



Huawei AP8130DN Access Points

Product Description

Issue 01
Date 2014-09-10

Copyright © Huawei Technologies Co., Ltd. 2014. All rights reserved.

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Huawei Technologies Co., Ltd.

Trademarks and Permissions



HUAWEI and other Huawei trademarks are trademarks of Huawei Technologies Co., Ltd.

All other trademarks and trade names mentioned in this document are the property of their respective holders.

Notice

The purchased products, services and features are stipulated by the contract made between Huawei and the customer. All or part of the products, services and features described in this document may not be within the purchase scope or the usage scope. Unless otherwise specified in the contract, all statements, information, and recommendations in this document are provided "AS IS" without warranties, guarantees or representations of any kind, either express or implied.

The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.

Huawei Technologies Co., Ltd.

Address: Huawei Industrial Base
Bantian, Longgang
Shenzhen 518129
People's Republic of China

Website: <http://enterprise.huawei.com>

Contents

1 About This Document.....	0
1 Product Positioning and Characteristics.....	1
1.1 Product Positioning.....	2
1.2 Product Characteristics.....	6
2 Hardware Structure.....	10
2.1 AP8130DN.....	11
3 Product Features.....	16
3.1 WLAN Features.....	17
3.2 Network Features.....	17
3.3 QoS Features.....	18
3.4 Security Features.....	18
3.5 Maintenance Features.....	19
3.6 BYOD.....	19
3.7 Locating Service.....	19
3.8 Spectrum Analysis.....	20
4 Technical Specifications.....	21
4.1 Basic Specifications.....	22
4.2 Radio Specifications.....	22
4.3 Standards Compliance.....	25

1 Product Positioning and Characteristics

About This Chapter

[1.1 Product Positioning](#)

[1.2 Product Characteristics](#)

1.1 Product Positioning

Table 1-1 Product positioning

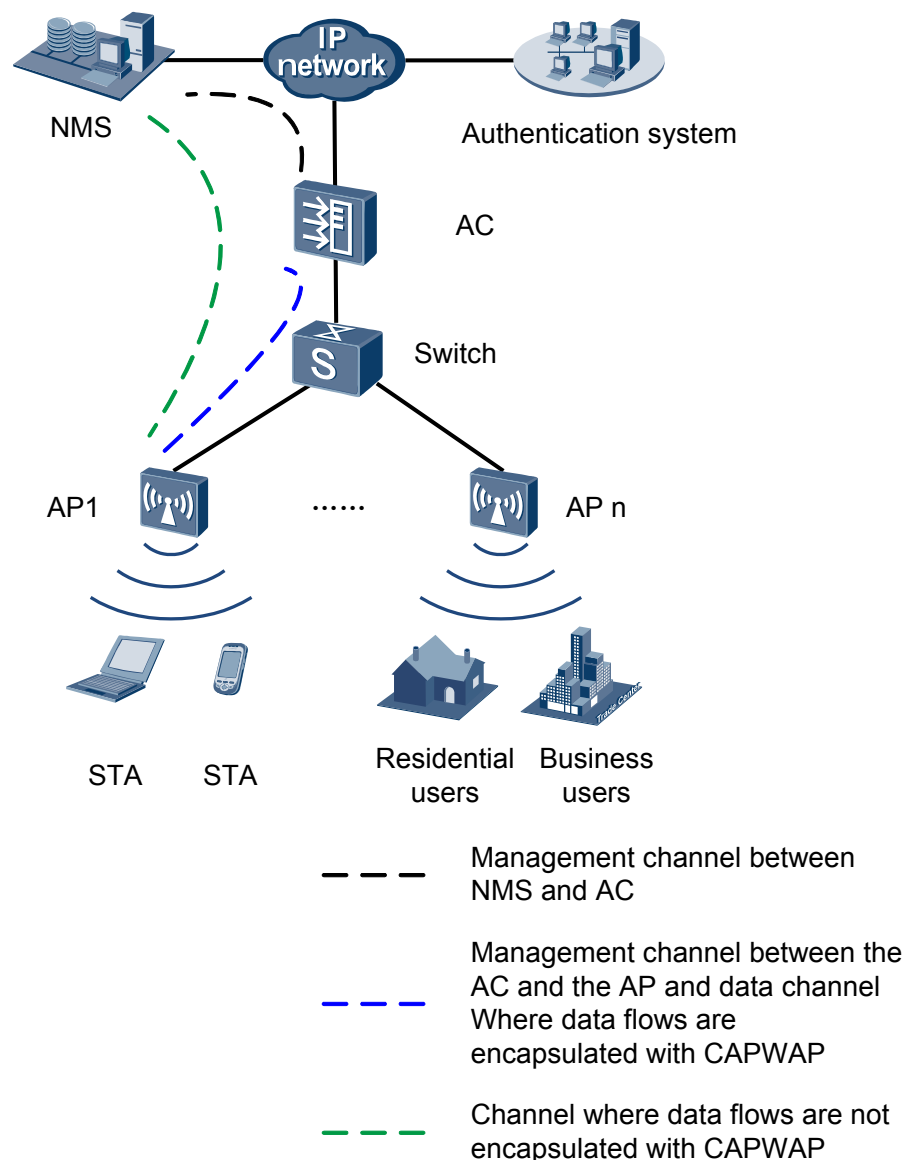
Product Model	Frequency Band	IEEE Standard Compliance	Positioning	Usage Scenario
AP8130DN	<p>Dual band:</p> <ul style="list-style-type: none"> ● 2.4 GHz ● 5 GHz <p>The AP8130DN can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users.</p> <p>It supports 2.4G-to-5G switchover and works on dual 5 GHz frequency bands.</p>	IEEE 802.11a/b/g/n/ac	<p>Huawei AP8130DN, physically hardened, supports 3x3 MIMO and offers enhanced outdoor coverage performance. The AP can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. It provides comprehensive service support capabilities and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance, which meets requirements of outdoor deployment.</p>	<p>Huawei AP8130DNs comply with IP67 dustproof and waterproof protection standards, applicable to coverage scenarios (for example, squares, pedestrian streets, and amusement parks) and bridging scenarios (for example, wireless harbors, data backhaul, video surveillance, and train-to-ground backhaul).</p>

