Omada by tp-link

Datasheet

Omada AX3000 Desktop Wi-Fi 6 Access Point

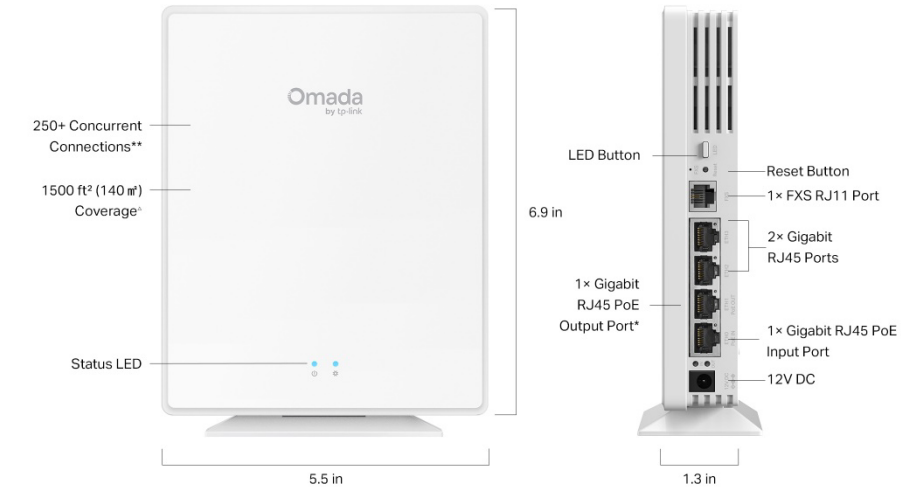
Model: EAP650-Desktop

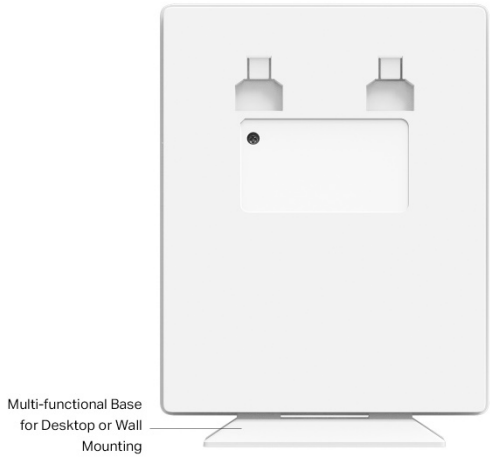
Product Overview

EAP650-Desktop is an Omada AX3000 Desktop Wi-Fi 6 Access Point with flexible deployment, designed to provide reliable indoor coverage in dense environments such as offices, retail, hotels, and MDUs.

- **Seamless 3.0 Gbps Wi-Fi 6 Speeds**: 2402 Mbps on 5 GHz and 574 Mbps on 2.4 GHz.†
- **Easy and Quick Installation:** Plug and play on a desk or mount on a wall, any way you need.
- **Multiple Ports for More Devices:** 4× Gigabit RJ45 ports (one for PoE-in, one for PoE-out) and 1× FXS port.
- **Low Latency and Interference:** 160 MHz bandwidth, OFDMA, MU-MIMO, and 1024-QAM ensure high performance for your network.‡
- **Flexible Deployment:** Supports 802.3af/at/bt PoE or 12 V/1.5 A DC for flexible installation with Omada SDN for one-click setup.
- **Advanced Features:** Supports centralized cloud management, PPSK, multiple portals, mesh, and seamless roaming. §
- **More Connections and Wider Coverage:** Supports 250+ concurrent connections** and covers up to 1,500 ft² (140 m²)* for reliable and extensive wireless connectivity.

