HPE Aruba Networking AP-505H Access Points

Installation Guide

Hewlett Packard Enterprise

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Hewlett Packard Enterprise Company
Attn: General Counsel
WW Corporate Headquarters
1701 E Mossy Oaks Rd, Spring, TX 77389
United States of America

The HPE Aruba Networking AP-505H Access Points support the full 802.11ax (Wi-FI 6) featureset with dual 2x2 MIMO radios, deliver locationing functions, and can serve as a flexible IOT gateway, delivered through the built-in BLE and 802.15.4 radio.
A variety of mounting scenarios are supported by a range of mount kits (sold separately). Make sure to purchase the correct mount kit for the intended deployment of the AP.

Hardware Overview

The following sections outline the hardware components of the AP-505H Access Points.
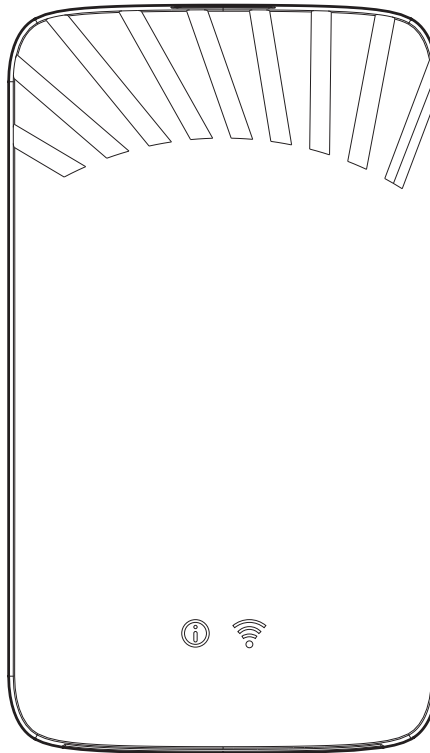
Figure 1 *AP-505H (front view)*
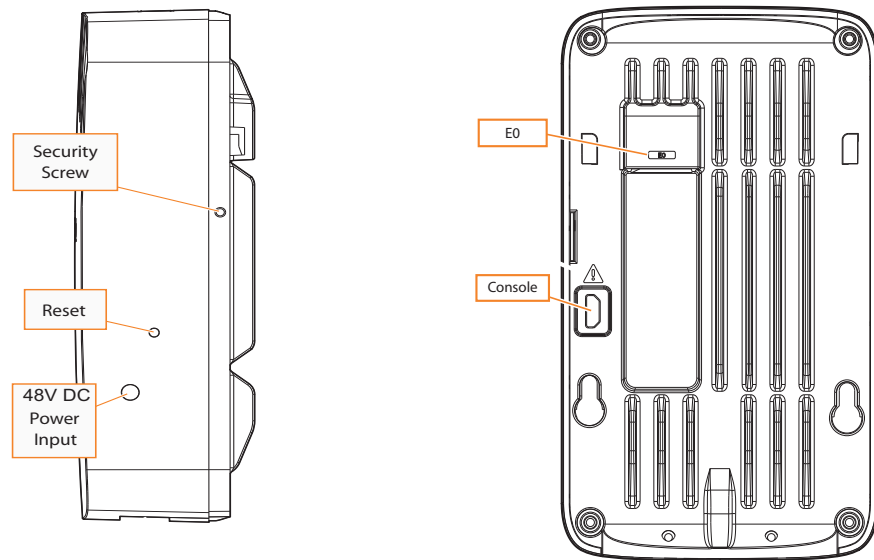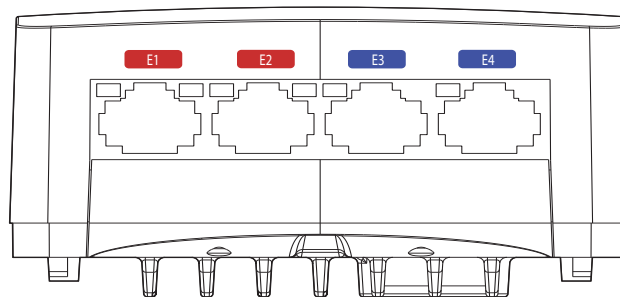
Figure 2 *AP-505H (side and rear view)*

Figure 3 *AP-505H (bottom view)*

LEDs

The hidden LED displays located on the front panel of the access point indicate the following functions:

System Status (i)

The System Status LED indicates the operating condition of the access point, See Table 1.

