security Lock

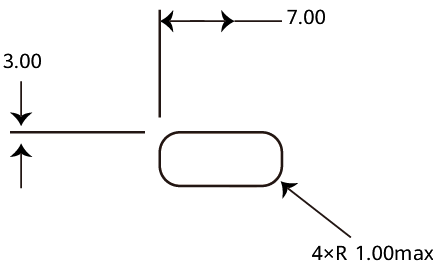
There is a security slot on the device. You can lock the device to an immovable object to prevent theft. The detailed procedure is as follows:

1. Fasten the cable of the security lock to an immovable object around.
2. Insert the security lock into the security slot and lock it.



 **NOTE**

You need to purchase the security lock separately. The security slot is 7 mm long and 3 mm wide. The maximum radius of its four round corners is 1 mm.



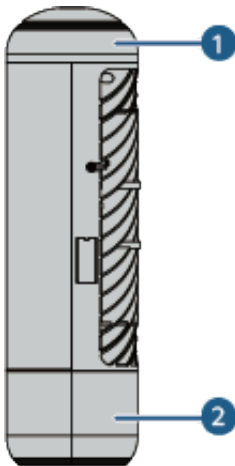
5.2.12 Installing Enclosures

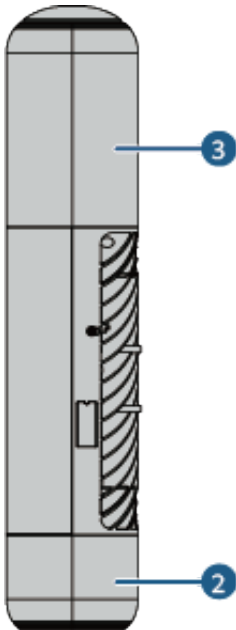
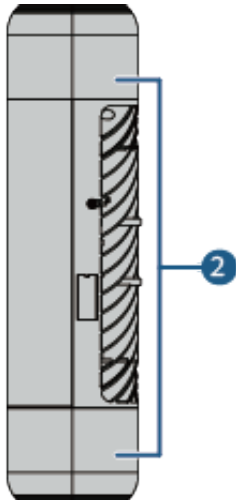
Enclosures can be installed only on the AirEngine 8760R-X1 and AirEngine 8760R-X1E.

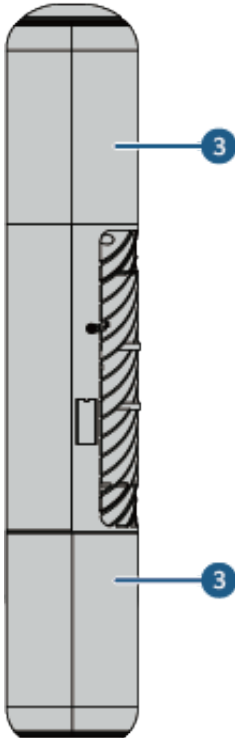
Enclosure Classification

You need to separately purchase enclosures based on AP models. [Table 5-158](#) lists mappings between enclosures and AP models.

Table 5-158 Mappings between enclosures and AP models

Application Scenario	Enclosure Matching
With two enclosures	

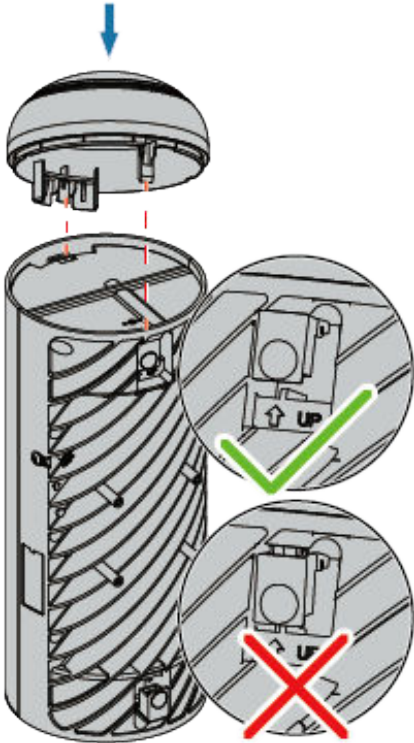
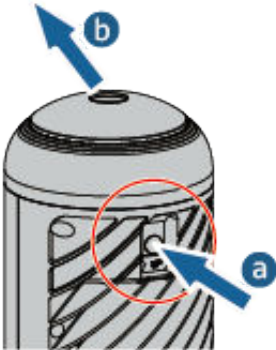
Application Scenario	Enclosure Matching
Connected to whip antennas on the top, with two enclosures	
Connected to remote antennas on the top, with an enclosure	

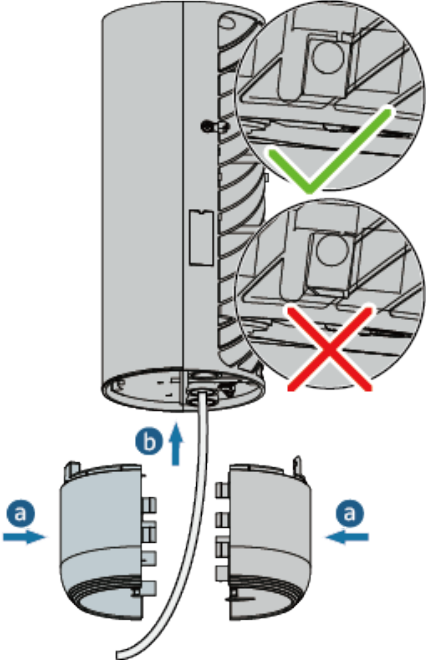
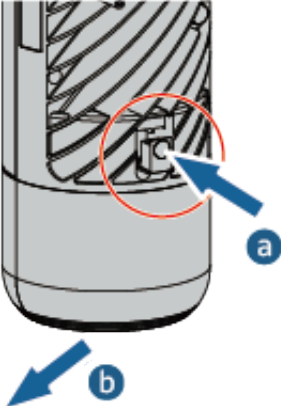
Application Scenario	Enclosure Matching
Connected to whip antennas on the top and bottom, with two enclosures	

