

## Highlights

### Advanced Radio Technology

#### Tri-Radio Design

- 5 GHz 4x4:4
- 2.4 GHz 2x2:2
- Sensor 2x2:2 (2.4 GHz/5 GHz)

### High Density Environments

- Delivers exceptional end-user experience even in the densest user environments

### WPA3 Support

- Includes the latest WPA3 Wi-Fi security standard delivering robust protections for users and IoT devices

### Fully Functional over 802.3at

- Capable of operation over 802.3af

### Cellular Coexistence Filter (CCF)

- Minimizes the impact of interference from cellular networks

### Designed for Harsh Environments

- IP67 Outdoor Rated
- Extended temp range- 40C to +60C

### Smart Management Choices

- ExtremeCloud™ IQ delivers powerful, simple and secure public or private cloud management capabilities [Future]
- ExtremeCloud Appliance or VX or NX controller is ideal for on-premises requirements



## ExtremeWireless™ AP460i/e

Wi-Fi 6 (802.11ax) Tri-Radio Outdoor Access Point with integrated or external antenna options

The AP460i/e is designed for harsh environments; from hurricane force winds to sub-zero temperature. The AP460i/e is IP67 outdoor rated and extends Extreme's Wi-Fi 6 coverage outdoors in a sleek form factor that is easy to install. Integrated GPS and BLE allows for state of the art location applications for asset tracking.

The AP460i/e provides high-efficiency, high-performance 802.11ax aggregate data rates up to 4.8 Gbps in the 5 GHz band and concurrent 2.4 Gbps in the 2.4 GHz band. Designed for high density environments, AP460i/e is powerful enough and smart enough to provide the highest level of client services without compromising security monitoring. Unlike other access points that scan only part time, the dedicated, dual-band sensor scans for rogue devices full time, eliminating the risk of vulnerability or attacks.

With more users, more devices, more things, more applications and more threats straining the infrastructure, the AP460i/e was engineered to meet those challenges. The AP460i/e combines powerful 802.11ax Wi-Fi 6 technology, advanced security and ML/AI management capabilities together into an enterprise class solution that allows you to deploy high speed, highly secure Wi-Fi into the toughest environments.



### Built to Suit Your Business Needs

**Extreme Elements** are the building blocks that allow you to tailor your network to your specific business environment, goals, and objectives. They enable the creation of an Autonomous Network that delivers the positive experiences and business outcomes most important to your organization.

Combining architecture, automation, and artificial intelligence, Extreme Elements enable you to ensure that your users get what they need — when and where they need it. Providing these superior user experiences is as simple as mixing and matching the right elements.

Learn more at <https://www.extremenetworks.com/extreme-elements/>.





## Security

The AP460i/e delivers the highest level of security services, beginning with support for the latest Wi-Fi Alliance WPA3 security certifications. Additionally, supporting a stateful L2-L7 DPI firewall for context-based access security.

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## Wi-Fi 6 (802.11ax)

Prior generations of 802.11n, 802.11ac wave 1 and 2, can be considered generational improvements with an emphasis on faster speed. 802.11ax technology instead enhances Wi-Fi efficiency as well as speed, taking Wi-Fi networks to an entirely new level. To learn more about 802.11ax, go to: <https://www.extremenetworks.com/are-you-ready-for-802-11ax>

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## Smart Sensor

Industry's first tri-radio 802.11ax access point with Smart Sensor capability to optimally manage radios to provide the highest level of client performance while simultaneously providing continuous RF monitoring for security threats.

The AP460i/e Patent Pending Smart-Sensor feature automates the provisioning of ADSP Sensors in customer setup without compromising their security performance. This feature intelligently selects and configures the Radio on APs that must act as sensors to cover entire site from wireless security perspective reducing the burden of network engineers.



