



# HP Cloud-Managed 802.11n Dual Radio Access Point Series



## Key features

- 2.4GHz and 5GHz radio each with 2x2:2 or 3x3:3 MIMO
- Data rate up to 450 Mbps per radio with three spatial streams
- Built-in spectral analysis scans the 2.4GHz and 5 GHz bands to identify sources of RF interference
- Comprehensive WLAN security with intrusion detection offers threat protection
- Includes HP lifetime hardware warranty 2.0 with 24x7 phone support for three years at no cost

## Product overview

The HP Cloud-Managed 802.11n Dual Radio Access Point Series provide two and three spatial access points offering enhanced coverage and reliability for voice and multi-media communications.

Built-in application awareness and Motion Aware roaming enhance the mobile user experience and help ensure peak application performance. HP Wi-Fi Clear Connect RF optimization and integrated wireless IDS/IPS provide automatic detection, classification, and mitigation of non-IEEE 802.11 interference and wireless threats. The access points can be powered by PoE and help ensure 100 percent uptime in case of WAN link failure. The access points work with HP Cloud Network Manager pay-as-you-use cloud service to provide a simple and easy-to-manage network solution for SMB, K-12, and remote offices. The solution provides enterprise-class reliability and performance and simplifies day-to-day operations by helping eliminate the need for onsite IT and brings users online faster.

## Features and benefits

### Management

- Access point management
  - HP Cloud Network Manager is a cloud-based platform that enables you to manage your HP wireless network. Designed as a software-as-a-service (SAAS) subscription, Cloud Network Manager provides a standard web-based interface that allows you to configure and monitor multiple HP wireless networks from anywhere, provided you have a Internet connection.
- HP Wi-Fi Clear Connect
  - Provides a system-wide approach to delivering WLAN reliability by proactively determining and adjusting to changing RF conditions; helps optimize WLAN performance by detecting interference from Wi-Fi and non-Wi-Fi sources—by using spectrum analysis capabilities built into the access points, identifying rogue activity and making decisions at a system-wide level
- Advanced radio resource management
  - Automatic radio power adjustments
    - Include real-time power adjustments based on changing environmental conditions and signal coverage adjustment
  - Automatic radio channel
    - Provides intelligent channel switching and real-time interference detection
  - Intelligent client load balancing
    - Determines the number of clients across neighboring APs and adjusts client allocation to balance the load
  - Airtime fairness
    - Provides equal RF transmission time for wireless clients
- Spectrum analysis
  - Power/frequency spectrum analysis
    - Measures noise from IEEE 802.11 remote sources
  - Signal detection/classification
    - Identifies source of RF interference; for example, Bluetooth, cordless phones, and microwave ovens
  - Evaluation of channel quality
    - Helps detect severe channel degradation and improves the reporting of poor RF performance
- AP and client troubleshooting
  - From the Cloud Network Manager dashboard, you see an overview of any access point or client that may need attention, flagged in an easy-to-read section. To check an alert on an individual AP or client, you can search by AP name, MAC address or serial number or any other attribute – and then click on the device for more detailed information.
- Enhanced AP survivability
  - Your network stays available, since you have all the functionality you need locally, with no dependence on WAN links.

### **Quality of Service (QoS)**

- Wireless
  - Voice network

When a client is associated to the Voice network, all data traffic is marked and placed into the high priority queue in QoS (Quality of Service).
  - Wi-Fi Multimedia Traffic Management (WMM)

WMM supports voice, video, best effort, and background access categories.

### **Connectivity**

- IEEE 802.3af Power over Ethernet (PoE) support
  - simplifies deployment and dramatically reduces installation costs by helping to eliminate the time and cost involved in supplying local power at each access point location
- Direct DC power
  - APs can be powered directly by 12 VDC
- Auto-MDIX
  - Adjusts automatically for straight-through or crossover cables on the Ethernet interface