Table 1 System Status LEDs

Color/State	Meaning
Off	Device powered off
Green- blinking [1]	Device booting, not ready
Green- solid	Device ready, fully functional, no network restrictions
Green- flashing pattern 1[2]	Device ready, fully functional, uplink negotiated in sub-optimal speed (<1Gbps)
Green- flashing pattern 2[3]	Deep sleep mode
Amber- solid	Device ready, restricted power mode (IPM restrictions applied), no network restrictions
Amber- flashing pattern 1	Device ready, restricted power mode (IPM restrictions applied), uplink negotiated in sub-optimal speed (<1Gbps)
Red	System error condition - Immediate attention required

1   Blinking: one second on/one second off, 2 second cycle.
2   Flashing Pattern 1: mostly on, briefly off, 2 second cycle.
3   Flashing Pattern 2: mostly off, briefly on, 2 second cycle.

Radio Status 📶

The Radio Status LED indicates the operating mode of the access point's radios. See Table 2.

Table 2 Radio Status LEDs

Color/State	Meaning
Off	AP powered off, or both radios disabled
Green- solid	Both radios enabled in access mode
Green- blinking	One radio enabled in access mode, other disabled
Amber- solid	Both radios enabled in monitor mode
Amber- blinking	One radio enabled in monitor mode, other disabled
Green/Amber- alternating[1]	Green: one radio in access mode Amber: one radio in monitor mode

1   Alternating: one second each color, 2 second cycle.

LED Display Settings

The LEDs have three operating modes that can be selected in the system management software:

- Default mode: Refer to Table 1 and Table 2
- Off mode: LEDs are off
- Blink mode: LEDs blink green

Force the LEDs into off mode and back to software defined mode by pressing the reset button for a short duration. Warning: pressing the reset button for longer than 10 seconds may cause the AP to reset and return to factory default state.

Console Port

The 5-pin Micro-B connector is located on the back of this device. Use the proprietary AP-CBL-SERU cable for direct management of this device when connected to a laptop or serial console (a standard USB cable cannot be used for this interface). For pin-out details, refer to Figure 4.
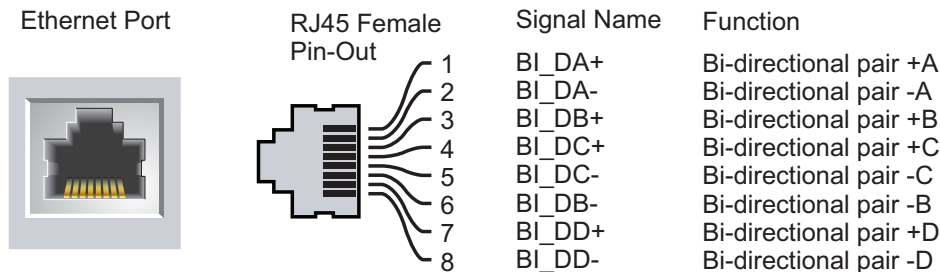
Figure 4 *Micro-B Port Pin-out*

1: NC
2: RXD
3: TXD
4: GND
5: GND
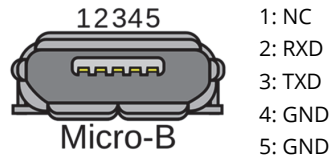
Ethernet Ports

The AP-505H access points are equipped with one active Ethernet port E0, shown in Figure 2. The port is 100/1000/2500 Base-T, auto-sensing MDI/MDX, which supports uplink connectivity when linked by an Ethernet cable. Refer to Figure 5 for a detailed port pin-out. The AP-505H access points support downlink network connectivity through E1-E4 Ethernet ports. The ports are 10/100/1000Base-T auto-sensing MDI/MDX. Ports E1 and E2 have power sourcing capability (PSE) to supply power to any compliant 802.3af (class 0-3) or 802.3at (class 4) PD device.

