AP331

Indoor Enterprise Middle Premium Wi-Fi 6 Access Point

AP331 is a global enterprise level middle premium Wi-Fi 6(802.11ax) AP, 2.4GHz & 5GHz dual radio eight spatial streams, 2.4GHz 4*4:4 + 5GHz 4*4：4, dedicated 2.4GHz/5GHz scanning radio, BLE5/Zigbee(802.15.4), 5GE+5GE dual uplink with PoE sharing features. 3.55Gbps high throughput and up to 1024 users, deliver high capacity for bandwidth hungry and latency sensitive voice and video clients, ideal for your high quality, high density wireless requirement.

AP331 supports a maximum concurrent data rate of 3.55Gbps (2.4Gbps in 5GHz and 1.15Gbps in 2.4GHz), eight spatial streams (4SS in 2.4GHz and 4SS in 5GHz), 160/80+80 MHz channels, and all Wi-Fi 6 (802.11ax) features, UL/DL MU-MIMO, UL/DL OFDMA, BSS color, etc. Enables faster speeds, more capacity, and efficient airtime allocation for clients on both 2.4Ghz and 5Ghz Wi-Fi bands.

Featuring enhanced WLAN technology with RF Radio Dynamic Adjustment, a distributed control Wi-Fi architecture, secure network admission control with unified access, built in application intelligence and analytics, making it ideal for enterprises of all sizes demanding a simple, secure and scalable wireless solution.

AP331 has integrated support for BLE5 / Zigbee (802.15.4), making it ideal for broad scope of IoT end points and applications.

Wi-Fi 6(802.11ax) Features

Wi-Fi 6(802.11ax) allows enterprises to deliver high performance wireless LAN services with increased throughput, enabling more clients in dense environments and bringing power efficiency to Internet of Things (IoT) devices, while it remains fully backward compatible with existing 802.11 a/b/g/n/ac deployments. Some of the key features enabled on AP331 series are:

• Orthogonal frequency division multiple access (OFDMA) enables more clients to simultaneously operate in the same channel and thereby improving efficiency, latency, and throughput. OFDMA can concurrently address multiple clients in both directions downlink (DL) and uplink (UL), including full 37 OFDMA Resource Units (RUs). OFDMA is very effective in environments where there are many devices with short frames demanding

lower latency.

• Multi-user multiple input, multiple output (MU-MIMO) allows more data to be transferred at once and enables an access point to handle a larger number of concurrent clients. This capability was introduced with 802.11ac, but now with 802.11ax the multi-user performance can be concurrently delivered in both directions downlink (DL) and uplink (UL).

• 1024 quadrature amplitude modulation mode (1024-QAM) boosting peak data-rates by as much as 25 percent.

• BSS Coloring improves spatial reuse in dense environments by providing a mechanism for color coding different overlapping BSS's, allowing more simultaneous transmissions.

• Extended Range (ER) provides increased coverage in scenarios where receiving side encounters high path loss and channel delay spread, especially in outdoor environments.

• Target wake time (TWT) makes Wi-Fi 6 devices more power efficient. This capability lets client devices to sleep much longer, and wake up to less contention, extending the battery life of smart phones, IoT sensors, and other devices.

Plug-and-play deployment

The AP331 works in a fully redundant cluster architecture to provide simplified plug-and-play deployments. The access point (AP) cluster is an autonomous system that consists of a group of APs and a virtual controller, which is a selected access point for cluster management. One AP cluster supports up to 255APs.

The access point cluster architecture ensures simplified and quick deployment. Once the first AP is configured using the configuration wizard, the remaining APs in the network will come up automatically with updated configuration. This ensures that the whole network is up and functional within a few minutes.

Network Management Platform deployment

The AP331 can be managed by CSP (Cloud Service Platform) or ESP (Enterprise Service Platform). APs is managed as one or more AP Groups (a logical grouping of one or more access points). CSP/ESP embeds a visionary controller-less architecture, providing user friendly workflows for WLAN management together with integrated Authentication Manager which helps define authentication strategy and policy enforcement for Employees, Guest and BYOD devices. The network administrator can obtain a comprehensive view of applications running in the network and apply adequate control to optimize the performance of the network for business-critical applications. Management platform provides advanced options for RF Management, wIDS/wIPS for intrusion detection and prevention.