### **Mobility**

- Three spatial-stream MIMO technology
  - Provides the latest in Wi-Fi technology (HP355), which allows for 450 Mbps of signaling per radio; and delivers potentially more than a 50 percent increase in performance over any two spatial stream products
- Beam forming
  - Provides better coverage area and better performance at distances from the AP
- Band steering
  - Redirects 5 GHz-capable clients automatically to the less-congested 5 GHz spectrum
- Embedded antennas
  - provides excellent coverage through use of embedded high-gain antennas 4.5dBi (HP 355) / 3.9dBi (HP 350) at 2.4 GHz and 5.5dBi (HP 355) / 4.3dBi (HP350) dBi antenna at 5 GHz; no need for the added cost of external antennas
- Anywhere, anytime wireless coverage
  - Per-radio software-selectable configuration of frequency bands; self-healing, self-optimizing local mesh that extends network availability; Wi-Fi Alliance Certifications for interoperability with all IEEE 802.11a/b/g/n client devices
- WLAN SSID
  - Includes up to 16 SSIDs per radio, each with unique MAC address and configurable SSID broadcasts; individual security and QoS profiles per SSID
- AP client access control functions
  - offers IEEE 802.1X authentication using EAP-SIM, EAP-FAST
  - delivers MAC address authentication using local or RADIUS access
  - provides RADIUS AAA using EAP-MD5, PAP, CHAP, and MS-CHAPv2
  - supports RADIUS Client (RFC 2865 and 2866) with location-aware

## Security

- Integrated IDS / IPS support
  - The Intrusion detection system (IDS) is a feature that monitors the network for the presence of unauthorized APs and clients. It also logs information about the unauthorized APs and clients, and generates reports based on the logged information. The Intrusion Protection System offers a wide selection of intrusion detection and protection features to protect the network against wireless threats.
- IEEE 802.1X support
  - provides port-based user authentication with support for Extensible Authentication Protocol (EAP) MD5, TLS, TTLS, and PEAP with choice of AES, TKIP, and static or dynamic WEP encryption for protecting wireless traffic between authenticated clients and the access point
- Choice of IEEE 802.11i, WPA2, or WPA
  - locks out unauthorized wireless access by authenticating users prior to granting network access; robust Advanced Encryption Standard (AES) or Temporal Key Integrity Protocol (TKIP) encryption secures the data integrity of wireless traffic
- TKIP/WEP encryption
  - is supported only on legacy IEEE 802.11a/b/g clients as it has been deprecated from the IEEE 802.11n standard
- Physical security
  - Kensington security slot

## Warranty and support

- HP Lifetime Warranty 2.0
  - Advance hardware replacement for as long as you own the product with next-business-day delivery (available in most countries).
- Electronic and telephone support (for Lifetime Warranty 2.0)
  - limited 24x7 telephone support is available from HP for the first 3 years; limited electronic and business hours telephone support is available from HP for the entire warranty period; to reach our support centers, refer to [hp.com/networking/contact-support](http://hp.com/networking/contact-support); for details on the duration of support provided with your product purchase, refer to [hp.com/networking/warrantysummary](http://hp.com/networking/warrantysummary)
- Software releases
  - to find software for your product, refer to [hp.com/networking/support](http://hp.com/networking/support); for details on the software releases available with your product purchase, refer to [hp.com/networking/warrantysummary](http://hp.com/networking/warrantysummary)

