Omada by tp-link

Datasheet

Omada AX3000 Wi-Fi 6 Desktop GPON Access Point

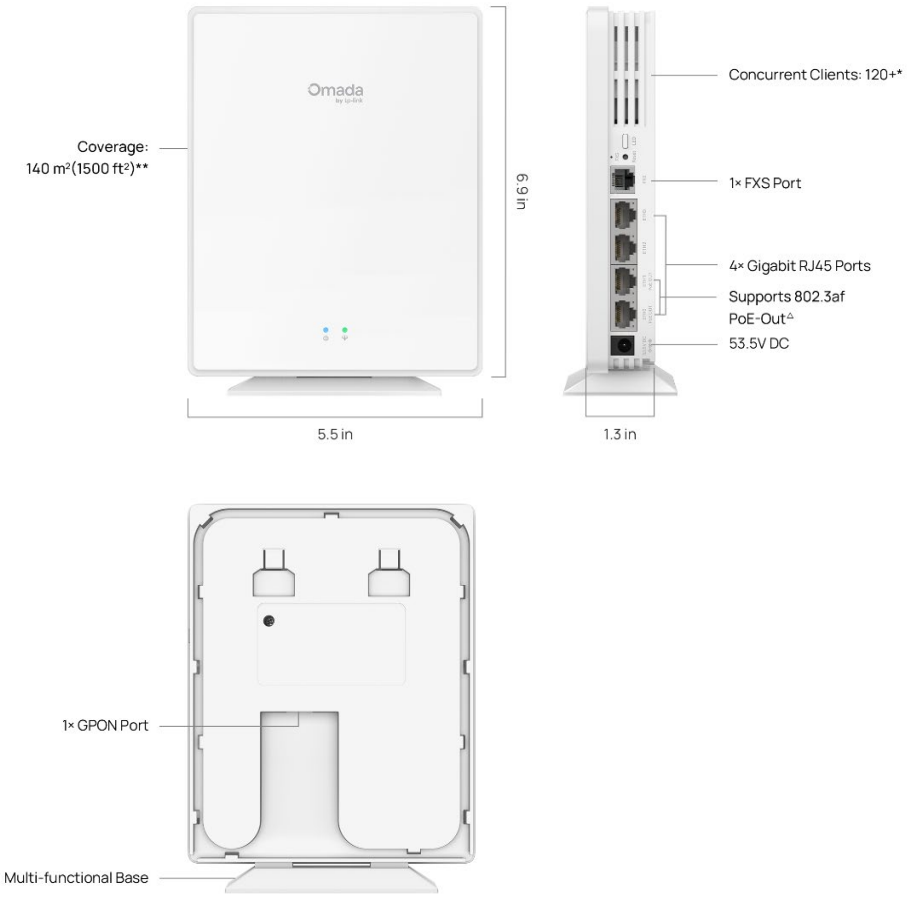
Model: EAP650GP-Desktop

Product Overview

EAP650GP-Desktop is an Omada AX3000 Wi-Fi 6 desktop/wall-mount GPON access point specially designed for FTTR/FTTH deployments. It integrates with the Omada Optical Networking Solution to deliver enterprise-grade Gigabit Passive Optical Networking (GPON). With a single fiber, EAP650GP-Desktop can connect multiple devices—such as cameras, PCs, and TVs—making it ideal for PtMP environments like hotels and MDUs.

- **Integrates into the Omada Optical Networking Solution:** Works with Omada switches, gateways, OLTs, and ONUs to form a complete optical networking solution.
- **One Fiber for Multiple Services:** Wired, Wireless, Voice, VoIP, Data, and HD Video Services.
- **Seamless 3.0 Gbps Wi-Fi 6 Speeds**: 2402 Mbps on 5 GHz & 574 Mbps on 2.4 GHz.†
- **Multiple Ports for More Devices:** 1× GPON port, 1× FXS port, 4× GbE ports (two support PoE-out).
- **Quick and Easy Setup:** Supports both wall and desktop mounting with one-click pairing and automatic adoption.
- **Advanced Features:** Unified management for OLT^ and Omada devices, PPSK,△ multiple portals, Omada mesh, and seamless roaming.§