Quality of service for unified communication apps

The AP331 supports fine tune quality of service (QoS) parameters to differentiate and provide appropriate QoS for each application such as voice, video and desktop sharing. Application aware RF scanning avoids interruption of real-time applications.

Integrated guest management

The AP331 supports role-based management access to the AP cluster which includes Admin, Viewer and GuestOperator access. The GuestOperator access simplifies guest account creation and management, and therefore can be used by any non-IT person, such as a receptionist. The AP331 also supports a built-in customizable captive portal which enables customers to offer unique guest access.

RF management

Radio Dynamic Adjustment (RDA) technology automatically assigns channels and power settings, provides DFS/TPC, and ensures that access points stay clear of all radio frequency interference (RFI) sources to deliver reliable, high-performance wireless LANs. The AP331 support dedicated scanning radio for spectrum analysis and wireless intrusion protection.

Product specifications

Radio specification

• AP type: Indoor, dual radio, 2.4 GHz 802.11ax 4x4:4, 5 GHz 802.11ax 4x4:4

• 5 GHz: Four spatial stream for up to 2.4 Gb/s wireless data rate.

• 2.4 GHz: Four spatial stream for up to 1.15 Gb/s wireless data rate.

• Supported frequency bands (country-specific restrictions apply):

- ¬ 2.400 to 2.4835 GHz
- ¬ 5.150 to 5.250 GHz
- ¬ 5.250 to 5.350 GHz
- ¬ 5.470 to 5.725 GHz
- ¬ 5.725 to 5.850 GHz

• Available channels: Dependent on

configured regulatory domain

- DFA (Dynamic Frequency Adjustment) optimizes available channels and provides proper transmission power
- Transmit beam forming (TxBF) for increased signal reliability and range
- 802.11n/ac packet aggregation: Aggregated Mac Protocol Data Unit (A-MPDU), Aggregated Mac Service Data Unit (A-MSDU)
- Supported radio technologies:
  - ¬ 802.11b: Direct-sequence spread-spectrum (DSSS)
  - ¬ 802.11a/g/n/ac: Orthogonal frequency-division multiplexing (OFDM)
  - ¬ 802.11ax: Orthogonal frequency-division multiple access (OFDMA) with up to 37 resource units (for an 80MHz channel)
- Supported data rates (Mbps):
  - ¬ 802.11b: 1, 2, 5.5, 11
  - ¬ 802.11a/g: 6, 9, 12, 18, 24,36,48,54
  - ¬ 802.11n:6.5 to 600 (MCS0 to MCS31, HT20 to HT40)
  - ¬ 802.11ac: 6.5 to 1,733 (MCS0 to MCS9, NSS = 1 to 4 for VHT20/40/80/160(80+80))
  - ¬ 802.11ax(2.4GHz): 3.6 to 1,147 (MCS0 to MCS11, NSS=1 to 4, HE20 to HE40)
  - ¬ 802.11ax(5GHz): 3.6 to 2,402 (MCS0 to MCS11, NSS=1 to 4, HE20 to HE160(80+80))
- Supported modulation types:
  - ¬ 802.11b: BPSK, QPSK, CCK
  - ¬ 802.11a/g/n/ac: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
  - ¬ 802.11n high-throughput (HT) support: HT 20/40
  - ¬ 802.11ac very high throughput (VHT) support: VHT 20/40/80/160/80+80
  - ¬ 802.11ax (HE): HE20/40/80/160/80+80
- Advanced Cellular Coexistence (ACC)
  - ¬ Minimizes interference from 3G/4G cellular networks, distributed antenna systems, and commercial small cell/femtocell equipment.
- 1×BLE5/Zigbee（802.15.4）module，up to 6dBm transmit power(class 1)，-93dBm RSSI. Hardware ready for Zigbee.