## HP Cloud-Managed 802.11n Dual Radio Access Point Series

### Specifications



	<b>HP 350 Cloud-Managed Dual Radio 802.11n (WW) Access Point (JL011A)</b> <b>HP 350 Cloud-Managed Dual Radio 802.11n (JP) Access Point (JL067A)</b> <b>HP 350 Cloud-Managed Dual Radio 802.11n (US) Access Point (JL012A)</b>	<b>HP 355 Cloud-Managed Dual Radio 802.11n (WW) Access Point (JL013A)</b> <b>HP 355 Cloud-Managed Dual Radio 802.11n (JP) Access Point (JL068A)</b> <b>HP 355 Cloud-Managed Dual Radio 802.11n (US) Access Point (JL014A)</b>
<b>I/O ports and slots</b>	1 RJ-45 autosensing 10/100/1000 port (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only	1 RJ-45 autosensing 10/100/1000 PoE port (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T, IEEE 802.3af PoE); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only
<b>Additional ports and slots</b>	1 RJ-45 serial console port	1 RJ-45 serial console port
<b>AP characteristics</b> Radios (built-in) Radio operation modes AP operation modes Wi-Fi Alliance Certification Number of internal antennas	802.11a/n, a/b/g/n Client access, Local mesh, RF security Cloud-managed a/b/g/n Wi-Fi Certified 4	802.11a/n, a/b/g/n Client access, Local mesh, Packet capture Cloud-managed a/b/g/n Wi-Fi Certified 6
<b>Physical characteristics</b> Dimensions Weight	5.91(w) x 5.91(d) x 1.63(h) in (15 x 15 x 4.15 cm) 1.1 lb (0.5 kg) mounting bracket	7.09(w) x 7.09(d) x 1.77(h) in (18 x 18 x 4.5 cm) 1.43 lb (.65 kg) shipping weight mounting bracket
<b>Mounting and enclosure</b>	Indoor, plenum rated; Includes 5/16" and 9/16" ceiling mounting clips	Indoor, plenum rated; Includes 5/16" and 9/16" ceiling mounting clips
<b>Environment</b> Operating temperature Operating relative humidity Nonoperating/Storage temperature Nonoperating/Storage relative humidity	32°F to 104°F (0°C to 40°C) 5% to 95%, noncondensing -40°F to 158°F (-40°C to 70°C) 5% to 95%, noncondensing	32°F to 122°F (0°C to 50°C) 5% to 95%, noncondensing -40°F to 158°F (-40°C to 70°C) 5% to 95%, noncondensing
<b>Electrical characteristics</b> Country/Region Description Maximum power rating PoE power	WW IEEE 802.3af PoE compliant for Gigabit Ethernet  10 W PoE	WW IEEE 802.3af PoE compliant for Gigabit Ethernet 13 W 13 W PoE
	<b>Notes</b> PoE Power is the power supplied by the internal power supply, it is dependent on the type and quantity of power supplies and may be supplemented with the use of a External Power Supply (EPS).	USB host port is disabled when using an 802.3af PoE power source; for unrestricted operation with PoE power, use an 802.3at compliant source

