Data sheet

HPE Aruba Networking 503 Series Campus Access Points

Affordable Wi-Fi 6 (802.11ax) for low-to-medium-density indoor environments

Key features

— 1.49 Gbps maximum real-world speed (HE80/HE20)

— WPA3 and Enhanced Open security

— Built-in technology that resolves sticky client issues

— OFDMA for enhanced multi-user efficiency

— IoT-ready Bluetooth 5 and Zigbee support (requires optional radio dongle)

— Offered as optional eco-friendly 10-packs

— Flexible management choices

The HPE Aruba Networking 503 Series Campus Access Points provide cost-effective, high performance connectivity for any organization experiencing device growth due to increased mobility, the shift to cloud, or IoT. With a maximum real-world aggregate data rate of 1.49 Gbps (HE80/HE20), the 503 series deliver the speed and reliability needed for medium-density venues and workplaces such as schools, midsize offices, and retailers. Each 503 series access point provides connectivity for a maximum of 256 associated clients per radio (512 in total).

Optimized user experience

The HPE Aruba Networking 503 Series Campus Access Points are designed to optimize user experience by maximizing Wi-Fi efficiency and dramatically reducing airtime contention between clients.

Features include orthogonal frequency-division multiple access (OFDMA) and cellular optimization. With up to 2 spatial streams (2SS) and 80 MHz channel bandwidth (HE80), the 503 series provides the next generation of wireless capabilities for cost-conscious deployments.

Advantages of OFDMA

This capability allows HPE Aruba Networking access points to handle multiple Wi-Fi 6 capable clients on each channel simultaneously, regardless of device or traffic type. Channel utilization is optimized by handling each transaction through smaller sub carriers or resource units (RUs), which means that clients are sharing a channel and not competing for airtime and bandwidth.

Client optimization

HPE Aruba Networking's patented AI-powered ClientMatch technology eliminates sticky client issues by placing Wi-Fi 6 capable devices on the best available access point. Session metrics are used to steer mobile devices to the best access point based on available bandwidth, types of applications being used, and traffic type—even as users roam.

Resource management

To better support growth in client device density and in data volumes, HPE Aruba Networking AirMatch uses machine learning techniques that provide automated radio frequency optimization.

By analyzing the entire wireless network, AirMatch determines the optimum radio configuration and enables the network to automatically adapt in real time to changing RF conditions such as high noise and radar. It also adjusts for higher density, co channel interference, and coverage gaps.

Reduced interference

Unique to HPE Aruba Networking, Advanced Cellular Coexistence (ACC) uses built-in filtering to automatically minimize the impact of interference from cellular networks, distributed antenna systems (DAS), and commercial small cell or femtocell equipment.

IoT platform capabilities

Using an optional IoT expansion radio, the 503 series can use the Bluetooth 5 and 802.15.4/Zigbee radio to simplify deploying and managing IoT-based location services, asset tracking services, security solutions, and IoT sensors.

This allows organizations to leverage the 503 series as an IoT platform, which eliminates the need for an overlay infrastructure and additional IT resources.

Target wake time (TWT)

Ideal for IoTs that communicate infrequently, TWT establishes a schedule for when clients need to communicate with an AP. This helps improve client power savings and reduces airtime contention with other clients.

HPE Aruba Networking secure infrastructure

The 503 series supports a zero trust / secure access service edge (SASE) architecture to better protect user authentication and wireless traffic. Select capabilities include:

WPA3 and Enhanced Open

Support for stronger encryption and authentication is provided through the latest version of WPA for enterprise protected networks. Enhanced Open offers seamless new protection for users connecting to open networks where each session is automatically encrypted to protect user passwords and data on guest networks.

WPA2-MPSK

MPSK enables simpler passkey management for WPA2 devices—should the Wi-Fi password on one device or device type change, no additional changes are needed for other devices. Requires ClearPass Policy Manager.

Simple and secure access

To improve security and ease of management, IT can centrally configure and automatically enforce role-based policies that define proper access privileges for employees, guests, contractors, and other user groups no matter where users connect on wired and WLANs. Dynamic segmentation eliminates the time consuming and error-prone task of managing complex and static VLANs, ACLs, and subnets by dynamically assigning policies and keeping traffic secure and separated.

