HPE Aruba Networking 500 Series Campus Access Points

Cost-effective Wi-Fi 6 (802.11ax) for 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 for Wi-Fi 6 and Wi-Fi 5 devices
- OFDMA for enhanced multi-user efficiency
- IoT-ready Bluetooth 5 and Zigbee support

These affordable Wi-Fi 6 access points provide high-performance connectivity for any organization experiencing growing numbers of mobile, IoT and mobility requirements. With a maximum real-world aggregate data rate of 1.49 Gbps (HE80/HE20), they deliver the speed and reliability needed for venues and workplaces such as schools, midsize offices and retailers.

Incredible efficiency

The HPE Aruba Networking 500 Series APs are also 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 500 Series provides groundbreaking wireless capabilities for budget-conscious deployments.

Read the Wi-Fi 6 Reference Guide for further information.

Advantages of OFDMA

This capability allows HPE Aruba Networking's APs 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 via smaller sub-carriers or resource units (RUs), which means that clients are sharing a channel and not competing for airtime and bandwidth.

HPE Aruba Networking Air Slice™ for extended application assurance Initially, APs in controller-less mode (Instant) can provide SLA-grade performance by allocating radio resources, such as time, frequency, and spatial streams, to specific traffic types. By combining Aruba's Policy Enforcement Firewall (PEF) and Layer 7 deep packet inspection (DPI) to identify user roles and applications, the APs will dynamically allocate the bandwidth needed. Non-Wi-Fi 6 clients can also benefit. Air Slice™ for APs uses HPE Aruba Networking Central for management. Controller-based APs will be supported in a future software release.

Wi-Fi 6 aware 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 AP. Session metrics are used to steer mobile devices to the best AP based on available bandwidth, types of applications being used and traffic type—even as users roam.

HPE Aruba Networking Advanced Cellular Coexistence (ACC)
This feature 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.

Intelligent Power Monitoring (IPM)
HPE Aruba Networking APs continuously monitor and report hardware energy consumption. They can also be configured to enable or disable capabilities based on available PoE power—ideal when wired switches have exhausted their power budget.

IoT platform capabilities
Like all HPE Aruba Networking Wi-Fi 6 APs, the 500 Series includes an integrated Bluetooth 5 and 802.15.4 radio (for Zigbee support) to simplify deploying and managing IoT-based location services, asset tracking services, security solutions and IoT sensors. This allows organizations to leverage the 500 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 HPE Aruba Networking 500 Series includes components of HPE Aruba Networking's 360 Secure Fabric to help protect user authentication and wireless traffic. Select capabilities include:

WPA3 and Enhanced Open
Support for stronger encryption and authentication is provided via 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.

VPN tunnels
In Remote AP (RAP) and IAP-VPN deployments, the 500 Series can be used to establish a secure SSL/IPSec VPN tunnel to a Mobility Controller that is acting as a VPN concentrator.

Trusted Platform Module (TPM)
For enhanced device assurance, all HPE Aruba Networking APs have an installed TPM for secure storage of credentials and keys, and boot code.

Simple and secure access
To simplify policy enforcement, the HPE Aruba Networking 500 Series uses HPE Aruba Networking's Policy Enforcement Firewall (PEF) feature to encapsulate all traffic from the AP to the Mobility Controller (or Gateway) for end-to-end encryption and inspection. Policies are applied based on user role, device type, applications, and location. This reduces the manual configuration of SSIDs, VLANs and ACLs. PEF also serves as the underlying technology for HPE Aruba Networking Dynamic Segmentation.

High-density connectivity
Each 500 Series AP provides connectivity for a maximum of 256 associated clients per radio (512 in total). In real-world scenarios, the maximum recommended client density is dependent on environmental conditions.



Flexible operation and management
Our unified APs can operate as standalone access points or with a gateway for greater scalability, security, and manageability. APs can be deployed using zero touch provisioning—without on-site technical expertise—for ease of implementation in branch offices and for remote work.

HPE Aruba Networking APs can be managed using cloud-based or on-premises solutions for any campus, branch, or remote work environment. As the management and orchestration console for HPE Aruba Networking ESP (Edge Services Platform), 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.



