

Alcatel-Lucent Enterprise OmniAccess 510 Series Campus Access Points

High performance 802.11ax Enterprise Access Points for Campus deployments

With an increasing number of mobile and Internet of Things (IoT) devices reliant on wireless access, networks must be capable of accommodating a diverse mixture of device types, applications and services.

The OmniAccess 510 series campus access points with 802.11ax technology are designed to deliver high performance access for mobile and (IOT) devices in environments where density is an issue. The 510 series uses 802.11ax features to efficiently and simultaneously serve multiple clients and traffic types in dense environments, increasing data rates for both individual device and overall system.

The 510 series support all mandatory and several optional 802.11ax features, which includes up- and downlink OFDMA* with up to 16 resource units, multi-user MIMO (MU-MIMO)*, 4x4 MIMO with up to four spatial streams in 5 GHz and 2x2 with up to two special streams in 2.4GHz, channel bandwidths up to 160 MHz (5 GHz; 40 MHz in 2.4 GHz), and 1024-QAM modulation.

The 510 series supports maximum data rates of 4.8 Gbps in the 5GHz band and 575 Mbps in the 2.4 GHz band (for an aggregate peak data rate of 5.4 Gbps). Each AP supports up to 256 associated client devices per radio (typical recommended limit for active clients is 150), making the mid-range 802.11ax 510 series APs ideal for high density environments, such as schools, retail branches, hotels and enterprise offices.

In addition to 802.11ax standard capabilities, the 510 Series supports unique features like ClientMatch radio management and additional radios for IoT applications. This delivers an unsurpassed user experience in today's all-wireless digital work environment and offers up to 4x higher capacity in a cost-effective manner.



Key features

- High performance Dual Radio 802.11ax AP with OFDMA* and Multi-User MIMO (MU-MIMO)*
- Supports all mandatory and several optional 802.11ax features*
- Maximum data rates of 4.8Gbps in the 5GHz band and 575Mbps in the 2.4GHz band (for an aggregate peak data rate of 5.4Gbps)
- Mid-range 802.11ax 510 series APs ideal for high density environments, such as schools, retail branches, hotels and enterprise offices
- Includes Bluetooth 5 and Zigbee radios for IoT use-case

High efficiency

The OmniAccess 510 Series will efficiently and simultaneously serve multiple clients, increasing data rates for both individual devices and as an overall system. Two key features of 802.11ax are multi-user connectivity and enhanced efficiency using Orthogonal Frequency Division Multiple Access (OFDMA)* and multi-user – multiple input multiple output (MU-MIMO)*.

Multi-user transmission with downlink and uplink OFDMA – OFDMA increases user data rates and also reduces latency, especially for large numbers of devices with short frames or low data-rate requirements, such as voice and IoT devices. By providing multi-user capabilities, a channel can be divided in the frequency domain, and multiple transmissions can be carried simultaneously.

OFDMA is particularly effective in raising network efficiency and capacity where there are many devices, short frames, or low data-rate streams.

Multi user transmission with downlink multi-user MIMO – MU-MIMO is another multi-user capability, originally introduced in 802.11ac. This improves network capacity by allowing multiple devices to transmit simultaneously.

Energy efficiency – As higher performance 802.11ax access points will handle a greater number of devices and traffic, they will be driving the need for more power consumption.

Unsurpassed performance

In addition to the standard 802.11ax capabilities, ClientMatch* technology will automatically detect and classify mobile devices with common characteristics, group these devices, and match them with the best APs and radios to optimize performance of the network. For example, ClientMatch will automatically attempt to group 802.11ax capable devices onto available AP radios with equivalent capabilities, so that the performance benefits of Orthogonal Frequency Division Multiple Access (OFDMA)* are maximized. This means increased network performance and a boost in network capacity.

The AP510 series run on AOS-W 8, which delivers always-on networking via features like LiveUpgrade, Controller Clustering and seamless fail-over. AOS-W 8 also includes AirMatch, which provides machine learning technology to automatically optimize the performance of a wireless network by tuning the radio frequencies (RF) of the access points.

