

FortiAP High Density Series



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The FortiAP High Density wireless solution, powered by the proprietary technology delivers carrier-grade Wi-Fi to large venue stadiums, arenas, and other high-traffic environments, bringing unmatched scalability and performance to Fortinet's secure networking portfolio.

Built for performance-critical environments, Fortinet's high-density wireless solutions combine custom RF engineering, advanced antenna arrays, and real-time analytics to deliver exceptional user capacity and low-latency throughput, ensuring a superior experience, even in the most challenging RF conditions.

Highlights

- Overhead Hyper Directional Access Points
- Multi Radio High Density Wireless Solution
- Software Defined Reconfigurable Coverage
- Web-based intuitive "Single pane of glass" management interface

Hardware Offerings		Indoor Use	Outdoor Use
802.11be Wi-Fi 7			
FAP-HD-444KW	Wireless Outdoor High Density Wide Reconfig AP - Four radio 4x4 streams (Wi-Fi 7 IEEE 802.11be Dual-band 5/6 GHz config modes supported)	—	✓
FAP-HD-444KN	Wireless Outdoor High Density Narrow Reconfig AP - Four radio 4x4 streams (Wi-Fi 7 IEEE 802.11be Dual-band 5/6 GHz config modes supported)	—	✓
FAP-HD-224KR	Wireless Outdoor High Density Ultra Narrow Fixed Right Beam AP - Two radio 4x4 streams (Wi-Fi 7 IEEE 802.11be Dual 5 GHz)	—	✓
FAP-HD-224KL	Wireless Outdoor High Density Ultra Narrow Fixed Left Beam AP - Two radio 4x4 streams (Wi-Fi 7 IEEE 802.11be Dual 5 GHz)	—	✓
FAP-HD-441K	Wireless Indoor High Density - Four radio 4 x 4 streams (Wi-Fi7 Tri-band 2.4/5/6GHz)	—	✓

AP	Radios	Band Support	Software Reconfig	Type	Streams/Radio	Total Streams
FAP-HD-444KW	4	5/6 GHz	✓	Outdoor/Wide	4x4	16
FAP-HD-444KN	4	5/6 GHz	✓	Outdoor/Narrow	4x4	16
FAP-HD-224KR	2	5 GHz	—	Outdoor/Ultra Narrow Right	2x2	4
FAP-HD-224KL	2	5 GHz	—	Outdoor/Ultra Narrow Left	2x2	4
FAP-HD-441K	4	2.4/5/6 GHz	—	Indoor	4x4	16

Critical Challenges

In high density user environments, traditional Wi-Fi solutions fail to deliver consistent performance leading to poor user experiences and higher operational costs. Designing and deploying reliable Wi-Fi in large venues also face several unique challenges described as follows.

RF Environment Issues

The large size, complex architecture, and bowl-shaped design of venues create significant radio frequency challenges. Interference from overlapping signals and construction materials makes it difficult to maintain strong and reliable connectivity.

Performance Degradation Under Load

Wi-Fi may perform well when a venue is empty but slows significantly as crowds fill the space. Traditional Wi-Fi architectures are not designed to sustain high throughput or consistent service quality across large numbers of devices and concurrent users.

High Cost and Complexity of Proximate Designs

Competing vendors frequently rely on proximate network designs, placing access points on or beneath seats. This design requires a higher number of devices, driving up cost and complexity while creating ongoing challenges in maintenance, servicing, and optimization.

Deployment Challenges

Architectural and aesthetic limitations restrict where access points can be installed, while dense deployments require extensive cabling. Under-seat installations are more time-consuming, costly, and prone to damage, increasing both complexity and long-term maintenance needs.

Proprietary Innovations Designed for Ultra-High-Density (UHD) Solutions

To address these challenges, Fortinet designed UHD wireless solutions using proprietary innovations to deliver reliable, scalable, and secure connectivity that redefine performance in demanding environments. These high-capacity access points are designed to deliver better performance, optimize capacity, coverage, and user experience while reducing cost and complexity.

Multi-Radio High Density

Delivers multiple radios per access point (AP) to support extreme user density and expand coverage.

HD SpotLight Wi-Fi

Hyper-directional antenna technology focuses wireless signals directly to individual users, increasing efficiency and minimizing interference. This precision targeting is key to delivering a faster, more consistent user experience.

Software-Defined Reconfigurable Coverage

Enables real-time customization of radio coverage to adapt dynamically to venue layouts, crowd movements, and evolving connectivity demands.

Fortinet's UHD solutions are engineered with hardware and management capabilities that translate innovation into real-world performance. From optimized access point placement to breakthrough Wi-Fi 7 capacity and streamlined controller-based operations, these features ensure consistent, high-quality connectivity even in the most demanding environments.



Highlights

- Concurrent quad-radio 802.11be 4x4:4
- PHY wireless rate up to 17.3 Gbps
- 16 concurrent MIMO streams
- Up to 2048 associated devices per AP
- Up to 200+ active devices per AP
- 15 Gbps backhaul RJ-45 GbE
- Built-in antennas: wide/narrow/directional beams
- Patented beamforming + shaping technology
- Simultaneous polarization and pattern diversity
- 5/6 GHz 4x4:4 per radio for:
 - 4x4 MU-MIMO UEs per radio
 - 4 concurrent SU-MIMO UEs per radio
- Small and compact size for overhead mount
- IP67: outdoor, indoor, and industrial

FortiAP-HD -444Kx and -224Kx Series

Ultra High Density

Fortinet provides the industry's leading Wi-Fi solutions addressing today's most pressing ultra-high density (UHD) challenges, including high user engagement, increased network capacity, faster throughput, and low total cost of ownership (TCO). The UHD wireless platform is designed and built specifically for large venues such as stadiums, arenas, convention centers, shopping malls, transport hubs, auditoriums, campuses, and smart cities to deliver reliable, scalable, and secure connectivity in even the most demanding environments.

Ultra High Performance Wi-Fi 7 Series Access Points

These solutions leverage the high-performance Wi-Fi 7 Series access points operating in the 5 GHz and 6 GHz bands (AFC standard power) including the 444KW for short range, 444KN for mid-range and 224Kx for long range coverage. Designed in a single overhead mount enclosure, this series is built on Fortinet's pioneering, field-proven, and next-generation architecture. The series delivers several industry-first innovations that include quad Wi-Fi 7 802.11be radios, patented UHD antenna technology, multi-radio beamforming and shaping, 16 concurrent MIMO streams, and 15 Gbps backhaul in a compact, low profile form factor.

Advanced Radio Architecture and Adaptive Antenna

The Series features the industry's only four Wi-Fi 7 radios, configurable in two modes: three 5 GHz radios and one 6 GHz radio, or two 5 GHz radios and two 6 GHz radios. With minimal internal radio interference and support for dual 6 GHz radios, the Series can leverage the full 1.74 GHz of available spectrum across the 5 GHz and 6 GHz bands, delivering the industry's highest and most flexible capacity.