Product Appearance

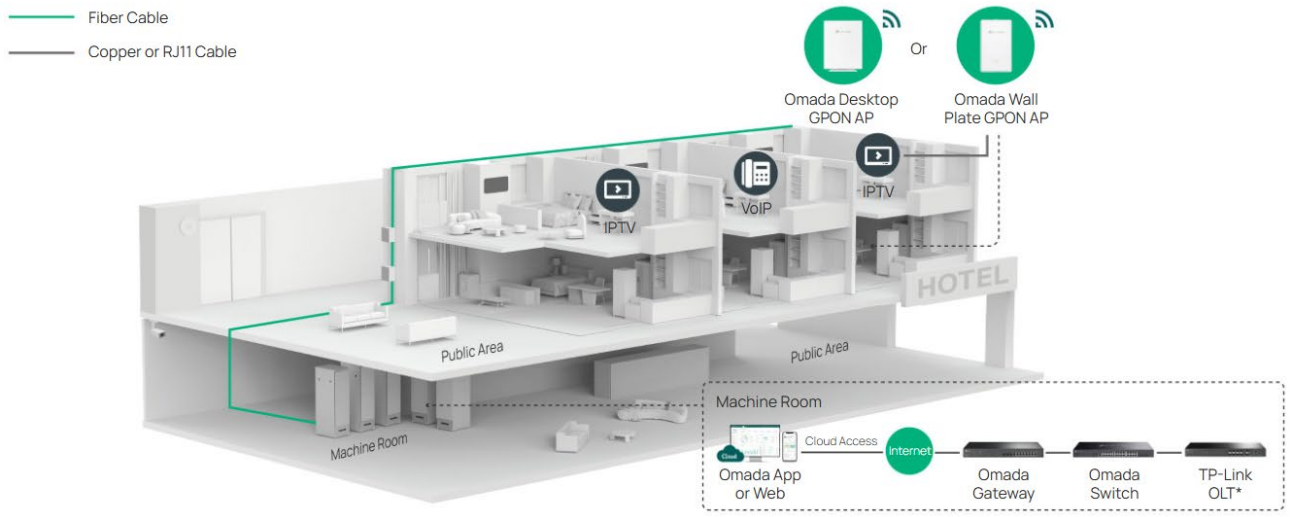


*The actual capacity depends on the wireless environment and client traffic and is generally less than the maximum number of client connections.
**Coverage is calculated based on laboratory testing. Actual coverage is not guaranteed and will vary as a result of client limitations and environmental factors.
△The two PoE ports support up to 22.4 W total PoE out.

Feature Descriptions

Omada Complete Optical Solution with GPON Aps

The Omada Optical Networking Solution delivers enterprise-grade gigabit passive optical networking (GPON). It seamlessly integrates essential components, including Omada GPON APs, Omada switches, gateways, OLTs (Optical Line Terminals), and ONUs (Optical Network Units), making it ideal for PtMP (point-to-multipoint) environments such as hotels and MDUs. Within this solution, all devices support unified management, easy adoption and setup, and zero-touch provisioning.



One Fiber, Multiple Devices

Connect a fiber optic cable to EAP650GP-Desktop, featuring a GPON, an FXS, dual Gigabit LAN, and dual PoE-out ports, for camera, PC, TV, and IP phone support to deliver data, voice, wired and wireless internet, HD video, and VoIP service.

No Complex Installation, No Complicated Cabling

Flexible wall and desktop mounting enables quick deployment in diverse settings, with a space-saving design that requires no extra installation.

Seamless Connectivity with Mesh and Roaming

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

Unified Management for Omada Devices

As part of Omada's unified SDN ecosystem, EAP650GP-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 × 4.5 dBi (peak gain), internal omnidirectional antennas • 5 GHz: 3 × 5 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 (RJ45); two support up to 22.4W total PoE out. • 1 x DC power interface: 53.5VDC *Note: If the total PoE power exceeds the upper limit, the lower-priority ports will shut down automatically. A port also automatically powers off if its output exceeds 15.4 W. Powered-off ports will attempt to resume power supply after 10 seconds. By default, ETH0 has a higher port priority than ETH1.	
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 × single-color Power LED indicates on the front: • On: The EAP is initializing or working normally. • Off: The EAP is working abnormally, power is off, or LEDs are turned off. • Flash Twice: Initialization is complete. • Flash Once per Second: The EAP is upgrading. • Quick Flash: The EAP is resetting or the Controller is locating the EAP.* • Slow Flash: The EAP is in the isolated state. 1 × single-color GPON LED indicates on the front: • Green On: The EAP is registered with the OLT. • Flash Green: The EAP is trying to register with the OLT. • Flash Red: No optical signal is received or the received signal is too weak. • Red On: The EAP is blocked by the OLT or not transmitting an optical signal. 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. 2 × single-color LAN (ETH0&ETH1) PoE 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: 352584 hours at the operating temperature of 25℃ (77℉) ; US: 286383 hours at the operating temperature of 25℃ (77℉)
Power Supply	Input	53.5 V/0.81 A DC
	Output	802.3af PoE: 53.5 V=0.287 A per port (Total 22.4 W)
Power Consumption	• 53.5 V / 0.81 A DC Input: 20 W (PoE out not included), 2.4 GHz radio 2×2, 5 GHz radio 2×2. • Idle mode: 5.85 W	