Interfaces

- 2× 5GBASE-T/2.5GBASE-T/1000BASE-T/100BASE-TX (RJ-45) port, Power over Ethernet (PoE) 802.3bt/at compliant
- 1× Management Console Port (RJ-45)
- 1× USB 3.0 Type A(5V,500mA)
- Reset button: Factory reset. Press reset button for 5s, AP LEDs will quickly flash for 3s, then AP will restart and restore factory configurations.
- Kensington security slot

Visual Indicators (Tri-color LEDs)

- For system and radio status
  - ¬ RED flashing: system abnormal, link down
  - ¬ RED light: system startup
  - ¬ RED and BLUE rotate flashing: OS upgrading
  - ¬ BLUE light: system running, dual bands working
  - ¬ GREEN flashing: no SSID created
  - ¬ GREEN light: system running, single band working
  - ¬ RED, BLUE and GREEN rotate flashing: system running, use for location of an AP

Security

Integrated Trusted Platform Module (TPM) for secure storage of credentials and keys.

Antenna

- AP331: Built-in 4×4:4 @ 2.4GHz, 4x4:4 @ 5GHz, scanning antenna
  - ¬ Integrated downtilt omni-directional antennas for 8SS with peak antenna gain of 3.9dBi in 2.4GHz, 4.6dBi in 5GHz.
  - ¬ Built-in antennas are optimized for horizontal ceiling mounted orientation of the AP. The downtilt angle for maximum gain is roughly 30 degrees.
- Integrated BLE antenna with peak gain 3.7dBi

Receive sensitivity (per chain)

	2.4 GHz	5 GHz
1 Mb/s	-98	
11 Mb/s	-90	
6 Mb/s	-93	-93
54 Mb/s	-77	-77
HT20 (MCS0/8)	-94	-94
HT20 (MCS7/15)	-76	-76
HT40 (MCS0/8)	-91	-91
HT40 (MCS7/15)	-73	-74
VHT20 (MCS0)	-94	-94
VHT20 (MCS8)	-71	-72
VHT40 (MCS0)	-91	-91
VHT40 (MCS9)	-67	-68
VHT80 (MCS0)		-88
VHT80 (MCS9)		-64
HE20 (MCS0)	-94	-94
HE20 (MCS11)	-65	-65
HE40 (MCS0)	-91	-91
HE40 (MCS11)	-62	-62
HE80+80 (MCS0)		-88
HE80+80 (MCS11)		-59

Maximum Transmit power (per chain) ± 2dBm

	2.4 GHz	5 GHz
1Mb/s	18 dBm	
11Mb/s	18 dBm	
6Mb/s	17 dBm	18 dBm
54Mb/s	15 dBm	15 dBm
HT20 (MCS0/8)	18 dBm	17 dBm
HT20 (MCS7/15)	15 dBm	14 dBm
HT40 (MCS0/8)	18 dBm	17 dBm
HT40 (MCS7/15)	15 dBm	14 dBm
VHT20 (MCS0)	17 dBm	17 dBm

VHT20 (MCS8)	14 dBm	14 dBm
VHT40 (MCS0)	17 dBm	17 dBm
VHT40 (MCS9)	14 dBm	14 dBm
VHT80(MCS0)		17 dBm
VHT80 (MCS9)		14 dBm
HE20 (MCS0)	17dBm	16 dBm
HE20 (MCS11)	12dBm	13 dBm
HE40 (MCS0)	17dBm	16 dBm
HE40 (MCS11)	12dBm	13 dBm
HE80 (MCS0)		16 dBm
HE80 (MCS11)		13 dBm
HE80+80 (MCS0)		16 dBm
HE80+80 (MCS11)		13 dBm

Note: Maximum capability of the hardware provided (excluding antenna gain).

Maximums transmit power is limited by local regulatory settings.

Power

• Supports direct DC power and Power over Ethernet (PoE)

• When both power sources are available, DC power takes priority over PoE

• Maximum (worst case) power consumption:

¬ 26.2W (IEEE 802.3bt PoE or DC)

• Direct DC source: 48V DC nominal, +/- 5%

• Power over Ethernet (PoE): IEEE 802.3bt/at/af source

¬ 26.2W (input IEEE 802.3bt PoE or dual IEEE 802.3at): Unrestricted functionality

¬ 23.2W (input single IEEE 802.3at or dual IEEE 802.3af PoE): The USB port is disabled

¬ 12.5W (input single IEEE 802.3af PoE): The USB port is disabled, Eth1 port is disabled, dual radio downgrade to 1*1:1.