## Management Analytics

In conjunction with Extreme Management system, cloud or on-premises the AP460i/e provides a very rich set of data displayed via context driven widgets, representing historical data or a combination of historical and current data. This provides context-specific granularity with perspective views for locations, network, APs, individual client devices as well as policy roles. In each context, administrators can adjust dashboards from widget library.

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## RF Monitoring

Network managers will appreciate a powerful choice of RF management for their Wi-Fi networks, with SmartRF, a robust RF management system with AI/ML like functionality. Built on 10 years of experience across thousands of large scale networks and millions of access points, SmartRF algorithms manage channels, radios, load balancing, band steering and many other attributes of the RF.

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## Integrated BLE

To support both IoT and Guest Engagement services the AP460i/e integrates Bluetooth to connect with IoT devices with Thread wireless or engage loyalty customers with Apple iBeacon. Enterprises can use Google Eddystone to send advertisements directly to shoppers, guests, and conference attendees. This makes it ideal for businesses to advertise their app-download pages, captive portals, or site-specific information.

# Product Specifications

## Radio Specifications

### 802.11a

- 5.150–5.850 GHz Operating Frequency
- Orthogonal Frequency Division Multiplexing (OFDM) Modulation
- Rates (Mbps): 54, 48, 36, 24, 18, 12, 9, 6 w/ auto fallback

### 802.11b

- 2.4–2.5 GHz Operating Frequency
- Direct-Sequence Spread-Spectrum (DSSS) Modulation
- Rates (Mbps): 11, 5.5, 2, 1 w/ auto fallback

### 802.11g

- 2.4–2.5 GHz Operating Frequency
- Orthogonal Frequency Division Multiplexing (OFDM) Modulation
- Rates (Mbps): 54, 48, 36, 24, 18, 12, 9, 6 w/ auto fallback

### 802.11n

- 2.4–2.5 GHz & 5.150–5.850 GHz Operating Frequency
- 802.11n Modulation
- Rates (Mbps): MCS0 – MCS31 (6.5Mbps - 600Mbps)
  - 5G: 4x4 Multiple-In, Multiple-Out (MIMO) Radio
  - 2.4G: 2x2 Multiple-In, Multiple-Out (MIMO) Radio
- HT20 High-Throughput (HT) Support (for both 2.4 GHz and 5 GHz)
- HT40 High-Throughput (HT) Support for 5 GHz
- A-MPDU and A-MSDU Frame Aggregation

### 802.11ac

- 5.150–5.850 GHz Operating Frequency
- 802.11ac Modulation (256-QAM)
- Rates (Mbps): MCS0–MCS9 (6.5Mbps – 3467Mbps), NSS = 1-4.
- 2x2:2 Stream Multiple-In, Multiple-Out (MIMO) Radio
- VHT20/VHT40/VHT80 support
- TxBF (Transmit Beamforming)

### 802.11ax (for 5 GHz Sensor)

- 5.150–5.850 GHz Operating Frequency
- 802.11ax Modulation (1024-QAM)
- Dual-band OFDMA
- Rates (Mbps): HE0-HE11 (8 Mbps – 1200 Mbps), NSS = 1-2.
- 2x2:2 Stream Multiple-In, Multiple-Out (MIMO) Radio
- VHT20/VHT40/VHT80/VHT160 support
- TxBF (Transmit Beamforming)

### 802.11ax (for 5 GHz Radio)

- 5.150–5.850 GHz Operating Frequency
- 802.11ax Modulation (1024-QAM)
- Dual-Band OFDMA
- Rates (Mbps): HE0-HE11 (7.3 Mbps – 4800 Mbps), NSS = 1-4.
- 4x4:4 Stream Multiple-In, Multiple-Out (MIMO) Radio
- HE20/HE40/HE80/HE160 support
- TxBF (Transmit Beamforming)

## Radios

- BLE Radio Bluetooth® Low Energy (BLE) and IEEE® 802.15.4 compliant
- Internal GPS - accuracy is 2.5m- 3m in open sky