The AP8130DN can work as a Fat AP or Fit AP and switch flexibly between the two working modes based on the network plan.

When the wireless network scale is small, customers need to purchase only AP products and set the APs to work as Fat APs. As the network scale expands, tens of or hundreds of APs exist on the network. To simplify network management, customers are advised to purchase ACs to perform centralized management on the APs and set the APs to work as Fit APs.

Typical networking modes are as follows:

Figure 1-1 Fit AP networking (AP mode)



In this networking, the AP functions as a fit AP and provides only data forwarding functions. The AC is responsible for user access, AP go-online, AP management, authentication, routing, security, and QoS. Huawei AC products include the AC6605, AC6005, and Access Controller Unit (ACU2).

Figure 1-2 Fit AP networking (WDS mode: point-to-point)

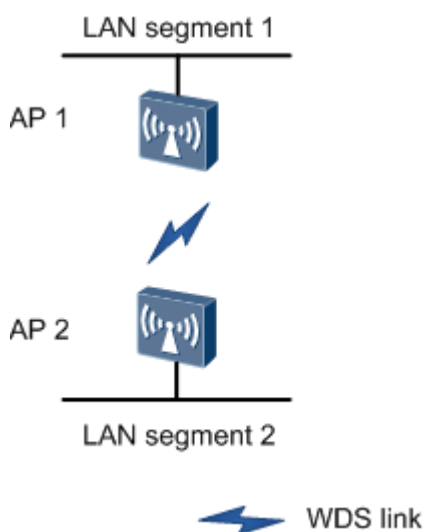
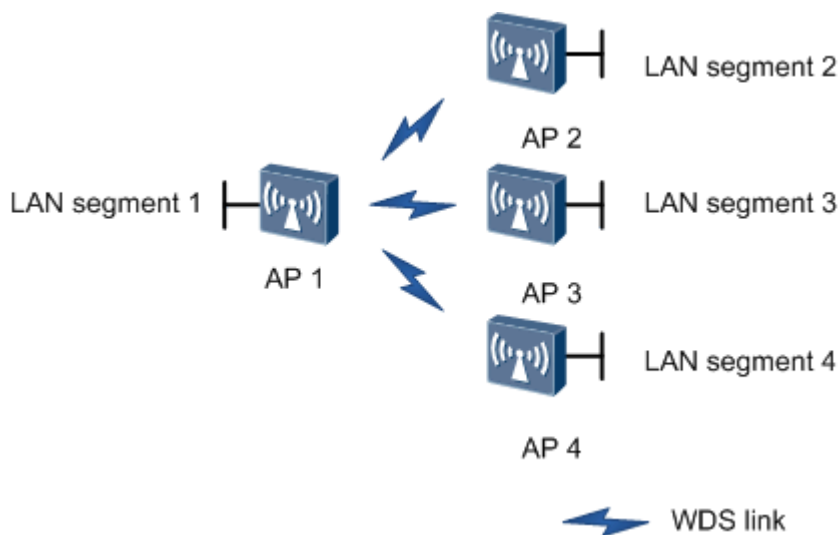
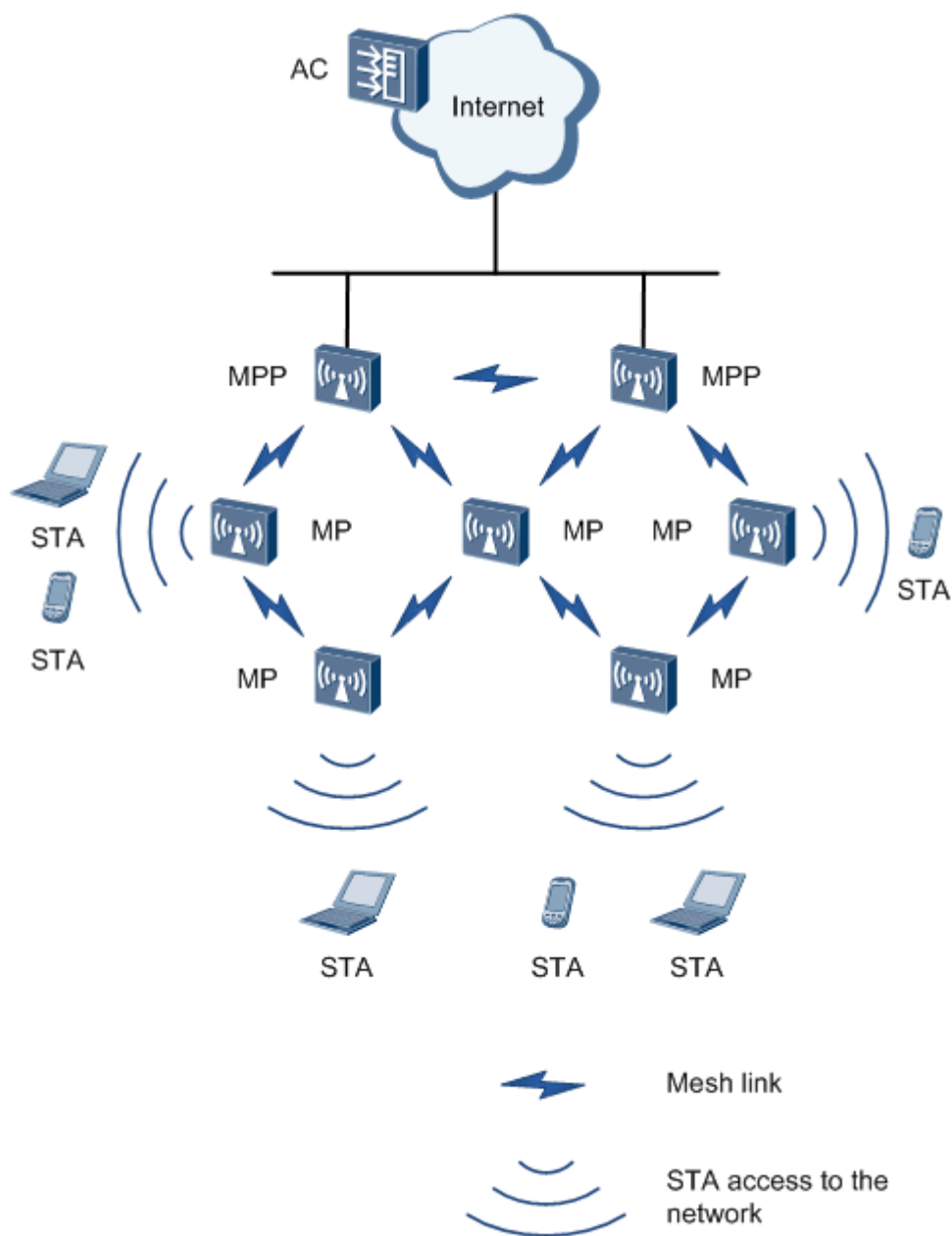