The Series also incorporates patented multi-antennas that enables directional, reconfigurable, beam forming and shaping with optimized multi-beam patterns. These capabilities allow the antennas to adapt to different venue layouts, focusing signals toward intended users while reducing interference to others, two key factors for successful UHD deployments. All antennas support polarization and pattern diversity to maximize spatial and frequency reuse.

The Series supports key Wi-Fi 7 features such as DL/UL OFDMA, TWT, BSS coloring, and future capabilities including Preamble Puncturing, and MLO. Combined with its quad-radio and advanced antenna design, the Series delivers superior user engagement, best-in-class capacity, ease of deployment flexibility and lowest total cost of ownership (TCO).

The Series also provides additional capabilities such as advanced radio resource management, active multi-radio client load balancing, and assisted roaming, all fully supported by the Fortinet WLAN controller. Its intuitive, streamlined interface allows the Series to be configured, managed, and monitored quickly and with minimal effort, providing operational efficiency and system scalability.



Series models include four SKUs:

FAP-HD-444KW

FAP-HD-444KN

FAP-HD-224KR

FAP-HD-224KL

Specifications

FortiAP-HD-444Kx Series	
Performance and Capacity	
Max. Associated Devices	Up to 2048
Active Devices	Up to 200+
Peak PHY Rates	5 GHz: 2.882 Gbps 6 GHz: 5.765 Gbps Total: 14.4 Gbps (mode 1) and 17.3 Gbps (mode 2)
Advanced Radio Technology	
Radios Per AP	5 GHz [mode 1 or mode 2]: 3x and 2x 6 GHz [mode 1 or mode 2]: 1x and 2x
MIMO	4x4 (SU-MIMO or MU-MIMO)
MIMO Streams (per radio)	SU-MIMO: 4 streams for 4x4 5/6 GHz devices Max. 1441 Mbps per stream Max. 5765 Mbps (5/6 GHz at 160 MHz channel) MU-MIMO (5/6 GHz): 4 streams for 4 concurrent devices
Features	OFDMA, TWT, BSS color, AFC, TPC, DFS, TxBF, SGI, Future: MLO, PP, MRC, MLD, CDD, STBC, LDPC
Max Tx Power (varies by country code, band, MCS)	5 GHz: 26 dBm 6 GHz: 26 dBm
Rx Sensitivity	802.11n/ac (MCS0, HT20/VHT20): -93 dBm 802.11ax/be (MCS0, EH20/EHT20): -93 dBm
Antenna Characteristics	
Characteristics	Band-optimized, reconfigurable Internal and integrated Directional and reconfigurable Pattern, polarization, spatial diversity
Patterns (EI x Az)	5 GHz: [15° 30° 45°] x 30° 6 GHz: [20° 45°] x 30° 5 GHz scan range: 70° 6 GHz range: +/-10°
Max Physical Antenna Gain	5 GHz: 11.33 dB and 17.0 dB 6 GHz: 13.1 dB
Wi-Fi Specifications	
Supported Standards	IEEE 802.11a/b/g/n/ac/ax/be
Supported Rates	802.11b: 1 - 11 Mbps 802.11a/g: 1 - 54 Mbps 802.11n: 6.5 - 600 Mbps (MCS0-31, 1-4 SS) 802.11ac Wave 2: 6.5 to 1.733 Gbps (MCS0-9, 1-4 SS) 802.11ax HE: VHT20/40/80/160 802.11be EHT: EHT20/40/80/160/320
Supported Channels (based on country code)	5.15-5.25 GHz: 36-48 (FCC: U-NII-1/IC/ETSI) 5.25-5.35 GHz: 52-64 (FCC: U-NII-2A/IC/ETSI) 5.47-5.725 GHz: 100-140 (FCC: U-NII-2C/IC/ETSI) 5.725-5.850 GHz: 149-165 (FCC: U-NII-3/IC) 5.625-6.425 GHz: 1-93 (FCC: U-NII-5) 6.525-6.885 GHz: 117-185 (FCC: U-NII-7)
Channelization	20/40/80/160 MHz
Security (pending)	Wi-Fi Protected Access (WPA) IEEE 802.11i (WPA2, WPA3, RSN) Transport Layer Security (TLS) Datagram Transport Layer Security IEEE 802.1X Encryption: AES, CBC, CCM CCMP128,256

FortiAP-HD-444Kx Series	
Power	
Max Input Power (per port)	POE+: 25.5 W @ 42.5 - 56 VDC 4PPoE: 30 W @ 42.5 - 56 VDC 4PPoE: 60 W @ 42.5 - 56 VDC
Max Power Consumption	51 W
Physical Interfaces	
Ethernet	1x 10 Gbps + 1x 5 Gbps Auto-sensing PoE 802.3at (Type I) [802.3af] PoE+ 802.3at (Type II) [802.3at] 4P PoE++ 802.3bt LLDP
Physical Characteristics	
Dimensions (LxWxH)	444 mm x 344 mm x 82 mm 17.5 in x 13.5 in x 3.2 in
Weight	1.6 Kg (3.5 lbs)
Environmental	
Operating Temperature	-40°C to 55°C (-40°F to 131°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F). Below -20°C: up to 20 min. for min internal operating temp of -20°C
Operating Humidity	5% to 95% non-condensing
Operating Altitude	3000 m
Surge Immunity:	1 kVa
Lightning Protection	-4 kV (with optional ext. primary protection)
Additional Features	Air vent valve for balancing humidity and pressure UV resistant Corrosion: IP67 rated (water, dust, smoke)
Wireless and Traffic Management	
Standards (pending)	802.11e QoS 802.11k RRM 802.11r Fast BSS transition (FT) 802.11v Wireless Network Management 802.11ae Prioritization of Management Frames
Wireless and Traffic Features (pending)	Airtime fairness Client load balancing Dynamic radio management based on client, radio, and AP metrics
Interfaces	WLAN controller: WMS and AC
Certification and Compliance	
Wi-Fi Alliance (pending)	Wi-Fi Certified n, ac, ax, be Wi-Fi Protected Access (WPA2, WPA3) Protected Management Frames Voice-Enterprise WMM® (Wi-Fi Multimedia™)
Regulatory and Safety (pending)	
Emissions (EMI/EMC)	FCC Part 15, Class B ICES-003 issue 6, Class B
Radio	FCC Part 15c, part 15e (US)
Surge	IEC 61000-4-5 Edition 2.0 2014, EN61000-4-5:2014
Safety	UL2043
Reliability	
MTBF	184 874 hours (calculated)
MTTR	30 minutes

* Frequency selection, transmit power, and certain communication features may be limited to comply with regional regulatory requirements. Operation in the 6 GHz band is subject to country-specific regulations and restrictions.



