About the Aruba 65
The Aruba 65 is part of a comprehensive wireless network solution. The device works only in conjunction with an Aruba Mobility Controller, and provides the following capabilities:

- Wireless transceiver
- Protocol-independent networking functionality
- IEEE 802.11a and IEEE 802.11b/g operation as a wireless Access Point
- IEEE 802.11a and IEEE 802.11b/g operation as a wireless Air Monitor
- Compatible with IEEE 802.3af Power Over Ethernet
- Can be centrally managed, configured, and upgraded through an Aruba Mobility Controller
- Can be remotely deployed as a Remote Access Point (RAP)

PACKAGE CONTENTS

- 1 x Aruba 65 Wireless Access Point (AP)
- 1 x Installation Guide (this document)

Inform your supplier if there are any incorrect, missing or damaged parts. If possible, retain the carton, including the original packing materials. Use them to repack the product in case there is a need to return it.

BEFORE STARTING

Before installing your Aruba 65 Wireless Access Point, please ensure you have the following:

- 1 x Fast Ethernet CAT5 UTP cable of required length

- 1 x 802.3af compliant Power over Ethernet source (POE) - Aruba Mobility Controller or midspan device, or

- 1 x Aruba AP65 AC adapter kit (sold separately)

- 1 x Aruba Mobility Controller provisioned on the network:
  - with Layer 2/3 network connectivity to your Aruba 65
  - One of the following network services:
    - Aruba Discovery Protocol (ADP)
    - DNS server with an "A" record
    - DHCP Server with vendor specific options
  (see Mobility Controller Discovery)

Optional:
- Aruba AP-65 secure wall mounting kit

The Aruba AP Setup Process
Setting up an Aruba AP typically consists of a planning stage and three installation steps:

WLAN Planning
Determine how many Aruba APs are needed for your wireless network deployment and where they will be installed. This can be easily accomplished using Aruba's automated RF Plan site-survey software (available separately). This stage should have been completed during the master Aruba Mobility Controller installation and configuration. In typical Aruba installations, the mobility controllers are configured and installed before APs.

1 Mobility Controller Discovery — Aruba APs are factory configured with initial settings that enable them to automatically discover and associate to a host Aruba Mobility Controller. Once an Aruba AP associates to its host Mobility controller, it will receive its AP configuration and may be provisioned later with additional services and security parameters.

2 AP Installation — Once Mobility Controller association has been reliably established, the AP can be physically installed at its intended permanent place of operation.

3 AP Provisioning — The administrator defines the operational behavior for each Aruba AP such as RF characteristics, security features and location codes. For specific AP configuration information, refer to the *ArubaOS User Guide*.

1 Mobility Controller Discovery
Aruba Networks, in compliance with governmental requirements, has designed the Aruba 65 such that only authorized network administrators can change the settings. For more information on AP configuration, refer to the *ArubaOS User Guide*.

CAUTION: ⚠

Access Points are radio transmission devices and as such are subject to governmental regulation. Network administrators responsible for the configuration and operation of Access Points must comply with local broadcast regulations. Specifically, Access Points must use channel assignments appropriate to the location in which the Access Point will be used.

About AP - Mobility Controller Discovery
Aruba APs are factory configured with basic network settings. This enables them (when connected to the network and powered on) to automatically discover and associate to a host Aruba Mobility Controller with no manual intervention required. The methods of automatic discovery and association include:

- Aruba Discovery Protocol (ADP)
- DNS
- DHCP with Vendor Specific Options

Aruba Discovery Protocol (ADP)
This is the simplest method for AP to Mobility Controller discovery and association. ADP allows Aruba APs to be connected to the network (or directly to an Aruba Mobility Controller) and brought into operation automatically.

ADP performs a single key task:

Obtain the IP address of the host Aruba Mobility Controller from which the Aruba AP will acquire its initial software configuration.

NOTE: Additionally, the AP software can also be uploaded via a standard TFTP server.

ADP with Directly / Layer 2 Connected APs
If your Aruba AP is directly connected to an active Ethernet interface on an Aruba Mobility Controller, then no configuration is required. You may proceed to the next step.