Figure 5 *AP-505H (Ethernet Port)*

| Ethernet Port	RJ45 Female Pin-Out	Signal Name	Function
	1	BI_DA+	Bi-directional pair +A
	2	BI_DA-	Bi-directional pair -A
	3	BI_DB+	Bi-directional pair +B
	4	BI_DC+	Bi-directional pair +C
	5	BI_DC-	Bi-directional pair -C
	6	BI_DB-	Bi-directional pair -B
	7	BI_DD+	Bi-directional pair +D
	8	BI_DD-	Bi-directional pair -D

Kensington Lock Slot

The AP-505H Kensington Lock Slot is available with the desktop mount accessory, while the security screw hole can be used with the mounting bracket.

USB Interface

The top of this access point is equipped with a USB-A host port that is compatible with cellular modems and other selected peripherals. When active, this port can supply up to 5W/1A to a connected device.

Figure 6 *AP-505H (USB port)*
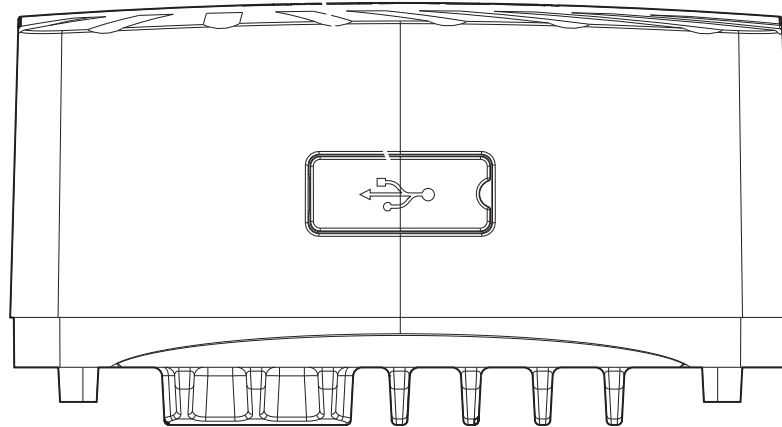
Reset Button

The reset button located on the side of the device (showed in Figure 2) can be used to reset the access point to factory default settings or turn off/on the LED display.

- Use one of the following methods to reset the access point to factory default settings:
    - To reset during normal operation:
        1. Hold the reset button for more than 10 seconds while the access point is running.
        2. Release the reset button.
    - To reset during power up, hold the reset button while the access point is powering up.

    The system status LED will flash again within 15 seconds indicating that the reset is completed. The access point will now continue to boot with the factory default settings.

- To toggle the LED display between Off and Normal:

    During the normal operation of the access point, shortly press and release the reset button using a small, narrow object, such as a paperclip.

Bluetooth Low Energy Radios

AP-505H Access Points are equipped with an integrated BLE and Zigbee radio that provide the following capabilities:

- location and asset-tracking applications
- wireless console access
- IoT gateway applications

Power

Ethernet port E0 supports PoE-in (AP is a PoE-PD device), allowing the device to draw power from compliant PoE power sources. If PoE is not available, the access point has a single 48V DC power input to support the AC-to-DC power adapter kit (sold separately). When both PoE and DC power sources are available, the DC power source takes precedence. Enabling IPM will remove all restrictions initially. It then applies configurable restrictions when needed, indicated by the amber LED.

Table 3 Power Restrictions

Power	Restrictions
DC Power	No restrictions (green)
802.3bt PoE power	No restrictions (green)
802.3at PoE power	USB port disabled when POE-PSE enabled. PSE limited to 802.3af on E1 only (green)
802.3af PoE power	USB and POE-PSE disabled, E3 and E4 disabled (amber)

Before You Begin

Refer to the sections below before beginning the installation process.