Specifications

FEATURE	FAP-HD-444KW	FAP-HD-444KN	FAP-HD-224KR FAP-HD-224KL
Wi-Fi Radios	4 Highest for UHD	4 Highest for UHD	2
5/6 GHz Radios	Mode 1: 3/1 Mode 2: 2/2	Mode 1: 3/1 Mode 2: 2/2	2/0
Total number of streams	16 Highest for UHD	16 Highest for UHD	4
Max Channel BW	160 MHz	160 MHz	80 MHz
Max PHY rate	17.3 Gb/s Highest for UHD	17.3 Gb/s Highest for UHD	3 Gb/s
Max associated users	2048 Highest for UHD	2048 Highest for UHD	1024
Max concurrent active users	200+ Highest for UHD	200+ Highest for UHD	100+
Max 5 GHz Antenna Gain	7.15 dBi	11.33 dBi	17 dBi
Max 6 GHz Antenna Gain	5.7 dBi	13.1 dBi	n/a
Antenna Beamwidths (EI x Az)	110° x 110°	[15° 30° 45°] x 30°	15° x 17°
Antenna Scan Range	360°	70° Largest for UHD	0° / 15° +/- 7.5°
Polarization	V & H	V & H	V & H
Diversity	Spatial/Angular	Angular/Beam	N/A
Coverage Range	Up to 75 ft	Up to 150 ft	Up to 250 ft
6 GHz AFC Standard Power (GPS + external antenna)	☑	☑	N/A
Max Power Consumption	51 W	51 W	33 W
Dimensions	12×12×3 in 31×31×7.6 cm Smallest UHD AP	18×14×3 in 44×34×8 cm Smallest UHD AP	18×14×3 in 44×34×8 cm
Weight	3.6 kg / 7.9 lbs Lightest UHD AP	4.0 kg / 8.8 lbs Lightest UHD AP	4.0 kg / 8.8 lbs



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FortiAP-HD-441K

Ultra High Density

Fortinet provides the industry's leading Wi-Fi solutions addressing today's most pressing ultra-high density (UHD) challenges, including high user engagement, increased network capacity, faster throughput, and low total cost of ownership (TCO). The UHD wireless platform is designed and built specifically for large venues such as stadiums, arenas, convention centers, shopping malls, transport hubs, auditoriums, campuses, and smart cities to deliver reliable, scalable, and secure connectivity in even the most demanding environments.

Optimized for Essential Indoor Environments

The FortiAP-HD-441K is an indoor, high density Wi-Fi 7 access point, designed for enterprise-grade connectivity for high-density data, voice and video applications. It is ideally suited for enterprise and retail networks where reliable, high-quality performance is essential.

Centralized Management and Intelligent Radio Optimization

The FortiAP-HD-441K integrates four Wi-Fi 7 service radios operating across the 2.4 GHz, 5 GHz, and 6 GHz bands, each supporting 4x4:4 MU-MIMO. This architecture enables true concurrent tri-band operation for high-capacity client connectivity, while an additional dedicated 2x2 scanning radio provides continuous spectrum monitoring, security analytics, and RF optimization without impacting user traffic. The result is a high-performance enterprise access point designed to support dense wireless environments with maximum efficiency and reliability.

The FortiAP-HD-441K also provides additional capabilities such as advanced radio resource management, active multi-radio client load balancing, and assisted roaming, all fully supported and managed by the Fortinet WLAN controller. Its intuitive, streamlined interface allows the AP to be configured, managed, and monitored quickly and with minimal effort, providing operational efficiency and system scalability for deployments of up to 1500 access points (AP).

Integrated Enterprise Security

The FortiAP-HD-441K delivers integrated, easy-to-configure security features that ensure safe and reliable connectivity for both employees and guests. With support for the latest 802.1 security standards, robust encryption and WPA3 authentication, the FortiAP-HD-441K provides the enterprise-grade protection required for modern workspaces and high traffic environments.

Intelligent Client Roaming and Load Balancing

Our patent-pending load balancing algorithms intelligently manage client associations, throughput, and roaming to ensure optimal performance.

