HAN AP521
Enterprise Indoor Mid-Range High density Wi-Fi 7 Access Point

AP521 is next generation of enterprise grade Wi-Fi 7 (802.11be) indoor ultra-high density wireless access point. It supports 2.4GHz, 5GHz, and 6GHz tri-radio operation, 8 spatial streams, 10GE high bandwidth uplink interface, 2.4GHz/5GHz/6GHz full frequency dedicated scanning radio, BLE5.3/Zigbee (802.15.4) Internet of Things, MLO multi-link operation, 4096-QAM high-order encoding, Multiple RU multi resource unit and other Wi-Fi 7 features. It provides powerful power for high-performance Wi-Fi applications and can support smooth upgrades in the future. It is suitable for high-density, high bandwidth and low latency applications such as education, healthcare, intelligent factories, 8K video playback, XR virtual reality.

AP521 supports a maximum peak speed of 12.22Gbps (2.4GHz 688Mbps, 5GHz 5.76Gbps, 6GHz 5.76Gbps), UL/DL MU-MIMO. It supports USB interface, BLE5.3, and 5GE uplink interface. Relying on the unique WLAN wireless RF dynamic optimization technology, the distributed software management architecture without hardware AC, high security unified wireless access control, and built-in WLAN wireless application and analysis software, HAN AP521 brings unparalleled connectivity, coverage, and performance experience.

Wi-Fi 7 Features

• MLO (Multi-Link Operation) is a technology allows for simultaneous connection of multiple frequency bands and parallel transmission, which can fully utilize the bandwidth resources of multiple frequency bands, improve overall network performance, and achieve faster speed and higher efficiency. In addition, MLO technology can help reduce network latency, improve signal coverage, and enhance network security.

• 4096-QAM.It's new encoding format increases system capacity, reduces latency, and improves Wi-Fi efficiency in multi-user high-density scenarios Compared to Wi-Fi 6's 1024-QAM, the encoding efficiency has increased by 20%.

•Multiple RU, based on Wi-Fi 6 OFDMA technology, the flexibility of spectrum resource scheduling is further improved, allowing multiple RUs to be allocated to a single user, greatly increasing the throughput of data transmission and improving network efficiency.

•Restricted TWT(Target Wake Time), for latency sensitive services, restricted target wake-up time (R-TWT) has been introduced on the basis of Wi Fi 6 TWT, allowing for enhanced channel access and resource reservation mechanisms to provide more predictable latency, lower worst-case delay, and lower jitter, as well as higher reliability for latency sensitive traffic.

Flexible deployment modes

• AP521 supports deployment in HAN CSP (Cloud Service Platform) public cloud management scenarios or HAN ESP (Enterprise Cloud Service Platform) private cloud management scenarios AP is managed as one or more AP groups (one or more APs form a logical group). The CSP/ESP management platform is a visual, controller free, workflow friendly user interface management architecture that supports WLAN wireless business management and user authentication management. Among them, user authentication management integrates different identity authentication policies and enforcement policies for employees, visitors, and BYOD devices.

• AP521 supports deployment in HAN ESG series edge service gateway management scenarios, providing a diverse and integrated management mode for various businesses.

Cluster Mode Deployment

AP521 works in Cluster mode by default, providing simple plug and play deployment capabilities Cluster is a self-managed system composed of a group of HAN APs deployed within the same layer 2 network. It is a Virtual Manager management architecture, where members of the cluster select one AP as the Prime Virtual Manager to manage the entire cluster A cluster can manage up to 255 Aps.

Cluster mode provides a simple and fast AP deployment and management mode After a local AP completes configuration using the configuration wizard, other APs in the network will automatically synchronize all configurations without the need for further configuration. In this way, the entire WLAN network can be quickly set up and start working within a few minutes.

Administrators use web browsers to log in and manage clusters You can choose to use HTTPS secure login management or HTTP login management.

Administrator privileges can manage all applications on the entire network to optimize network configuration and ensure the experience of critical network applications. Optional advanced management features can be configured, such as RF management, WIDS/wIPS intrusion detection and protection.

AP521 also supports zero configuration management developed jointly with third-party partners This mechanism allows all APs within the same cluster to securely obtain boot configuration files and the latest AP OS image files from a locally deployed device.

Integrated guest management

AP521 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 AP521 also supports a built-in customizable captive portal which enables customers to offer unique guest access.

Quality of service for unified communication apps

AP521 supports fine-tuned, 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.

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 AP521 support dedicated scanning radio, can be configured to part-time air monitoring also for spectrum analysis and wireless intrusion protection.