IoT ready

The 802.11ax technology also provides unique benefits for IoT devices ranging from dedicated channels in OFDMA which is simultaneous transmission of IoT connections with low latency, to power saving options with Target Wake Time (TWT)* to save battery life.

In addition, the 510 series support an integrated Bluetooth 5 and Zigbee radio, as well as a USB port for maximum flexibility, providing secure and reliable connectivity for IoT devices.

*Feature not supported in initial release; it will be enabled in a future software release

Additional features

- Unified AP support: flexibility to deploy in either controller-based (AOS-W) or controller-less (InstantOS) networks
- Dual Radio 802.11ax access point with OFDMA* and Multi-User MIMO (MU-MIMO)*
 - Supports up to 4.8 Gbps in the 5 GHz band (with 4SS/HE160 clients) and up to 575 Mbps in the 2.4 GHz band (with 2SS/HE40 clients)
 - Up to 16 OFDMA resource units and up to 256 associated client devices per radio (typical recommended limit for active clients is 150)
 - Antenna polarization diversity for optimized RF performance
- SmartRate uplink Ethernet port (EO)
 - Supports up to 2.5 Gbps with NBase-T and IEEE 802.3bz Ethernet compatibility
 - Backwards compatible with 100/1000Base-T
- Built-in Bluetooth 5 and Zigbee radio
 - Enables a wide range of IoT use-cases
- Advanced Cellular Coexistence (ACC)
 - Minimizes interference from 3G/4G cellular networks, distributed antenna systems and commercial small cell/femtocell equipment
- Quality of service for unified communications applications
 - Supports priority handling and policy enforcement for unified communication apps, including Skype for Business with encrypted videoconferencing, voice, chat and desktop sharing
- AppRF technology leverages deep packet inspection to classify and block, prioritize, or limit bandwidth for thousands of applications in a range of categories
- Best-in-class RF Management
 - Integrated AirMatch technology manages the 2.4 GHz and 5 GHz radio bands and actively optimizes the RF environment including channel width, channel selection and transmit power
 - Adaptive Radio Management (ARM) technology provides airtime fairness and ensures that APs stay clear of all sources of RF interference to deliver reliable, high-performance WLANs
- Spectrum analysis*
 - Capable of part-time or dedicated air monitoring, the spectrum analyzer remotely scans the 2.4 GHz and 5 GHz radio bands to identify sources of RF interference from 20 MHz through 160 MHz operation
- Secure Core
 - Device assurance: Use of Trusted Platform Module (TPM) for secure storage of credentials and keys as well as secure boot
 - Integrated wireless intrusion protection offers threat protection and mitigation, and eliminates the need for separate RF sensors and security appliances
 - IP reputation and security services identify, classify, and block malicious files, URLs and IPs, providing comprehensive protection against advanced online threats
 - SecureJack-capable for secure tunneling of wired Ethernet traffic
- Intelligent Power Monitoring (IPM)
 - Enables the AP to continuously monitor and report its actual power consumption and optionally make autonomous decisions to disable certain capabilities based on the amount of power available to the unit
 - Software configurable to disable capabilities in specified order of priority
 - The IPM feature applies when the unit is powered by a PoE source

Deployment options

The OmniAccess 510 Series APs offer a choice of deployment and operating modes to meet your unique management and deployment requirements:

- Controller-based mode – When deployed in conjunction with an Mobility Controller, OmniAccess 510 Series APs offer centralized configuration, data encryption, policy enforcement and network services, as well as distributed and centralized traffic forwarding.
- Controller-less (Instant) mode – The controller function is virtualized in a cluster of APs in Instant mode. As the network grows and/or requirements change, Instant deployments can easily migrate to controller-based mode.
- Remote AP (RAP) mode for branch deployments.
- Air monitor (AM) for wireless IDS, rogue detection and containment.
- Spectrum analyzer (SA), dedicated or hybrid, for identifying sources of RF interference.*
- Secure enterprise mesh portal or point.*