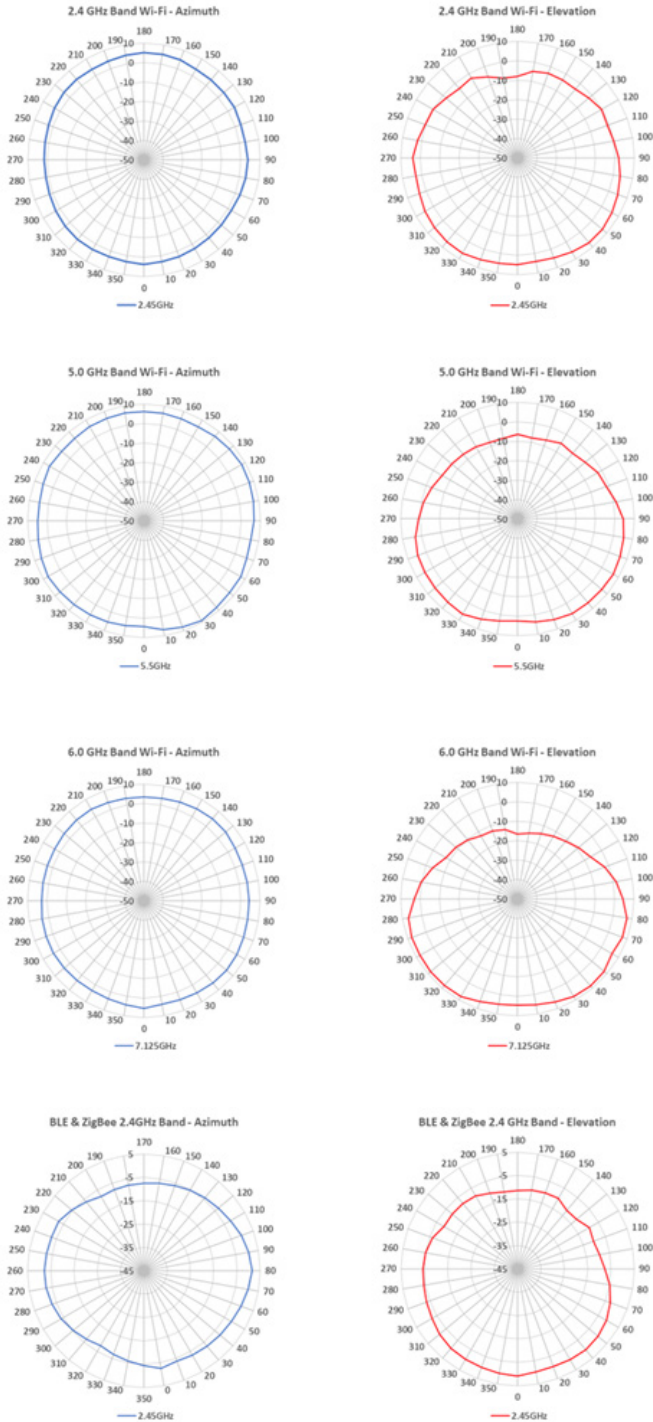
Highlights

- Tri band Wi Fi 7 (2.4 / 5 / 6 GHz)
- 4x4 MIMO on 2.4, 5, and 6 GHz radios
- Up to 21.3 Gbps aggregate PHY rate
- Up to 512 clients per radio
- Supports up to 180+ active devices at 1 Mbps each
- 320 MHz channel support on 6 GHz
- 4096 QAM modulation support
- Dedicated 2x2 tri band scanning radio
- OFDMA, BSS Coloring, UL/DL MU MIMO, TWT, ZeroWait DFS
- Dual 10G multigigabit Ethernet uplinks
- Integrated BLE radio for IoT and location services
- Software configurable scanning across 2.4 / 5 / 6 GHz
- Internal high gain directional antennas
- WPA3 security with AES 128/256 encryption
- 802.3bt PoE support

Antenna Radiation Patterns

FAP-HD-441K

The FAP-HD-441K offers flexible mounting options (ceiling or wall mount). In either mounting position, the FAP-HD-441K provides a true hemispherical radiation pattern, providing broad, consistent coverage with minimal dead spots. Shown below is a typical view of the elevation (z-plane) coverage pattern for a ceiling mounted FAP-HD-441K.



Specifications

FortiAP-HD-441K	
Hardware Performance and Capacity	
Max. Associated Devices	Up to 512 clients per radio (Radio 1, Radio 2, and Radio 3)
Active Devices	Up to 180+ with up to 1 Mbps per device
Peak PHY Rates	6 GHz: 4804 Mbps (MCS 13, 320 MHz) 5 GHz: 2402 Mbps (MCS 13, 240 MHz) 2.4 GHz: 1201 Mbps (MCS 11, 40 MHz) Total: 21.3Gbps Backhaul: 2×10Gbps
Advanced Radio Technology	
Radios Per AP: 4 + 1 BLE	Radio 1: 2.4 GHz Radio 2: 5.0 GHz Radio 3: 6.0 GHz Radio 4: 2.4/5.0/6.0 GHz (Scanning)
MIMO Streams (per radio)	2.4 GHz: 4×4 5 GHz: 4×4 6 GHz: 4×4 2.4/5.0/6.0GHz: 2×2
Max Tx Power (varies by country code, band, MCS)	2.4 GHz: 29 dBm 5 GHz: 27.8 dBm 6 GHz: 23 dBm
Rx Sensitivity	-147 dBm
Features	OFDMA, BSS Coloring, UL/DL MU-MIMO, TWT, ZeroWait DFS
Antenna Characteristics	
Max Physical Antenna Gain	2.4 GHz: 4.0 dBi 5 GHz: 5.6 dBi 6 GHz: 5.4 dBi
Wi-Fi Specifications	
Supported Standards	802.11a, 802.11b, 802.11be, 802.11e, 802.11g, 802.11h, 802.11i, 802.11j, 802.11k, 802.11n, 802.11r, 802.11v, 802.11ac, 802.11ax, 802.11mc, 802.1X, 802.3ad, 802.3at, 802.3bt, 802.3az, 802.1Q, 802.11u, 802.11w, 802.3bz
Supported Modulation Type Rates	BPSK, QPSK, 64/256/1024/4096 QAM
Channelization	2.4 GHz: 2400-2495 MHz 5 GHz: 5150-5250 MHz, 5725-5850 MHz 6 GHz: 5925-6425 MHz, 6425-6525 MHz, 6525-6875 MHz, 6875-7125 MHz 2.4/5.0/6.0GHz
Security	WPA, WPA2, WPA3 (802.1x or Preshared key), WEP, Web Captive Portal
Encryption	AES. CBC, CCM, CCMP128,256

FortiAP-HD-441K	
Power	
Max Input Power	48W
Max PoE Power Consumption	41.7W
Input PoE Power Requirement	802.3bt (GPI-145)
DC Power Requirements	12V, 4A (SP-FAP250-PA-10)
Physical Interfaces	
Ethernet	x2 100M/1000M/2.5G/5.0G/10G Multigigabit (RJ45)
Power	PoE 802.3at (Type II), DC Jack (12Vdc)
Reset Button	(check)
Diagnostic LEDs	Power, radios, LAN
Physical Characteristics	
Dimensions (LxWxH)	9.84 × 9.84 × 2.26 inches (250 × 250 × 57.5 mm)
Weight	4.36 lbs (1.98 kg)
Environmental	
Operating Temperature	32°F to 122°F (0°C to 50°C)
Storage Temperature	-22°F to 158°F (-30°C to 70°C)
Operating Humidity	5% to 90% non-condensing
Wireless and Traffic Management	
Standards	802.11e QoS, 802.11k RRM 802.11r Fast BSS transition (FT) 802.11v Wireless Network Management 802.11ae Prioritization of Management Frames
Wireless and Traffic Features	Airtime fairness, client load balancing, Dynamic radio management (per client, radio, AP)
Certification and Compliance	
Wi-Fi Alliance	
Regulatory and Safety	
Radio	FCC Subpart B, Subpart C Part 15.247, Subpart E 15.407 CE EN300.328, EN301.893, EN 50385, EN 55032, EN 55024



