ZYXEL





WAC6500 Series

802.11ac Dual Radio Unified Pro Access Point

In the Gigabit era in Wi-Fi connectivity, upgrading to the 802.11ac standard represents the next step in wireless evolution. Many enterprises looking to break the 1-Gbps Wi-Fi speed barrier face the challenge of replacing existing 802.11n access points. While 802.11n operates on both 2.4 GHz and 5 GHz frequency band, 802.11ac predominantly uses the 5 GHz band which by its nature traditionally reduces coverage when compared to 2.4 GHz. This led to costly and time consuming efforts for installers to ensure that sufficient APs were installed to give complete coverage.

Zyxel Smart Antenna technology is a groundbreaking feature of the WAC6500 Series of wireless APs that solves the coverage problem by adaptively adjusting antenna patterns to fit a variety of wireless environments. The WAC6500 Series's industry-leading RF output power and sensitivity combine to offer greater coverage and performance over traditional networks, making Zyxel's WAC6500 Series the ultimate one-to-one AP upgrade choice.

As well as Zyxel Smart Antenna technology, the WAC6500 Series includes several other new features including the innovative APFlexTM, tool-less mounting bracket, and many other software enhancements such as the Zyxel One Network utilities, making the WAC6500 a complete product designed to streamline network installation and speed deployment for the best possible Wi-Fi experience.



Dual-band 2.4 GHz and 5 GHz 802.11ac Wireless Access Point



WAC6503D-S and WAC6502D-S Smart Antenna AP is ideal for high-density and interferenceladen indoor environments



WAC6553D-E Outdoor AP featuring IP66-rated weather protection is ideal for harsh outdoor environments



Advanced IEEE 802.11ac delivers up to 1.75 Gbps combined data rates



Industry-leading receive sensitivity as low as -102 dBm



APFlex[™], DCS and tool-less bracket design streamline deployment



Zyxel One Network is supported



Datasheet WAC6500 Series

Benefits

Breakthrough Smart Antenna technology for any environment

The WAC6500 Series of 802.11ac APs delivers industry leading performance, thanks in part to its innovative Smart Antenna design. Featuring more than 700 optimized antenna patterns, the Zyxel Smart Antenna continuously calculates the ideal physical-layer path for each individual client. This feature not only offers the best possible signal by shaping to various patterns, but it also mitigates interference from other wireless clients. The WAC6500 Series's ultra-fast capabilities makes it perfect for delivering premium performance in interference-laden environments, such as conference rooms, airports, educational facilities and other high-density venues. And the series' enhanced adaptability further simplifies one-to-one AP replacement.

Best-in-class coverage and performance

In a Wi-Fi market crowded with 802.11ac APs, the WAC6500 Series stands out with regard to performance and coverage due to its unique RF design. The AP's three-stream hardware configuration provides power of up to 30 dBm while providing unequaled receive sensitivity as low as -102 dBm. The Zyxel Smart Antenna doubles the WAC6500 Series' performance over conventional internal antennas, and performs three times (3x) better than legacy 802.11n APs.

Easy and instant deployment with APFlex™, DCS, and tool-less bracket design

Zyxel APFlexTM eases installation by resolving the managed/standalone AP mode configuration, automatically integrating into the network environment with or without Dynamic Host Configuration Protocol (DHCP), eliminating the need for pre-installation preparation. Other helpful features include Dynamic Channel Selection (DCS), avoid the interference of cochannel and overlapping channel at initialization. In addition to software solutions, the WAC6500 Series' simplifies installation through creative design features. For example, the universal and tool-less bracket design allows for flexible ceiling track mounting without the need for special tools. From software to hardware, the WAC6500 Series makes setup and operation fast and simple.

Efficient and reliable Wi-Fi network

The WAC6500 Series ensures users get the best possible overall network performance by utilizing load balancing and client steering. Load balancing allows administrators to set limits on network traffic and the number of clients associated with each AP. Client steering monitors the capabilities of each wireless client and steers them to the less congested band and better signal AP. When it comes to deployments in challenging cabling locations, wireless mesh networks help extend Wi-Fi coverage. Zyxel's proprietary ZyMesh creates reliable and resilient mesh links instantly. Yet the configuration is intuitive and centralized manageable on NXC controller. ZyMesh improves network reliability through true wireless connectivity with repeater APs selecting multiple routes to provide backup and failover for uninterrupted service. Together, these three technologies provide the WAC6500 Series with unbeatable efficiency and reliability.