Mounting

• The AP ships with mount kits for flat surface (wall).

• Optional mount kits for Open Silhouette and Flanged Interlude.

• Optional mount kits for 9/16-inch or 15/16-inch flat T-bar drop-tile ceiling.

Environmental

• Operating temperature: 0°C to 45°C (+32°F to +113°F)

• Humidity: 5% to 95% non-condensing

• Storage and transportation Temperature: -40°C to +70°C (-40°F to +158°F)

Dimensions/weight

• Single AP excluding packing box and accessories

¬ 210mm (W) x 210mm (D) x 40mm (H) -8.27” (W) x 8.27” (D) x 1.57” (H) / 1020g / 2.25lb

• Single AP including packing box and accessories

¬ 238mm (W) x 237mm (D) x 69mm (H) -9.37” (W) x 9.33” (D) x 2.72” (H) / 1215g / 2.68lb

Reliability

MTBF: 1,001,304h (114.3 years) at +25ºC operating temperature

Capacity

• Up to 8 SSID/Radio (16 SSID/AP), hardware ready for 16 SSID per radio (32 SSID/AP)

• Support for up to 1024 associated client devices

• Up to 8k APs managed by HAN Networking Management Platform

• Up to 255 APs per Web managed (HTTP/HTTPS) cluster

Software feature

• Auto channel selection

• Auto transmit power control

• Bandwidth control per SSID

• L2 roaming

• L3 roaming with CSP

• Captive Portal

• Internal User Database

• Radius Client

• Wireless QoS

• Band steering

• Client smart load balance

• Client sticky avoidance

• User behavior tracking

• Whitelist/blacklist

• Zero-touch provisioning (ZTP) with support of third-party partner

• NTP server client

• ACL

• Wireless MESH P2P/P2MP

• Rogue AP location and containment

• Wireless Attack Detection

• System log report

• SNMP Trap Notification with CSP/ESP

• Floor plan and heat map with CSP/ESP

Note: some features are limited by local regulatory settings

Authentication & Encryption

• 802.11i, Wi-Fi Protected Access 2 (WPA2), WPA, WPA3(WPA3 - Enterprise with CNSA Option, Personal (SAE), Enhanced Open (OWE))

• 802.1X

• Portal page authentication

• Advanced Encryption Standard (AES), Temporal Key Integrity Protocol (TKIP)

IEEE standard

• IEEE 802.11a/b/g/n/ac/ax

• IEEE 802.11e WMM

• IEEE 802.11h, 802.11i, 802.11e QoS

• IEEE 802.11k Radio Resource Management

• IEEE 802.11v BSS Transition Management

• IEEE 802.11r Fast roaming

Regulatory & certification

• CB Scheme Safety, cTUVus

- CE Marked
- FCC
- EN 60601-1-1 & EN 60601-1-2
- RoHS, REACH, WEEE
- Wi-Fi Alliance (WFA) certified Wi-Fi 6
- Wi-Fi Alliance (WFA) certified Passpoint R3
- UL2043 plenum rating
- EMI and susceptibility (Class B)
- 2014/35/EU Low Voltage Directive
- 2014/30/EU EMC Directive
- 2011/65/EU RoHS Directive
- 2014/53/EU Radio Equipment Directive
- EN 55032
- EN 55035
- EN 50385
- IEC/EN 60950 and 62368
- EN 300 328
- EN 301 893
- EN 301 489-1
- EN 301 489-17
- SRRC