CAUTION

FCC Statement: Improper termination of access points installed in the United States configured to non-US model controllers will be in violation of the FCC grant of equipment authorization. Any such wilful or intentional violation may result in a requirement by the FCC for immediate termination of operation and may be subject to forfeiture (47 CFR 1.80).

Pre-Installation Checklist

Before installing your AP-505H Access Points, be sure that you have the following (not included with the AP):
- A mount kit compatible with the AP and mount surface
- A Cat5E or better UTP cable with network access

Optional items:
- A compatible power adapter with cord
- A compatible PoE midspan injector with power cord
- An AP-CBL-SERU console cable

Also, make sure at least one of the following network services is supported:
- AP-505H access points Discovery Protocol (ADP)
- DNS server with an "A" record
- DHCP Server with vendor-specific options

NOTE

HPE Aruba Networking, in compliance with governmental requirements, has designed the AP-505H Access Points so that only authorized network administrators can change the settings. For more information about access point configuration, refer to the *Access Point Software Quick Start Guide*.

Identifying Specific Installation Locations

Use the access point placement map generated by AP-505H access points RF Plan software application to determine the proper installation location(s). Each location should be as close as possible to the center of the intended coverage area and should be free from obstructions or obvious sources of interference. These RF absorbers/reflectors/interference sources will impact RF propagation and should be accounted for during the planning phase and adjusted for in RF plan.

Identifying Known RF Absorbers/Reflectors/Interference Sources

Identifying known RF absorbers, reflectors, and interference sources while in the field during the installation

phase is critical. Make sure that these sources are taken into consideration when you attach an access point to its fixed location.

RF absorbers include:

- Cement/concrete—Old concrete has high levels of water dissipation, which dries out the concrete, allowing for potential RF propagation. New concrete has high levels of water concentration in the concrete, blocking RF signals.
- Natural Items—Fish tanks, water fountains, ponds, and trees
- Brick

RF reflectors include:

- Metal Objects—Metal pans between floors, rebar, fire doors, air conditioning/heating ducts, mesh windows, blinds, chain link fences (depending on aperture size), refrigerators, racks, shelves, and filing cabinets.
- Do not place an access point between two air conditioning/heating ducts. Make sure that access points are placed below ducts to avoid RF disturbances.

RF interference sources include:

- Microwave ovens and other 2.4 or 5 GHz objects (such as cordless phones)
- Cordless headset such as those used in call centers or lunch rooms

CAUTION

RF Radiation Exposure Statement: This equipment complies with RF radiation exposure limits. This equipment should be installed and operated with a minimum distance of 7.87 inches (20cm) between the radiator and your body for 2.4 GHz and 5 GHz operations. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

CAUTION

Déclaration sur les limites d'exposition aux radiofréquences : cet équipement est conforme aux limites d'exposition aux rayonnements radioélectriques spécifiées. Il doit être installé et utilisé à une distance minimale de 35 cm par rapport à votre corps pour les fréquences de 2,4 et 5 GHz. Cet émetteur-récepteur ne doit pas être utilisé ou situé à proximité d'autres antennes ou émetteurs-récepteurs.

CAUTION

Portable RF communications equipment should be used no closer than 30 cm (12 inches) to any part of the access point. Otherwise, degradation of the performance of this equipment could result.

Access Point Installation

CAUTION

All HPE Aruba Networking access points should be professionally installed by a professional installer. The installer is responsible for ensuring that grounding is available and meets applicable national and electrical codes. Failure to properly install this product may result in physical injury and/or damage to property.

CAUTION

Tous les points d'accès HPE Aruba Networking doivent impérativement être installés par un professionnel agréé. Ce dernier doit s'assurer que l'appareil est mis à la terre et que le circuit de mise à la terre est conforme aux codes électriques nationaux en vigueur. Le fait de ne pas installer correctement ce produit peut entraîner des blessures corporelles et / ou des dommages matériels.

CAUTION

For indoor use only. The access point, AC adapter, and all connected cables are not to be installed outdoors. This stationary device is intended for stationary use in partly temperature controlled weather-protected environments (class 3.2 per ETSI 300 019).