Seamless handoffs to cellular

Built on the technical foundations of Passpoint® and Wi-Fi Calling, HPE Aruba Networking Air Pass creates a roaming network across the HPE Aruba Networking enterprise customer footprint, extending cellular coverage and enhancing the visitor and subscriber experience to deliver a great experience for your guests while reducing costs and management overhead for DAS.

Flexible operation and management

Our unified access points can operate as stand-alone access points or with a gateway for greater scalability, security, and manageability. Access points can be deployed using zero touch provisioning for ease of implementation in branch offices and for remote work.

HPE Aruba Networking access points can be managed using cloud-based or on-premises solutions for any campus, branch, or remote work environment. HPE Aruba Networking Central provides a single pane of glass for overseeing every aspect of wired and wireless LANs, WANs, and VPNs. AI-powered analytics, end-to-end orchestration and automation, and advanced security features are built natively into the solution. The 503 series can also be deployed using HPE GreenLake for Networking for flexible consumption and financing options.

Additional Wi-Fi features

Each access point also includes the following standards-based technologies:

Transmit beamforming

Increased signal reliability and range

Dynamic frequency selection (DFS)

Optimized use of available RF spectrum

Maximum ratio combining (MRC)

Improved receiver performance

Cyclic delay/shift diversity (CDD/CSD)

Greater downlink RF performance

Space-time block coding

Increased range and improved reception

Low-density parity check (LDPC)

High-efficiency error correction for increased throughput

Technical specifications

Hardware variants

— AP-503: Campus AP platform, integrated antennas

Wi-Fi radio specifications

— Access point type: Indoor, dual-radio, 2.4 GHz and 5 GHz (dual concurrent) 802.11ax 2x2 MIMO

— 2.4 GHz radio: Two spatial stream Single User (SU) MIMO for up to 574 Mbps wireless data rate with 2SS HE40 802.11ax client devices (287 Mbps for HE20)

— 5 GHz radio: Two spatial stream Single User (SU) MIMO for up to 1.2 Gbps wireless data rate with 2SS HE80 802.11ax client devices

— Up to 256 associated client devices per radio, and up to 16 BSSIDs per radio

— Supported frequency bands (country-specific restrictions apply):
  • 2.400 to 2.4835 GHz ISM
  • 5.150 to 5.250 GHz U-NII-1
  • 5.250 to 5.350 GHz U-NII-2A
  • 5.470 to 5.725 GHz U-NII-2C
  • 5.725 to 5.850 GHz U-NII-3/ISM
  • 5.850 to 5.895 GHz U-NII-4

— Available channels: Dependent on configured regulatory domain (country)

— Dynamic Frequency Selection (DFS) optimizes the use of available RF spectrum in the 5 GHz band

— 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 8 resource units

— Supported modulation types:
  • 802.11b: BPSK, QPSK, CCK
  • 802.11a/g/n: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM (proprietary extension)
  • 802.11ac: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM (proprietary extension)
  • 802.11ax: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM

— 802.11n high-throughput (HT) support: HT20/40

— 802.11ac very high throughput (VHT) support: VHT20/40/80/160

— 802.11ax high efficiency (HE) support: HE20/40/80/160

— 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), 400 with 256-QAM (proprietary extension)
  • 802.11ac: 6.5 to 867 (MCS0 to MCS9, NSS = 1 to 2, VHT20 to VHT80); 1083 with 1024-QAM (MCS10 and MCS11, proprietary extension)
  • 802.11ax (2.4 GHz): 3.6 to 574 (MCS0 to MCS11, NSS = 1 to 2, HE20 to HE40)
  • 802.11ax (5 GHz): 3.6 to 1201 (MCS0 to MCS11, NSS = 1 to 2, HE20 to HE80)

— 802.11n/ac/ax packet aggregation: A-MPDU, A-MSDU

— Transmit power: Configurable in increments of 0.5 dBm

— Maximum (aggregate, conducted total) transmit power (limited by local regulatory requirements):
  • Per radio (2.4 GHz / 5 GHz): +21 dBm (18 dBm per chain)
  • Note: conducted transmit power levels exclude antenna gain. For total (EIRP) transmit power, add antenna gain.