Figure 1-3 Fit AP networking (WDS mode: point-to-multipoint)



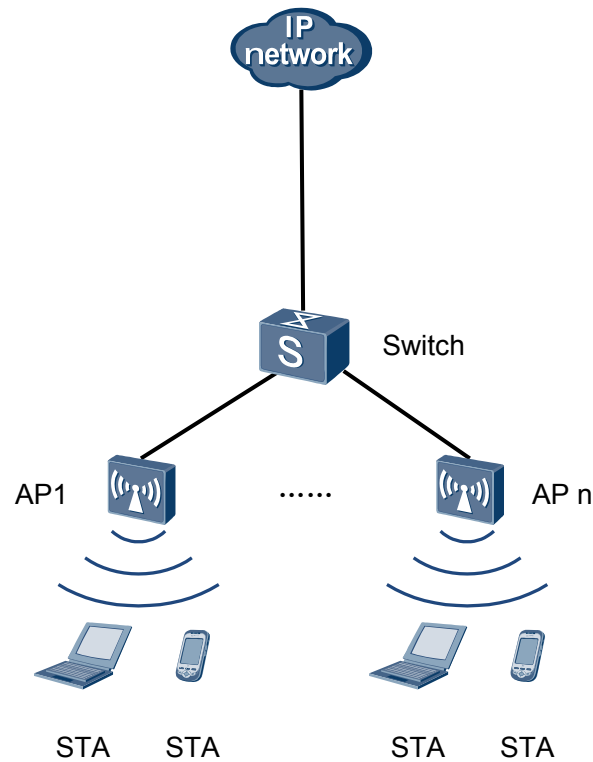
In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. With 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

Figure 1-4 Fit AP mesh networking



On the preceding network, APs function as mesh points (MPs) and are fully-meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

Figure 1-5 Fat AP networking



On the preceding network, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

1.2 Product Characteristics

The AP8130DN has the following advantages on a WLAN.

Product Characteristics	Description
High-speed and reliable wireless access	<ul style="list-style-type: none"> ● Complies with IEEE 802.11a/b/g/n/ac. ● Supports 3×3 MIMO and provides a maximum rate of 1.75 Gbit/s. ● Supports Wi-Fi Multimedia (WMM) and priority mapping on the air interface and wired interface. ● Supports wired link integrity check. ● Provides two GE auto-sensing uplink electrical ports and supports PoE power supply. ● Supports load balancing. ● Supports roaming without service interruption in Fit AP mode. ● Supports AC dual-link backup in Fit AP mode. ● Supports 11n beamforming. ● Uses the latest 802.11ac chip to provide higher performance and wider coverage. ● Uses a metal shell and heat dissipation design to ensure high reliability. ● Supports airtime scheduling which ensures fairness in channel occupation time for all users.
Comprehensive user access control capability	<ul style="list-style-type: none"> ● Supports access control lists (ACLs) and implements user access control based on the user group policy. ● Provides fine-grained bandwidth management for each user. ● Supports user isolation policies. ● Supports unified authentication on the AC in Fit AP mode. ● Identifies the device type according to the organizationally unique identifier (OUI) in the MAC address, user agent (UA) information in an HTTP packet, and DHCP options in Fit AP mode. ● The RADIUS server delivers packet forwarding, security, and QoS policies according to the device type carried in the RADIUS authentication and accounting packets in Fit AP mode.