ADP with Layer 3 Connected APs
If your Aruba AP is NOT directly / Layer 2 connected to an Aruba Mobility Controller, and IP multicast routing is enabled on the host network, then ADP multicasts packets to locate a host Aruba Mobility Controller's IP address.

To ensure ADP is enabled, issue the following commands on the Master Aruba Mobility Controller:

(A6000) (config) #adp discovery enable
(A6000) (config) #adp igmp-join enable

An IP helper address on the subnet's default gateway, mapped to the host Aruba Mobility Controller's IP address, can be also used to facilitate the multicast / broadcast.

DNS
If the Aruba 65 is Layer 3 network connected, it can use network based DNS to resolve a factory configured default host name "aruba-master" to derive the host Mobility Controller's IP address. To enable this, a record for "aruba-master" must be created on the network DNS server.

DHCP with Vendor Specific Options
A standards compliant DHCP server can be configured to return the host Aruba Mobility Controller's IP address through Vendor Specific Options (option 43) in the DHCP reply. If the host Mobility Controller's IP address is obtained via DHCP, it will be used to upload the Aruba AP's software image and configuration.

NOTE: If you have location-specific configurations for your APs, you need to apply this configuration information using AP Provisioning.

Next Steps
If you wish to fully configure and provision your Aruba AP before installing it at its final desired location, before installing it proceed to step 3, "AP Provisioning".

2 Installing the Aruba 65
Select a location as close as possible to the center of the intended coverage area. The service location should be free from obstructions or obvious sources of interference. Normally, the higher you place an AP or AM, the better its performance.

The Aruba 65 can be mounted on a ceiling, wall or cubicle or stood upright on a desk stand.

NOTE: For dimensions, see "Product Specifications". Allow for additional space to accommodate antenna articulation.

Desktop Placement
The preinstalled desk stand allows you to place the AP vertically on a desk or table top.

You can also hang the AP using the built-in mounting slots or attach the AP to a standard non-recessed 15/16" ceiling tile rail using the built-in ceiling tile rail slots, but you must first detach the desk stand. To detach the desk stand:

1. On the rear of AP, press down the tab on the lower left corner that secures the desk stand to the device.

2. Twist the stand counter-clockwise to detach it from the AP (see Figure 1)

Using the Built-In Mounting Slots
The keyhole-shaped slots on the back of the AP 65 can be used to attach the device upright to an indoor wall or shelf

To hang the AP upright using the mounting slots, perform the following steps:

1. Install two screws in the wall or shelf. If attaching the device to drywall, We recommend using appropriate wall anchors (not included).

2. Align the AP mounting slots to capture the surface screws (see Figure 2)

3. Orient the antenna. For best performance, swivel the antenna so that it is oriented vertically

Figure 1

Figure 2
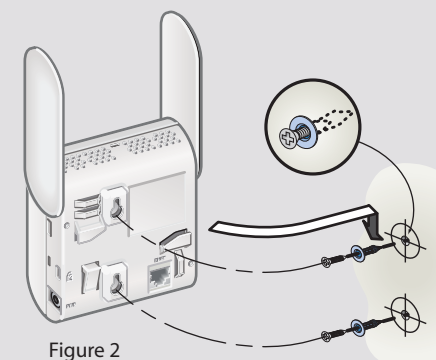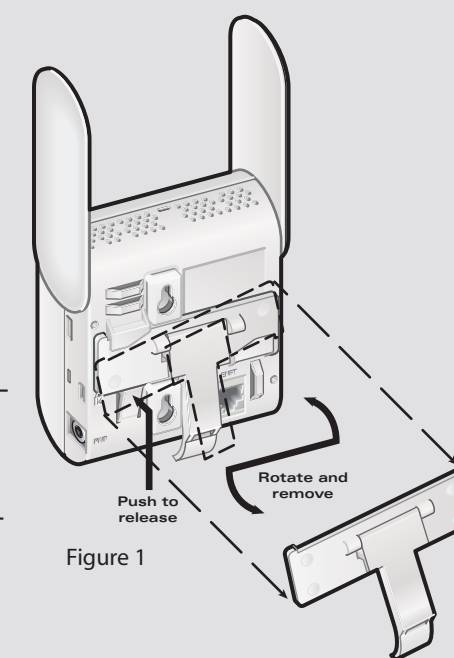
### Ceiling Mount Using the Built-In Ceiling Tile Rail Slots
The snap-in tile rail slots on the rear of the Aruba 65 can be used to securely attach the device directly to a 15/16" wide, standard ceiling tile rail.