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<b>Frequency band and operating channels</b>		
Americas	2.412 - 2.462 GHz (1 - 11 channels) 5.180 - 5.320 GHz (36 - 64 channels) 5.500 - 5.700 GHz (100 - 140 (excluding 5600-5670 MHz) channels)	2.412 - 2.462 GHz (1 - 11 channels) 5.180 - 5.320 GHz (36 - 64 channels) 5.500 - 5.700 GHz (100 - 140 (excluding 5600-5670 MHz) channels)
European Union	5.745 - 5.825 GHz (149 - 165 channels) 2.412 - 2.472 GHz (1 - 13 channels) 5.180 - 5.320 GHz (36 - 64 channels) 5.500 - 5.700 GHz (100 - 140 (excluding 5600-5650 MHz) channels)	5.745 - 5.825 GHz (149 - 165 channels) 2.412 - 2.472 GHz (1 - 13 channels) 5.180 - 5.320 GHz (36 - 64 channels) 5.500 - 5.700 GHz (100 - 140 (excluding 5600-5650 MHz) channels)
Rest of World (Actual channels designated by selecting country in UI)	2.412 - 2.472 GHz (1 - 13 channels) 5.180 - 5.320 GHz (36 - 64 channels) 5.500 - 5.700 GHz (100 - 140 channels) 5.745 - 5.825 GHz (149 - 165 channels)	2.412 - 2.472 GHz (1 - 13 channels) 5.180 - 5.320 GHz (36 - 64 channels) 5.500 - 5.700 GHz (100 - 140 channels) 5.745 - 5.825 GHz (149 - 165 channels)
Japan	2.412 - 2.472 GHz (1 - 13 channels) 5.180 - 5.320 GHz (36 - 64 channels) 5.500 - 5.700 GHz (100 - 140 channels)	2.412 - 2.472 GHz (1 - 13 channels) 5.180 - 5.320 GHz (36 - 64 channels) 5.500 - 5.700 GHz (100 - 140 channels)
<b>Radio</b>	FCC Part 15.247; IC RSS 210; RSS-210 (Canada); EN 300 328; EN 301-489-1; EN 301-489-17; EN 301 893 (Europe); EU 1999/519/EC; RSS-Gen (Canada); ETS 301 893; TELECOM 33B (Japan); OFTA (Hong Kong); MIC (Korea); DSPP (Japan); EN 300 328 (EU); OFTA approval (Hong Kong); MIC approval (Korea); EN 301 893 (EU); ETSI 301 893; ETSI 300 328; FCC Part 15.247 (no DFS); RSS-210, Issue 7; RSS-Gen, Issue 2; FCC Part 15.407; RSS-210, Issue 8; RSS-Gen, Issue 3; EN 301 893; RSS-210	FCC Part 15.247; FCC Part 15.407 (US); IC RSS 210; RSS- 210 (Canada); EN 300 328; EN 301-489-1; EN 301-489- 17; EN 301 893 (Europe); EU 1999/519/EC; RSS-Gen (Canada); ETS 301 893; TELECOM 33B (Japan); OFTA (Hong Kong); MIC (Korea); DSPP (Japan); EN 300 328 (EU); OFTA approval (Hong Kong); MIC approval (Korea); EN 301 893 (EU); ETSI 301 893; ETSI 300 328; FCC Part 15.247 (no DFS); RSS-210, Issue 7; RSS-Gen, Issue 2; NCCLP0002 (Taiwan); FCC Part 15.407 (no DFS); FCC Part 15.407; RSS- 210, Issue 8; RSS-Gen, Issue 3; EN 301 893
<b>Safety</b>	CE Labeled; CAN/CSA-C22.2 No.60950-00/UL 60950 - Third Edition, Safety Information for Technology Equipment; CAN/CSA-C22.2 No. 60950-1; EN 301 489- 17; EN 301 489-1; FCC Part 15, Subpart B; EN 300 328; EN 301 893; FCC Part 15.247, 15.209, 15.207; EU RoHS Compliant; EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN 61000-4-6; EN 61000-4-11; AS/NZS 60950:2000 Australia, Russian GOST Safety Approval; EN 60950-1:2006+A11:2009+A1:2010+A12:2011; IEC 60950- 1:2005, Amd 1: 2009	CE Labeled; CAN/CSA-C22.2 No.60950-00/UL 60950 - Third Edition, Safety Information for Technology Equipment; EN 301 489-17; EN 301 489-1; FCC Part 15, Subpart B; EN 300 328; EN 301 893; FCC Part 15.247, 15.209, 15.207; EU RoHS Compliant; EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN 61000-4-6; EN 61000-4-11; AS/NZS 60950:2000 Australia, Russian GOST Safety Approval; EN 60950-1:2006+A11:2009+A1: 2010+A12:2011; IEC 60950-1:2005, Amd 1: 2009
<b>Emissions</b>	EN 300 489-1; EN 300 489-17; FCC Part 15.247; FCC Part 15.407; ICES-003 Class B; FCC Part 15, Subpart B; EN 300 328; EN 301 893; FCC Part 15.247, 15.209, 15.207; EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4- 5; EN 61000-4-6; EN 61000-4-11; AS/NZS 60950:2000 Australia, Russian GOST Safety Approval; EN 62311; ETS 301 893; ETS 301-398; EN 60950-1:2006+A11:2009+A1: 2010+A12:2011	EN 300 489-1; EN 300 489-17; FCC Part 15.247; FCC Part 15.407; ICES-003 Class B; FCC Part 15, Subpart B; EN 300 328; EN 301 893; FCC Part 15.247, 15.209, 15.207; EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4- 5; EN 61000-4-6; EN 61000-4-11; AS/NZS 60950:2000 Australia, Russian GOST Safety Approval; EN 62311; ETS 301 893; ETS 301-398; EN 60950-1:2006+A11:2009+A1: 2010+A12:2011

