Aruba 65 Wireless Access Point
Quick Installation Guide

ARUBA ™
The **Mobile Edge** Company

Installation instructions for the deployment and installation of your Aruba 65 802.11a/b/g wireless access point.

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 (POE)
- Can be centrally managed, configured, and upgraded through an Aruba Mobility Controller

PACKAGE CONTENTS

- 1 x Aruba 65 Wireless Access Point
- 1 x Quick 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 GETTING STARTED

Before installing your Aruba 65 wirless access point, please ensure you have the following:

- 1 x Fast Ethernet cable of required length

- 1 x 802.3af compliant Power over Ethernet source (PSE) - Aruba Mobility Controller or Midspan device

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

  Optional:
- Mounting screws (not supplied)

The Aruba AP Setup Process

Setting up an Aruba AP typically consists of a planning stage and three AP installation stages:

WLAN Planning — Determine how many Aruba access points will be 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 prior to access points.

1 **AP Provisioning** — Provides each Aruba access point with the initial setting required to locate the host Aruba Mobility Controller.

Once the Aruba access point is associated to its host Mobility Controller, device specific configuration may be applied as required (such as location code).

2 **AP Installation** — Once provisioned, the AP can be physically installed at its intended place of operation.

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

1 Provisioning the Aruba 65

Aruba Networks, in compliance with governmental requirements, has designed the Aruba 65 such that only authorized network administrators can change these settings. For more information on Access Point configuration, refer to the ArubaOS User Guide.

⚠ CAUTION:

Access Points are radio broadcast 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.

Goal of Access Point Provisioning

Provisioning provides the Aruba access point with basic network settings that allow it to locate the host Aruba Mobility Controller. Initial provisioning may be achieved through a number of methods, including:

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

Aruba Discovery Protocol (ADP)

This is the simplist method for AP provisioning. ADP allows Aruba access pionts to be connected to the network (or directly to a Aruba Mobility Controller) and brought into operation automatically.

ADP performs one key task:

Obtain the IP address of the host Aruba Mobility Controller from which the Aruba access point will obtain its initial software load and configuration.

NOTE: Additionally, the access point software can be uploaded via a standard TFTP server.

ADP with Directly / Layer 2 Connected Access Points
If your Aruba access point 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 Access Points
If your Aruba access point is NOT directly / Layer 2 connected to an Aruba Mobility Controller, and IP multicast routing is enabled on the host network, then ADP will multicast 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:

(A5000) (config) #adp discovery enable
(A5000) (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 based aspect of this process.

Provisioning using DNS

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

Provisioning using 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 for uploading the Aruba access point's software image and configuration.

NOTE: If you have location-specific configurations for your Access Points, you will need to apply this configuration information using AP Reprovisioning.

AP Reprovisioning

Once an AP is associated to an Aruba Mobility Controller, it is capable of being Reprovisioned if necessary. AP Reprovisioning is the process by which APs are assigned unique configuration characteristics, for example, location codes. Location codes are important for recalibration and triangulation. For details on AP Reprovisioning, see the ArubaOS User Guide.

AP Provisioning

Recommended only in instances where APs require to be pre-staged or provisioned in advance of shipment and final network installation (suchas as Remote Access Point (RAP) deployments), in AP programming mode, AP configuration parameters are defined on the Aruba Mobility Controller via command line interface or web interface, where they can then be uploaded to individual access points as required.

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 access point or air monitor, the better its performance.

The Aruba 65 can be mounted on a wall using the mounting slots on the bottom of the unit.

NOTE: For dimensions, see "Product Specifications". Allow 5 cm (2") additional space on the right-hand side for cables and ensure enough space for antenna articulation.

Using the Built-In Ceiling Tile Rail Mounting Slots
The snap-in tile rail slots on the back of the Aruba 65 can be used to attach the device directlyto a 1" wide, standard ceiling tile rail.

⚠ CAUTION: Do not use the mounting slots to hang the Aruba 65 from the ceiling, sideways, or in any place where it could fall on people or equipment. For more secure installation, use one of the optional mounting kits.

To hang the Aruba 65 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 Aruba 65 mounting slots to capture the surface screws.

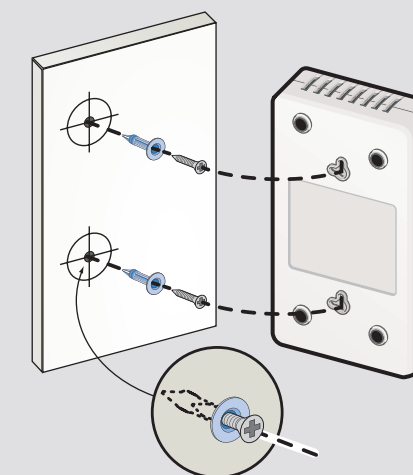3 Orient the antenna. For best performance, swivel the antenna so that it is oriented vertically.

Figure 0-1: Aruba 65 Mounting

Connecting Required Cables

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

The 10/100 Mbps Ethernet (FE) port is used to connect the AP to a 10Base-T/100Base-TX (twisted-pair) Ethernet LAN segment. Use a 4- or 8-conductor, Category 5 UTP, straight-through FE cable.X 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.