Technical specifications

Hardware variants

- AP514: External antenna models
- AP515: Internal antenna models

Wi-Fi radio specifications

- AP type: Indoor, dual radio, 5 GHz 802.11ax 4x4 MIMO and 2.4 GHz 802.11ax 2x2 MIMO
- 5 GHz radio:
 - Four spatial stream Single User (SU) MIMO for up to 4.8 Gbps wireless data rate to individual 4SS HE160 802.11ax client devices (max)*
 - Two spatial stream Single User (SU) MIMO for up to 1.2 Gbps wireless data rate to individual 2SS HE80 802.11ax client devices (typical)*
 - Four spatial stream Multi User (MU) MIMO for up to 4.8 Gbps wireless data rate to up to four 1SS or two 2SS HE160 802.11ax DL-MU-MIMO capable client devices simultaneously (max)*
 - Four spatial stream Multi User (MU) MIMO for up to 2.4 Gbps wireless data rate to up to four 1SS or two 2SS HE80 802.11ax DL-MU-MIMO capable client devices simultaneously (typical)*
- 2.4 GHz radio:
 - Two spatial stream Single User (SU) MIMO for up to 575 Mbps wireless data rate to individual 2SS HE40 802.11ax client devices or to two 1SS HE40 802.11ax DL-MU-MIMO capable client devices simultaneously (max)

- Two spatial stream Single User (SU) MIMO for up to 287 Mbps wireless data rate to individual 2SS HE20 802.11ax client devices or to two 1SS HE20 802.11ax DL-MU-MIMO capable client devices simultaneously (typical)
- Support for up to 256 associated client devices per radio (typical recommended limit for active clients is 150), and up to 16 BSSIDs per radio
- 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
- Dynamic frequency selection (DFS) optimizes the use of available RF spectrum
- 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 16 resource units (for an 80 MHz channel)*
- 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 (2.4 GHz): 6.5 to 300 (MCS0 to MCS15, HT20 to HT40)
 - 802.11n (5 GHz): 6.5 to 600 (MCS0 to MVC31, HT20 to HT40)
 - 802.11ac: 6.5 to 3,467 (MCS0 to MCS9, NSS = 1 to 4, VHT20 to VHT160)
 - 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 4,803 (MCS0 to MCS11, NSS = 1 to 4, HE20 to HE160)
- 802.11n/ac 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 (18dBm per chain)
 - 5 GHz band: +24 dBm (18 dBm per chain)

Note: conducted transmit power levels exclude antenna gain. For total (EIRP) transmit power, add antenna gain.

Datasheet

- 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

- AP514: Four (female) RP-SMA connectors for external dual band antennas (A0 through A3, corresponding with radio chains 0 through 3). Worst-case internal loss between radio interface and external antenna connectors (due to diplexing circuitry): 1.3 dB in 2.4 GHz and 1.7 dB in 5 GHz.
- AP515: Four integrated dual-band downtilt omni-directional antennas for 4x4 MIMO with peak antenna gain of 4.2 dBi in 2.4 GHz and 7.5 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 effective per-antenna pattern is 3.8 dBi in 2.4 GHz and 4.6 dBi in 5 GHz.

Additional interfaces

- E0: SmartRate port (RJ-45, maximum negotiated speed 2.5 Gbps)
 - Auto-sensing link speed (100/1000/2500BASE-T) and MDI/MDX
 - 2.5 Gbps speed complies with NBase-T and 802.3bz specifications
 - PoE-PD: 48Vdc (nominal) 802.3af/at/bt (class 3 or higher)
 - 802.3az Energy Efficient Ethernet (EEE)
- E1: 10/100/1000BASE-T Ethernet network interface (RJ-45)
 - Auto-sensing link speed and MDI/MDX

- 802.3az Energy Efficient Ethernet (EEE)
- Link aggregation (LACP) support between both network ports for redundancy and increased capacity
- 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 5 and Zigbee (802.15.4) radio
 - Bluetooth 5: up to 8 dBm transmit power (class 1) and -95 dBm receive sensitivity
 - Zigbee: up to 8 dBm transmit power and -97 dBm receive sensitivity
 - Integrated vertically polarized omnidirectional antenna with roughly 30 degrees downtilt and peak gain of 3.5 dBi (AP515) or 4.9 dBi (AP514)
- Visual indicators (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)
- Kensington security slot

Power sources and power consumption

- The AP supports direct DC power and Power over Ethernet (PoE; on port E0)
- When both power sources are available, DC power takes priority over PoE
- Power sources are sold separately; see the ordering Information section below for details
- When powered by DC or 802.3at (class 4) / 802.3bt (class 5) PoE, the AP will operate without restrictions.
- When powered by 802.3af (class 3) PoE and with the IPM feature enabled, the AP will start up in unrestricted mode, but it may apply restrictions depending on the PoE budget and actual power. What IPM restrictions to apply, and in what order, is programmable.
- Operating the AP with an 802.3af (class 3 or lower) PoE source and IPM disabled is not supported.