Zyxel One Network experience

Aiming for relieving our customers from repetitive operations of deploying and managing a network, Zyxel One Network is designed to simplify the configuration, management, and troubleshooting, allowing our customers to focus on the business priorities. Zyxel One Network presents an easy-to-use tool, Zyxel One Network Utility (ZON Utility), to realize speed network setup. Zyxel Smart Connect allows Zyxel networking equipment to be aware and recognize each other and further facilitating the network maintenance via one-click remote functions such as factory reset or power cycling. Zyxel One Network redefines the network integration across multiple networking products from switch to Wi-Fi AP and to Gateway.

Feature Highlights



Zyxel Smart Antenna

Zyxel Smart Antenna continuously applies a unique algorithm to compute the best physical-layer path for every individual client. It not only considers best signal, but also mitigates RF interference on over 700 optimized antenna patterns. The "switch-beam" technique mitigating RF interference runs at the physical layer, requiring no effort on the part of the enduser. The adaptive antenna design handles a variety of tough deployments, including high-capacity, high-performance and interference-laden environments like conference rooms, airports, classrooms and other crowded venues.



Tool-less Installation

WAC6500 Series features a creative mounting bracket design allowing installation of the AP in a variety of suspended ceiling tracks without the need for tools. The variable width of ceiling tracks makes our bracket universally adaptable to any building structure. Individual end-users can easily install the hardware, saving valuable time that could be better spent deploying additional APs.



Zyxel APFlex™

Zyxel APFlex™ includes Zero-touch AP mode changing and Automatic IP configuration. The Zero-touch AP mode setting detects if there is an existing Zyxel controller and chooses stand-alone or managed mode. The Automatic IP configuration removes manual configuration, allowing the AP to set itself to fixed or dynamic IP address automatically. With these two intelligent features, IT administrators can skip the two critical settings that were handled manually on legacy products, shifting focus to more critical configuration tasks.



Wireless Layer-2 Isolation

The Layer-2 isolation protects private networks among client users, allowing users to access their shared devices without entering the rest of a private network for enhanced security. In addition, the intra-BSS blocking prevents different WiFi clients associated with the same AP from seeing each other and each others data.



WPA2 Enterprise Certified

Zyxel WAC6500 Series has been certified with industrial-strength WPA2 enterprise protection and supports a wide range of Extensible Authentication Protocol (EAP) types. It can be seamlessly integrated with deployed corporate RADIUS servers.



Zyxel Wireless Optimizer

Zyxel Wireless Optimizer (ZWO) provides a

powerful tool for centralized management covering initial planning, adjustment during deployment and after-sale maintenance of an AP network. Architects can simulate AP deployment on a map displaying the number of APs needed. During deployment, ZWO will also map actual signal coverage for architects to adjust their AP locations or configurations. After-sale, network administrators can access key performance details from ZWO, including channel in use, transmit retry rate and frame error rate, as well as the devices on the environment map. ZWO's user-friendly presentation saves time and facilitates quick response to the network problems.



Zyxel One Network Utility

To streamline the management process, the WAC6500 Series comes with the Zyxel One Network (ZON) utility, allowing administrators to assign IP addresses to multiple APs through just one platform. Administrators can avoid the hassle logging into each AP to change the default IP addresses before physical installation.



ZyMesh

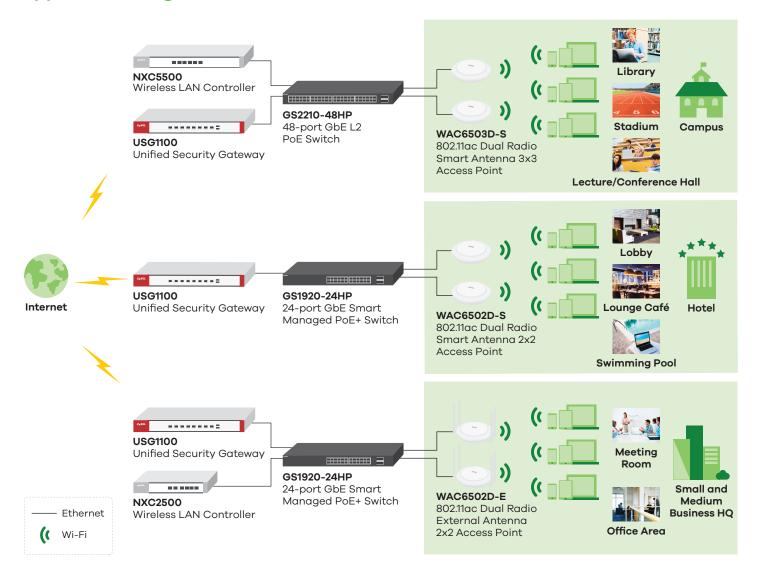
Wireless Mesh is an array of access points automatically forming dynamic wireless links. Built on this foundation of mesh networking, ZyMesh is Zyxel's proprietary protocol for creating wireless mesh links for easy configuration, optimized management and enhanced reliability.