Product Appearance





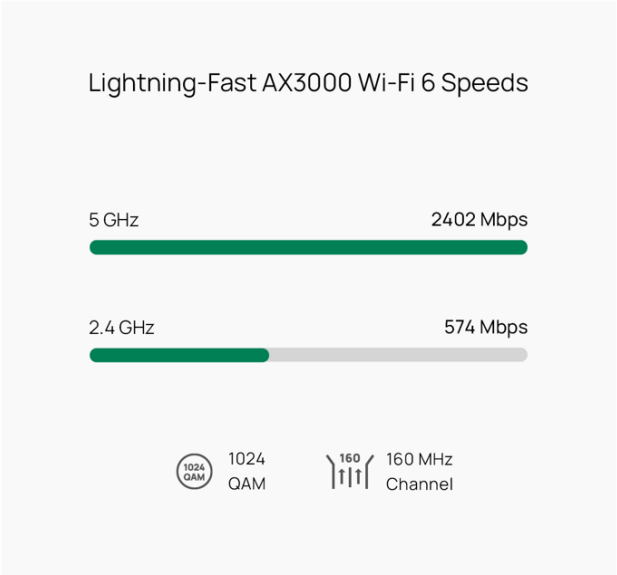
**The actual capacity depends on the wireless environment and client traffic and is generally less than the maximum number of client connections.

*Coverage is calculated based on laboratory testing. Actual coverage is not guaranteed and will vary as a result of client limitations and environmental factors

Feature Descriptions

Omada Wi-Fi 6 Technology for Blazing-Fast Networking

Featuring Wi-Fi 6 technologies, including 160 MHz bandwidth, OFDMA, MU-MIMO, and 1024-QAM, Omada EAP650-Desktop enables fast speeds and low latency—ideal for seamless streaming, gaming, and multitasking across multiple devices. Compared to Wi-Fi 5, it offers 25% higher data rates through 1024-QAM modulation.



No Complex Installation, No Complicated Cabling

Flexible desktop and wall mounting enable quick deployment in diverse settings, with a space-saving design that requires no additional installation. EAP650-Desktop also supports 802.3af/at/bt PoE for flexible deployment and simple setup eliminating the need for extra power wiring.

High-Performance Connectivity for Multiple Devices

EAP650-Desktop comes equipped with a versatile port array for optimized performance and flexible deployment. Four Gigabit RJ45 ports deliver high-speed, stable wired connectivity for critical devices, while the dedicated FXS port enables reliable VoIP communication for analog telephones or fax machines.

Easy Setup via the Omada App or Web Browser

Omada Software-Defined Networking (SDN) enables rapid setup of the EAP650-Desktop through auto-discovery and one-click adoption. Manage and configure seamlessly via the Omada app or web portal for effortless control.

Seamless Connectivity with Mesh and Roaming

Omada Mesh and 802.11k/v/r roaming ensure customers enjoy uninterrupted streaming when moving around by automatically switching clients to the access points with the optimal signals.

Cloud-Based Centralized Management

As part of Omada's unified SDN ecosystem, EAP650-Desktop works with Omada switches, gateways, and controllers. Businesses gain end-to-end visibility, automated optimization, zero-touch provisioning, and batch configuration—all managed from a single cloud interface.

Specifications

Hardware Specifications

Item	Description	
Wi-Fi Standards	5 GHz: IEEE 802.11a/n/ac/ax 2.4 GHz: IEEE 802.11b/g/n/ax	
802.11ax	Spatial Streams	• 2.4 GHz: 2×2 Uplink/Downlink MU-MIMO with 2 spatial streams • 5 GHz: 2×2 Uplink/Downlink MU-MIMO with 2 spatial streams
	Frequency Bands	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 *Note: Country-Specific Restriction Apply
	Bandwidth	2.4 GHz: 20 MHz/40 MHz 5 GHz: 20 MHz/40 MHz/80 MHz/160 MHz *Note: Country-Specific Restriction Apply
	Wireless Data Rate	• 2.4 GHz: 8.6 Mbps to 574 Mbps (MCS0-MCS11, NSS=1 to 2, HE20/40) • 5 GHz: 8.6 Mbps to 2402 Mbps (MCS0-MCS11, NSS=1 to 2, HE20/40/80/160) *Note: Country-Specific Restriction Apply
	Radio Technology	Uplink/downlink OFDMA (Orthogonal Frequency-Division Multiple Access)
	Modulation Type	1024-QAM, 256-QAM. 64-QAM, 16-QAM, QPSK, BPSK
	Frame Aggregation	• A-MPDU (Aggregate MAC Protocol Data Unit) for Tx/Rx • A-MSDU (Aggregate MAC Service Data Unit) for Tx/Rx
	Others	• MRC (Maximal Ratio Combining) • TxBF (Transmit Beamforming) • WPA3 (Wi-Fi Protect Access 3) • DFS (Dynamic Frequency Selection) • CDD (Cycle Delay Diversity) • CSD (Cycle Shift Diversity) • STBC (Space-Time Block Coding) • LDPC (Low-Density Parity-Check)
802.11ac	Spatial Streams	• 5 GHz: 2×2 Downlink MU-MIMO with 2 spatial streams
	Frequency Bands	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 *Note: Country-Specific Restriction Apply
	Bandwidth	5 GHz: 20 MHz/40 MHz/80 MHz/160 MHz