Additional Wi-Fi features

Each AP also includes the following standards-based technologies:

Transmit beamforming (TxBF)	Increased signal reliability and range
Passpoint Wi-Fi (release 2) (hotspot 2.0)	Seamless cellular-to-Wi-Fi carryover for guests
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
802.11mc fine timing measurement (FTM)	For precision distance ranging

Technical specifications

Model	**AP-504**	**AP-505**
AP type	Indoor, dual radio, 5 GHz and 2.4 GHz 802.11ax 2x2 MIMO	
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	
2.4 GHz radio	Two spatial stream Single User (SU) MIMO for up to 574 Mbps (287 Mbps) wireless data rate with 2SS HE40 (HE20) 802.11ax client devices	
Maximum number of associated client devices	Up to 256 associated client devices per radio	
Maximum number of BSSIDs	16 BSSIDs per radio	
Supported frequency bands (country-specific restrictions apply)	Porio maximus nonserum et ipsae qui dus eost pari	
Memory	• 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 • 5.850 to 5.895 GHz	• ISM • U-NII-1 • U-NII-2A • U-NII-2C • U-NII-3/ISM • U-NII-4
Available channels	Dependent on configured regulatory domain	
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	
802.11ax high efficiency (HE) support:	HE20/40/80	
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 • 802.11ac: 6.5 to 867 (MCS0 to MCS9, NSS = 1 to 2, VHT20 to VHT80), 1,083 with 1024-QAM • 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 1,201 (MCS0 to MCS11, NSS = 1 to 2, HE20 to HE80)	

Technical specifications

Model	AP-504	AP-505
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):	2.4 GHz band: +21 dBm (18 dBm per chain) 5 GHz band: +21 dBm (18 dBm per chain) Note: conducted transmit power levels exclude antenna gain. For total (EIRP) transmit power, add antenna gain.	

Wi-Fi antennas

AP-504	AP-505
Two (female) RP-SMA connectors for external dual band antennas (A0 and A1, corresponding with radio chains 0 and 1). Worst-case internal loss between radio interface and external antenna connectors (due to diplexing circuitry): 0.7dB in 2.4 GHz and 1.3 dB in 5 GHz.	Two integrated dual-band downtilt omni-directional antennas for 2x2 MIMO with peak antenna gain of 4.9 dBi in 2.4 GHz and 5.7 dBi in 5 GHz. Built-in antennas are optimized for horizontal ceiling mounted orientation of the AP. 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 4.3 dBi in 2.4 GHz and 5.6 dBi in 5 GHz.

Other interfaces

Model	AP-504	AP-505
E0: Ethernet wired network port (RJ-45)	• Auto-sensing link speed (10/100/1000BASE-T) and MDI/MDX • PoE-PD: 48Vdc (nominal) 802.3af/at PoE (class 3 or 4) • 802.3az Energy Efficient Ethernet (EEE)	
DC power interface	12 Vdc (nominal, +/- 5%), accepts 2.1 mm/5.5 mm center-positive circular plug with 9.5 mm length	
USB 2.0 host interface (type A connector)	Capable of sourcing up to 1A / 5W to an attached device	
Bluetooth low energy(BLE5.0) and zigbee (802.15.4) radio	• BLE: up to 7 dBm transmit power (class 1) and -93 dBm receive sensitivity (1 Mbps) • Zigbee: up to 6 dBm transmit power and -96 dBm receive sensitivity Integrated vertically polarized omnidirectional antenna with roughly 30 degrees downtilt and peak gain of 3.3 dBi	
Visual indictors (two multi-color LEDs):	For system and radio status	
Reset button:	Factory reset, LED mode control (normal/off)	
Serial console interface	Proprietary, micro-B USB physical jack	
Security slot	Kensington security slot	

Power sources and power consumption

Model	AP-504	AP-505
Power Sources: The AP supports direct DC power and Power Over Ethernet	• The AP supports direct DC power and Power over Ethernet • When both DC and PoE power sources are available, DC power takes priority over PoE • Power sources are sold separately; see the 500 Series Ordering Guide for details • When powered by DC or 802.3at (class 4) PoE, the AP will operate without restrictions. • When powered by 802.3af (class 3) PoE and with the IPM feature disabled, the AP will disable the USB port. In the same configuration but with IPM enabled, the AP will start up in unrestricted mode, but may dynamically apply restrictions depending on the PoE budget and actual power. The feature restrictions and order can be programmed.	

Power sources and power consumption

Model	AP-504	AP-505
Maximum (worst-case) power consumption (without/with a USB device attached):	• DC powered: 8.9W / 14.2W. • PoE powered (802.3at): 11.0W / 16.5W. • PoE powered (802.3af): 11.0W / 13.5W. • This assumes that up to 5W is supplied to the attached USB device.	
Maximum (worst-case) power consumption in idle mode:	4.3W (DC) or 6.2W (PoE).	
Maximum (worst-case) power consumption in deep-sleep mode:	1.7W (DC) or 3.7W (PoE).	