## Interfaces

- 100/1000/2500 Mbps auto-negotiation Ethernet port, RJ45 PoE+ (Power over Ethernet 802.3at) Port
- 10/100/1000 Mbps auto-negotiation Ethernet port, RJ45

## Power Specifications

- IEEE 802.3at PoE+ Power

## Power Options

- Power Draw: Typical: 15.23W; Max. 19.78W
- 802.3at Power over Ethernet (PoE+) capable Gigabit Ethernet port (RJ-45 power input pins: Wires 4,5,7,8 or 1,2,3,6)
- 802.3af Power over Ethernet injector

## Physical

- 10" x 7.5" x 2.5" (260mm x 192mm x 65mm)
- AP460i: 3.7 lbs (1.7 kg)
- AP460e: 3.9 lbs (1.8 kg)

## Antennas

### AP460i – Internal Antennas

- (2) Integrated single band, 2.4-2.5 GHz omnidirectional antennas
- (4) Integrated single band, 5.1-5.8 GHz omnidirectional antennas
- (2) Integrated dual band, 2.4-2.5 GHz and 5.1-5.8 GHz omnidirectional antennas for Sensor
- (1) Integrated single band, 2.4-2.5 GHz omnidirectional antennas for BLE

### AP460e – External Antennas

- 8 Ntype connectors
- 1 Ntype connector for BLE

## Mounting

- Pole Mount with 15 degree tilt
- 12" Extension arm
- 10" Extension w/2-axis 80 degree tilt

## Environmental

- Operating: AP460i/e: -40 to 60 °C
- Storage: -40 to 70 °C
- Humidity: 0% to 95% (non-condensing)

## Environmental Discharge

- +/- 8KV contact and +/- 15 KV air

## Environmental Compliance

- Housing: IP67 rated outdoor use
- Wind Gust for 165 mph

## Regulatory Compliance

### Product Safety Certifications

- IEC 60950-1, EN 60950-1, UL 60950-1, CSA 22.2 No.60950-1-03 AS/NZS 60950.1,
- RoHS Directive 2011/65/EU

## Radio Approvals

- FCC CFR 47 Part 15, Class B
- FCC Subpart C 15.247
- RSS247
- IEC/EN 60601-1-2,
- EN 62311
- EN 301 489-1
- EN 301 489-17
- EN 55011, (Group 1, Class B)
- EN 60601-1-2
- EN 61000-3-3
- EN 301 893
- EN 50581
- ICES-003, Class B
- FCC Subpart E 15.407
- AS/NZS4268 + CISPR32
- EN 62479
- EN 50385
- EN 301 489-3
- EN 55032, (Class B)
- EN 55024
- EN 61000-3-2
- EN 300 328
- EN 300 440
- EN 302 502

## Support

- 1 Year Warranty

## AP460i

### Power and Receive Sensitivity - 2.4 GHz

Channel	Data Rate	Power (dBm)	Sensitivity
11b	1 - 11 Mbps	23	-96, -89
11g	6 Mbps	23	-92
	54 Mbps	22	-75
11n HT20	MCS0, 7	23, 22	-92, -72
11n HT40	MCS0, 7	23, 22	-89, -69
11ax HE20	HE0, 11	23, 20	-91, -62
11ax HE40	HE0, 11	23, 20	-88, -59

### Power and Receive Sensitivity - 5 GHz

Channel	Data Rate	Power (dBm)	Sensitivity
11a	6 Mbps	22	-95
	54 Mbps	20	-77
11n HT20	MCS0, 7	22, 18	-94, -75
11n HT40	MCS0, 7	22, 18	-91, -72
11ac VHT20	MCS0, 8	22, 17	-94, -71
11ac VHT40	MCS0, 9	22, 17	-91, -66
11ac VHT80	MCS0, 9	22, 17	-88, -63
11ac VHT160	MCS0, 9	22, 17	-85, -60
11ax HE20	HE0, 11	22, 16	-93, -63
11ax HE40	HE0, 11	22, 16	-90, -60
11ax HE80	HE0, 11	22, 16	-87, -57
11ax HE160	HE0, 11	22, 16	-84, -54