Zyxel AP Configurator

While deploying a number of APs, repetitive configuration of each unit takes time and effort. Zyxel AP Configurator (ZAC) builds templates that allows users to copy one profile to several APs, allowing batch firmware upgrades and profile backups in three easy steps to significantly reduce configuration time and effort.

Application Diagram



Robust Hardware & Smart Antenna



Specifications

Model		WAC6503D-S	WAC6502D-S	WAC6502D-E	WAC6553D-E
Product name		802.11ac Dual Radio Smart Antenna 3x3 Access Point	802.11ac Dual Radio Smart Antenna 2x2 Access Point	802.11ac Dual Radio External Antenna 2x2 Access Point	802.11ac Dual Radio External Antenna 3x3 Outdoor Access Point
		2,422	25,222	I Zyare I	ZyXEL
Main Design					
Wireless freq	uency	2.4 and 5 GHz	2.4 and 5 GHz	2.4 and 5 GHz	2.4 and 5 GHz
Radio		2	2	2	2
RF Specificat	tions				
Frequency bo	and	2.4 GHz (IEEE 802.11 b/g • USA (FCC): 2.412 to 2.4 • Europe (ETSI): 2.412 to • Taiwan (TW): 2.412 to	, 462 GHz o 2.472 GHz	 5 GHz (IEEE 802.11 a/n/ USA (FCC): 5.15 to 5.3 5.850 GHz European (ETSI): 5.15 5.725 GHz Taiwan (TW): 5.25 to 5 5.850 GHz 	5 GHz; 5.725 to to 5.35 GHz; 5.470 to
802.11n/ac premium features		 3x3 Multiple-Input Multiple-Output (MIMO) with three spatial streams Maximal Ratio Combining (MRC) 20-, 40- and 80- MHz channels Packet aggregation: A-MPDU (Tx/Rx), A-MSDU (Tx/Rx) Cyclic Delay Diversity (CSD) support Maximum Likelihood Demodulation (MLD) support Low Density Parity Check (LDPC) support 	 2x2 Multiple-Input Multiple-Output (MIMO) with two spatial streams Maximal Ratio Combining (MRC) 20-, 40- and 80-MHz channels Packet aggregation: A-MPDU (Tx/Rx), A-MSDU (Tx/Rx) Cyclic Delay Diversity (CSD) support Maximum Likelihood Demodulation (MLD) support Low Density Parity Check (LDPC) support 		 3x3 Multiple-Input Multiple-Output (MIMO) with three spatial streams Maximal Ratio Combining (MRC) 20-, 40- and 80- MHz channels Packet aggregation: A-MPDU (Tx/Rx), A-MSDU (Tx/Rx) Cyclic Delay diversity (CSD) support Maximum Likelihood Demodulation (MLD) support Low Density Parity Check (LDPC) support
Typical	FCC 11b/g	29	28	28	29
transmit output power (Conducted)	FCC 11g/n	29	28	28	29
	FCC 11a	30	28	28	29
	FCC 11n/a (ac)	30	28	28	29
	EU 11b/g	15	14	14	15
	EU 11g/n	15	14	14	15
	EU 11a	23	22	22	23
	EU 11n/a (ac)	23	22	22	23
Number of antenna		6 embedded smart antenna	4 embedded smart antenna	4 external	6 N-type connectors*
Antenna gain		4 dBi @2.4 GHz 6 dBi @5 GHz	4 dBi @2.4 GHz 6 dBi @5 GHz	5 dBi @2.4 GHz 7 dBi @5 GHz	-

^{*} The antenna is not embedded and external antennas are separately sold.