Mechanical specifications

Model	AP-505
Dimensions/weight (AP-505; unit, excluding mount bracket):	160 mm (W) x 161 mm (D) x 37 mm (H) 500g
Dimensions/weight (AP-505; shipping):	193 mm (W) x 183 mm (D) x 63 mm (H) 645g
Mounting details	A mounting bracket has been pre-installed on the back of the AP. This bracket is used to secure the AP to any of the mount kits (sold separately); see the 500 Series Ordering Guide for details.

Environmental specifications

Model	AP-504	AP-505
Operating conditions	• Temperature: 0°C to +50°C / +32°F to +122°F • Humidity: 5% to 93% non-condensing • AP is plenum rated for use in air-handling spaces • ETS 300 019 class 3.2 environments	
Storage and transportation conditions	• Temperature: -40°C to +70°C / -40°F to +158°F • Humidity: 5% to 93% non-condensing • ETS 300 019 classes 1.2 and 2.3 environments	

Reliability

Model	AP-504	AP-505
Mean time between failure (MTBF):	1.3 Mhrs (148yrs) at +25C operating temperature.	

Regulatory and safety compliance

Model	AP-504	AP-505
Regulatory model numbers	APIN0504	APIN0505
Minimum ArubaOS release	• HPE Aruba Networking Operating System and HPE Aruba Networking InstantOS 8.6.0.0 • HPE Aruba Networking Operating System 10.1.0.0	
Regulatory compliance (For more country-specific regulatory information and approvals, please see your HPE Aruba Networking representative.)	• 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 • EN 60601-1-1, EN60601-1-2	• Railway Certs (AP-505 Only): – EN 50155:2017—Railway Applications – EN 50121-1:2017—Railway EMC – EN 50121-3-2—Railway EMC – EN 50121-4:2016—Railway Immunity – IEC 61373 ed2:2008—Railway Shock and Vibration
Certifications	• UL2043 plenum rating • Wi-Fi Alliance: – Wi-Fi CERTIFIED a, b, g, n, ac – Wi-Fi CERTIFIED 6 (ax) – WPA, WPA2 and WPA3—Enterprise with CNSA option, Personal (SAE), Enhanced Open (OWE) – WMM, WMM-PS, W-Fi Agile Multiband – Passpoint (release 2) – Wi-Fi CERTIFIED Location™ • Bluetooth SIG • Ethernet Alliance (PoE, PD device, class 4)	

RF performance table

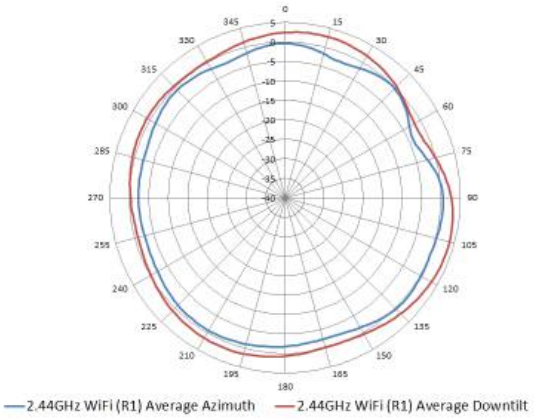
Band, rate	Maximum transmit power (dBm) per transmit chain	Receiver sensitivity (dBm) per receive chain
2.4 GHz, 802.11b		
1 Mbps	18	-98
11 Mbps	18	-90
2.4 GHz, 802.11g		
6 Mbps	18	-93
54 Mbps	18	-76
2.4 GHz, 802.11n HT20		
MCS0	18	-93
MCS7	16	-75
2.4 GHz, 802.11ax HE20		
MCS0	18	-93
MCS11	14	-62
5 GHz, 802.11a		
6 Mbps	18	-92
54 Mbps	18	-75
5 GHz, 802.11n HT20		
MCS0	18	-92
MCS7	16	-74
5 GHz, 802.11n HT40		
MCS0	18	-90
MCS7	16	-71
5 GHz, 802.11ac VHT20		
MCS0	18	-92
MCS9	16	-69
5 GHz, 802.11ac VHT40		
MCS0	18	-90
MCS9	16	-65
5 GHz, 802.11ac VHT80		
MCS0	18	-87
MCS9	16	-62
5 GHz, 802.11ax HE20		
MCS0	18	-93
MCS11	14	-62
5 GHz, 802.11ax HE40		
MCS0	18	-90
MCS11	14	-59
5 GHz, 802.11ax HE80		
MCS0	18	-87
MCS11	14	-56