### (Sensor) Receive Sensitivity - 2.4 GHz

Channel	Data Rate	Sensitivity
11b	1 - 11 Mbps	-95, -88
11g	6 Mbps	-91
	54 Mbps	-74
11n HT20	MCS0, 7	-91, -71
11n HT40	MCS0, 7	-88, -68
11ax HE20	HE0, 11	-90, -61
11ax HE40	HE0, 11	-87, -58

### Receive Sensitivity - 5 GHz

Channel	Data Rate	Power (dBm)
11a	6 Mbps	-94
	54 Mbps	-76
11n HT20	MCS0, 7	-93, -73
11n HT40	MCS0, 7	-90, -70
11ac VHT20	MCS0, 8	-93, -69
11ac VHT40	MCS0, 9	-90, -64
11ac VHT80	MCS0, 9	-86, -61
11ax HE20	HE0, 11	-92, -62
11ax HE40	HE0, 11	-89, -59
11ax HE80	HE0, 11	-86, -56

## AP460e

### Power and Receive Sensitivity - 2.4 GHz

Channel	Data Rate	Power (dBm)	Sensitivity
11b	1 - 11 Mbps	23	-95, -88
11g	6 Mbps	22	-91
	54 Mbps	21	-74
11n HT20	MCS0, 7	22, 21	-91, -71
11n HT40	MCS0, 7	22, 21	-88, -68
11ax HE20	HE0, 11	22, 19	-90, -61
11ax HE40	HE0, 11	22, 19	-87, -58

### Power and Receive Sensitivity - 5 GHz

Channel	Data Rate	Power (dBm)	Sensitivity
11a	6 Mbps	20	-93
	54 Mbps	18	-75
11n HT20	MCS0, 7	20, 16	-92, -73
11n HT40	MCS0, 7	20, 16	-89, -70
11ac VHT20	MCS0, 8	20, 15	-92, -69
11ac VHT40	MCS0, 9	20, 15	-89, -64
11ac VHT80	MCS0, 9	20, 15	-86, -61
11ac VHT160	MCS0, 9	20, 15	-83, -58
11ax HE20	HE0, 11	20, 14	-91, -61
11ax HE40	HE0, 11	20, 14	-88, -58
11ax HE80	HE0, 11	20, 14	-85, -55
11ax HE160	HE0, 11	20, 14	-82, -52

### (Sensor) Receive Sensitivity - 2.4 GHz

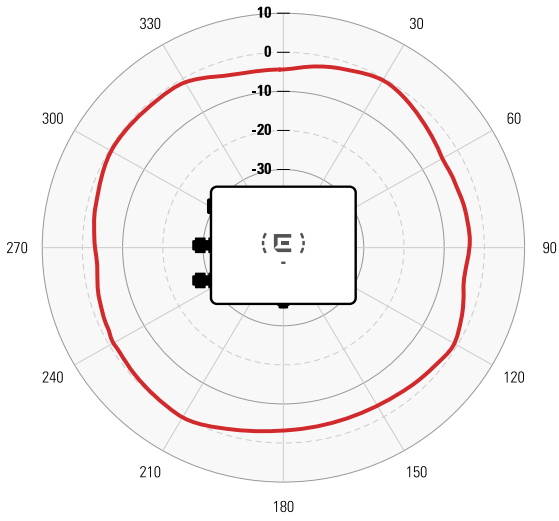
Channel	Data Rate	Sensitivity
11b	1 - 11 Mbps	-94, -87
11g	6 Mbps	-90
	54 Mbps	-73
11n HT20	MCS0, 7	-90, -70
11n HT40	MCS0, 7	-87, -67
11ax HE20	HE0, 11	-89, -60
11ax HE40	HE0, 11	-86, -57