CAUTION: Ensure secure fit of the Aruba 65 to the tile rail or mounting points when hanging the device from the ceiling, as poor installation could cause it to fall on people or equipment.

Service to all Aruba Networks equipment should be performed by trained service personnel only.

To suspend the Aruba 65 from the ceiling using the integrated 15 /16" ceiling tile rail slots, perform the following steps:

1 Pull the FE networking cable (with RJ-45 male connector) through a prepared hole in the ceiling tile, located where the Aruba 65 is to be placed.

2 Insert the RJ-45 cable into the Aruba 65 FE port.

3 Align the Aruba 65 with the ceiling tile rail (15/16" wide) mounting slot guides at approximately a 30 degree angle to the cailing tile rail. Ensure any FE cable slack is located above the ceiling tile (see figure 3).

4 Pushing towards the ceiling tile, twist the Aruba 65 clockwise until the device "clicks" into place on the ceiling tile rail (see figure 3).

5 Orient the antenna. For best performance, swivel the antenna so that it is oriented vertically.

Figure 3
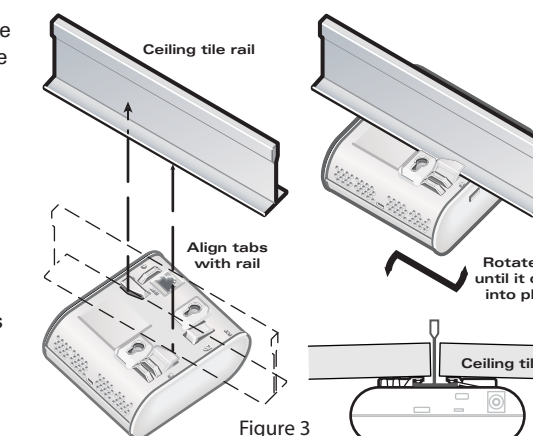
Connecting Required Cables
The AP 65's integrated 10/100 Mbps Fast Ethernet (FE) port is used to connect the AP to a 10Base-T/100Base-TX (twisted-pair) Ethernet LAN segment or directly to an Aruba Mobility Controller. Use a 4 or 8-conductor, Category 5 UTP, straight-through FE cable, however, the AP 65 FE port supports MDI/MDX and automatically adjusts for straight-through or cross-over cables. The maximum length for FE cables is 100 meters (325 feet). Install cables in accordance with all applicable local and national regulations and practices.

NOTE: Aruba 65 APs are intended only for installation in Environment A as defined in IEEE 802.3af, Power over Ethernet. All interconnected equipment must be contained within the same building, including the interconnected equipment's associated LAN connections.

NOTE: When installed in an air-handling space, such as above suspended ceiling (plenum), the unit is required to be powered via PoE only. Additional cabling such as Fast Ethernet (FE) cables installed in such spaces should be suitable under NEC Article 800.50 and marked accordingly for use in plenums and air-handling spaces with regard to smoke propagation, such as CL2-P, CL3-P, MPP or CMP.

Connecting Cables & Power
1 Connect one end of the FE cable directly to the Aruba 65 FE port.

2 Connect the other end of the FE cable to one of the following:
- a network port on an Aruba Mobility Controller, or
- a network mid-span device that supports 802.3af compliant port, or
- (if AC powering the device) an Ethernet switch with Layer 2/3 network connectivity to an Aruba Mobility Controller, while powering the AP 65 using the optional AC power adapter (use only approved Aruba Wireless Networks adapter UL Listed, marked "LPS" or "NEC" Class 2 and rated 5.0VDC, 3.0A output).