Model	WAC6503D-S	WAC6502D-S	WAC6502D-E	WAC6553D-E
RF Specifications				
Support data rate	•		1 Mbps ops in MCS15 (40 MHz)	 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps 802.11b: 1, 2, 5.5 and 11 Mbps 802.11n: up to 450 Mbps in MCS23 (40 MHz) 802.11ac: up to 1300 Mbps in MCS9 (80 MHz)
Receive sensitivity	Min. Rx sensitivity up to -102 dBm	Min. Rx sensitivity up to -100 dBm	Min. Rx sensitivity up to -100 dBm	Min. Rx sensitivity up to -102 dBm
Interfaces				
Number of 10/100/1000M LAN	2	2	2	1
Console port	RJ-45 serial	RJ-45 serial	RJ-45 serial	RJ-45 serial
PoE	Yes	Yes	Yes	Yes
PoE power draw	17.04W	15.12W	15.12W	25W
WLAN Features				
WLAN maximum throughput	Up to 900 Mbps	Up to 600 Mbps	Up to 600 Mbps	Up to 900 Mbps
Mesh AP (By license)*1	Yes*1	Yes*1	Yes*1	Yes*1
Mesh AP for multiple SSID with VLAN (through tunnel mode) ¹¹	Yes*¹	Yes*¹	Yes*¹	Yes* ¹
Fast roaming	Pre-authentication, PMK caching and 802.11r	Pre-authentication, PMK caching and 802.11r	Pre-authentication, PMK caching and 802.11r	Pre-authentication, PMK caching and 802.11r
Wireless Security				
WEP	Yes	Yes	Yes	Yes
WPA/WPA2-PSK	Yes	Yes	Yes	Yes
WPA/WPA2-Enterprise	Yes	Yes	Yes	Yes
EAP types	EAP-TLS, EAP-TTLS, EAPPEAP, EAP-FAST, EAP-AKA and EAP-SIM			
IEEE 802.1X	Yes	Yes	Yes	Yes
Number of SSID	16	16	16	16
Web authentication*1	Yes	Yes	Yes	Yes
MAC filtering	Yes	Yes	Yes	Yes
Layer-2 isolation	Yes	Yes	Yes	Yes
RADIUS authentication	Yes	Yes	Yes	Yes
Microsoft AD authentication [™]	Yes	Yes	Yes	Yes
LDAP authentication ¹	Yes	Yes	Yes	Yes
MAC authentication ^{*1}	Yes	Yes	Yes	Yes
Rogue AP detection [™]	Yes	Yes	Yes	Yes
Rogue AP containment ^{*1}	Yes	Yes	Yes	Yes

^{*1:} Features supported when working with Zyxel NXC controller series (ZyMesh feature on WAC6500 Series is available from FW release 4.21 or above.)