Specifications

FortiAP 441K		
Hardware		
Type	Indoor AP	
Number of Radios	4 + 1 BLE	
Number of Antennas	Internal: x4 dual band WIFI + x4 6GHz WIFI + x2 Tri-band scanning + x1 2.4GHz BLE/ZigBee + x1 GPS	
Antenna Type Support		
Antenna Type and Peak Gain	Omni Directional Antenna Dual band antenna: 4.0 dBi for 2.4GHz 5.6 dBi for 5 GHz 6GHz antenna: 5.4dBi for 6GHz band	Tri-band antenna: 4.0 dBi for 2.4 GHz, 6.0 dBi for 5 GHz and 5.7 dBi for 6 GHz band BLE antenna: 5.1 dBi for 2.4GHz GPS active antenna: 2.2 dBi antenna
Frequency Bands (GHz)	· ISM 2.4-2.484 GHz · U-NII-1 5.15-5.25 GHz · U-NII-2A 5.25-5.35 GHz · U-NII-2C 5.47-5.725 GHz · U-NII-3 5.725-5.85 GHz	· U-NII-4 5.850-5.925 GHz · U-NII-5 5.925-6.425 GHz · U-NII-6 6.425-6.525 GHz · U-NII-7 6.525-6.875 GHz · U-NII-8 6.875-7.125 GHz
Radio 1 Capabilities	Frequency band: 2.4GHz Channel width: 20/40MHz Modulation: BPSK, QPSK, 64/256/1024 QAM MIMO Chains: 4x4 Service	
Radio 2 Capabilities	Frequency band: 5.0GHz UNII-1 to UNII-4 Channel width: 20/40/80/160/240MHz Modulation: BPSK, QPSK, 64/256/1024/4096 QAM MIMO Chains: 4x4 Service	
Radio 3 Capabilities	Frequency band: 6.0GHz UNII-5 to UNII-8 Channel width: 20/40/80/160/320MHz Modulation: BPSK, QPSK, 64/256/1024/4096 QAM MIMO Chains: 4x4 Service	
Radio 4 Capabilities	Frequency band: 2.4/5.0/6.0GHz Channel width: 20/40/80/160MHz Modulation: BPSK, QPSK, 64/256/1024 QAM MIMO Chains: 2x2 Scanning	
Maximum Data Rate	2.4GHz band: up to 1.148 Gbps 5.0GHz band: up to 8.648 Gbps 6.0GHz band: up to 11.530 Gbps	
Bluetooth Low Energy (BT/BLE) Radio	Bluetooth scanning and iBeacon advertizement @10 dBm max TX power	
Trusted Platform Module (TPM)	Yes	
GNSS		
Supported Bands	GPS L1 C/A, QZSS L1 C/A: 1575.42 MHz,	
Default constellations	GLONASS L1: 1598.0625-1605.375 MHz BDS B1I : 1561.098 MHz, Galileo E1: 1575.42 MHz GPS + GLONASS + BDS + Galileo + QZSS	
No. of tracking channels	47	
No. of concurrent GNSS	5	
SBAS	WAAS, EGNOS, MSAS and GAGAN	
Sensitivity (@ default constellations)	-147dBm	
Interfaces	x2 100M/1000M/2.5G/5.0G/10G Multigigabit Ethernet (RJ45) x1 Type 3.0 USB at 4.5W, x1 RS-232 RJ45 Serial Port	
Power over Ethernet (PoE)	LAN1:802.3bt, LAN2:802.3bt	
Hit-less PoE Failover	Yes	
Simultaneous SSIDs	Up to 8 per client serving radio (7 if background scanning is enabled)	
EAP Type(s)	EAP-TLS, EAP-TTLS/MSCHAPv2, PEAPv0/EAP-MSCHAPv2 PEAPv1/EAP-GTC, EAP-SIM, EAP-AKA, EAP-FAST, EAP-TTLS/PAP	
User/Device Authentication	WPA™, WPA2™, and WPA3™ with 802.1x or Preshared key, WEP, Web Captive Portal, MAC blacklist and whitelist	
Maximum Tx Power (Conducted)	2.4GHz band: 29 dBm / 794 mW (4 chains combined)*5.0GHz band: 27.8 dBm / 602 mW (4 chains combined)*6.0GHz band: 23 dBm / 200 mW (4 chains combined @ 160MHz BW)*	

FortiAP 441K	
Kensington Lock	Yes
IEEE Standards	802.11a, 802.11b, 802.11be, 802.11e, 802.11g, 802.11h, 802.11i, 802.11j, 802.11k, 802.11n, 802.11r, 802.11v, 802.11ac, 802.11ax, 802.11mc, 802.1X, 802.3ad, 802.3at, 802.3bt, 802.3az, 802.1Q, 802.11u, 802.11w, 802.3bz
SSID Types Supported	Local-Bridge, Mesh, and Tunnel
IPv6 Support	Yes
Per Radio Client Capacity	Up to 512 clients per radio (Radio1, Radio2 and Radio3)
Cellular Co-existence	Yes
LED Off Mode	Yes
Advanced 802.11 Features	
OFDMA	Yes
Spatial Reuse (BSS Coloring)	Yes
UL MU-MIMO	Yes
DL- MU-MIMO	Yes
Enhanced Target Wake Time (TWT)	Yes
ZeroWait DFS	Yes
Onboard Security Functions	
UTP Capable	Yes
UTP Features	Application Control, Web Filtering
Wireless Monitoring Capabilities	
Rogue Scan radio modes	Background, Dedicated
WIPS / WIDS radio modes	Background, Dedicated (recommended)
Packet Sniffer Mode	Yes
Spectrum Analyzer	Yes
Dimensions	
Length x Width x Height	9.84 × 9.84 × 2.26 inches (250 × 250 × 57.5 mm)
Weight	4.36 lbs (1.98 kg)
Package (shipping) Weight	6.9 lbs (3.13 kg)
Mounting Options	Ceiling, T-Rail, and Wall
Included Accessories	Standard Mounting Kit for Ceiling, T-Rail, and Wall
Environment	
CPU/RAM	Quad-core ARM Cortex-A73 2.2GHz / 2 GB
Power Supply	GPI-145 or SP-FAP250-PA-10
Power Consumption (Max)	41.7 W
PoE Mode	Full - 802.3bt or 2x802.3at or DC : Tx Power - Maximum (all radios); # of Chains - 4x4 ; USB - Enabled High - 802.3at or 2x802.3af : R1(2.4GHz), R2(5GHz) and R3 (6GHz) Operation in Low Tx Power 17 dBm, # of Chains - 2x2; R4 operational ; USB - Disabled
Humidity	5% to 90% non-condensing
Operating/Storage Temp.	32°F to 122°F (0°C to 50°C) / -22°F to 158°F (-30°C to 70°C)
Directives	Low Voltage Directive * RoHS
UL2043 Plenum Material	Yes
Mean Time Between Failures	>10 Years
IP Rating	N/A
Surge Protection Built In	Yes
Certifications	
Wi-Fi7 Certified	Certified
DFS	Europe, FCC, Japan, Australia, Brazil, Taiwan, S. Korea, India
Warranty	
Limited Lifetime Warranty	Yes

* Frequency selection, power, and some communication features may be restricted to abide by regional regulatory compliance laws.