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<b>RF Exposure</b>	FCC Part 15.247; EN 300-328; ETS 301-398; ETS 301 893; To ensure compliance with various national and international Electromagnetic Field (EMF) standards, this device should only be operated with HP-approved antennas and accessories.; EN 62311	FCC Part 15.247; EN 300-328; ETS 301-398; ETS 301 893; To ensure compliance with various national and international Electromagnetic Field (EMF) standards, this device should only be operated with HP-approved antennas and accessories.; EN 62311
<b>Features</b>	Dual radio: IEEE 802.11a/n for high-throughput applications and IEEE 802.11a/b/g/n for legacy support and high-speed applications <ul style="list-style-type: none"> <li>• Both IEEE radios, supporting 2x2 MIMO reaching 300 Mbps per radio</li> <li>• Both radios operate at full power and full performance on IEEE 802.3af PoE/Gigabit Ethernet</li> </ul>	Dual radio: IEEE 802.11a/n for high-throughput applications and IEEE 802.11a/b/g/n for legacy support and high-speed applications <ul style="list-style-type: none"> <li>• Both IEEE radios, supporting three spatial streams and 3x3 MIMO reaching 450 Mbps per radio</li> <li>• Both radios operate at full power and full performance on IEEE 802.3af PoE/Gigabit Ethernet</li> </ul>
<b>Notes</b>	Two spatial stream AP, supporting 300 Mbps per radio. Maximum transmit power varies by country. Regulatory model number: APIN103	Three spatial stream AP, supporting 450 Mbps per radio. Maximum transmit power varies by country.
<b>Services</b>	Refer to the HP website at <a href="http://hp.com/networking/services">hp.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	Refer to the HP website at <a href="http://hp.com/networking/services">hp.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.

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#### Note

This transmit power data is EIRP and includes the embedded antennas.

#### IEEE 802.11n 5 GHz @ 40 MHz channel

Data rate	MCS15 - 300 Mbps	MCS8 - 30 Mbps
Receiver sensitivity	-69 dBm	-89 dBm
Transmit power	23 dBm	27 dBm

#### IEEE 802.11n 5 GHz @ 20MHz channel

Data rate	MCS15 - 144 Mbps	MCS8 - 14.4 Mbps
Receiver sensitivity	-73 dBm	-92 dBm
Transmit power	23 dBm	27 dBm

#### IEEE 802.11n 2.4 GHz @ 40MHz channel

Data rate	MCS15 - 300 Mbps	MCS8 - 30 Mbps
Receiver sensitivity	-70 dBm	-86 dBm
Transmit power	23 dBm	27 dBm

#### IEEE 802.11n 2.4 GHz @ 20MHz channel

Data rate	MCS15 - 144 Mbps	MCS8 - 14.4 Mbps
Receiver sensitivity	-73 dBm	-88 dBm
Transmit power	23 dBm	27 dBm

#### IEEE 802.11b/g 2.4 GHz

Data rate	54 Mbps	11 Mbps	6 Mbps	1 Mbps
Receiver sensitivity	-76 dBm	-91 dBm	-88 dBm	-93 dBm
Transmit power	25 dBm	27 dBm	27 dBm	27 dBm

#### IEEE 802.11a 5GHz

Data rate	6 Mbps	54 Mbps
Receiver sensitivity	-92 dBm	-76 dBm
Transmit power	27 dBm	25 dBm



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#### Note

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#### IEEE 802.11n 5GHz @ 40MHz channel

Data rate	MCS23 - 450 Mbps	MCS16 - 45 Mbps
Receiver sensitivity	-67 dBm	-88 dBm
Transmit power	24 dBm	29 dBm

#### IEEE 802.11n 5GHz @ 20MHz channel

Data rate	MCS23 - 216 Mbps	MCS16 - 21.6 Mbps
Receiver sensitivity	-71 dBm   -92 dBm	
Transmit power	24 dBm   29 dBm	

#### IEEE 802.11n 2.4 GHz @ 40MHz channel

Data rate	MCS23 - 450 Mbps	MCS16 - 45 Mbps
Receiver sensitivity	-69 dBm	-90 dBm
Transmit power	25 dBm	29 dBm