— Advanced cellular coexistence (ACC) minimizes the impact of interference from cellular networks

— Maximum ratio combining (MRC) for improved receiver performance

— Cyclic Delay/Shift Diversity (CDD/CSD) for improved downlink RF performance

— Space-time block coding (STBC) for increased range and improved reception

— Low-density parity check (LDPC) for high-efficiency error correction and increased throughput

— Transmit beam-forming (TxBF) for increased signal reliability and range

— 802.11ax target wait time (TWT) to support low-power client devices

Wi-Fi antennas

— AP-503: Integrated downtilt omnidirectional antennas for 2x2 MIMO with peak antenna gain of 1.7 dBi in 2.4 GHz and 4.8 dBi in 5 GHz. Built-in antennas are optimized for horizontal ceiling mounted orientation of the access point. The downtilt angle for maximum gain is roughly 30 degrees.
  • Combining the patterns of each of the antennas of the MIMO radios, the peak gain of the combined, average pattern is 1.5 dBi in 2.4 GHz and 3.9 dBi in 5 GHz.

Other interfaces and features

— E0: Ethernet wired network port (RJ-45)
  • Auto-sensing link speed (10/100/1000BASE-T) and MDI/MDIX
  • POE-PD: 48Vdc (nominal) 802.3af PoE (class 3 or higher)
  • 802.3az Energy Efficient Ethernet (EEE)
— USB 2.0 host interface (type A connector)
  • Capable of sourcing up to 100mA/500mW to an attached device
— Built-in Trusted Platform Module (TPM) for enhanced security and anti-counterfeiting
— Visual indicators (two multicolor LEDs): for system and radio status
— Reset button: factory reset, LED mode control (normal/off)
— Serial console interface (proprietary, micro-B USB physical jack)
— Automatic thermal shutdown and recovery function

Power sources and power consumption

— The access point supports Power over Ethernet (PoE) on port E0
— Power sources are sold separately; see the 503 Series ordering guide for details
— Maximum (worst-case) power consumption: 10.9W
— Maximum (worst-case) power consumption in idle mode: 4.7W
— Both numbers assume no power is drawn from the USB interface
  • Drawing 0.5W from the USB interface increases max access point power consumption by up to 0.7W

Mounting details

A generic mount bracket to attach the AP-503 to suspended ceiling rails ships with the access point. Alternate or spare brackets can be ordered separately; see the 503 Series ordering guide for details.

Mechanical specifications

— Dimensions/weight (AP-503; unit with mount bracket):
  • 145 mm (W) x 145 mm (D) x 51 mm (H)
  • 270g
— Dimensions/weight (AP-503; unit without mount bracket):
  • 145 mm (W) x 145 mm (D) x 35 mm (H)
  • 255g
— Dimensions/weight (AP-503; shipping):
  • 196 mm (W) x 183 mm (D) x 67 mm (H)
  • 515g

Environmental specifications

— Operating conditions
  • Temperature: 0°C to +40°C/+32°F to +104°F
  • Relative humidity: 5% to 95%
  • ETS 300 019 class 3.2 environments
  • AP is plenum rated for use in air-handling spaces
— Storage conditions
  • Temperature: –25°C to +55°C/+13°F to +131°F
  • Relative humidity: 10% to 100%
  • ETS 300 019 class 1.2 environments
— Transportation conditions
  • Temperature: –40°C to +70°C/–40°F to +158°F
  • Relative humidity: up to 95%
  • ETS 300 019 class 2.3 environments

Reliability

Mean Time Between Failure (MTBF): 930 khrs (106yrs) at +25°C operating temperature.

Regulatory compliance

— FCC/ISED
— CE Marked
— RED Directive 2014/53/EU
— EMC Directive 2014/30/EU
— Low Voltage Directive 2014/35/EU
— UL/IEC/EN 62368-1

For more country-specific regulatory information and approvals, see your HPE Aruba Networking representative.

Regulatory model numbers

— AP-503 (all models): APIN0503

Certifications

— Wi-Fi Alliance (WFA):
  • Wi-Fi CERTIFIED a, b, g, n, ac
  • Wi-Fi CERTIFIED 6
  • WPA, WPA2 and WPA3—Enterprise with CNSA option, Personal (SAE), Enhanced Open (OWE)
  • WMM, WMM-PS, Wi-Fi Agile Multiband
— Ethernet Alliance (PoE, PD device, class 3)

Warranty

HPE Aruba Networking's hardware limited lifetime warranty.