Product Characteristics	Description
High network security	<ul style="list-style-type: none"> ● Open system authentication ● WEP authentication/encryption ● WPA/WPA2/WPA-WPA2-PSK authentication and encryption ● WPA/WPA2/WPA-WPA2-802.1x authentication and encryption ● WPA, WPA2, and WPA-WPA2 support TKIP and CCMP encryption algorithms, where CCMP uses 128-bit advanced encryption standard (AES) encryption algorithm and has high security. ● WAPI authentication and encryption ● Supports wireless intrusion detection system (WIDS) and wireless intrusion prevention system (WIPS), including rogue device detection and countermeasure, attack detection and dynamic blacklist, STA/AP blacklist and whitelist.
Flexible networking and environment adaptability	<ul style="list-style-type: none"> ● Provides flexible networking capabilities and applies to various application scenarios. Mesh and WDS scenarios are supported only in Fit AP mode. ● Has strong environment adaptability. The AP can automatically select the transmission rates, channels, and transmit power to adapt to various radio environments and avoid interference in real time. ● Adjusts bandwidth allocation based on the user quantity and environment to improve user experience. ● Supports the MIMO antenna system and connects to external dual-band antennas (2.4 GHz and 5 GHz). The antennas can be flexibly adjusted. ● Identifies interference sources such as baby monitors, Bluetooth devices, digital cordless phones (at 2.4 GHz frequency band only), wireless audio transmitters (at both the 2.4 GHz and 5 GHz frequency bands), wireless game controllers, and microwaves in Fit AP mode and works with eSight to locate interference sources and display spectrums.
Easy device management and maintenance	<ul style="list-style-type: none"> ● Automatically goes online and loads the configuration, and supports plug-and-play (PnP) in Fit AP mode. ● Supports batch upgrade. ● Manages APs locally on the web platform and supports HTTP or HTTPS login, configuration, and maintenance in Fat AP mode. ● Allows real-time monitoring on the network management system (NMS) to facilitate remote configuration and fast fault location. ● Supports the Link Layer Discovery Protocol (LLDP) to implement automatic link discovery and obtain the network topology.

Product Characteristics	Description
High reliability and protection level	<ul style="list-style-type: none">● Provides strong hardware protection capability.● Adapts to a wide temperate range from -40°C to +60°C.● Uses industry-standard components and design methods, improving industry-level reliability.● Complies with IP65/IP66/IP67 protection standards.● Has a built-in 5 kA feeder surge protector and requires no external surge protective devices, which simplifies installation and lowers costs.● Provides 6 kA or 6 kV surge protection capability on an Ethernet interface.● Complies with international standards and China safety standards III.

2 Hardware Structure

About This Chapter

[2.1 AP8130DN](#)

2.1 AP8130DN

Appearance

Figure 2-1 shows the appearance of the AP.

 **NOTE**

The actual device appearance may be different from the following device appearance, but these differences will not affect device functions.