Software

For instructions on choosing operating modes and initial software configuration, refer to the AP Software Quick Start Guide.

> **CAUTION**
>
> HPE Aruba Networking access points are classified as radio transmission devices, and are subject to government regulations of the host country. The network administrator(s) is/are responsible for ensuring that configuration and operation of this equipment is in compliance with their country's regulations. For a complete list of approved channels in your country, refer to the *HPE Aruba Networking Downloadable Regulatory Table* at www.arubanetworks.com/techdocs/DRT/Default.htm.

Verifying Post-Installation Connectivity

The integrated LED on the access point can be used to verify that the access point is receiving power and initializing successfully (see Table 1 and Table 2). Refer to the **Access Point Software Quick Start Guide** for further details on verifying post-installation network connectivity.

Electrical and Environmental Specifications

For additional specifications on this product, please refer to the product data sheet at www.arubanetworks.com.

Electrical

- Ethernet:
  - E0: 100/1000/2500 Base-T auto-sensing Ethernet RJ45 interface
  - IEEE 802.3u (100 Base-T). IEEE 802.3ab (1000 Base-T), IEEE 802.3bz (2500 Base-T)
  - Power over Ethernet IEEE 802.3bt, 802.3at, or 802.3af
- Power:
  - 48V DC power interface, support powering through AC-to-DC power adapter
  - Maximum power consumption (excluding USB): Refer to datasheet

> **NOTE**
>
> If a power adapter other than the HPE Aruba Networking-approved adapter is used in the US or Canada, it should be NRTL listed, with an output rated 48V DC, minimum 1.045A, marked "LPS" and "Class 2", rated for 40°C ambient or higher, and suitable for plugging into a standard power receptacle in the US and Canada.

Environmental

- Operating:
  - Temperature: 0°C to +40°C (+32°F to +122°F)
  - Humidity: 5% to 93% non-condensing
- Storage and transport:
  - Temperature: -40°C to +70°C (-40°F to +158°F)
  - Humidity: 5% to 93% non-condensing

> **CAUTION**
>
> For indoor use only. The access point, AC adapter, and all connected cables are not to be installed outdoors. This stationary device is intended for stationary use in partly temperature controlled weather-protected environments (class 3.2 per ETSI 300 019).

BLE Radio Default State

When the Access Point is in factory default state the integrated BLE radio is enabled. This applies to the non-TAA/FIPS product SKUs only. On the TAA/FIPS products, the BLE radio is disabled when the unit is in factory default conditions. Once the AP has established a connection with its management platform, the BLE radio state is updated to match what's configured there. This state is maintained if the AP is power-cycled or rebooted.

Console Port Default State

When the Access Point is in factory default state the console interface (both physical port and BLE) is enabled

with default credentials (username is "admin" and password is the serial number of the unit). Once the AP has established a connection with its management platform, the console port state (enabled/disabled) and access credentials are updated to match what's configured there. State and credentials are maintained if the AP is power-cycled or rebooted.

USB Host Interface Default State

When the Access Point is in factory default state the USB host interface is powered and enabled, assuming the AP is not in a restricted power mode. On some AP models the USB port may be disabled when a POE source with insufficient power budget is used. Once the AP has established a connection with its management platform, the USB host interface state is updated to match what's configured there. This state is maintained if the AP is power-cycled or rebooted.

Regulatory Information

For the purpose of identification needed for regulatory compliance certifications, this product has been assigned a unique regulatory model number (RMN). The regulatory model number can be found on the product nameplate label, along with all required approval markings and information. When requesting compliance information for this product, always refer to this regulatory model number. The regulatory model number is not the marketing name or model number of the product.

- AP-505H RMN: APINH505

CAUTION

Changes or modifications to this unit not expressly approved by the party responsible for regulatory compliance could void the user's authority to operate this equipment.

Toute modification effectuée sur cet équipement sans l'autorisation expresse de la partie responsable de la conformité est susceptible d'annuler son droit d'utilisation.

Brazil

Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.