Minimum operating system software versions

HPE Aruba Networking Wireless Operating System and HPE Aruba Networking InstantOS 8.11.1.0,
HPE Aruba Networking Wireless Operating System 10.5.0.0

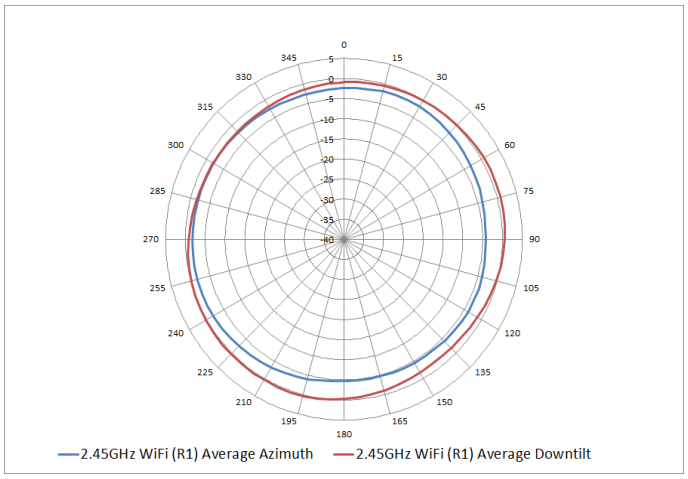
RF performance table

Band, rate	Maximum transmit power (dBm) per transmit chain	Receiver sensitivity (dBm) per receive chain
2.4 GHz, 802.11b		
1 Mbps	18.0	–96.0
11 Mbps	18.0	–88.0
2.4 GHz, 802.11g		
6 Mbps	18.0	–92.0
54 Mbps	18.0	–74.0
2.4 GHz, 802.11n HT20		
MCS0	18.0	–93.0
MCS7	16.0	–72.0
2.4 GHz, 802.11ax HE20		
MCS0	18.0	–92.0
MCS11	12.0	–62.0
5 GHz, 802.11a		
6 Mbps	18.0	–94.0
54 Mbps	16.0	–74.0
5 GHz, 802.11n HT20 / HT40		
MCS0	18.0/18.0	–93.0/–90.0
MCS7	16.0/16.0	–73.0/–70.0
5 GHz, 802.11ac VHT20 / VHT40 / VHT80		
MCS0	18.0/18.0/18.0	–93.0/–90.0/–87.0
MCS9	14.0/14.0/14.0	–67.0/–64.0/–61.0
5 GHz, 802.11ax HE20 / HE40 / HE80		
MCS0	18.0/18.0/18.0	–93.0/–90.0/–87.0
MCS11	12.0/12.0/12.0	–64.0/–61.0/58.0

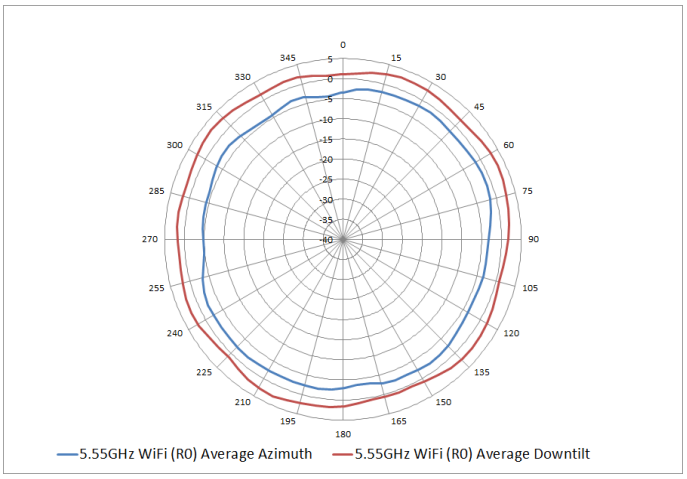
Antenna patterns

Horizontal planes (top view)