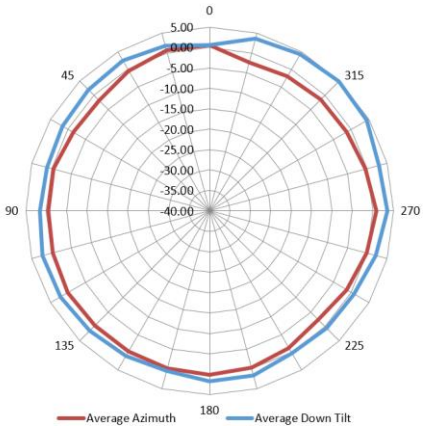
Ordering information

Item	Description
AP331	Indoor Enterprise Wi-Fi 6 (802.11ax) AP, 2.4GHz 4*4:4 + 5GHz 4*4： 4, 1*2.4GHz/5GHz dedicated scanning, 1*BLE5, 2*5GbE, 1*USB, 1*Console, 1*DC jack, built-in antennas.
AP-MNT-IN-BE	Indoor mounting kit, Type B1(9/16") and B2(15/16") for T shaped ceiling rail mounting. Standard configuration in the product packaging. Optional for customer ordering
AP-MNT-IN-CE	Indoor mounting kit, Type C1(Open Silhouette) and C2 (Flanged Interlude), for other shaped ceiling rail mounting. Optional for customer ordering
AP-MNT-IN-W	Indoor mounting kit, Type W wall mounting with screws. Optional for customer ordering

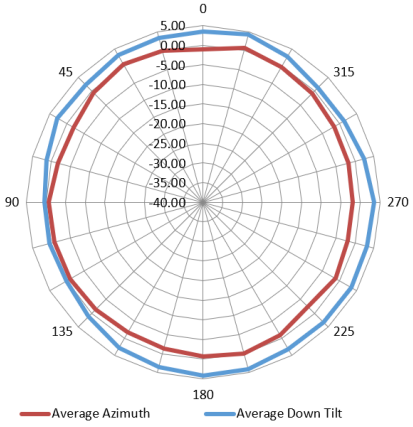
Figure 1. AP331 antenna pattern plots

Azimuth plane (top view)

2.45GHz

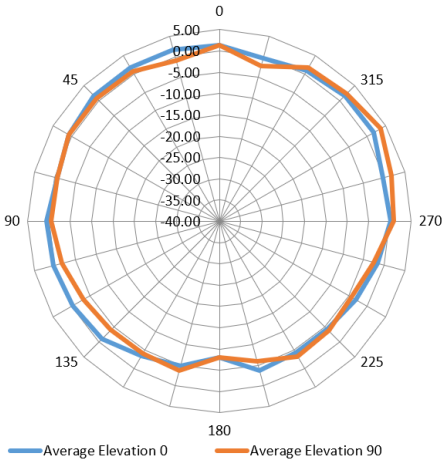


5.5GHz

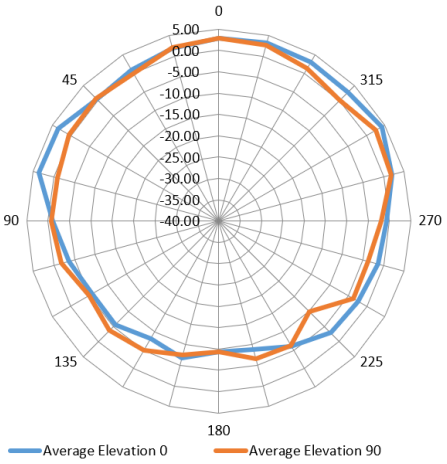


Elevation plane (side view)

2.45GHz

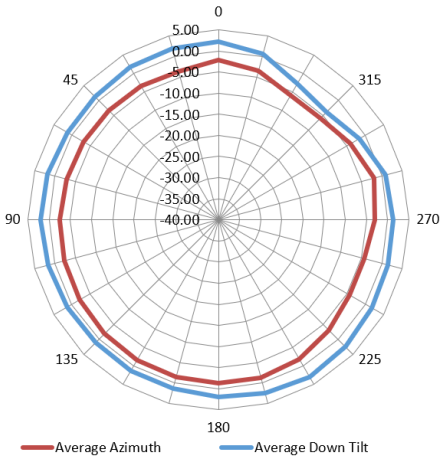


5.5GHz



BLE

Azimuth plane (top view)



Elevation plane (side view)