Highlights

- Web based intuitive 'Single pane of glass' management interface
- Auto discovery and configuration of FortiAP-HD Wi-Fi access points
- Bulk tools to configure and manage access points and software upgrades
- Customizable dashboard with pre-defined network reports and analytics
- Client performance data and analytics
- Stacked multi-floor providing direct view of AP status and metrics, and direct access to configuration and monitoring
- Customizable alerts and event notification
- Advanced 'Event Analytics' for UHD environments such as stadiums, arenas, and concert halls
- Automatic event report generation with user-selectable time-based graphs such as network users, throughput, and total data
- Advanced features such as client load balancing, fast roaming, and carrier Wi-Fi offload
- RESTful APIs for third party integration
- Compatible with TR-069 and TR-181 standards

FortiAP-HD WLAN Controller

Wireless Management System for UHD Environments

Fortinet provides the industry's leading Wi-Fi solutions addressing today's most pressing ultra-high density (UHD) challenges, including high user engagement, increased network capacity, faster throughput, and low total cost of ownership (TCO). Our solutions leverage the FortiAP High Density (FortiAP-HD) Wi-Fi platform, designed and built specifically for large venues such as stadiums, arenas, convention centers, shopping malls, transport hubs, auditoriums, campuses, and smart cities to deliver reliable, scalable and secure connectivity in even the most demanding environments.

Centralized WLAN Control and Streamlined Network Management

A foundational component of the Fortinet UHD platform is the FortiAP-HD WLAN controller, a fully featured controller and wireless management system built for UHD-grade WLAN networks. Delivered as a software-suite, the FortiAP-HD WLAN controller is engineered for speed, simplicity, and operational efficiency. Key capabilities include rapid network deployment, effortless access point configuration, streamlined management, comprehensive performance monitoring and real-time network visualization, to support environments ranging from small installations to large scale deployments with up to 1000 APs and 100 000 users.

Speed, Simplicity and Real-Time Network Insight

For fast and efficient network deployment, the FortiAP-HD WLAN controller enables APs to be auto-discovered and configured either automatically, in bulk, or through importable custom configurations. Even large-scale networks can be brought online within minutes.

The FortiAP-HD WLAN controller provides a browser-based, single pane of glass interface accessible across all platforms, including mobile devices, simplifying configuration and day to day management. Its intuitive design streamlines workflows and makes it easy to manage networks of any size.

For comprehensive performance monitoring and tracking, the controller offers a customizable, visually rich dashboard that delivers real-time analytics in preconfigured, chart-based, and time-trend formats. Administrators can drill down from network-level views to device-level views for deep RF and data analysis, as well as archive user-defined event data.

For real-time network visualization, the controller includes a dynamic multi-floor map views that display AP locations, real-time performance parameters, heat maps, and threshold-based color-coding for rapid AP fault identification.

Designed with an agile, high-performance software architecture, the FortiAP-HD WLAN controller provides all the tools necessary to manage, monitor, and optimize network performance through a streamlined, easy-to-navigate user interface.



FortiAP-HD WLAN Controller

Simple And Intuitive User Interface

The FortiAP-HD WLAN controller is a modern browser-based software platform with an intuitive single pane of glass for managing and optimizing FortiAP-HD-based WLAN systems. It streamlines AP deployment and management for small environments (1-64 APs), and up to large scale networks (64-100 APs), ensuring consistent operations. Network administrators can quickly configure all system, network, security and radio parameters, including transmit power, channel assignment, and antenna settings. Configurations for different events or operational requirements can be saved, retrieved, or archived for auditing and historical tracking.

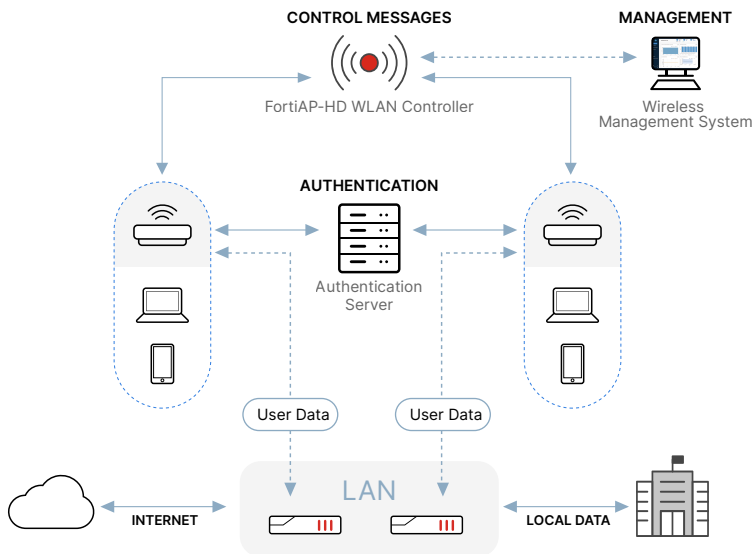


Real-Time Analytics and Customizable Reporting

The FortiAP-HD WLAN controller offers a rich, intuitive, and visually engaging dashboard, giving network administrators comprehensive views of the entire wireless network. The dashboard supports a wide range of predefined and customizable reports and analytics, easily arranged based on user preferences. Flexible reporting options offer predefined chart-based and time-trending views with insights into AP and client health, concurrent clients and visitors activity, and throughput and data transfer metrics.

High Availability Through Split Control Architecture

The FortiAP-HD WLAN controller integrates seamlessly into the existing network architecture of the venue. It utilizes a split control plane architecture in which all user traffic is switched locally at the access points, ensuring that APs continue to serve users even if connectivity to the FortiAP-HD WLAN controller is temporarily lost. Since only management and control traffic are sent to the FortiAP-HD WLAN controller through a secure and encrypted tunnel, this architecture delivers exceptional scalability, flexibility, and reliability across a wide range of deployment scenarios.



Scalability

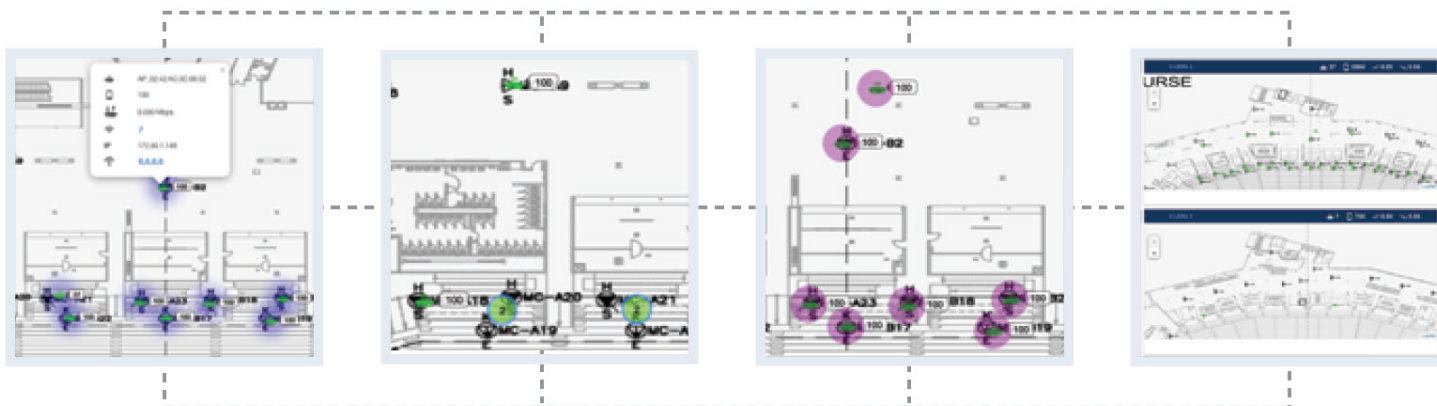
A single FortiAP-HD WLAN controller management system can manage up to 1000 access points and 100 000 clients, while supporting as many as 256 wireless networks.