Figure 2-1 AP8130DN appearance



CAUTION

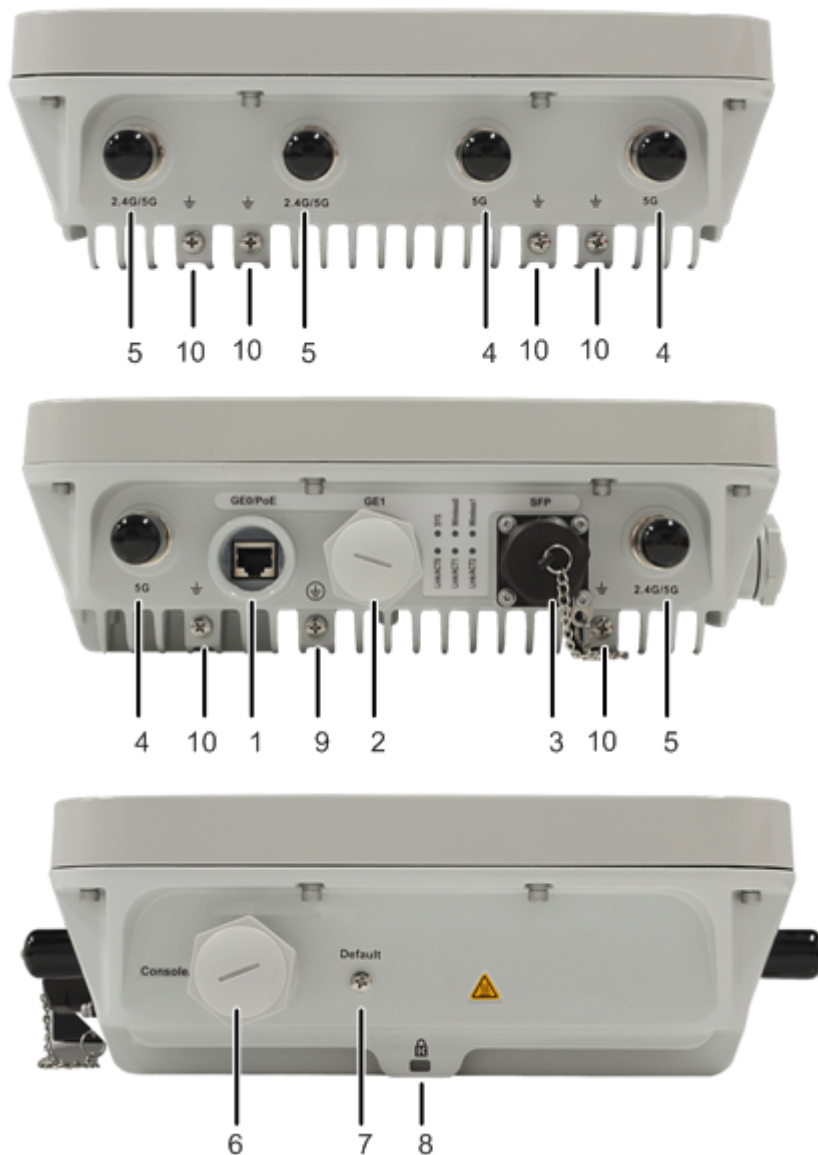


There is a scald warning label attached on the device, warning you not to touch the device after the device has been operating for a long time.

Interfaces

The following figure shows interfaces on the AP8130DN.

Figure 2-2 Interfaces on the AP8130DN



1. GE0/PoE interface: a 10/100/1000M interface, which connects to the wired Ethernet and supports the PoE power supply.
2. GE1 interface: a 10/100/1000M interface, which connects to the wired Ethernet.
3. SFP: an optical interface.
4. 5 GHz antenna interface.
5. 2.4 GHz or 5 GHz antenna interface.
6. Console interface
7. Default button: restores the factory settings if you remove the screw and hold down the button more than 3s from the hole.

8. Security slot: Connects to a security lock.
9. Device ground screw: Connects a ground cable to the AP.
10. Ground screw for the surge protective device: Connects the AP to the ground point of an external surge protective device.

LED Indicators

The AP8130DN provides multiple indicators: SYS indicator, Link indicator, and Wireless indicator. The following table describes indicators on AP8130DN.

NOTE

Indicator colors may vary slightly at different temperature.

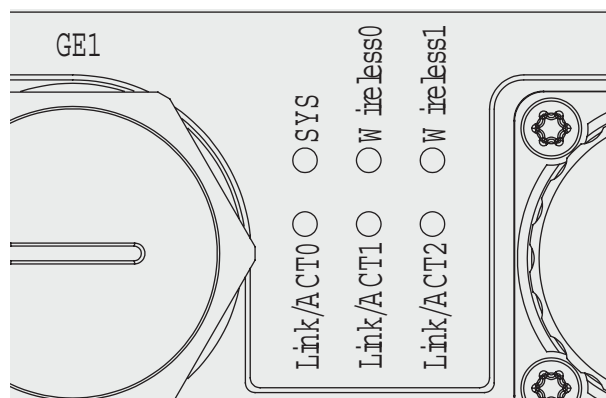


Table 2-1 Descriptions about the SYS indicator

Type	Color	Status	Description
Default status after power-on	Green	Steady on	The AP is just powered on and the software is not started yet.
Software startup status	Green	Steady on after blinking once	After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green.
Running status	Green	Blinking once every 2s (0.5 Hz)	<ul style="list-style-type: none"> ● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP. ● The system enters the Uboot CLI.
		Blinking once every 5s (0.2 Hz)	The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state.

Type	Color	Status	Description
Alarm	Green	Blinking once every 0.25s (4 Hz)	<ul style="list-style-type: none"> ● The software is being upgraded. ● After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established). ● The AP working in Fit AP mode fails to go online on the AC (the CAPWAP link disconnects).
Fault	Red	Steady on	A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually.

Table 2-2 Descriptions about the Link indicator

Type	Color	Status	Description
LINK	Green	Steady on	The system is running properly, the Ethernet connection is normal, and no data is being transmitted.
ACT	Green	Blinking	The system is running properly, the Ethernet connection is normal, and the AP is transmitting data. The indicator blinks more quickly when more data is being transmitted.

Table 2-3 Description about the Wireless indicator (Traffic volume indicator)

Color	Status	Description
Yellow/green	Off	Radios are disabled, and no STA is connected to the AP.
Yellow/green	Steady on	The AP has STAs connected to the 2.4 GHz radio or 5 GHz radio, but no data is being transmitted.
Green	Blinking	The AP has STAs connected to the 2.4 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted.
Yellow	Blinking	The AP has STAs connected to the 5 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted.

Color	Status	Description
Yellow/green	Blinking alternatively	The AP has STAs connected to both the 2.4 GHz radio and 5 GHz radio. The indicator blinks more quickly when more data is being transmitted.

Table 2-4 Description about the Wireless indicator (Wireless bridge indicator)

Color	Status	Description
Yellow/green	Off	The AP is not transmitting or receiving data or the signal strength is extremely low.
	Blinking once every 2s (0.5 Hz)	The AP is transmitting or receiving data normally, and the signal strength is low.
	Blinking green once every 0.25 seconds (4 Hz)	The AP is transmitting or receiving data normally, and the signal strength is medium.
	Steady on	The AP is transmitting or receiving data normally, and the signal strength is high.

 **NOTE**

When the WDS/mesh function is enabled on an AP, the blinking frequency of its Wireless LED indicates the receive signal strength on the WDS/mesh connection by default. After you connect an AP to a WDS/mesh network, you can run the **wifi-light { signal-strength | traffic }** command on the AC to make the Wireless LED blinking frequency indicate receive signal strength or service traffic rate.