FE Port Specifications
The 10/100 Mbps FE port is located on the rear of the Aruba 65 and has an RJ-45 female connector. The port pin-outs are shown in Figure 4:
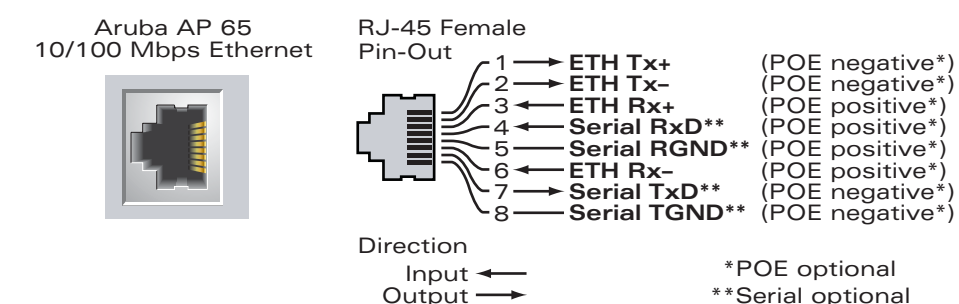

Aruba AP 65
10/100 Mbps Ethernet

RJ-45 Female Pin-Out

Pin	Signal	
1	ETH Tx+	(POE negative*)
2	ETH Tx-	(POE negative*)
3	ETH Rx+	(POE positive*)
4	Serial RxD**	(POE positive*)
5	Serial RGND**	(POE positive*)
6	ETH Rx-	(POE positive*)
7	Serial TxD**	(POE negative*)
8	Serial TGND**	(POE negative*)

Direction
Input
Output

*POE optional
**Serial optional

Figure 4

Verifying Successful Installation

The integrated LEDs on the AP 65 may be used at this point to verify the AP is receiving power and initializing successfully. LED status is as follows:

LED	Color(s)	Activity	Action
PWR	Green	On	Power On, Device Ready
		Flashing	System Initializing
ENET (10/100 Mbps)	Green	Off	No Link
		Green On	10/100Mbps Link Negotiated
		Green Flashing	10/100Mbps Data Activity
A and B/G LEDs	Green	Off	Wirless Radio Disabled
		Green On	Wireless Radio AP Mode Enabled
		Green Flashing	Wireless Radio AM Mode Enabled

❸ Provisioning the Aruba 65

Once an AP associates to a host Aruba Mobility Controller and receives its basic configuration, it may be provisioned.

AP Provisioning is the process by which APs are assigned advanced or AP unique configuration parameters, for example location codes, security credentials, or Remote AP credentials. Location codes are important for RF calibration and triangulation.

AP Provisioning is not mandatory for basic wireless deployment however it is recommended. It is mandatory for situations where APs are required to be pre-staged or provisioned in advance of shipment and final network installation, such as Remote AP (RAP) deployments.

Aruba APs may be provisioned in bulk in AP programming mode, where configuration parameters are defined on the Aruba Mobility Controller via command line interface or web interface, and then uploaded to APs in batches.

For details on AP configuration and provisioning, see the *ArubaOS User Guide.*

Specifications

Mechanical
Device Dimensions (antenna stowed) (HxWxD) :
• 100mm x 100mm x 37mm
• 3.94" x 3.94" x 1.47"

Device Dimensions (antenna extended 180 degree) (HxWxD) :
• 167mm x 100mm x 37mm
• 6.58" x 3.94" x 1.47"

Device Weight - 0.42 lbs / 0.191 Kilos

Shipping Dimensions (HxWxD) :
• 138mm x 172mm x 51mm
• 5.43" x 6.77" x 2.00"

Shipping Weight - 0.5 lbs / 0.227 Kilos

Temperature:
• Operating: 0ºC to 50ºC (32ºF to 122ºF)
• Storage: -10ºC to 70ºC (14ºF to 158ºF)