- Maximum (worst-case) power consumption:
 - DC powered: 16.0 W
 - PoE powered (802.3af, IPM enabled): 13.5 W
 - PoE powered (802.3at/bt): 20.8 W
 - All numbers above are without an external USB device connected. When sourcing the full 5 W power budget to such a device, the incremental (worst-case) power consumption for the AP is up to 5.7 W (PoE powered) or 5.5 W (DC powered).
 - Maximum (worst-case) power consumption in idle mode: 12.6 W (PoE) or 9.7W (DC)
- Maximum (worst-case) power consumption in deep-sleep mode: 5.9 W (PoE) or 1.5 W (DC)

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 (sold separately) mount kits; see the ordering information section below for details.

Mechanical specifications

- Dimensions/weight (AP515; unit, excluding mount bracket):
 - 200 mm (W) x 200 mm (D) x 46 mm (H)/7.9" (W) x 7.9" (D) x 1.8" (H)
 - 810 g/28.5 oz
- Dimensions/weight (AP515; shipping):
 - 230 mm (W) x 220 mm (D) x 72 mm (H)/9.1" (W) x 8.7" (D) x 2.8" (H)
 - 1010 g/35.5 oz

Environmental specifications

- 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

Mean Time Between Failure (MTBF):
560,000 hrs (64 yrs) 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 60950
- EN 60601-1-1, EN60601-1-2

For more country-specific regulatory information and approvals, please see your ALE representative.

Regulatory model numbers

- OAW-AP514: APIN0514
- OAW-AP515: APIN0515

Certifications

- UL2043 plenum rating
- Wi-Fi Alliance:
 - Wi-Fi CERTIFIED a, b, g, n, ac
 - WPA, WPA2 and WPA3 – Enterprise with CNSA option, Personal (SAE), Enhanced Open (OWE)
 - WMM, WMM-PS, Wi-Fi Vantage, Wi-Fi Agile Multiband
 - Passpoint (release 2)
- Bluetooth SIG
- Ethernet Alliance (PoE, PD device, class 4)

Warranty

Hardware limited lifetime warranty.

Minimum operating system software versions

AOS-W and InstantOS 8.4.0.0.

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	-96
11 Mbps	18	-88
2.4 GHz, 802.11g		
6 Mbps	18	-93
54 Mbps	17	-75
2.4 GHz, 802.11n HT20		
MCS0	18	-93
MCS7	16	-75
2.4 GHz, 802.11ax HE20		
MCS0	18	-92
MCS11	14	-62
5 GHz, 802.11a		
6 Mbps	18	-93
54 Mbps	17	-75
5 GHz, 802.11n HT20		
MCS0	18	-93
MCS7	16	-73
5 GHz, 802.11n HT40		
MCS0	18	-90
MCS7	16	-70
5 GHz, 802.11ac VHT20		
MCS0	18	-93
MCS9	16	-68
5 GHz, 802.11ac VHT40		
MCS0	18	-90
MCS9	16	-65