- **wifi-light signal-strength:**
 - If the mesh function is enabled on the AP, the blinking frequency of the Wireless LED reflects the weakest signal strength of all neighboring APs.
 - If WDS is enabled on an AP, the blinking frequency of the Wireless LED reflects the strength of signals received from a WDS AP.
 - If the AP works in leaf mode, the blinking frequency of the Wireless LED reflects the strength of signals received from a middle AP.
 - If the AP works in middle mode, the blinking frequency of the Wireless LED reflects the strength of signals received from a root AP.
 - If the AP works in root mode, the blinking frequency of the Wireless LED reflects the weakest signal strength of middle APs.
- **wifi-light traffic:** allows the Wireless LED to reflect the service traffic volume on the radio.

The Fat AP does not support WDS/Mesh functions; therefore, the Wireless indicator of the Fat AP does not indicate the signal strength.

3 Product Features

About This Chapter

- 3.1 WLAN Features
- 3.2 Network Features
- 3.3 QoS Features
- 3.4 Security Features
- 3.5 Maintenance Features
- 3.6 BYOD
- 3.7 Locating Service
- 3.8 Spectrum Analysis

3.1 WLAN Features

WLAN features supported by the AP are as follows:

- Complies with IEEE 802.11a/b/g/n/ac, supports 3x3 MIMO, and provides a maximum rate of 1.75 Gbit/s.
- Maximum ratio combining (MRC)
- Space time block code (STBC)
- 802.11n Beamforming
- Low-density parity-check (LDPC)
- Maximum-likelihood detection (MLD)
- Data unit aggregation, including A-MPDU (Tx/Rx) and A-MSDU (Rx only)
- Supports 802.11 dynamic frequency selection (DFS)
- Short GI in 20 MHz, 40 MHz and 80 MHz modes
- Priority mapping and packet scheduling based on a Wi-Fi Multimedia (WMM) profile to implement priority-based data processing and forwarding
- Automatic and manual rate adjustment
- WLAN channel management and channel rate adjustment

NOTE

For details about WLAN channel management, see the *Country Code & Channel Compliance Table*.

- Automatic channel scanning and interference avoidance
- Service set identifier (SSID) hiding
- Signal sustain technology (SST)
- Unscheduled automatic power save delivery (U-APSD)
- Control and Provisioning of Wireless Access Points (CAPWAP) in Fit AP mode
- Automatic login in Fit AP mode
- Extended Service Set (ESS) in Fit AP mode
- Wireless distribution system (WDS) in Fit AP mode
- Mesh networking in Fit AP mode
- Multi-user CAC

3.2 Network Features

Network features supported by the AP are as follows:

- Compliance with IEEE 802.3u
- Auto-negotiation of the rate and duplex mode and automatic switchover between the Media Dependent Interface (MDI) and Media Dependent Interface Crossover (MDI-X)
- SSID-based VLAN assignment
- VLAN trunk on uplink Ethernet ports
- 4094 VLAN IDs (1-4094) and a maximum of 16 virtual APs (VAPs) for each radio

- AP control channel in tagged and untagged mode
- DHCP client, obtaining IP addresses through DHCP
- Tunnel data forwarding and direct data forwarding
- STA isolation in the same VLAN
- Access control lists (ACLs)
- Link Layer Discovery Protocol (LLDP)
- Uninterrupted service forwarding upon CAPWAP channel disconnection in Fit AP mode
- Unified authentication on the AC in Fit AP mode
- AC dual-link backup in Fit AP mode
- NAT
- IPv6 in Fit AP mode

3.3 QoS Features

QoS features supported by the AP are as follows:

- Priority mapping and packet scheduling based on a Wi-Fi Multimedia (WMM) profile to implement priority-based data processing and forwarding
- WMM parameter management for each radio
- WMM power saving
- Priority mapping for upstream packets and flow-based mapping for downstream packets
- Queue mapping and scheduling
- User-based bandwidth limiting
- Adaptive bandwidth management (the system dynamically adjusts bandwidth based on the number of users and radio environment to improve user experience)
- Airtime scheduling

3.4 Security Features

Security features supported by the AP are as follows:

- Open system authentication
- WEP authentication/encryption using a 64-bit, 128-bit, or 152-bit encryption key
- WPA/WPA2-PSK authentication and encryption (WPA/WPA2 personal edition)
- WPA/WPA2-802.1x authentication and encryption (WPA/WPA2 enterprise edition)
- WPA-WPA2 hybrid authentication
- WAPI authentication and encryption
- Supports wireless intrusion detection system (WIDS) and wireless intrusion prevention system (WIPS), including rogue device detection and countermeasure, attack detection and dynamic blacklist, STA/AP blacklist and whitelist.
- 802.1x authentication, MAC address authentication, and Portal authentication
- DHCP Snooping

- DAI (Dynamic ARP Inspection)
- IPSG (IP Source Guard)

3.5 Maintenance Features

Maintenance features supported by the AP are as follows:

- Unified management and maintenance on the AC in Fit AP mode
- Automatic login and configuration loading, and plug-and-play (PnP) in Fit AP mode
- WDS zero-configuration deployment in Fit AP mode
- Mesh network zero-configuration deployment in Fit AP mode
- Batch upgrade
- Local AP management using Telnet
- STelnet or SFTP: user information protection using SSH v2
- Web local AP management through HTTP or HTTPS
- Real-time configuration monitoring and fast fault location using the NMS
- SNMP v1/v2/v3
- System status alarm
- Network Time Protocol (NTP)

3.6 BYOD

NOTE

The AP supports bring your own device (BYOD) only in Fit AP mode.