Item	Description	
	Wireless Data Rate	• 5 GHz: 6.5Mbps to 1733Mbps (MCS0-MCS9, NSS=1 to 2, VHT20/40/80/160)
	Radio Technology	OFDM (Orthogonal Frequency-Division Multiplexing)
	Modulation Type	256-QAM. 64-QAM, 16-QAM, QPSK, BPSK
	Frame Aggregation	• A-MPDU (Aggregate MAC Protocol Data Unit) for Tx/Rx • A-MSDU (Aggregate MAC Service Data Unit) for Tx/Rx
	Others	• MRC (Maximal Ratio Combining) • TxBF (Transmit Beamforming) • WPA3 (Wi-Fi Protect Access 3) • DFS (Dynamic Frequency Selection) • CDD (Cycle Delay Diversity) • CSD (Cycle Shift Diversity) • STBC (Space-Time Block Coding) • LDPC (Low-Density Parity-Check)
802.11n	Spatial Streams	• 2.4 GHz: 2×2 MIMO with 2 spatial streams • 5 GHz: 2×2 MIMO with 2 spatial streams
	Frequency Bands	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 *Note: Country-Specific Restriction Apply
	Bandwidth	20 MHz/40 MHz
	Wireless Data Rate	• 2.4 GHz: 6.5Mbps to 300 Mbps (MCS0-MCS7, NSS=1 to 2, HT20/40) • 5 GHz: 6.5Mbps to 300 Mbps (MCS0-MCS7, NSS=1 to 2, HT20/40)
	Radio Technology	OFDM (Orthogonal Frequency-Division Multiplexing)
	Modulation Type	64-QAM, 16-QAM, QPSK, BPSK
	Frame Aggregation	• A-MPDU (Aggregate MAC Protocol Data Unit) for Tx/Rx • A-MSDU (Aggregate MAC Service Data Unit) for Tx/Rx
	Others	• MRC (Maximal Ratio Combining) • TxBF (Transmit Beamforming) • WPA3 (Wi-Fi Protect Access 3) • DFS (Dynamic Frequency Selection) • CDD (Cycle Delay Diversity) • CSD (Cycle Shift Diversity) • STBC (Space-Time Block Coding) • LDPC (Low-Density Parity-Check)
Antenna	Wi-Fi	• 2.4 GHz: 2 × 5 dBi (peak gain), internal omnidirectional antennas • 5 GHz: 3 × 4.7 dBi (peak gain), internal omnidirectional antennas *Note: The gains above are the single-antenna peak gains.