### Receive Sensitivity - 5 GHz

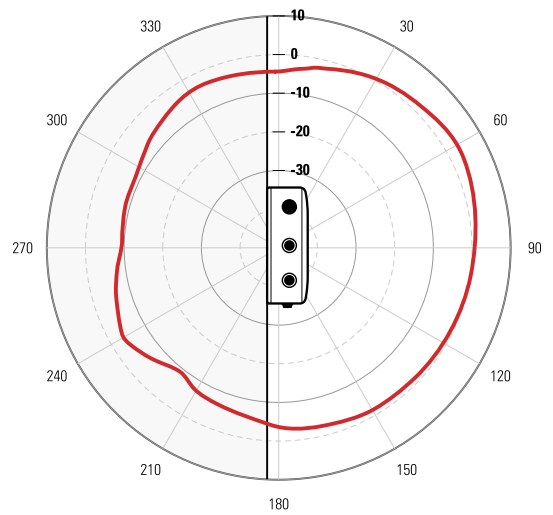
Channel	Data Rate	Power (dBm)
11a	6 Mbps	-93
	54 Mbps	-75
11n HT20	MCS0, 7	-92, -73
11n HT40	MCS0, 7	-89, -70
11ac VHT20	MCS0, 8	-92, -69
11ac VHT40	MCS0, 9	-89, -64
11ac VHT80	MCS0, 9	-86, -61
11ax HE20	HE0, 11	-91, -61
11ax HE40	HE0, 11	-88, -58
11ax HE80	HE0, 11	-85, -55