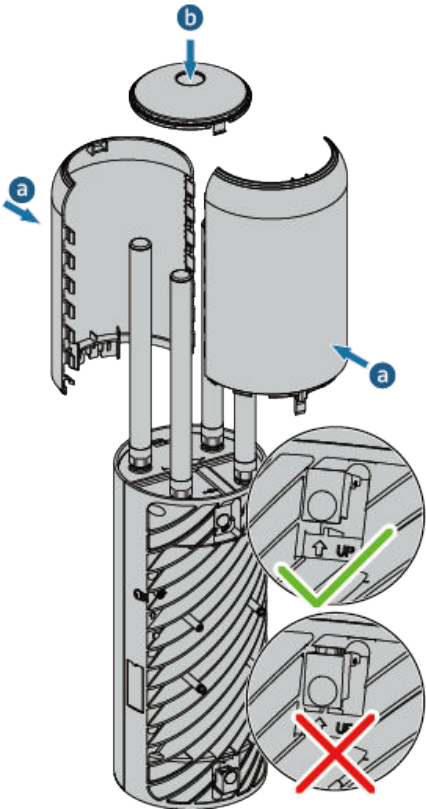
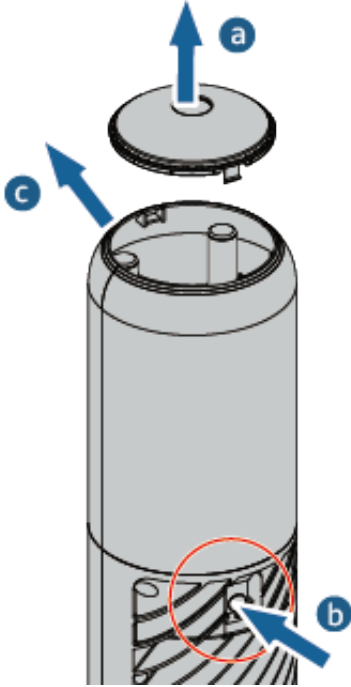
Enclosure types include:

- 1. Top enclosure (part number: 21205452), 165 mm (diameter) x 20 mm
- 2. Cabling enclosure (part number: 21205453), 165 mm (diameter) x 150 mm
- 3. Whip antenna enclosure (part number: 21205454), 165 mm (diameter) x 280 mm

Installing and Removing an Enclosure

Enclosure	Installation Method	Removal Method
21205452	<p>Align the two protrusions on the enclosure with the corresponding holes on the AP, vertically install the enclosure, and press the cover with proper force to ensure that the buckle springs back in place.</p> 	<p>Press the buckle with one hand. At the same time, use the other hand to slightly open the enclosure through the hole on its center and pull it out in an oblique direction.</p> 

Enclosure	Installation Method	Removal Method
21205453	<p>Assemble the two parts of the enclosure. Align the two protrusions on the enclosure with the corresponding holes on the AP, vertically install the enclosure, and press the cover with proper force to ensure that the buckle springs back in place.</p> 	<p>Press the buckle with one hand. At the same time, use the other hand to slightly open the enclosure and pull it out in an oblique direction.</p> 

Enclosure	Installation Method	Removal Method
21205454	<p>Assemble the cylinder part of the enclosure. Align the two protrusions on the enclosure with the corresponding holes on the AP, vertically install the enclosure, and press the cover with proper force to ensure that the buckle springs back in place. When the enclosure is installed on top of the AP, install the end cover of the enclosure.</p> 	<p>Vertically pull out the end cover of the enclosure through the hole. Press the buckle, and slightly open the cylinder part of the enclosure to pull it out in an oblique direction.</p> 

5.2.13 Verifying the Installation

Table 5-159 shows the items to be checked after AP installation is complete. For more information, see **17.6 Installation Checklist** in the appendix.

Table 5-159 Post-installation checklist

No.	Check Item
1	The device is installed by strictly following the design draft. The installation position meets space requirements, with maintenance space reserved.

No.	Check Item
2	The AP is securely installed. The wall can bear the weight of four times the total weight of the device and mounting bracket without damage.
3	Waterproof caps are installed on idle interfaces and securely fastened.
4	The power cables and PGND cables are intact and not spliced.
5	Terminals of the power cables and PGND cables are welded or cramped firmly.
6	All power cables or PGND cables are not short-circuited or reversely connected and must be intact with no damage.
7	Power cables and ground cables are separated from other cables and bundled separately.
8	The working ground, protection ground, and surge protection ground share the same group of ground bars.
9	Connectors of signal cables are complete, intact, and tightly connected. The signal cables are not damaged or broken.
10	PG connectors of network cables and optical fibers are secured fastened as required.
11	Labels are correct, legible, and complete. Labels at both ends of cables, feeders, and jumpers are correct.
12	The shell, mounting bracket, screws, Ethernet cables, and power cables are not in contact with high-voltage conductors, thereby avoiding damage to the device or even injury to the human body.
13	All idle RF ports are connected with 50-ohm RF loads and properly wrapped with insulation tapes and waterproof tapes.
14	Power adapters and power supply surge protectors are placed in a waterproof box, and the waterproof box is securely sealed.

After an AP is powered on, observe indicators on the AP to determine the system running status. For details, see the indicator description.

 NOTE

Do not frequently power on and off the device.

Installation Effect