Item	Description	
Interfaces	• 4 x 10M/100M/1000M Multigigabit Ethernet Port (One Ethernet port supports PoE Out: 802.3at/af output at 802.3bt input, 802.3af class 2 output at 802.3at input) • 1 x FXS Port • 1 x DC power interface: 12VDC	
Memory	• Flash: 1Gbit • DRAM: 2Gbit	
Button	1 × Reset button: With the EAP powered on, press and hold the button for about 5 seconds until the Power LED flashes, then release the button, the EAP will restore to factory settings. When the EAP is just powered on, press and hold the button for about 10 seconds until the Power LED flashes, then release the button, the EAP will enter to recovery mode. 1 × LED button: Press the button to turn on/off the LEDs.	
Indicator	1 × dual-color Power LED indicates on the front: • Blue On: Power supply is normal. • Flash Orange: Power supply is insufficient. • Off: Power is off, or LEDs are turned off. 1 × single-color System LED indicates on the front: • On: The EAP is initializing or working normally. • Off: The EAP is working abnormally. • Flash Twice: Initialization is complete. • Flash Once per Second: The EAP is upgrading or resetting. • Quick Flash: The Controller is locating the EAP.* • Sustained Flash: The EAP is in the isolated state. 1 × single-color FXS LED indicates on the side: • On: The SIP account is registered successfully. • Slow Flash: The phone is off hook. • Quick Flash: The phone is ringing. • Off: No SIP account is registered. 4 × single-color LAN (ETH0~ETH3) Link/Act LEDs indicate on the side: • On: The port is linked but has no activity. • Flash: The port is transmitting or receiving data. • Off: The port is not linked. 1 × dual-color PoE IN (ETH0) Status LEDs indicate on the side: • Green On: The port is receiving 802.3bt PoE power. • Orange On: The port is receiving non-802.3bt PoE power**. • Off: The port is not connected or not receiving PoE power. 1 × single -color PoE OUT (ETH1) Status LEDs indicate on the side: • On: The port is supplying power to a PoE powered device. • Off: The port is not connected or not supplying power.	
Reliability	MTBF (Mean Time between Failure)	EU: 332584 hours at the operating temperature of 25℃ (77℉) ; US: 256383 hours at the operating temperature of 25℃ (77℉)
Power Supply	Input	• 802.3at/bt PoE: 42.5 - 57 V • DC: 12 V / 1.5 A DC *Note: If both DC power and PoE are available, the DC power will take priority.
	Output	ETH1 port support 802.3at/af output at 802.3bt input, 802.3af class 2 output at 802.3at input

Item	Description	
Power Consumption	• 12 V / 1.5 A DC Input: 16.8 W, 2.4 GHz radio 2×2, 5 GHz radio 2×2, PoE Out disable • 802.3 bt (PoE++): 19.9 W, 2.4GHz radio 2×2, 5GHz radio 2×2, PSE Out 802.3at/af (30W) available • 802.3 at (PoE++): 19.9 W, 2.4GHz radio 2×2, 5GHz radio 2×2, PSE Out 802.3af class2(7W) available • 802.3 af (PoE++): 12 W, 2.4GHz radio 2×2, 5GHz radio disable, PSE Out disable • Idle mode: 6.5W (PoE) or 5.4W (DC)	
Surge/Lightning Protection	Ethernet Ports: CM 2.5 kV	
ESD/EMP Protection	• Air discharge: ±8.5 kV • Contact discharge: ±4.5 kV *Note: ESD/EMP Protection means Electrostatic Discharge/Electromagnetic Pulse Protection independently.	
Tx Power	Maximum transmit power	CE (EIRP) • 2.4 GHz: 20 dBm • 5 GHz: 23 dBm in U-NII-1, 23 dBm in U-NII-2A, 29 dBm in U-NII-2C FCC (Conducted Power) • 2.4 GHz: 26 dBm • 5 GHz: 27 dBm in U-NII-1, 23 dBm in U-NII-2A, 23 dBm in U-NII-2C, 27 dBm in U-NII-3 *Note: MIMO combined power, excluding antenna gains. The actual transmit power depends on local laws and regulations.
	Minimum transmit power	CE (ERIP) • 2.4 GHz: 7 dBm • 5 GHz: 6 dBm FCC (Conducted Power) • 2.4 GHz: 4 dBm • 5 GHz: 4 dBm *Note: MIMO combined power, excluding antenna gains. The actual transmit power depends on local laws and regulations.
	Adjustable power increment	1 dB
Environment	Temperature	• Operating: 0℃ to +40℃ (32℉ to +104℉) • Storage: -40℃ to +70℃ (-40℉ to +158℉)
	Humidity	• Operating: 10% to 90% (non-condensing) • Storage: 5% to 90% (non-condensing)
	Altitude	• Storage: up to + 2000 m (6561feet) • Operating: up to + 2000 m (6561feet)
Unit	Dimensions (W×D×H)	• Main Unit: 175×140×33 mm (6.9 × 5.5 × 1.3 in.) • Shipping Unit: 209 × 176.5 × 96.5 mm (8.2 × 6.9 × 3.8 in.)
	Weight	• Main Unit: 0.5 kg (1.1 lbs) • Mounting Bracket: 0.05 kg (0.11 lbs) • Shipping Unit: 0.88 kg (1.94 lbs)
	Mounting	• Desktop /Wall Mounting (Kits included)