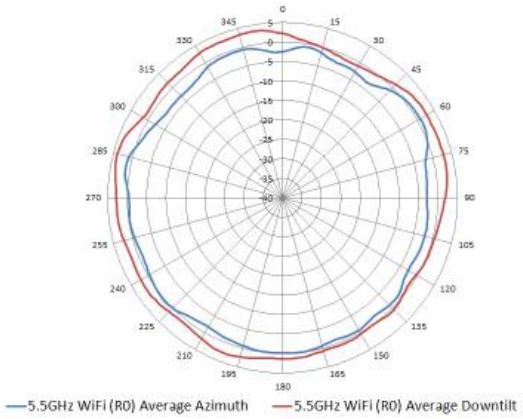
Antenna patterns

Horizontal planes (top view)

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



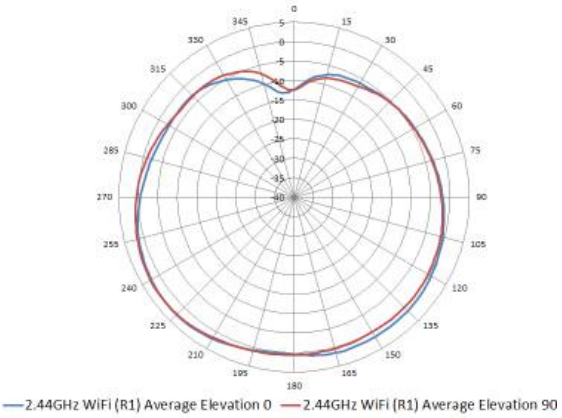
2.44 GHz Wi-Fi (antennas 1, 2)



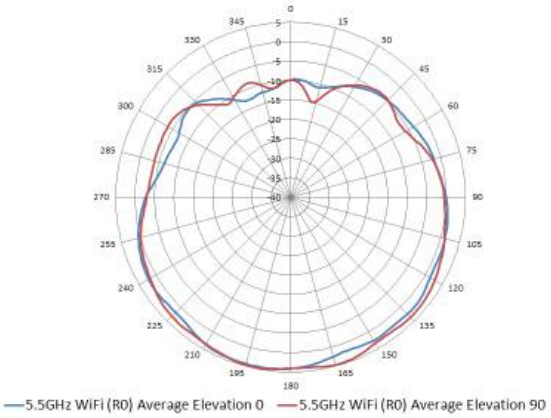
5.5 GHz Wi-Fi (antennas 1, 2)

Vertical (elevation) planes (side view, AP facing down)

Showing side view with AP rotated 0 and 90 degrees (averaged patterns for all applicable antennas)



2.44 GHz Wi-Fi (antennas 1, 2)



5.5 GHz Wi-Fi (antennas 1, 2)

Ordering information

Part number	Description
HPE Aruba Networking 500 Series Campus Access Points	
Internal antenna access points	
R2H25A	HPE Aruba Networking AP-505 (EG) Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H26A	HPE Aruba Networking AP-505 (IL) Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H27A	HPE Aruba Networking AP-505 (JP) Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H28A	HPE Aruba Networking AP-505 (RW) Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H28ACM	HPE Aruba Networking CM AP-505 (RW) Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H29ACM	HPE Aruba Networking CM AP-505 (US) Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
External antenna access points	
R2H19A	HPE Aruba Networking AP-504 (EG) Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H20A	HPE Aruba Networking AP-504 (IL) Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H21A	HPE Aruba Networking AP-504 (JP) Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H22A	HPE Aruba Networking AP-504 (RW) Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H23A	HPE Aruba Networking AP-504 (US) Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
Internal antenna access points—TAA models	
R2H35A	HPE Aruba Networking AP-505 (EG) TAA Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H36A	HPE Aruba Networking AP-505 (IL) TAA Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H37A	HPE Aruba Networking AP-505 (JP) TAA Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H38A	HPE Aruba Networking AP-505 (RW) TAA Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H39A	HPE Aruba Networking AP-505 (US) TAA Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
External antenna access points—TAA models	
R2H30A	HPE Aruba Networking AP-504 (EG) TAA Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H31A	HPE Aruba Networking AP-504 (IL) TAA Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H32A	HPE Aruba Networking AP-504 (JP) TAA Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H33A	HPE Aruba Networking AP-504 (RW) TAA Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H34A	HPE Aruba Networking AP-504 (US) TAA Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
For compatible accessories, see the 500 Series Ordering Guide	

Note: All hardware SKUs can be managed by HPE Aruba NetworkingCentral. Central Managed (CM) SKUs are used for simplified ordering within US and Canada only.

Resources:
500 Series Ordering Guide

Make the right purchase decision.
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