Showing azimuth (0°) and 30° downtilt patterns (averaged patterns for all applicable antennas)



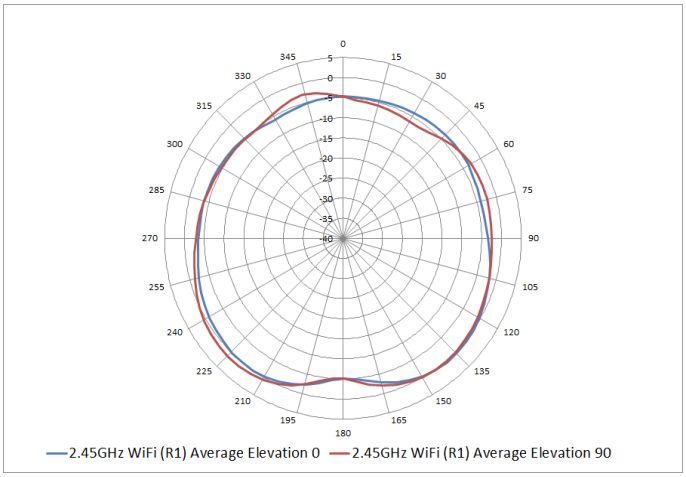
2.45 GHz Wi-Fi (antennas 1, 2)



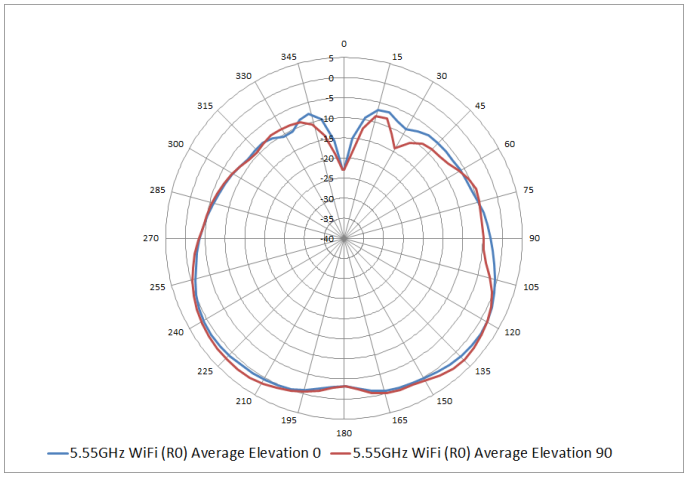
5.55 GHz Wi-Fi (antennas 1, 2)

Vertical (elevation) planes (side view, access point facing up)

Showing side view with access point rotated 0° and 90° (averaged patterns for all applicable antennas)



2.45 GHz Wi-Fi (antennas 1, 2)



5.55 GHz Wi-Fi (antennas 1, 2)

Ordering information

Part number	Description
HPE Aruba Networking 503 Series Campus Access Points	
Internal antenna access points (1-pack)	
R8M95A	HPE Aruba Networking Access Point-503 (EG) Dual Radio 2x2:2 802.11ax Wi-Fi 6 Campus Access Point
R8M96A	HPE Aruba Networking Access Point-503 (IL) Dual Radio 2x2:2 802.11ax Wi-Fi 6 Campus Access Point
R8M97A	HPE Aruba Networking Access Point-503 (JP) Dual Radio 2x2:2 802.11ax Wi-Fi 6 Campus Access Point
R8M98A	HPE Aruba Networking Access Point-503 (RW) Dual Radio 2x2:2 802.11ax Wi-Fi 6 Campus Access Point
R8M99A	HPE Aruba Networking Access Point-503 (US) Dual Radio 2x2:2 802.11ax Wi-Fi 6 Campus Access Point
S5D83A	HPE Aruba Networking AP-503 (ID) Dual Radio 2x2 802.11ax Internal Antennas Campus Access Point
Internal antenna access points (eco-friendly 10-packs)	
S1E83A	HPE Aruba Networking Access Point-503 (RW) 10-Pack Dual Radio 2x2:2 802.11ax Wi-Fi 6 Campus Access Point
S1E84A	HPE Aruba Networking Access Point-503 (US) 10-Pack Dual Radio 2x2:2 802.11ax Wi-Fi 6 Campus Access Point

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