Software Specifications

Item	Description	
Wireless Functions	Maximum number of BSSIDs	16 (8 on each band)
	Maximum number of associated STAs	250+
	Guest Network	Yes
	ACS (Automatic Channel Selection)	Yes
	Airtime Fairness	Yes
	Band Steering	Yes
	802.11 Rate Control	Yes
	Rogue AP Detection	Yes
	URL Filtering	Yes
	RF Scan	No
	WLAN Optimization	Yes
	WIDS/WIPS	No
	Lock to AP	Yes
	Rate Limit	• SSID Rate Limit • Client Rate Limit
	Load Balance	• Maximum Associated Clients • RSSI Threshold
	MLO	No
	Roaming	• 802.11 k • 802.11v • 802.11r • Non-Stick Roaming • Ping-Pong Roaming Suppression • AI Roaming *Note: Only support Layer 2 Roaming currently.
	Multicast/Broadcast Management	• Multicast-to-Unicast Conversion • ARP-to-Unicast Conversation • Multicast Filtering • Multicast/Broadcast Rate Limit
	QoS (Quality of Service)	• WMM (Wi-Fi Multimedia) • DSCP (Differentiated Services Code Point) • U-APSD (Unscheduled Automatic Power Save Delivery)

Item	Description	
Security and Authentication	ACL	
	MAC Filter	
	802.1X Authentication	
	MAC-Based Authentication	
	• None • Enhanced Open • WPA/WPA2/WPA3-Personal • WPA/WPA2/WPA3-Enterprise	
	Radius Accounting	
	• PPSK without Radius • PPSK with Radius (Generic Radius with bound MAC/EKMS/Generic Radius with unbound MAC)	
	Captive Portal	• No Authentication • Simple Password • Hotspot (Voucher / Local User / SMS / RADIUS / Form Auth) • RADIUS Server • External LDAP Server • External Portal Server • Pre-Authentication Access • Authentication-Free Client
	EAP Types	• EAP-TLS • EAP-TTLS • EAP-PEAP • EAP-CHAP • EAP-SIM • EAP-AKA • EAP-GTC • EAP-FAST • EAP-PEAP • EAP-MD5 • EAP-MSCHAPv2 • PEAPv0 • PEAPv1
Management methods	Omada Controller	• Omada Local Controller V6.1 and above • Omada CBC V5.15 and above
	App	Omada App V5.0 and above
	Standalone Management	Yes
	Standalone Mesh	No
	SSH	Yes
	SNMP	v1, v2c, v3
Operating Modes	AP	Yes
	Mesh	Yes

Item	Description	
System Feature	System Log	Yes
	Reboot Schedule	Yes
	WLAN Schedule	Yes
	NTP (Network Time Protocol)	Yes
	Email Alerts	Yes
	Firmware Upgrade	Yes
	Restore & Backup	Yes
	LED Control	Yes
Network Features	VLAN	• SSID VLAN • Dynamic VLAN • Management VLAN
	Static IP / DHCP Client	Yes
	IPv4/IPv6	Yes
	LLDP (Link Layer Discovery Protocol)	Yes
	mDNS	Yes
	Tools	• Ping / Traceroute / DNSLookup • Packet Capture • Terminal