Relative Humidity - 5% to 90% non-condensing Altitude - 8,000ft @ 28ºC (82.4ºF)

Mounting:
• Wall, cube or ceiling mountable
• Enclosure supports integrated rear mounted snap-in 15/16" ceiling tile rail guides

Antenna - Integrated, non-detachable articulating tri-band antenna

Visual Status Indicators (LEDs):
• PWR - Power / Status
• ENET - Ethernet link status / Activity
• WLAN G - WLAN 2.4GHz status / Mode
• WLAN A - WLAN 5GHz status / Mode

Electrical
Ethernet:
• 1 x 10/100 Base-T auto-sensing Ethernet RJ-45 Interface, MDI/MDX
• IEEE 802.3af compliant Power Over Ethernet
• IEEE 802.3, IEEE 802.3u
• Power Over Ethernet, 48V DC / 220mA

Wireless LAN
Network Standards - IEEE 802.11a, IEEE 802.11b and

IEEE 802.11g

Antenna Type - Integral, 802.11a/b/g omni-directional high-gain antenna

Antenna Gain:
• 5.150GHz / 2.5dBi
• 5.350GHz / 3.3dBi
• 2.4 ~ 2.5GHz / 3.3dBi
• VSWR 1.5:1
• Dual antenna - supports diversity

Radio Technology:
• Orthogonal Frequency Division Multiplexing (OFDM)
• Direct Sequence Spread Spectrum (DSSS)

Radio Modulation Type:
• 802.11a - BPSK, QPSK,16-QAM, 64-QAM
• 802.11b - CCK, BPSK, QPSK
• 802.11g - CCK, BPSK, QPSK,16-QAM, 64-QAM

Media Access Control - CSMA/CA with ACK

Supported Frequency Bands 5GHz:
• 5.150 ~ 5.250GHz (low band), country specific*
• 5.250 ~ 5.350GHz (mid band), country specific*
• 5.470 ~ 5.725GHz (Europe), country specific*
• 5.725 ~ 5.850GHz (high band), country specific (* not approved in Taiwan)

Supported Frequency Bands 2.4GHz:
• 2.400 ~ 2.4835GHz (Global), channels country specific

Supported Operating Channels:

802.11b	802.11g	802.11a
• US, Canada , Taiwan 11	• US, Canada, Taiwan 11	• US, Canada, Taiwan 7
• ETSI up to 13	• ETSI up to 13	• ETSI up to 19
• Japan 14	• Japan 13	• Japan 8

Supported Countries:
Complete country list available at
http://www.arubanetworks.com/products/aps/certification

Data Rates:
• 802.11a - 6, 9, 12, 18, 24, 36, 48 and 54 Mbps per channel
• 802.11b - 1, 2, 5.5, 11 Mbps per channel
• 802.11g - 6, 9, 12, 18, 24, 36, 48 and 54 Mbps per channel

Output Transmit Power - 100 mW maximum (or lower as configured on the Aruba Mobility Controller to comply with local regulatory requirements). In Taiwan, 802.11a.b.g 2.4/5 GHz limited to 17dBm

Miscellaneous Functionality
Maximum Clients - 255

Radio Band Selection - via Mobility Controller in software

Manageability:
• Management of all 802.11 parameters
• Network Wide AP Management via CLI, WEB GUI and SNMPv3
• Access Point Profiles, managed by Geographical Location, BSSID and Radio Type

Encryption (AP and Mobility Controller) - 40bit / 64bit / 128bit / 152bit WEP, TKIP, AES

Compliance

FCC
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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, 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:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from

that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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

This product complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION STATEMENT: FCC RF Radiation Exposure Statement This equipment complies with FCC RF radiation exposure limits set forth for indoor use only. This equipment should be installed and operated with a minimum distance of 20 centimeters (7.87 inches) 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.

This device is restricted to indoor use due to its operation in the 5.15 to 5.25 GHz frequency range. The FCC requires this product to be used indoors to reduce the potential for harmful interference to co-channel Mobile Satellite systems. High power radars are allocated as primary users of the 5.25 to 5.35 GHz and 5.65 to 5.85 GHz bands. These radar stations can cause interference with and/or damage this device.