Industry Canada

This Class B digital apparatus meets all of the requirements of the Canadian Interference-Causing Equipment Regulations.
This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions: (1) This device may not cause interference; and (2) This device must accept any interference, including interference that may cause undesired operation of the device.
When operated in 5.15 to 5.25 GHz frequency range, this device is restricted to indoor use to reduce the potential for harmful interference with co-channel Mobile Satellite Systems.

Déclaration d'Industrie Canada

Cet appareil numérique de classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.
Cet appareil contient des émetteurs / récepteurs exemptés de licence qui sont conformes aux RSS exempts de licence d'Innovation, Sciences et Développement économique Canada. Son fonctionnement est soumis aux deux conditions suivantes: (1) ce périphérique ne doit pas provoquer d'interférences, et (2) ce périphérique doit accepter toute interférence, y compris les interférences susceptibles de provoquer un dysfonctionnement.
En cas d'utilisation dans la plage de fréquences de 5,15 à 5,25 GHz, cet appareil doit uniquement être utilisé en intérieur afin de réduire les risques d'interférence avec les systèmes satellites mobiles partageant le même canal.

European Union Regulatory Conformity

The Declaration of Conformity made under RED 2014/53/EU is available for viewing at: www.hpe.com/eu/certificates. Find and select the document that corresponds to your device's model number as it is indicated on the product label.
Compliance is only assured if the HPE Aruba Networking approved accessories as listed in the ordering guide are used.
https://www.arubanetworks.com/assets/og/OG_AP-500HSeries.pdf.

Wireless Channel Restrictions

5150-5350MHz band is limited to indoor only in the following countries; Austria (AT), Belgium (BE), Bulgaria (BG), Croatia (HR), Cyprus (CY), Czech Republic (CZ), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (GR), Hungary (HU), Iceland (IS), Ireland (IE), Italy (IT), Latvia (LV), Liechtenstein (LI), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Norway (NO), Poland (PL), Portugal (PT), Romania (RO), Slovakia (SK), Slovenia (SL), Spain (ES), Sweden (SE), Switzerland (CH), Turkey (TR), United Kingdom (UK).

Table 4 RF Power Limits for BLE, Zigbee, and WiFi

Radio	Frequency Range MHz	Max EIRP
BLE/Zigbee	2402-2480	9 dBm
Wi-Fi	2412-2472	20 dBm
	5150-5250	23 dBm
	5250-5350	23 dBm
	5470-5725	30 dBm
	5725-5850	14 dBm

⚠️ **CAUTION** Lower power radio LAN product operating in 2.4 GHz and 5 GHz bands. Please refer to the AP-505H access points OS User Guide/Instant User Guide for details on restrictions.

Mexico

La operación de este equipo está sujeta a las siguientes dos condiciones: (1) es posible que este equipo o dispositivo no cause interferencia perjudicial y (2) este equipo o dispositivo debeaceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada.

Morocco

Singapore

Complies with
IDA Standards
DB100427

Нормативные требования Евразийского Экономического Союза

Russia

HPE Russia: ООО "Хьюлетт Паккард Энтерпрайз" Российская Федерация, 125171, г. Москва, Ленинградское шоссе, 16А, стр.3, Телефон: +7 499 403 4248 Факс: +7 499 403 4677

'HPE Belarus': ИООО «Хьюлетт-Паккард Бел», Республика Беларусь, 220030, г. Минск, ул. Интернациональная, 36-1, Телефон/факс: +375 17 392 28 20

'HPE Kazakhstan': ТОО «Хьюлетт-Паккард (К)», Республика Казахстан, 050040, г. Алматы, Бостандыкский район, проспект Аль-Фараби, 77/7, Телефон/факс: + 7 727 355 35 50

Kazakhstan

ЖШС "Хьюлетт Паккард Энтерпрайз" Ресей Федерациясы, 125171, Мәскеу, Ленинград тас жолы, 16А блок 3, Телефон: +7 499 403 4248 Факс: +7 499 403 4677

«HEWLETT-PACKARD Bel» ЖШС, Беларусь Республикасы, 220030, Минск қ., Интернациональная көшесі, 36/1, Телефон/факс: +375 17 392 28 20