BYOD features supported by the AP are as follows:

- Identifies the device type according to the organizationally unique identifier (OUI) in the MAC address.
- Identifies the device type according to the user agent (UA) information in an HTTP packet.
- Identifies the device type according to DHCP options.
- The RADIUS server delivers packet forwarding, security, and QoS policies according to the device type carried in the RADIUS authentication and accounting packets.

3.7 Locating Service

NOTE

The AP supports the locating service only in Fit AP mode.

Locating service features supported by the AP are as follows:

- Locates tags manufactured by AeroScout or Ekahau.
- Locates Wi-Fi terminals.
- Works with eSight to locate rogue devices.

3.8 Spectrum Analysis

 **NOTE**

The AP supports spectrum analysis only in Fit AP mode.

Spectrum analysis features supported by the AP are as follows:

- Identifies interference sources such as baby monitors, Bluetooth devices, digital cordless phones (at 2.4 GHz frequency band only), wireless audio transmitters (at both the 2.4 GHz and 5 GHz frequency bands), wireless game controllers, and microwaves.
- Works with eSight to perform spectrum analysis on interference sources.

4 Technical Specifications

About This Chapter

- [4.1 Basic Specifications](#)
- [4.2 Radio Specifications](#)
- [4.3 Standards Compliance](#)

4.1 Basic Specifications

Table 4-1 Basic Specifications of the AP8130DN

Item		Description
Technical specifications	Dimensions (H x W x D)	100 mm x 290 mm x 260 mm
	Weight	4.0 kg
	System memory	<ul style="list-style-type: none"> ● 256 MB DDR2 ● 64 MB Flash
Power specifications	Power input	PoE power supply: -48 V DC (in compliance with IEEE 802.3at)
	Maximum power consumption	22.4 W NOTE The actual maximum power consumption depends on local laws and regulations.
Environment specifications	Operating temperature	-60 m to +1800 m: -40°C to +60°C +1800 m to +5000 m: Temperature decreases by 1°C every time the altitude increases 220 m.
	Storage temperature	-40°C to +70°C
	Operating humidity	5% to 95% (non-condensing)
	IP rating	IP67
	Atmospheric pressure	53 kPa to 106 kPa

4.2 Radio Specifications

Table 4-2 Radio specifications

Item	Description
Antenna type	Outdoor external antenna

Item	Description		
Maximum number of concurrent users	<ul style="list-style-type: none"> ● Fit AP mode: ≤ 256 <p>NOTE The number of concurrent online users on each VAP cannot exceed 128. The number of concurrent online users on each radio cannot exceed 128.</p> <ul style="list-style-type: none"> ● Fat AP mode: ≤ 64 		
Channel rate supported	<ul style="list-style-type: none"> ● 2.4 GHz: 28 dBm ● 5 GHz: 26 dBm <p>NOTE The actual transmit power depends on local laws and regulations. You can adjust the transmit power from the maximum transmit power to 1 dBm, with a step of 1 dB.</p>		
Maximum number of non-overlapping channels	<p>2.4 GHz</p> <p>802.11b/g</p> <ul style="list-style-type: none"> ● 20 MHz: 3 <p>802.11n</p> <ul style="list-style-type: none"> ● 20 MHz: 3 ● 40 MHz: 1 	<p>5 GHz</p> <ul style="list-style-type: none"> ● 802.11a <ul style="list-style-type: none"> - 20 MHz: 13 ● 802.11n <ul style="list-style-type: none"> - 20 MHz: 13 - 40 MHz: 6 ● 802.11ac <ul style="list-style-type: none"> - 20MHz: 13 - 40MHz: 6 - 80MHz: 3 	<p>NOTE The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the <i>Country Code & Channels compliance status</i></p> <p>NOTICE If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage.</p> <ol style="list-style-type: none"> 1. The country code of the AP is fixed. 2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency.
Channel rate	<ul style="list-style-type: none"> ● 802.11a: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s ● 802.11b: 1, 2, 5.5, and 11 Mbit/s ● 802.11g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s ● 802.11n: 6.5 to 450 Mbit/s ● 802.11ac: 6.5 to 1300 Mbit/s 		