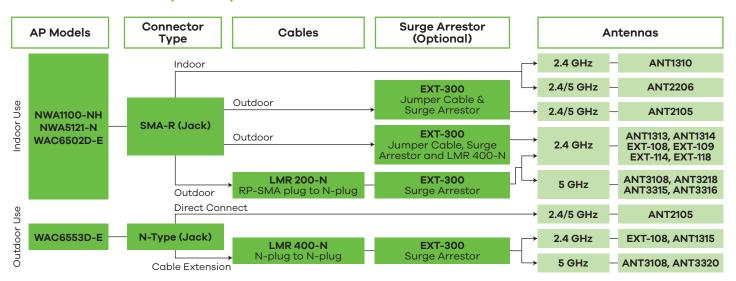
Pv6 host	Model	WAC6503D-S	WAC6502D-S	WAC6502D-E	WAC6553D-E
Pv6 host	Network				
Mode		Yes	Yes	Yes	Yes
WMM (Wi-Fl certified)	VLANs	Yes	Yes	Yes	Yes
WMM (Wi-Fi certified)	DHCP client	Yes	Yes	Yes	Yes
Ves	QoS				
DiffServ marking	WMM (Wi-Fi certified)	Yes	Yes	Yes	Yes
Property	WMM power save	Yes	Yes	Yes	Yes
### Discovery of Zyxel switches, APs and gateways - Centralized and batch configuration Password configuration Preserved configuration Preserv	DiffServ marking	Yes	Yes	Yes	Yes
Centralized and batch configuration Prenew Device reboot Prenew P	Management				
## One-click remote management access to the neighboring Zyxel devices ## Statch AP configuration	ZON utility	 Centralized and batch configurations IP configuration IP renew Device reboot Device locating Web GUI access Firmware upgrade 			ware upgrade
Batch AP profile backup	Smart connect	Neighbor device discovery			devices
### Standalone AP mode	Zyxel AP configurator	Batch AP configuration Batch AP firmware upgrade			
Managed AP mode Yes Yes Yes Yes CLI Yes Yes Yes Yes Web UI Yes Yes Yes Yes SNMP y2c/v3 y2c/v3 y2c/v3 y2c/v3 Others Plenum rating Yes Yes Yes Yes Kensington lock support Yes Yes Yes PoE: 802.3at Kensington lock support Yes Yes Yes - Input power DC input: 12VDC 2A; PoE: 802.3at compliant (Power adapter is sold separately) poE: 802.3at compliant MTBF (hr) 1,202,489 1,407,374 1,427,755 562,413 Standard Compliance Ethernet • IEEE 802.3	Zyxel wireless optimizer	Wi-Fi coverage detection			
CLI Yes Yes Yes Yes Web UI Yes Yes Yes Yes SNMP v2c/v3 v2c/v3 v2c/v3 v2c/v3 Others Plenum rating Yes Yes Yes Yes Kensington lock support Yes Yes Yes PoE: 802.3at Input power DC input: 12VDC 2A; PoE: 802.3at compliant (Power adapter is sold separately) PoE: 802.3at compliant (Power adapter is compliant) PoE: 802.3at compliant MTBF (hr) 1,202,489 1,407,374 1,427,755 562,413 Standard Compliance Ethernet IEEE 802.3 IEEE 802.3 IEEE 802.3 IEEE 802.3 IEEE 802.3 IEEE 802.3u IEEE 802.3au IEEE 802	Standalone AP mode	Yes	Yes	Yes	Yes
Web UI Yes Yes Yes Yes SNMP v2c/v3 v2c/v3 v2c/v3 v2c/v3 Others Plenum rating Yes Yes Yes Yes Kensington lock support Yes Yes Yes - Input power DC input: 12VDC 2A; PoE: 802.3at compliant (Power adapter is sold separately) PoE: 802.3at compliant PoE: 802.3at compliant MTBF (hr) 1,202,489 1,407,374 1,427,755 562,413 Standard Compliance Ethernet IEEE 802.3 IEEE 802.3 IEEE 802.3 IEEE 802.3 IEEE 802.3u IEEE 802.3au IEEE 802.3au <th>Managed AP mode</th> <th>Yes</th> <th>Yes</th> <th>Yes</th> <th>Yes</th>	Managed AP mode	Yes	Yes	Yes	Yes
SNMP V2c/v3 V2c/v3 V2c/v3 V2c/v3 Others Plenum rating Yes Yes Yes Yes Kensington lock support Yes Yes Yes - Input power DC input: 12VDC 2A; PoE: 802.3at compliant (Power adapter is sold separately) PoE: 802.3at compliant (Power adapter is sold separately) PoE: 802.3at compliant (Power adapter is sold separately) MTBF (hr) 1,202,489 1,407,374 1,427,755 562,413 Standard Compliance Ethernet • IEEE 802.3 • IEEE 802.3 • IEEE 802.3 • IEEE 802.3u • IEEE 802.3u • IEEE 802.1ab • IEEE 802.3u • IEEE 802.3u • IEEE 802.3u • IEEE 802.3u • IEEE 802.3au • IEEE 802.3au • IEEE 802.3au • IEEE 802.3au • IEEE 802.3au • IEEE 802.3au • IEEE 802.3at • IEEE 802.3at • IEEE 802.3at • IEEE 802.3at • IEEE 802.3at • IEEE 802.3at	CLI	Yes	Yes	Yes	Yes
Plenum rating Yes PoE: 802.3at PoE: 802.3at Sold separately) PoE: 802.3at	Web UI	Yes	Yes	Yes	Yes
Plenum rating Yes Yes Yes Yes Yes Yes Yes Tes Tes Yes Yes Yes Tes Yes	SNMP	v2c/v3	v2c/v3	v2c/v3	v2c/v3
New	Others				
Input power DC input: 12VDC 2A; PoE: 802.3at compliant (Power adapter is sold separately) Sold separately) 1,407,374 1,427,755 562,413	Plenum rating	Yes	Yes	Yes	Yes
Sold separately Compliant	Kensington lock support	Yes	Yes	Yes	-
Standard Compliance	Input power				
Ethernet	MTBF (hr)	1,202,489	1,407,374	1,427,755	562,413
IEEE 802.3u	Standard Compliance				
WLAN • 802.11b: DBPSK, DQPSK, CCK • 802.11g: BPSK, QPSK, 16-QAM, 64-QAM • 802.11a: BPSK, QPSK, 16-QAM, 64-QAM • 802.11n: BPSK, QPSK, 16-QAM, 64-QAM • 802.11ac: BPSK, QPSK, 64-QAM, 256-QAM Certifications Radio FCC Part 15C, FCC Part 15E, ETSI EN 300 328, EN 301 893, LP0002 EMC FCC Part 15B, EN 301 489-1, EN 301 489-17, EN55022, EN55024, EN61000-3-2/-3, EN60601-1-2, BSMI CNS13438	Ethernet	IEEE 802.3uIEEE 802.11abIEEE 802.3auIEEE 802.3az	IEEE 802.3uIEEE 802.11abIEEE 802.3auIEEE 802.3az	IEEE 802.3uIEEE 802.11abIEEE 802.3auIEEE 802.3az	IEEE 802.3uIEEE 802.11abIEEE 802.3auIEEE 802.3az
• 802.11a: BPSK, QPSK, 16-QAM, 64-QAM • 802.11a: BPSK, QPSK, 16-QAM, 1	PoE	IEEE 802.3at*1	IEEE 802.3at*1	IEEE 802.3at*1	IEEE 802.3at
Radio FCC Part 15C, FCC Part 15E, ETSI EN 300 328, EN 301 893, LP0002 EMC FCC Part 15B, EN 301 489-1, EN 301 489-17, EN55022, EN55024, EN61000-3-2/-3, EN60601-1-2, BSMI CNS13438	WLAN	• 802.11a: BPSK, QPSK, 16-QAM, 64-QAM • 802.11n: BPSK, QPSK, 16-QAM, 64-QAM			
EMC FCC Part 15B, EN 301 489-1, EN 301 489-17, EN55022, EN55024, EN61000-3-2/-3, EN60601-1-2, BSMI CNS13438	Certifications				
EN60601-1-2, BSMI CNS13438	Radio	FCC Part 15C, FCC Part 15E, ETSI EN 300 328, EN 301 893, LP0002			
Safety Safety EN 60950-1, IEC 60950-1, BSMI CNS14336-1	EMC				
	Safety	Safety EN 60950-1, IEC 60950-1, BSMI CNS14336-1			