#### IEEE 802.11n 2.4 GHz @ 20MHz channel

Data rate	MCS23 - 216 Mbps	MCS16 - 21.6 Mbps
Receiver sensitivity	-73 dBm	-93 dBm
Transmit power	25 dBm	29 dBm

#### IEEE 802.11a/g 5GHz

Data rate	6 Mbps	54 Mbps
Receiver sensitivity	-92 dBm	-74 dBm
Transmit power	30 dBm	26 dBm

#### IEEE 802.11a/g 2.4GHz

Data rate	6 Mbps	54 Mbps
Receiver sensitivity	-93 dBm	-76 dBm
Transmit power	30 dBm	27 dBm

#### IEEE 802.11b 2.4GHz

Data rate	1 Mbps	11 Mbps
Receiver sensitivity	-97 dBm	-88 dBm
Transmit power	32 dBm	32 dBm

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MCS Index	800 nS Guard Interval		400 nS Guard Interval	
	20 MHz Rate (Mbps)	40 MHz Rate (Mbps)	20 MHz Rate (Mbps)	40 MHz Rate (Mbps)
0	6.5	13.5	7.2	15
1	13	27	14.4	30
2	19.5	40.5	21.7	45
3	26	54	28.9	60
4	39	81	43.3	90
5	52	108	57.8	120
6	58.5	121.5	65	135
7	65	135	72.2	150
8	13	27	14.4	30
9	26	54	28.9	60
10	39	81	43.3	90
11	52	108	57.8	120
12	78	162	86.7	180
13	104	216	115.6	240
14	117	243	130	270
15	130	270	144.4	300
16	19.5	40.5	21.7	45
17	39	81	43.4	90
18	58.5	121.5	65	135
19	78	162	86.7	180
20	117	243	130	270
21	156	324	173.3	360
22	175.5	364.5	195	405
23	195	405	216.7	450

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9	26	54	28.9	60
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22	175.5	364.5	195	405
23	195	405	216.7	450

#### Standards and Protocols

(applies to all products in series)

<b>Mobility</b>	IEEE 802.11a High Speed Physical Layer in the 5 GHz Band IEEE 802.11b Higher-Speed Physical Layer Extension in the 2.4 GHz Band	IEEE 802.11d Global Harmonization IEEE 802.11g Further Higher Data Rate Extension in the 2.4 GHz Band	IEEE 802.11i Medium Access Control (MAC) Security Enhancements EEE 802.11n WLAN Enhancements for Higher Throughput
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## HP Cloud-Managed 802.11n Dual Radio Access Point Series accessories

<b>Power Supply</b>	HP 1-port Power Injector (J9407B) HP 3xx Cloud-Managed Access Point Universal Power Supply (JL017A) HP Single-Port 802.3at Gigabit PoE In-Line Power Supply (J9867A)
<b>HP 350 Cloud-Managed Dual Radio 802.11n (WW) Access Point (JL011A)</b>	HP 350 Cloud-Managed Access Point Wall Mount Kit (JL018A)
<b>HP 355 Cloud-Managed Dual Radio 802.11n (WW) Access Point (JL013A)</b>	HP 355/365 Cloud-Managed Access Point Wall Mount Kit (JL019A)
<b>HP 350 Cloud-Managed Dual Radio 802.11n (JP) Access Point (JL067A)</b>	HP 350 Cloud-Managed Access Point Wall Mount Kit (JL018A)
<b>HP 350 Cloud-Managed Dual Radio 802.11n (US) Access Point (JL012A)</b>	HP 350 Cloud-Managed Access Point Wall Mount Kit (JL018A)
<b>HP 355 Cloud-Managed Dual Radio 802.11n (JP) Access Point (JL068A)</b>	HP 355/365 Cloud-Managed Access Point Wall Mount Kit (JL019A)
<b>HP 355 Cloud-Managed Dual Radio 802.11n (US) Access Point (JL014A)</b>	HP 355/365 Cloud-Managed Access Point Wall Mount Kit (JL019A)

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HP access points and access devices are Wi-Fi Certified, providing our customers with the assurance that these products have met and passed the rigorous interoperability testing performed by the Wi-Fi Alliance Organization. See the Specifications section of this series for more information.

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