Standards Compliance and Certifications

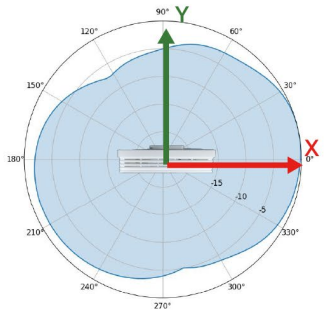
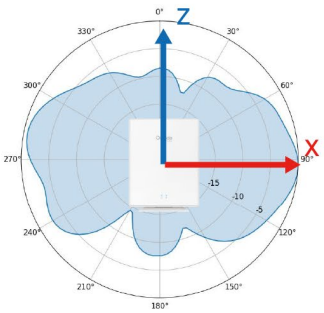
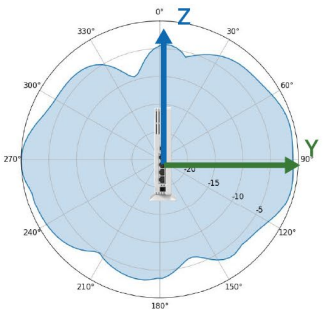
Item	Category	Description
Standards compliance	IEEE Standards	• IEEE 802.11a/b/g/n/ac/ax • IEEE 802.11e/i/k/v/r • IEEE 802.1x/q • IEEE 802.3af/at/bt • IEEE 802.3ab • IEEE 802.3x
	Radio Standards	• ETSI EN 300 328 • ETSI EN 301 893 • FCC Part 15E • FCC Part15C • RSS-247 Issue 3, RSS-GEN Issue 5
	EMC standards	• EN 55032 • EN 55035 • EN 301489-1 • EN 301489-17 • EN 61000-3-3 • EN IEC 61000-3-2 • EN 60601-1-2:2015+A1:2021 • FCC Part 15B • ICES-003 Issue 7 • VCCI-CISPR 32:2016
	Safety Standards	• EN 62368-1 • IEC 62368-1
	Security Standards	• WPA-Personal/Enterprise • WPA2-Personal/Enterprise • WPA3-Personal/Enterprise • OWE
	RoHS	• Directive 2011/65/EU, Directive (EU) 2015/863 • EN IEC 63000: 2018
	Others	• Equipment Radio Regulations: 2008 (including amendments)
Certifications	• FCC/CE/MIC,VCCI,ISED,WFA	

RF Performance

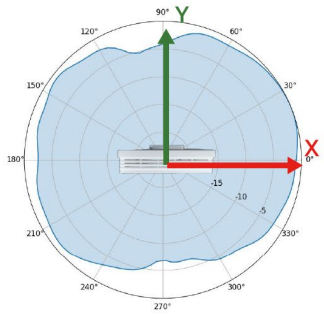
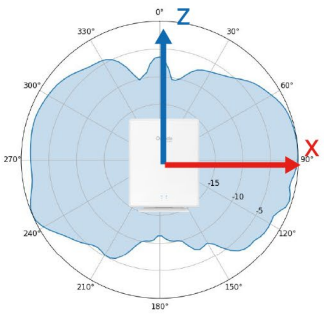
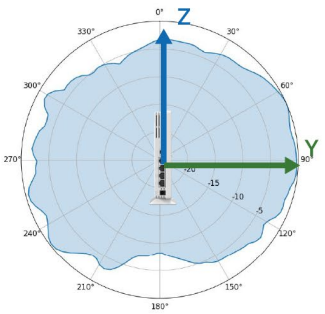
Frequency Band	Wi-Fi Protocol & Bandwidth	MCS Index / Data Rate	EU/US Maximum Transmit Power (dBm) per transmit chain	Receiver Sensitivity (dBm) per receive chain
2.4 GHz	802.11n, HT20	MCS0	14/23	-95.5
		MCS7	14/20	-77
	802.11n, HT40	MCS0	14/22	-92.5
		MCS7	14/20	-73.5
	802.11ax, HE20	MCS0	14/23	-95.5
		MCS11	14/18	-65.5
	802.11ax, HE40	MCS0	14/22	-94
		MCS11	14/18	-64.5
5 GHz	802.11n, HT20	MCS0	22/22	-95
		MCS7	20/20	-76
	802.11n, HT40	MCS0	22/22	-92
		MCS7	20/20	-73.5
	802.11ac, HT20	MCS0	22/22	-96
		MCS8	19.5/19.5	-74
	802.11ac, HT40	MCS0	22/22	-92.5
		MCS9	19/19	-69.5
	802.11ac, HT80	MCS0	22/22	-89.5
		MCS9	19/19	-66
	802.11ac, HT160	MCS0	22/18	-86
		MCS9	19/19	-63
	802.11ax, HE20	MCS0	22/22	-94.5
		MCS11	18/18	-64.5
	802.11ax, HE40	MCS0	22/22	-92.5
		MCS11	18/18	-62.5
	802.11ax, HE80	MCS0	22/22	-90
		MCS11	18/18	-60.5
	802.11ax, HE160	MCS0	22/18	-86.5
		MCS11	18/18	-57