Interactive Network Maps

The FortiAP-HD WLAN controller includes an advanced maps feature that delivers a powerful visual layer for managing and monitoring large numbers of access points. Administrators can upload custom floor plans and place APs directly onto the map for an accurate, site-specific view. A color-coded system status provides immediate views of operational status, enabling rapid identification of areas that may require attention.

The maps view offers intuitive, real-time visualization of key network performance metrics, such as client load and AP throughput, displayed either per-AP for detailed insights or through heat maps for broader, environment-wide analysis.

To simplify visibility of large deployments, the controller intelligently clusters nearby APs together, allowing administrators to zoom in and out of each cluster to quickly identify APs that might require attention. When action is required, AP configuration settings and performance data are directly accessible within the map interface, minimizing navigation and saving time. The maps view also supports timeline and historical views, to provide deeper insights into network performance behaviors and trends.



Real-Time Alerts

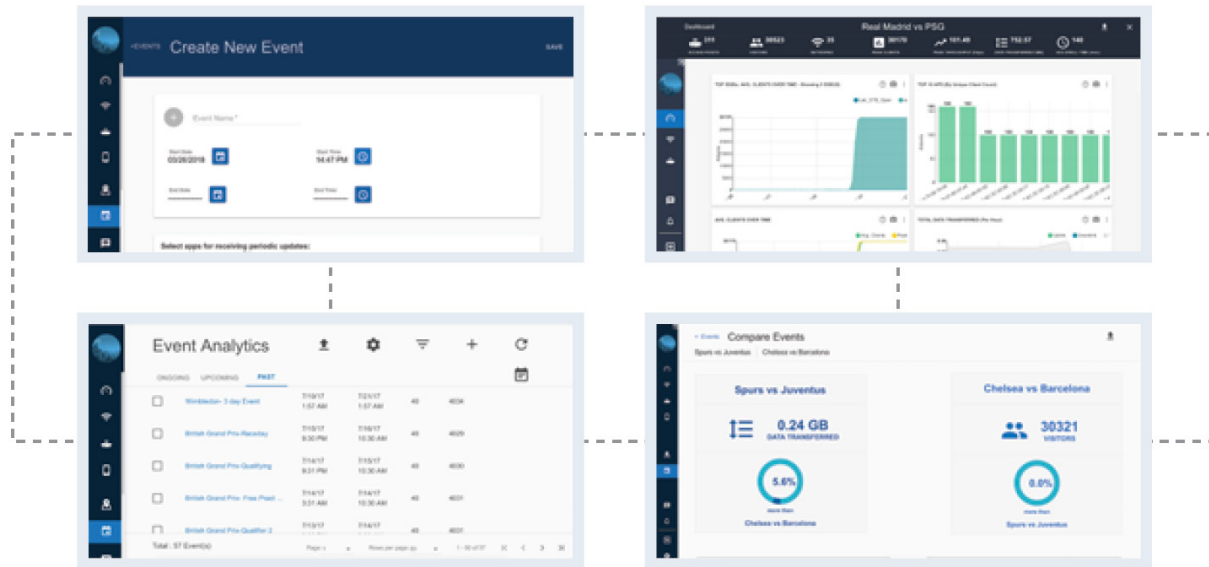
The FortiAP-HD WLAN controller includes an alerts feature that enables administrators to track alarms and events in real time. Historical views of alarm and event activity help administrators quickly identify patterns and potential issues.

Real-Time Client Insights

The FortiAP-HD WLAN controller provides real-time, detailed client information including device type, association time, signal strength, and throughput. This information enables administrators to track individual clients and access their analytics such as recent AP associations, timestamps, and roaming behavior for deeper visibility.

Events Analytics

The FortiAP-HD WLAN controller includes a powerful Event Analytics feature, designed specifically for high-capacity venues such as stadiums, convention centers and arenas. Administrators can upload an events calendar, and allow the controller to automatically track, analyze, report, and store analytics for each event. Detailed reports can be generated at the completion of each event, providing valuable insights into performance, usage and trends across the events.



Intelligent Client Load Balancing

The FortiAP-HD WLAN controller interacts with the access points (APs) to deliver advanced client load balancing, optimizing network performance and ensuring a consistent user experience. It automatically discovers neighboring APs and intelligently distributes clients to maintain optimal connectivity and balanced load.

Carrier Offload

The FortiAP-HD WLAN controller provides a Carrier Offload feature that enables mobile traffic to shift from the MNO anchor network to the Wi-Fi network. Mobile devices automatically detect the carrier-specific SSID, connect to the Wi-Fi network, and authenticate through the carrier's infrastructure. Detailed metering reports can be generated for carrier visibility and analysis.

RESTful API Integration

The FortiAP-HD WLAN controller offers a comprehensive set of RESTful APIs for seamless third-party integration. The APIs provide access to detailed network-wide status, statistics, and analytics and can be used to build or integrate with powerful third-party reporting and alerting applications. Payloads are delivered in JSON and also offer a compressed version to reduce bandwidth consumption when retrieving statistics in large-scale deployments.



Specifications

FortiAP-HD WLAN Controller	
Capacity	
Access Points	Up to 1000
Concurrent Devices	Up to 100 000
Wireless Networks	Up to 256
Applications	
Captive Portal	Integrates with well-known third party captive portal providers
Hotspot	802.11u
Voice	802.11e WMM
Carrier Offload (on-boarding)	Supported
User Analytics	Available
Security	
Standards	WPA-2 and WPA-3 802.11i
Encryption	AES
Authentication	802.11X Captive portal
Access Control	Client isolation
	Client blocklist
Quality of Service	
Traffic Prioritization	Supported (DSCP to wireless queues mapping)
Client Load Balancing	Supported
Wireless Multi-media	Supported
Management	
Configuration	Out-of-the-box web-based UI Tools for bulk configuration of APs
AP Provisioning	Auto-provisioning using staging servers
MAPs	Upload multiple custom floor plans
	One click AP configuration and monitoring
	Search and filter by AP name
	Heat maps for client density, throughput, and radio utilization Timeline
Analytics	Granular data available
	Daily
	Persistent event analytics reports
APIs	REST APIs with JSON encoding
	Compression support for bulk fetches
Alerts	Available
Minimum Server Appliance Requirements	
VM	8 CPU cores
RAM	16 GB
Hard Disk	320 GB