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:
  - To a network port on the Mobility Controller, or
  - To a network mid-span device that supports 802.3af compliant port

FE Port Specifications
The 10/100 Mbps Ethernet (FE) port is located on the right-hand side of the Aruba 65 and has an RJ-45 female connector. The port pin-outs are shown in Figure 0-2:
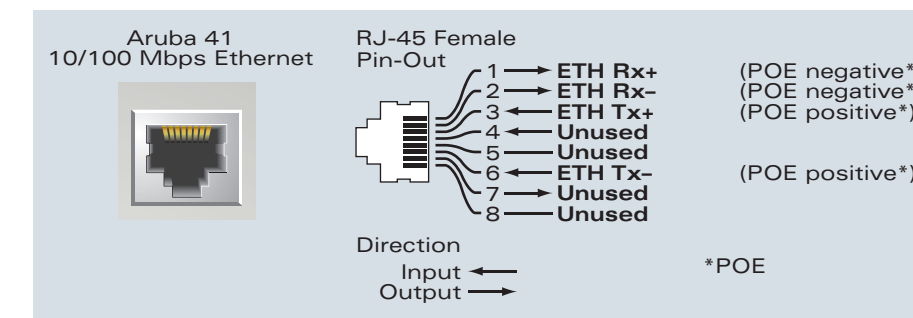
Aruba 41 10/100 Mbps Ethernet   RJ-45 Female Pin-Out

Pin	Signal	
1	ETH Rx+	(POE negative*)
2	ETH Rx-	(POE negative*)
3	ETH Tx+	(POE positive*)
4	Unused	
5	Unused	
6	ETH Tx-	(POE positive*)
7	Unused	
8	Unused	

Direction
Input ←
Output →   *POE

Figure 0-2: Aruba 65 FE Port

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 behavior indicated status as follows:

LED	Color(S)	Activity	Action
Power/Test	Green	On	Power On, Device Ready
		Flashing	System Initializing
LAN (10/100 Mbps)	Green/Amber	Off	No Link
		Green On	100Mbps Link Negotiated
		Green Flashing	100Mbps Data Activity
		Amber On	10Mbps Link Negotiated
		Amber Flashing	10Mbps Data Activity
WLAN	Green/Amber	Off	Wirless Radio Disabled
		Green On	Wireless Radio Enabled
		Green Flashing	Wireless Data Activity

3 Configuring the Aruba 65

Once the Aruba 65 has been provisioned and installed, it will be capable of discovery and association to an Aruba Mobility Controller where the wireless and security parameters can be set. For AP configuration information, refer to 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"

Shipping Dimensions (HxWxD) :
- 100mm x 100mm x 37mm
- 3.94" x 3.94" x 1.47"

Device Weight - TBD
Shipping Weight - TBD

Temperature:
- Operating: 0°C to 50°C (32°F to 122°F)
- Storage: -10°C to 70°C (14°F to 158°F)

Relative Humidity - 5% to 90% non-condensing
Altitude - 8,000ft @ 28°C (82.4°F)

Mounting:
- Wall, cube or ceiling mountable
- Enclosure supports integrated rear mounted snap-in 1" 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 / Activity
- WLAN A - WLAN 5GHz status / Activity

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 802.11a 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 ~ 5.825GHz GHz (high band), country specific

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

Operating Channels:

802.11b	802.11g	802.11a
• US, Canada 11	• US, Canada 11	• US, Canada 12
• ETSI 13	• ETSI 13	• ETSI (up to 19)
• Japan 13	• Japan 13	• Japan 4

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)

Miscellaneous Functionality
Maximum Clients - 128

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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

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 15.2 inches (38.5 centimeters) 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.

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。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

CE - Class B
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.

EU - Class B
This product complies with EN5022 Class B and EN5024 standards.

Certifications

Electromagnetic Compatibility
- IEC 60950 CB certificate and report
- 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
- RSS 210 (Canada)
- VCCI Class B (Japan)
- Telec 2.4, Channel 14 and 5GHz approved (Japan)
- CE marked with NB letter of opinion for RTTE
      - ETS 300 328 2.4 GHz
      - ETS 301 893 5.4 GHz
      - ETS 301 489 EMC
- MIC Korea
- SRRC (China)
- AS/NZS 3548 Class B
- AS/NZS4771 (C-tick)

The CE approval mark on back of the product indicates that it meets R&TTE Directive - EN 300 328, EN 301 489, EN 301 893

Safety
IEC 60950 CB certificate and report
cULus listed (AC Power Supply)
PSE Mark (AC Power Supply)
UL Listed (UL60950)
UL Listed (Canadian Electrical Code/CSA 22.2 No. 60950)
EN60950 / IEC60950
UL Listed (UL2043) Plenum Rating

Disposal of the Aruba 65
When the useful life of the Access Point has expired, be sure to dispose of the unit in accordance with all local code and environmental regulations. Contact your local waste management or environmental agencies for details.

Warranty
Standard warranty - 90 Days return to manufacturer

Customer Support

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

E-mail
Sales: sales@arubanetworks.com
Support: support@arubanetworks.com

Telephone Numbers
Main   408-227-4500
Fax   408-227-4550
Sales   408-754-1201
Support   In the U.S.: 800-WI-FI-LAN (800-943-4526)
                International: 408-754-1200

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