ЖШС «Хьюлетт-Паккард (K)», Қазақстан Республикасы, 050040, Алматы к., Бостандык ауданы, Әл-Фараби даңғ ылы, 77/7, Телефон/факс: +7 (727) 355 35 50

Taiwan

Taiwan RoHS Hazardous Substances table
台灣限用物質含有情況標示

單元	限用物質及其化學符號					
	鉛 (Pb)	汞 (Hg)	鎘 (Cd)	六價鉻 (Cr(VI))	多溴聯苯 (PBB)	多溴二苯醚 (PBDE)
傳輸線和網路線	O	O	O	O	O	O
斷路器	−	O	O	O	O	O
冷卻及加熱系統	O	O	O	O	O	O
磁碟控制器	−	O	O	O	O	O
外殼	−	O	O	O	O	O
風扇	O	O	O	O	O	O
液晶顯示器	−	O	O	O	O	O
存取裝置(HDD)	−	O	O	O	O	O
液壓/氣壓系統	O	O	O	O	O	O
鍵盤	O	O	O	O	O	O
影音設備（CD/DVD/光碟機）	O	O	O	O	O	O
記憶體	O	O	O	O	O	O
滑鼠	O	O	O	O	O	O
其他機械組裝設備	−	O	O	O	O	O
變壓器/電源供應器	−	O	O	O	O	O
印刷電路零組件 (PCAs)	−	O	O	O	O	O
無線網路線	−	O	O	O	O	O

備考1. "O" 係指該項限用物質之百分比含量未超出百分比含量基準值。
備考2. "−" 係指該項限用物質為排除項目。

第十二條

取得審驗證明之低功率射頻器材，非經許可，公司，商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

1. 應避免影響附近雷達系統之操作。

2. 高增益指向性天線只得應用於固定式點對點系統

3. 電磁波暴露量 MPE 標準值 1 mW/cm2, 送測產品實測值為：0.552 mW/cm2

" 本器材須經專業工程人員安裝及設定，始得設置使用，且不得直接販售給一般消費者

United States

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

● Reorient or relocate the receiving antenna.
● Increase the separation between the equipment and receiver.
● Connect the equipment into an outlet on a circuit that is different from that to which the receiver is connected. Consult the dealer or an experienced radio or television technician for help.

Improper termination of access points installed in the United States configured to a non-US model controller is a violation of the FCC grant of equipment authorization. Any such willful or intentional violation may result in a requirement by the FCC for immediate termination of operation and may be subject to forfeiture (47 CFR 1.80).

The network administrator(s) is/are responsible for ensuring that this device operates in accordance with local/regional laws of the host domain.

Medical

1. Equipment not suitable for use in the presence of flammable mixtures.
2. Connect to only IEC 60950-1 or IEC 60601-1 3rd edition certified products and power sources. The end user is responsible for the resulting medical system complies with the requirements of IEC 60601-1 3rd edition.
3. Wipe with a dry cloth, no additional maintenance required.
4. No serviceable parts, the unit must be sent back to the manufacturer for repair.
5. No modifications are allowed without AP-505H access points approval.

This product has not been qualified as a Medical Device under EU Directive 92/42/EEC. When deployed in medical environments it must be inaccessible to patients. If integrated as a component into a Medical Device, the integrator is responsible for ensuring that the requirements of 92/42/EEC are met.

Contacting Support

Main Site	https://www.arubanetworks.com
Support Site	https://networkingsupport.hpe.com/home
Airheads Social Forums and Knowledge Base	https://community.arubanetworks.com
North America Telephone	1-800-943-4526 1-408-754-1200
International Telephone	https://www.arubanetworks.com/support-services/contact-support
Software Licensing Site	https://lms.arubanetworks.com
End-of-Life Information	https://www.arubanetworks.com/support-services/end-of-life/
Security Incident Response Team (SIRT)	https://www.arubanetworks.com/support-service/security-bulletins/ Email: aruba-sirt@hpe.com