# Antenna Radiation Patterns

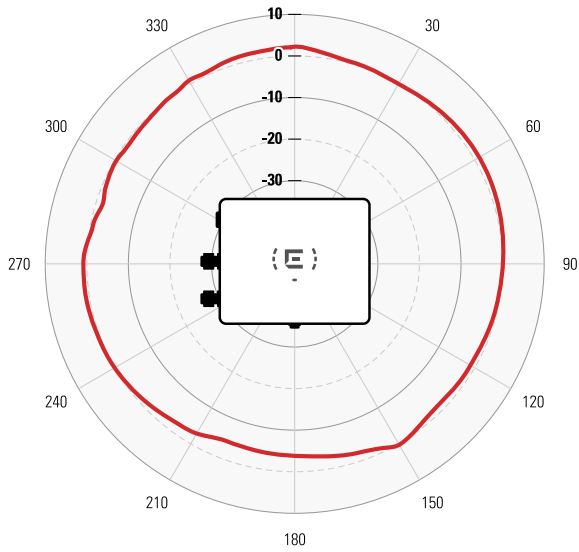
## Azimuth - 2.4 GHz



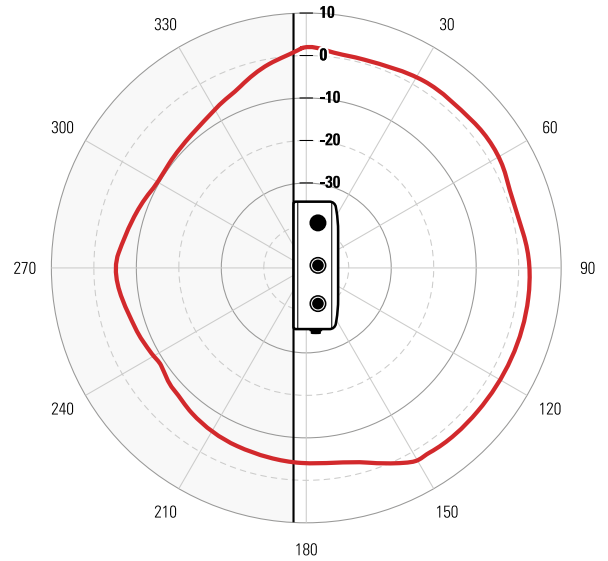
## Elevation - 2.4 GHz



## Azimuth - 5 GHz

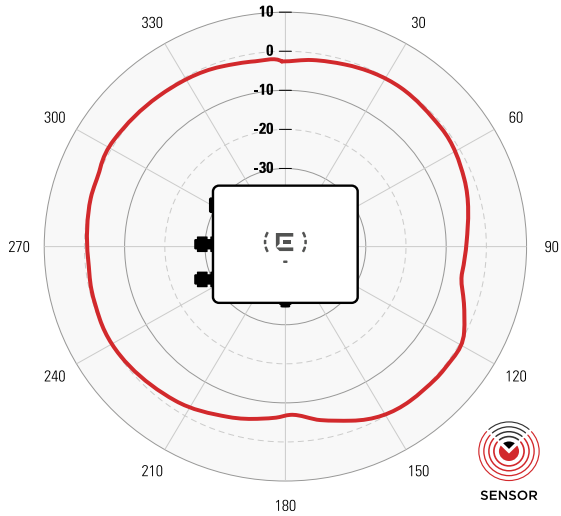


## Elevation - 5 GHz

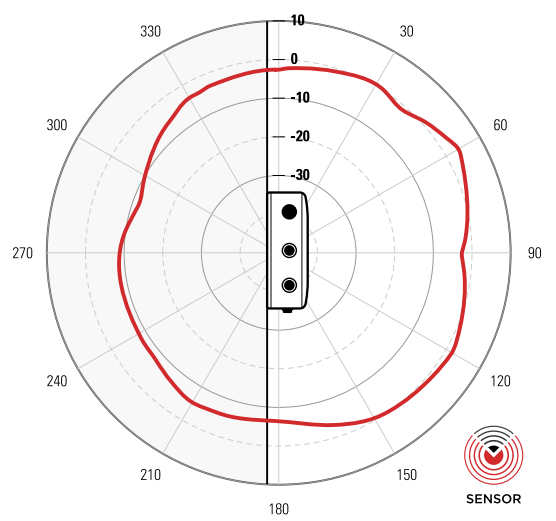


# Antenna Sensor Patterns

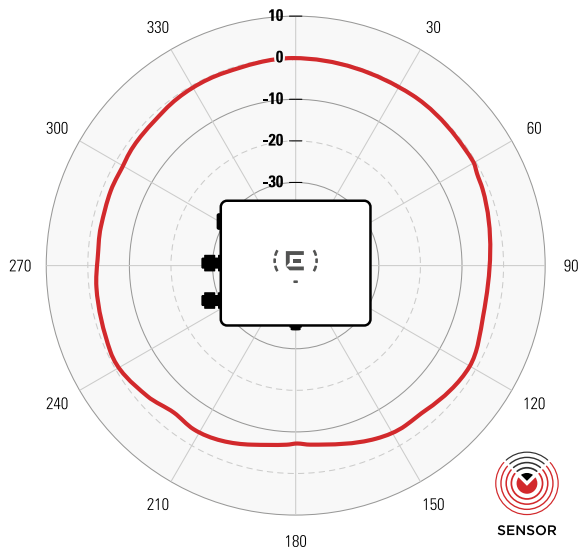
## Azimuth - 2.4 GHz



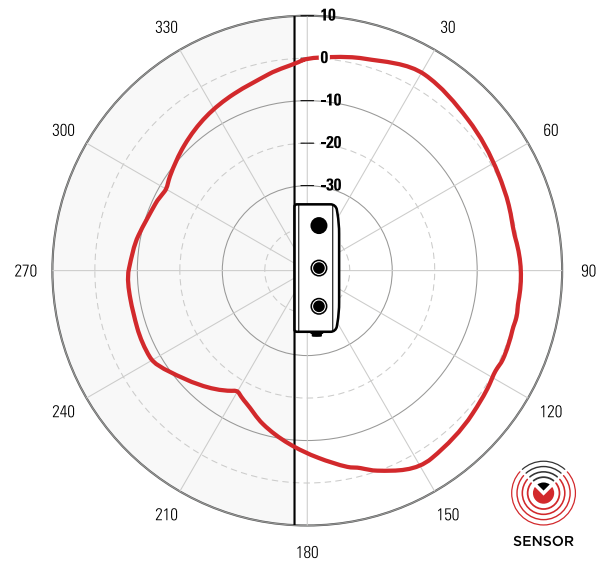
## Elevation - 2.4 GHz



## Azimuth - 5 GHz



## Elevation - 5 GHz



## Ordering Information

### AP460i/e

Mkt Part #	Description
AP460i-FCC	Tri Radio 802.11ax - 4x4:4 + 2x2:2, Full time 2x2:2 Sensor, Outdoor Internal Antenna Access Point. Domain: US, and Puerto Rico
AP460i-CAN	Tri Radio 802.11ax - 4x4:4 + 2x2:2, Full time 2x2:2 Sensor, Outdoor Internal Antenna Access Point. Domain: Canada
AP460i-WR	Tri Radio 802.11ax - 4x4:4 + 2x2:2, Full time 2x2:2 Sensor, Outdoor Internal Antenna Access Point. Domain: EMEA, Rest of World
AP460e-FCC	Tri Radio 802.11ax - 4x4:4 + 2x2:2, Full time 2x2:2 Sensor, Outdoor External Antenna Access Point. Domain: US, and Puerto Rico
AP460e-CAN	Tri Radio 802.11ax - 4x4:4 + 2x2:2, Full time 2x2:2 Sensor, Outdoor External Antenna Access Point. Domain: Canada
AP460e-WR	Tri Radio 802.11ax - 4x4:4 + 2x2:2, Full time 2x2:2 Sensor, Outdoor External Antenna Access Point. Domain: EMEA, Rest of World