1 Not available initially; will require a software upgrade

Datasheet

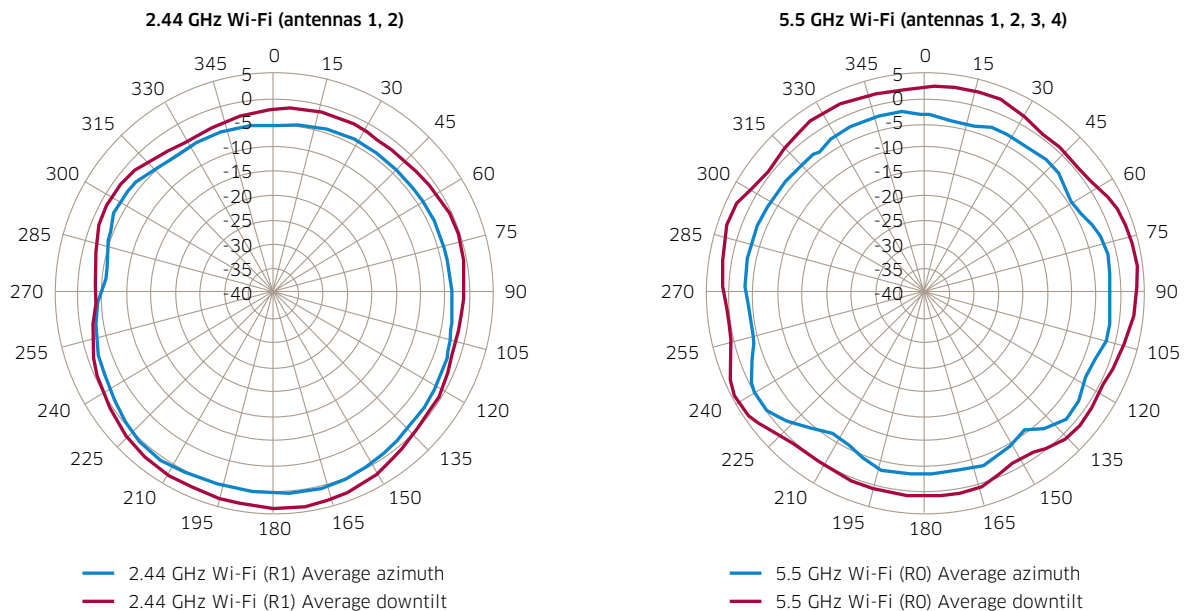
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Band, rate	Maximum transmit power (dBm) per transmit chain	Receiver sensitivity (dBm) per receive chain
5 GHz, 802.11ac VHT80		
MCS0	18	-87
MCS9	16	-62
5 GHz, 802.11ac VHT160		
MCS0	18	-84
MCS9	16	-59
5 GHz, 802.11ax HE20		
MCS0	18	-90
MCS11	14	-60
5 GHz, 802.11ax HE40		
MCS0	18	-87
MCS11	14	-57
5 GHz, 802.11ax HE80		
MCS0	18	-84
MCS11	14	-54
5 GHz, 802.11ax HE160		
MCS0	18	-81
MCS11	13	-51

AP515/IAP515 antenna pattern plots

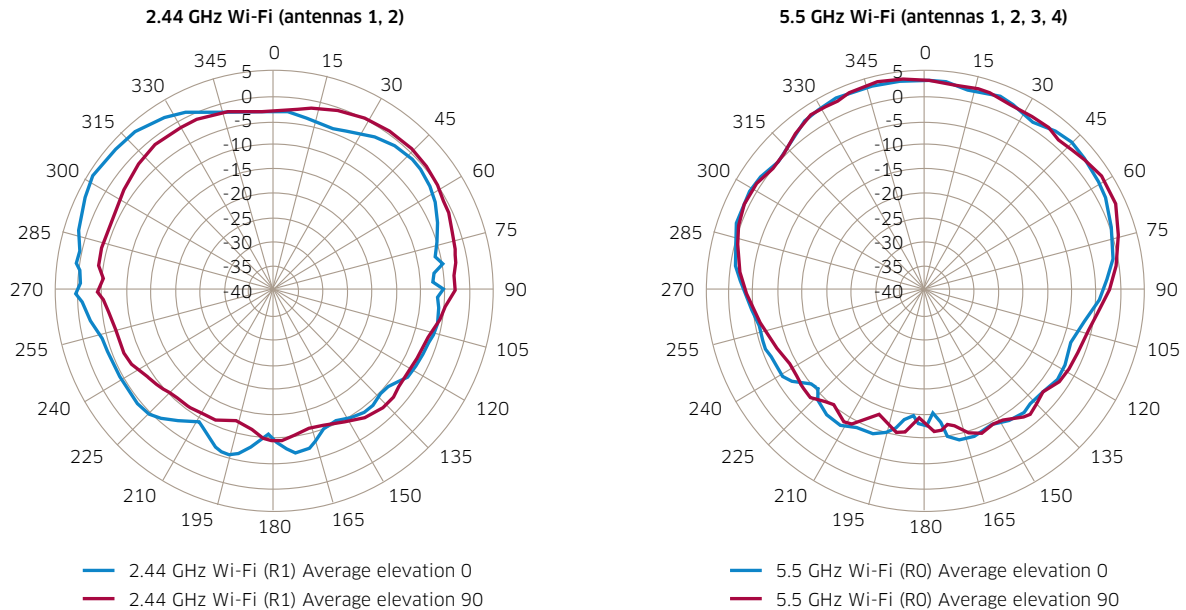
Horizontal planes (top view)