Item	Description	
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: 245 × 228 × 65 mm (9.7 × 9.0 × 2.6 in.)
	Weight	• Main Unit: 0.5 kg (1.1 lb) • Mounting Bracket: 0.05 kg (0.11 lb) • Shipping Unit: 0.792 kg (1.75 lb)
	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	128
	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	• Client Rate Limit
	Load Balance	• Maximum Associated Clients • RSSI Threshold
	Roaming	• 802.11k • 802.11v • 802.11r *Note: Only support Layer 2 Roaming currently.
	Multicast/Broadcast Management	• Multicast-to-Unicast Conversion • ARP-to-Unicast Conversation • Multicast Filtering
	QoS (Quality of Service)	• WMM (Wi-Fi Multimedia) • DSCP (Differentiated Services Code Point) • U-APSD (Unscheduled Automatic Power Save Delivery)
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	

Item	Description	
	• PPSK without Radius • PPSK with Radius (Generic Radius with bound MAC/EKMS/Generic)	
	Captive Portal	• No Authentication • Simple Password • Hotspot (Voucher / Local User / SMS / RADIUS / Form Auth) • RADIUS 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 Controller V5.15.24 and above
	App	Omada App V4.25 and above
	Standalone Management	Yes
	Standalone Mesh	No
	SSH	Yes
	SNMP	v1, v2c, v3
Operating Modes	AP	Yes
	Repeater	No
	Mesh	Yes
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

Item	Description	
	Static IP / DHCP Client	Yes
	IPv4/IPv6	Yes
	LLDP (Link Layer Discovery Protocol)	Yes
	mDNS	Yes
	Tools	• Ping / Traceroute • Packet Capture • Terminal

Standards Compliance and Certifications

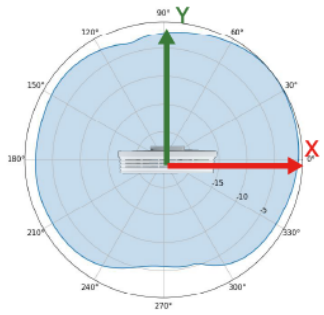
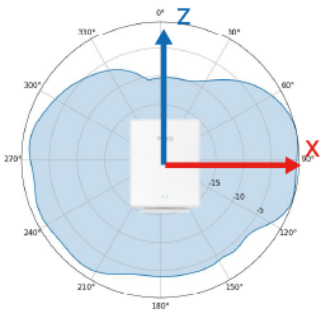
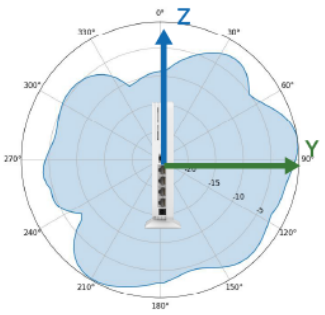
Item	Category	Description
Standards compliance	IEEE Standards	• IEEE 802.11a/b/g/n/ac/ax • IEEE 802.11e/i/k/v/r • IEEE 802.1x/q • IEEE 802.3af • IEEE 802.3ab • IEEE 802.3x
	Radio Standards	• ETSI EN 300 328 • ETSI EN 301 893 • EN50665 EN IEC 62311 • FCC Part 15E • LP0002
	EMC standards	• EN 55032 • EN 55035 • EN 301489-1 • EN 301489-17 • FCC Part 15C • CNS 15936
	Safety Standards	• EN 62368-1 • IEC 62368-1 • CNS 15598-1
	Security Standards	• WPA-Personal/Enterprise • WPA2-Personal/Enterprise • WPA3-Personal/Enterprise
	RoHS	• Directive 2011/65/EU, Directive (EU) 2015/863 • EN IEC 63000: 2018
Certifications	• FCC/CE/NCC/RCM/BSMI	