### Mounting Options - AP460i/e

Mkt Part #	Description
KT-147407-02	OUTDOOR MOUNTING HARDWARE KIT FOR OUTDOOR ACCESS POINTS- STAINLESS STEEL FOR HARSH ENVIRONMENTS
KT-150173-01	OUTDOOR AP 12 IN EXT ARM FOR MNTG KIT
32216	WS-MBV-VMM Vehicle Bracket
30520	WS-MBO-POLE01 Outdoor Pole mounting bracket
MBO-ART02	MBO-ART02 Articulating Mtg Brkt

### Power Options - AP460e

Mkt Part #	Description
PD-9001GO-ENT	OUTDOOR 802.3AT POE SINGLE PORT MIDSPAN

### Antennas - AP460e

Mkt Part #	Description
ML-2452-HPAG4A6-01	Dipole, 4dBi/ 7.3dBi, dual band, outdoor, white with standard N plug connector (up to 9 per AP)
ML-2452-PNA5-01R	Panel, 120 deg sector, 4.5dBi/ 5dBi, dual band, outdoor, 4" lead with standard N plug connector (up to 9 per AP)
ML-2452-HPAG5A8-01	Dipole Omni, 7.5dBi/8dBi, dual band, outdoor with standard N Plug connector (up to 9 per AP)
ML-2452-HPA6-01	Dipole Omni, 5.3/4.6/6.1dBi, dual band, outdoor with standard N Plug connector (up to 9 per AP)
ML-2452-PNA7-01R	Panel, 68/ 52 deg sector, 7.8dBi/ 10.7dBi, dual band, outdoor, 4" lead with standard N plug connector (up to 9 per AP)
30724	WS-AO-DQ04360N Outdoor, 2.4-2.5/5.15-5.875GHz, 4-feed 4dBi, Omni antenna with standard N-type plug connector



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