Canada
This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of the Department of Communications.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques," NMB-003 édictée par le ministère des Communications.

Japan

この製品は法律により、5GHz帯での屋外使用を禁じられています。

VCCI - Class B

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準
に基づくクラスＢ情報技術装置です。この装置は、家庭環境で使用すること
を目的としていますが、この装置がラジオやテレビジョン受信機に近接して
使用されると受信障害を引き起こすことがあります。
　取り扱い説明書に従って正しい取り扱いをして下さい。

Europe
Warning—This is a Class B product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

This product complies with 1999/5/EC, EN55022 Class B, and EN55024 standards.

Korea

B급 기기 (가정용 정보통신기기)
이 기기는 가정용으로 전자파적합등록을 한 기기로서
주거지역에서는 물론 모든지역에서 사용할 수 있습니다.

"Class B" Equipment (Household purpose info/telecommunication equipment)
As this equipment has undergone EMC registration for household purpose, this product can be used in any area including residential area.

Taiwan

" 經型式認證合格之低功率射頻電機，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。
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"

Certifications

Electromagnetic Compatibility
• FCC DOC Part 15 Class B (digital portion)
• FCC Part 15 Subpart C 15.247
• FCC Part 15 Subpart E 15.407
• ICES-003 Class B (Canada)
• RSS 210 (Canada)
• VCCI Class B (Japan)
• Telec 2.4, Channel 14 and 5GHz approved (Japan)
• CE marked with NB letter of opinion

- EN 300 328 2.4 GHz
- EN 301 893 5.4 GHz
- EN 301 489 EMC
• MIC (Korea)
• SRRC (China)
• AS/NZS CISPR22: 2002
• AS/NZS 4268
• DGT (Taiwan)

Safety Compliance
• IEC 60950
• EN 60950

Aruba Networks provides a multi-language document containing country specific restrictions, additional safety and regulatory information for the enclosed Access Point. You may find this reference on our website at:
www.arubanetworks.com/pdf/0510272-01.pdf

Plenum Use
Suitable for use in environmental air handling space in accordance with Section 300.22.C of the National Electrical Code, and Sections 2-128, 12-010(3) and 12-100 of the Canadian Electrical Code, Part 1, C22.1

Medical
• EN 60601-1-1: 2001
• EN 60601-1-2: 2001

Disposal of the Aruba 65

This product at end of life is subject to separate collection and treatment in the EU Member states, Norway, and Switzerland and therefore is marked with the symbol shown at the left. Treatment applied at end of life of these products in these countries shall comply with the applicable national laws implementing Directive 2002/96EC on Waste of Electrical and Electronic Equipment (WEEE).

The WEEE Directive 2002/96/EC and RoHS (Restriction of Hazardous Substances) Directive 2002/95/EC sets collection, recycling and recovery targets for various categories of electrical products and their waste.

The Restriction on Hazardous Substances Directive (RoHS) (2002/95/EC), which accompanies the WEEE Directive, bans the use of heavy metals and brominated flame-retardants in the manufacture of electrical and electronic equipment. Specifically, restricted materials under the RoHS Directive are Lead (Including Solder used in PCB's), Cadmium, Mercury, Hexavalent Chromium, and Bromine.

Aruba declares compliance with the European Union (EU) WEEE Directive (2002/96/EC). For more information on WEEE, refer to:
http://www.dti.gov.uk/sustainability/weee

Warranty
Standard warranty - 1 year return to manufacturer

Customer Support

Main Site: www.arubanetworks.com
Support: www.arubanetworks.com/support

Telephone Numbers
Main 408-227-4500
Fax 408-227-4550
Support In the US: 800-WI-FI-LAN (800-943-4526)
France: +33 (0) 1 70 72 55 59
UK: +44 (0) 20 7127 5989
Germany: +49 (0) 69 38 09 77 22 8
All Other : +001 408-754-1200

ARUBA™
The **Mobile Edge** Company