RF Performance

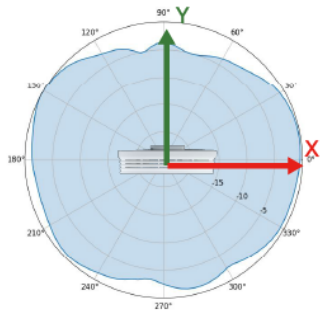
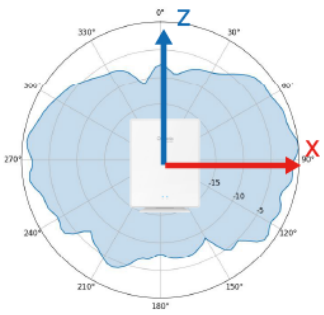
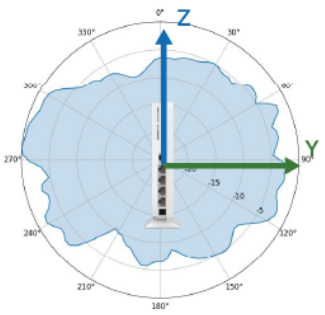
Frequency Band	Wi-Fi Protocol & Bandwidth	MCS Index / Data Rate	EU/US Maximum Transmit Power (dBm) per transmit chain	Receiver Sensitivity (dBm) per receive chain
2.4 GHz	802.11n, HT20	MCS0	14/23	-95.5
		MCS7	14/20	-77
	802.11n, HT40	MCS0	14/22	-92.5
		MCS7	14/20	-73.5
	802.11ax, HE20	MCS0	14/23	-95.5
		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

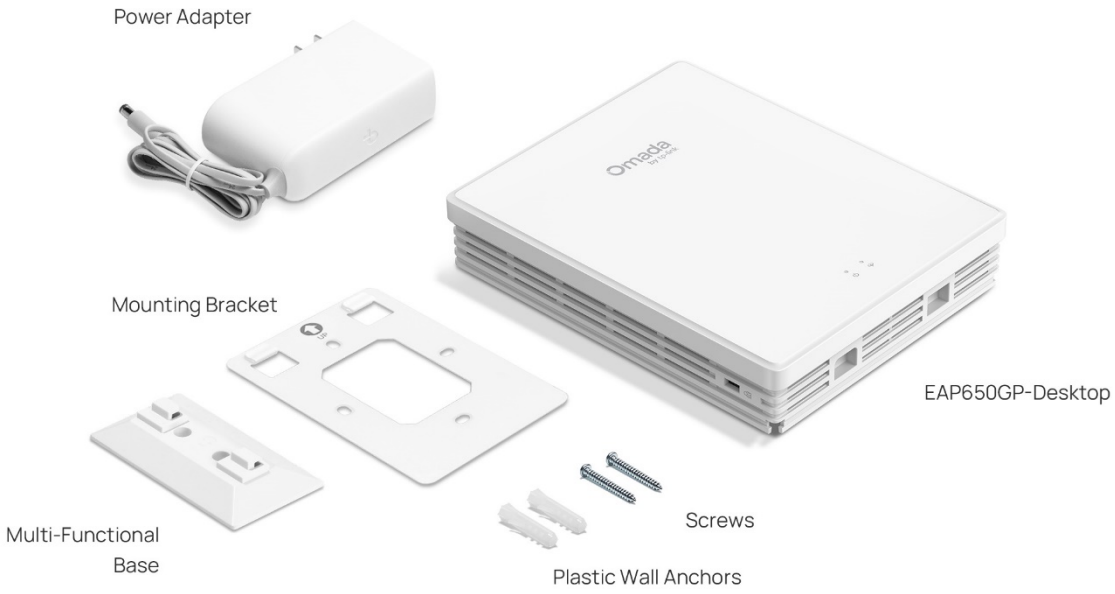
XY Plane	XZ Plane	YZ Plane
		

5 GHz

XY Plane	XZ Plane	YZ Plane
		

Package Contents

Item	Quantity
EAP650GP-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	2025-09-19	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.

[§]Seamless Roaming and Captive Portal require the use of Omada SDN controllers.

[△]This feature needs to be used with a switch that supports VPN Server. And at the same time, the Omada controller needs to be used with a switch that supports CLI Templates.

[^]Certain TP-Link OLT models already support Omada SDN, with dedicated Omada OLT devices currently in development.

*Use of Wi-Fi 6 (802.11ax) and its features, including OFDMA, 1024-QAM, and more, requires clients to support the corresponding features.