Antenna Radiation Patterns

2.4 GHz

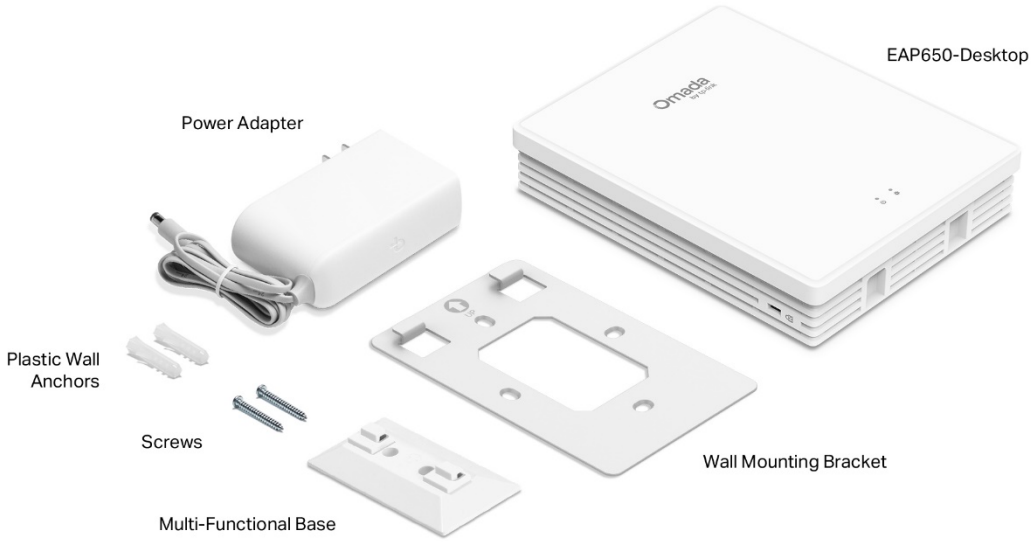
XY Plane	XZ Plane	YZ Plane
		

5 GHz

XY Plane	XZ Plane	YZ Plane
		

Package Contents

Item	Quantity
EAP650-Desktop	1
Power Adapter	1
Multi-Functional Base	1 (See the picture below for details)
Mounting Kit	1 (See the picture below for details)
Installation Guide	1



Support Services

We are committed to providing you with comprehensive and reliable support services to ensure seamless experience with Omada products.

- Contact Support: https://support.omadanetworks.com/#contact-us
- Warranty Services: https://www.omadanetworks.com/support/replacement-warranty/

Revision History

Version	Date	Description
V1.0	2025-12-30	Initial release.

[†]Maximum wireless signal rates are the physical rates derived from IEEE Standard 802.11 specifications. Actual wireless data throughput and wireless coverage are not guaranteed and will vary as a result of 1) environmental factors, including building materials, physical objects, and obstacles, 2) network conditions, including local interference, volume and density of traffic, product location, network complexity, and network overhead, and 3) client limitations, including rated performance, location, connection, quality, and client condition.

[‡]Use of Wi-Fi 6 (802.11ax) and its features, including OFDMA, 1024-QAM, and more, requires clients to support the corresponding features. The 160 MHz bandwidth is only available on the 5 GHz band and may be unavailable in some regions/countries due to regulatory restrictions.

[§]These features require the use of Omada SDN controllers.

*Coverage is calculated based on laboratory testing. Actual coverage is not guaranteed and will vary as a result of client limitations and environmental factors.

**Actual capacity depends on the wireless environment and client traffic and is generally less than the maximum number of client connections.

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