Product Specifications

Radio specification

• AP type: Indoor, tri-radio, 2.4GHz 2x2:2+5GHz 4x4:4+6GHz 2x2:2

•2.4 GHz: Two spatial stream DL/UL MU- MIMO for up to 688 Mb/s

• 5 GHz: Two spatial stream DL/UL MU-MIMO for up to 5.76 Gb/s wireless data rate

• 6 GHz: Two spatial stream DL/UL MU-MIMO for up to 5.76 Gb/s wireless data rate

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

- ¬ 2.400 - 2.4835 GHz
- ¬ 5.150 - 5.250 GHz
- ¬ 5.250 - 5.350 GHz
- ¬ 5.470 - 5.725 GHz
- ¬ 5.725 - 5.850 GHz
- ¬ 5.925 to 6.425 GHz
- ¬ 6.425 to 6.525 GHz
- ¬ 6.525 to 6.875 GHz
- ¬ 6.875 to 7.125 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

• Supported 20MHz, 40MHz, 80MHz, 160MHz, 320MHz

• 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 300 (MCS0 to MCS15, HT20 to HT40)
- ¬ 802.11ac(5GHz): 6.5 to 866.7 (MCS0 to MCS9, NSS = 1 to 2 for VHT20/40/80)
- ¬ 802.11ax(2.4GHz): 3.6 to 573.5 (MCS0 to MCS11, NSS=1 to 2, HE20 to HE40)
- ¬ 802.11ax(5GHz): 3.6 to 2402 (MCS0 to MCS11, NSS=1 to 2, HE20 to HE160)
- ¬ 802.11be(2.4GHz): 3.6 to 688 (MCS0 to MCS13, NSS=1 to 2, EHT20 to EHT40)
- ¬ 802.11be(5GHz): 3.6 to 2882 (MCS0 to MCS13, NSS=1 to 2, EHT20 to EHT160)
- ¬ 802.11be(6GHz): 3.6 to 5760 (MCS0 to MCS14, NSS=1 to 2, EHT20 to EHT320)

• Supported modulation types:

- ¬ 802.11b: BPSK, QPSK, CCK
- ¬ 802.11a/g/n/ac: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
- ¬ 802.11ax:BPSK,QPSK,16-QAM,64-QAM,256-QAM,1024-QAM
- ¬ 802.11be:BPSK,QPSK,16-QAM,64-QAM,256-QAM,1024-QAM,4096-QAM

• Advanced Cellular Coexistence

- ¬ Minimizes interference from 3G/4G cellular networks, distributed antenna systems, and commercial small cell/femtocell equipment.

• 1×BLE5.3/Zigbee（802.15.4）module

Interfaces

• 1× 10/100/1000/2500/5000/10000Mbps (RJ-45) port, Power over Ethernet (PoE) 802.3bt

• 1× 10/100/1000Mbps (RJ-45) port

• 1× Management Console Port (USB Type C)

• 1× USB 2.0 TypeC(5V,1A)

• 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 or tri 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

Antenna

- AP521: built-in 2×2:2 @ 2.4GHz, 4x4:4 @ 5GHz antenna, 2×2:2 @ 6GHz
- ¬ Antenna Gain: 4.6dBi @ 2.4 GHz, 5.8dBi @ 5 GHz, 6.4dBi@6GHz
- ¬ Built-in antennas are optimized for horizontal ceiling mounted orientation of the AP.

Receive sensitivity

-97dBm@2.4GHz, -94dBm@5GHz, -93dBm@6GHz

Maximum Transmit power ± 2dBm

25dBm@2.4GHz, 29dBm@5GHz, 27dBm@6GHz

Power

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

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

• Maximum (worst case) power consumption: 40.2W (802.3bt PoE or DC)

Mounting

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

• 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, 210mm (W) x 210mm (D) x 43mm(H), 1020g

Reliability

MTBF: 650, 124hours(74.22years),+25ºC operating temperature

Software Feature

• 16 SSID/Radio

• Max 1280 association clients

• Max 255 APs per Cluster

• Auto channel selection

• Auto transmit power control

• Bandwidth control per SSID

• L2 roaming

• L3 roaming

• Captive Portal

• Internal User Database

• Radius Client

• Wireless QoS

• Band steering
• Client smart load balance
• Client sticky avoidance
• User behavior tracking
• Allowed/Blocked list
• Zero-touch provisioning (ZTP) with support of third-party partner
• NTP server client
• ACL
• Rogue AP location and containment
• Wireless Attack Detection
• System log report

Note: some features are limited by local regulatory settings

Authentication & Encryption

• 802.11i, Wi-Fi Protected Access 3 (WPA3), WPA2, WPA
• 802.1X
• Web Portal authentication
• WEP, Advanced Encryption Standard (AES), Temporal Key Integrity Protocol (TKIP)

IEEE standard

• IEEE 802.11a/b/g/n/ac/ax/be
• IEEE 802.11e WMM, U-APSD
• IEEE 802.11h, 802.11i, 802.11e QoS
• 802.11k Radio Resource Management
• 802.11v BSS Transition Management • 802.11r Fast roaming