^{*1:} Compatible with 802.3af mode with restricted function: 1x3 MIMO or 1x2 MIMO with 1 spatial stream.

Model		WAC6503D-S	WAC6502D-S	WAC6502D-E	WAC6553D-E
Physical Spec	ifications				
Item	Dimensions (WxDxH)(mm/in.)	236 x 227 x 62/ 9.28 x 8.95 x 2.43	236 x 227 x 62/ 9.28 x 8.95 x 2.43	236 x 227 x 62/ 9.28 x 8.95 x 2.43	255 x 256 x 62/ 10.04 x 10.08 x 2.44
	Weight (g/lb.)	982/2.17	961/2.12	841/1.86	1708/3.77
Packing	Dimensions (WxDxH)(mm/in.)	308 x 323 x 127/ 12.13 x 12.72 x 5.00	308 x 323 x 127/ 12.13 x 12.72 x 5.00	308 x 323 x 127/ 12.13 x 12.72 x 5.00	393 x 158 x 430/ 15.47 x 6.22 x 16.93
	Weight (g/lb.)	1743/3.85	1722/3.81	1699/3.75	3904/8.63
Included accessories		Ceiling mount plateMounting screws	Ceiling mount plateMounting screws	External antennaCeiling mount plateMounting screws	Pole/wall mounting kitsPoE injector (optional)Power cord (optional)
Environmento	al Specifications				
Weather prot	ection	-	-	-	IP66 (Embedded heater for harsh weather)
Operating environment	Temperature	0°C to 50°C/ 32°F to 122°F	0°C to 50°C/ 32°F to 122°F	-20°C to 60°C/ -4°F to 140°F	-40°C to 60°C/ -40°F to 140°F
	Humidity	10% to 90% (non-condensing)	10% to 90% (non-condensing)	10% to 90% (non-condensing)	10% to 90% (non-condensing)
Storage environment	Temperature	-40°C to 70°C/ -40°F to 158°F	-40°C to 70°C/ -40°F to 158°F	-40°C to 70°C/ -40°F to 158°F	-40°C to 70°C/ -40°F to 158°F
	Humidity	10% to 90% (non-condensing)	10% to 90% (non-condensing)	10% to 90% (non-condensing)	10% to 90% (non-condensing)

Optional Accessories

Antenna & Cable Compatibility



Power Modules

Part Number	Description		
ACCESSORY-ZZ0101F	Universal power adapter (12V/2A)		
POE12-HP-EU0102F	802.3at PoE injector, ROHS		
POE12-HP-US0102F	802.3at PoE injector, ROHS		

For more product information, visit us on the web at www.zyxel.com

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