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



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

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



Ordering information

Part number	Description
OmniAccess 510 Series Unified Hardened Access Points	
OAW-AP514-EG	OmniAccess W-AP514 (EG) Dual Radio 4x4:4 + 2x2:2 802.11ax External Antennas Unified Campus AP
OAW-AP514-IS	OmniAccess W-AP514 (IL) Dual Radio 4x4:4 + 2x2:2 802.11ax External Antennas Unified Campus AP
OAW-AP514-JP	OmniAccess W-AP514 (JP) Dual Radio 4x4:4 + 2x2:2 802.11ax External Antennas Unified Campus AP
OAW-AP514-RW	OmniAccess W-AP514 (RW) Dual Radio 4x4:4 + 2x2:2 802.11ax External Antennas Unified Campus AP
OAW-AP514-US	OmniAccess W-AP514 (US) Dual Radio 4x4:4 + 2x2:2 802.11ax External Antennas Unified Campus AP
OAW-AP515-EG	OmniAccess W-AP515 (EG) Dual Radio 4x4:4 + 2x2:2 802.11ax Internal Antennas Unified Campus AP
OAW-AP515-IS	OmniAccess W-AP515 (IL) Dual Radio 4x4:4 + 2x2:2 802.11ax Internal Antennas Unified Campus AP
OAW-AP515-JP	OmniAccess W-AP515 (JP) Dual Radio 4x4:4 + 2x2:2 802.11ax Internal Antennas Unified Campus AP
OAW-AP515-RW	OmniAccess W-AP515 (RW) Dual Radio 4x4:4 + 2x2:2 802.11ax Internal Antennas Unified Campus AP
OAW-AP515-US	OmniAccess W-AP515 (US) Dual Radio 4x4:4 + 2x2:2 802.11ax Internal Antennas Unified Campus AP
Accessories	
AP-MNT-MP10-A	OmniAccess AP-MNT-MP10-A Campus AP mount bracket kit (10-pack) type A: suspended ceiling rail, flat 9/16
AP-MNT-MP10-B	OmniAccess AP-MNT-MP10-B Campus AP mount bracket kit (10-pack) type B: suspended ceiling rail, flat 15/16
AP-MNT-MP10-C	OmniAccess AP-MNT-MP10-C Campus AP mount bracket kit (10-pack) type C: suspended ceiling rail, profile 9/16
AP-MNT-MP10-D	OmniAccess AP-MNT-MP10-D Campus AP mount bracket kit (10-pack) type D: solid surface
AP-MNT-MP10-E	OmniAccess AP-MNT-MP10-E Campus AP mount bracket kit (10-pack) type E: wall-box
AP-515-CVR-20	OmniAccess 20-pack for AP-515 with Holes for LED Indicators White Non-glossy Snap-on Covers
Power accessories	
AP-AC-12V30B	OmniAccess 12V/30W AC-to-DC Desktop Style Power Adapter with Type B DC plug 2.1/5.5/9.5mm circular, 90-degree angled. (Note does not include country specific power cord PWR-CORD-xx).
PD-9501GR/AC	1-Port IEEE 802.3at 4-pair PoE Midspan. Port speed 10/100/1000M PoE power 60W. No power cord included. Please order PWR-CORD-XX for country specific power cord
Other accessories	
AP-CBL-SERU	Micro-USB TTL3.3V to USB2.0 AP Console Adapter Cable