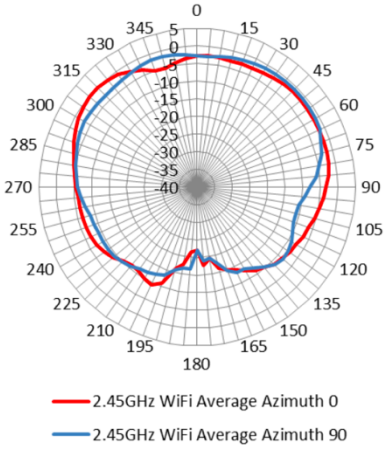
Regulatory & certification

• CB Scheme Safety, cTUVus
• CE
• EN 60601-1-1 & EN 60601-1-2
• FCC
• WFA certified Wi-Fi 7， Passpoint
• RoHS, REACH, WEEE
• UL2043(plenum rated)
• SRRC

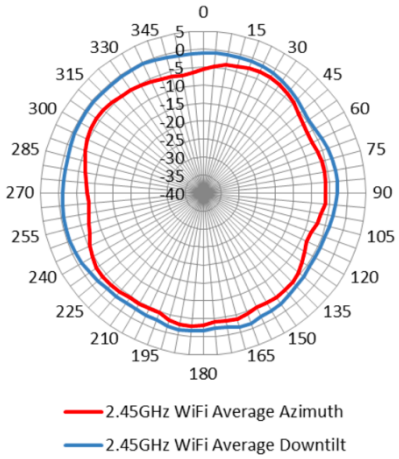
Ordering Information

Model	Description
AP521	Indoor Enterprise Wi-Fi 7 AP, 2.4GHz 11be 2x2:2 + 5GHz 11be 4x4:4 + 6GHz 11be 2x2:2,1x 2.4GHz/5GHz/6GHz scanning radio,1x 10GbE+1GbE, BLE/Zigbee,1x Console (USB-C), 1x USB(Type C), 48V DC jack, built-in omni antennas. Mount kit included.

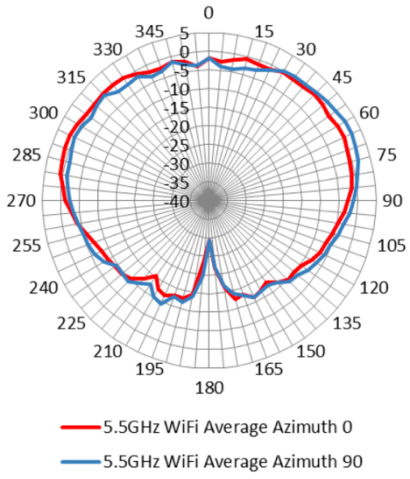
Azimuth Plane (top view) – 2.4GHz



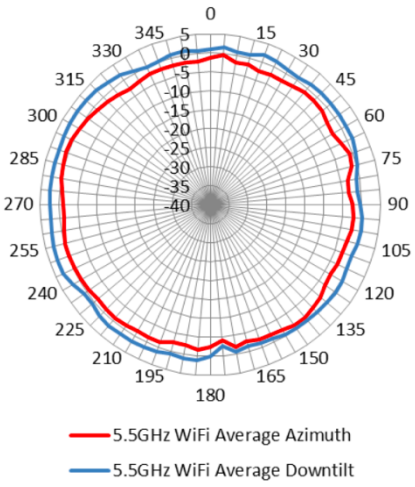
Elevation Plane (side view) – 2.4GHz



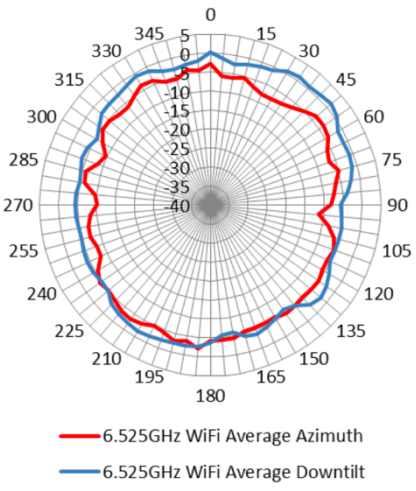
Azimuth Plane (top view) – 5GHz



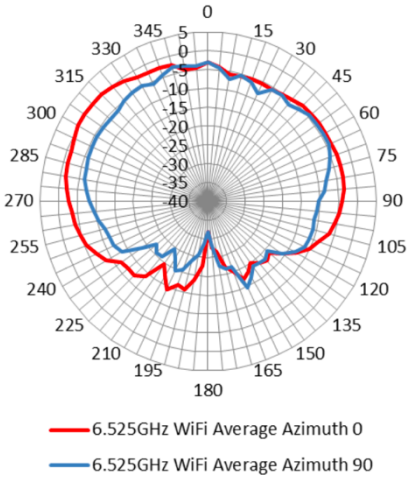
Elevation Plane (side view) – 5GHz



Azimuth Plane (top view) – 6GHz



Elevation Plane (side view) – 6GHz



www.han-networks.com All rights reserved. Passing on and copying of this document, use and communication of its contents not permitted without written authorization from HAN Networks