Ordering Information

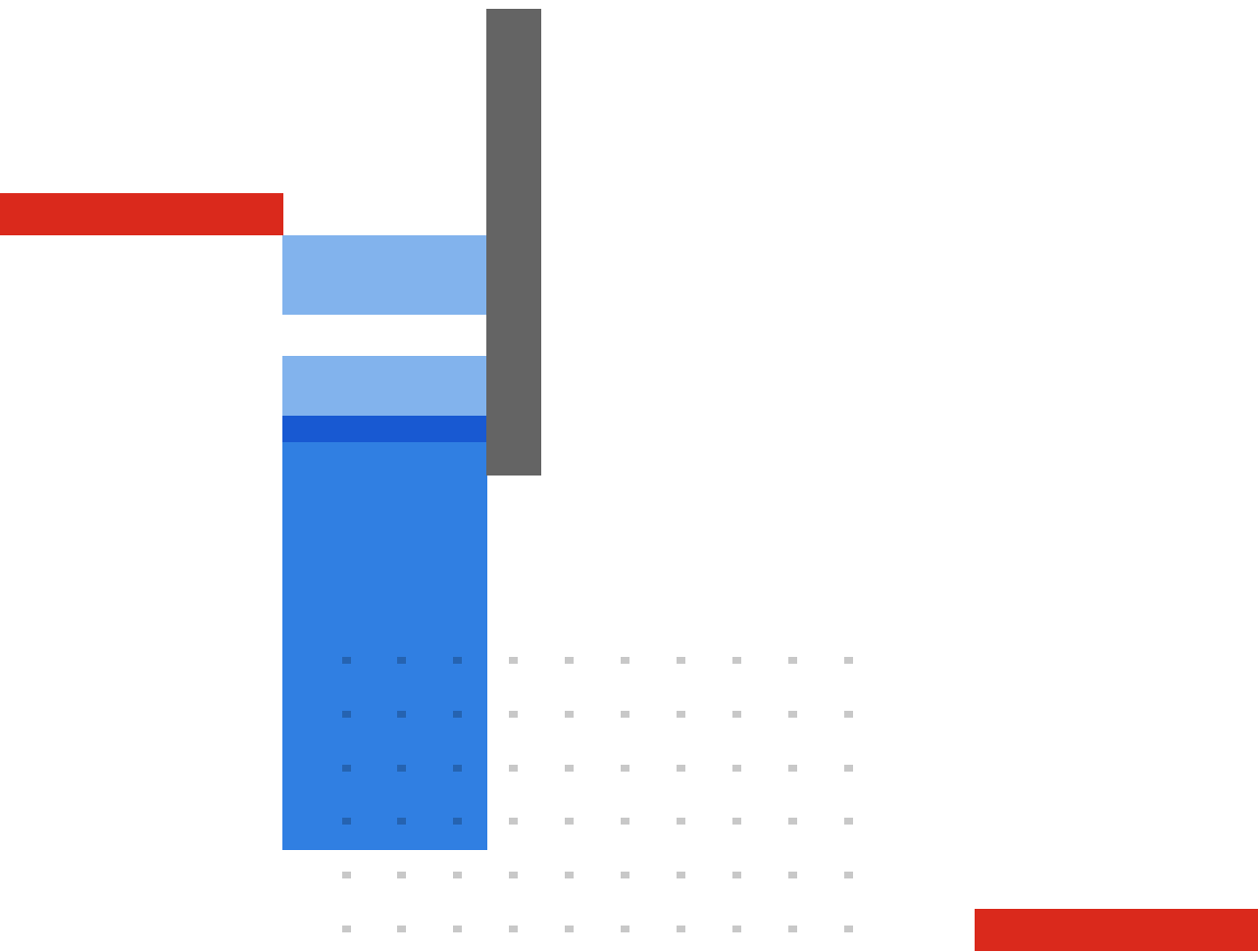
Product	SKU	Description
FortiAP-HD-444KW	FAP-HD-444KW	Wireless Outdoor High Density Wide Reconfig AP - Four radio 4×4 streams (Wi-Fi 7 IEEE 802.11be Dual-band 5/6 GHz config modes supported) Note: 6 GHz band not available in all regulatory domains], internal antennas, 1× 10 Gbps. 1× 5 Gbps. 802.3bt PoE supported. Use of the 6 GHz band subjects to regional regulatory authority approval.
	FC-10-HD4KW-247-02-DD	Forticare Premium Support.
FortiAP-HD-444KN	FAP-HD-444KN	Wireless Outdoor High Density Narrow Reconfig AP - Four radio 4×4 streams (Wi-Fi 7 IEEE 802.11be Dual-band 5/6 GHz config modes supported) [Note: 6 GHz band not available in all regulatory domains], internal antennas, 1× 10 Gbps. 1× 5 Gbps. 802.3bt PoE supported. Use of the 6 GHz band subjects to regional regulatory authority approval.
	FC-10-HD4KN-247-02-DD	Forticare Premium Support.
FortiAP-HD-224KR	FAP-HD-224KR	Wireless Outdoor High Density Ultra Narrow Fixed Right Beam AP - Two radio 4×4 streams (Wi-Fi 7 IEEE 802.11be Dual 5 GHz) internal antennas, 1× 10 Gbps. 1× 5 Gbps. 802.3bt PoE supported.
	FC-10-HD2KR-247-02-DD	Forticare Premium Support.
FortiAP-HD-224KL	FAP-HD-224KL	Wireless Outdoor High Density Ultra Narrow Fixed Left Beam AP - Two radio 4×4 streams (Wi-Fi 7 IEEE 802.11be Dual 5 GHz) internal antennas, 1× 10 Gbps. 1× 5 Gbps. 802.3bt PoE supported.
	FC-10-HD2KL-247-02-DD	Forticare Premium Support.
FortiAP-HD-441K	FAP-HD-441K-[RC]	Indoor Wireless AP - 4 radios (Wi-Fi-7 Tri-band 2.4/5/6GHz 4+4+4 4 streams 4 radios), internal antennas, 2× 10G Base-T RJ45, BT/BLE, 1x Type A USB, 1x RS-232 RJ45 Serial Port. Ceiling/wall mount kit included. For power order: 802.3bt PoE injector. Region Code *
	FC-10-H441K-247-02-DD	FortiCare Premium Support.
FortiAP-HD WLAN Controller	LIC-WMS-HD-SW	WMS High Density Software Per Site.
	FC-10-HDWMS-248-02-DD	Forticare Premium Support.

Visit <https://www.fortinet.com/resources/ordering-guides> for related ordering guides.



Fortinet Corporate Social Responsibility Policy

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