Item	Description			
Receiver sensitivity	2.4 GHz 802.11b (CCK) <ul style="list-style-type: none"> ● -93 dBm @ 1 Mb/s ● -89 dBm @ 2 Mb/s ● -89 dBm @ 5.5 Mb/s ● -86 dBm @ 11 Mb/s 	2.4 GHz 802.11g (non-HT20) <ul style="list-style-type: none"> ● -83 dBm @ 6 Mb/s ● -83 dBm @ 9 Mb/s ● -83 dBm @ 12 Mb/s ● -83 dBm @ 18 Mb/s ● -80 dBm @ 24 Mb/s ● -77 dBm @ 36 Mb/s ● -73 dBm @ 48 Mb/s ● -71 dBm @ 54 Mb/s 	2.4 GHz 802.11n (HT20) <ul style="list-style-type: none"> ● -83 dBm @ MCS0 ● -83 dBm @ MCS1 ● -83 dBm @ MCS2 ● -79 dBm @ MCS3 ● -78 dBm @ MCS4 ● -71 dBm @ MCS5 ● -70 dBm @ MCS6 ● -68 dBm @ MCS7 	2.4 GHz 802.11n(HT40) <ul style="list-style-type: none"> ● -81 dBm @ MCS0 ● -80 dBm @ MCS1 ● -80 dBm @ MCS2 ● -76 dBm @ MCS3 ● -73 dBm @ MCS4 ● -68 dBm @ MCS5 ● -67 dBm @ MCS6 ● -65 dBm @ MCS7
	5 GHz 802.11a (non-HT20) <ul style="list-style-type: none"> ● -87 dBm @ 6 Mb/s ● -87 dBm @ 9 Mb/s ● -85 dBm @ 12 Mb/s ● -83 dBm @ 18 Mb/s ● -79 dBm @ 24 Mb/s ● -76 dBm @ 36 Mb/s ● -72 dBm @ 48 Mb/s ● -70 dBm @ 54 Mb/s 	5 GHz 802.11n (HT20) <ul style="list-style-type: none"> ● -88 dBm @ MCS0 ● -85 dBm @ MCS1 ● -83 dBm @ MCS2 ● -76 dBm @ MCS3 ● -75 dBm @ MCS4 ● -70 dBm @ MCS5 ● -69 dBm @ MCS6 ● -67 dBm @ MCS7 	5 GHz 802.11n (HT40) <ul style="list-style-type: none"> ● -85 dBm @ MCS0 ● -82 dBm @ MCS1 ● -80 dBm @ MCS2 ● -75 dBm @ MCS3 ● -72 dBm @ MCS4 ● -67 dBm @ MCS5 ● -66 dBm @ MCS6 ● -64 dBm @ MCS7 	-

Item	Description			
	5 GHz 802.11ac (VTH20)	5 GHz 802.11ac (VTH40)	5 GHz 802.11ac (VTH80)	-
	<ul style="list-style-type: none"> ● -88 dBm @ MCS0NSS1 ● -85 dBm @ MCS1NSS1 ● -83 dBm @ MCS2NSS1 ● -78 dBm @ MCS3NSS1 ● -74 dBm @ MCS4NSS1 ● -70 dBm @ MCS5NSS1 ● -69 dBm @ MCS6NSS1 ● -67 dBm @ MCS7NSS1 ● -63 dBm @ MCS8NSS1 	<ul style="list-style-type: none"> ● -85 dBm @ MCS0NSS1 ● -82 dBm @ MCS1NSS1 ● -79 dBm @ MCS2NSS1 ● -75 dBm @ MCS3NSS1 ● -72 dBm @ MCS4NSS1 ● -67 dBm @ MCS5NSS1 ● -66 dBm @ MCS6NSS1 ● -65 dBm @ MCS7NSS1 ● -61 dBm @ MCS8NSS1 ● -57 dBm @ MCS9NSS1 	<ul style="list-style-type: none"> ● -82 dBm @ MCS0NSS1 ● -79 dBm @ MCS1NSS1 ● -76 dBm @ MCS2NSS1 ● -72 dBm @ MCS3NSS1 ● -69 dBm @ MCS4NSS1 ● -65 dBm @ MCS5NSS1 ● -63 dBm @ MCS6NSS1 ● -61 dBm @ MCS7NSS1 ● -57 dBm @ MCS8NSS1 ● -53 dBm @ MCS9NSS1 	

4.3 Standards Compliance

Safety standards

- UL 60950-1
- UL 60950-22
- CAN/CSA 22.2 No.60950-1
- CAN/CSA 22.2 No.60950-22
- IEC 60950-1
- IEC 60950-22
- EN 60950-1
- EN 60950-22
- GB 4943

Radio standards

- ETSI EN 300 328

- ETSI EN 301 893
- FCC Part 15C: 15.247
- FCC Part 15C: 15.407
- RSS-210
- AS/NZS 4268

EMC standards

- ETSI EN 301 489-1
- ETSI EN 301 489-17
- ETSI EN 60601-1-2
- FCC Part 15
- ICES-003
- YD/T 1312.2-2004
- ITU k.21
- GB 9254
- GB 17625.1
- AS/NZS CISPR22
- EN 55022
- EN 55024
- CISPR 22
- CISPR 24
- IEC61000-4-6
- IEC61000-4-2

IEEE standards

- IEEE 802.11a/b/g
- IEEE 802.11n
- IEEE 802.11ac
- IEEE 802.11h
- IEEE 802.11d
- IEEE 802.11e

Security standards

- 802.11i, Wi-Fi Protected Access 2(WPA2), WPA
- 802.1X
- Advanced Encryption Standards(AES), Temporal Key Integrity Protocol(TKIP)
- EAP Type(s)

Environment standards

- ETSI 300 019-2-1

- ETSI 300 019-2-2
- ETSI 300 019-2-4
- IEC 60068-2-52
- ETSI 300 019-1-1
- ETSI 300 019-1-2
- ETSI 300 019-1-4

EMF

- CENELEC EN 62311
- CENELEC EN 50385
- OET65
- RSS-102
- FCC Part1&2
- FCC KDB

RoSH

- Directive 2002/95/EC & 2011/65/EU

Reach

- Regulation 1907/2006/EC

WEEE

- Directive 2002/96/EC & 2012/19/EU