# Aruba AP 70
# Access Point

## Installation Guide

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## Warranty

This hardware product is protected by the standard Aruba warranty of one year parts/labor.

For more information, refer to the ARUBACARE SERVICE AND SUPPORT TERMS AND CONDITIONS.

**NOTE:** Altering this device (such as repainting it) voids the warranty.

# Contents

# Contents

# Preface

This preface includes the following information:

- An overview of the sections in this manual
- A list of related documentation for further reading
- A key to the various text conventions used throughout this manual
- How to contact Aruba Wireless Networks

## Overview of this Manual

This manual is for trained technicians responsible for installing the Aruba AP 70 access point.

## Related Documents

The following items are part of the complete documentation for the Aruba system:

- *Aruba AP 70 Wireless Access Point Installation Guide* (this document)
- *Aruba Mobility Controller Installation Guide*
- *ArubaOS User Guide*

For the current versions of these manuals, or to obtain the latest product release notes, visit the support section of our Web site (see page vii).

ARUBA™
The **Mobile Edge** Company

# Text Conventions

The following conventions are used throughout this manual to emphasize important concepts:

TABLE 1   Text Conventions

| Type Style | Description |
| --- | --- |
| *Italics* | This style is used to emphasize important terms and to mark the titles of books. |
| `System items` | This fixed-width font depicts the following:<br>■ Sample screen output<br>■ System prompts<br>■ Filenames, software devices, and certain commands when mentioned in the text |
| **Commands** | In the command examples, this bold font depicts text that the user must type exactly as shown. |
| *\<Arguments\>* | In the command examples, italicized text within angle brackets represents items that the user should replace with information appropriate to their specific situation. For example:<br><br># **send**  *\<text message\>*<br><br>In this example, the user would type "send" at the system prompt exactly as shown, followed by the text of the message they wish to send. Do not type the angle brackets. |
| [ Optional ] | In the command examples, items enclosed in brackets are optional. Do not type the brackets. |
| { Item A \| Item B } | In the command examples, items within curled braces and separated by a vertical bar represent the available choices. Enter only one choice. Do not type the braces or bars. |

# Contacting Aruba Networks

| Web Site | |
|---|---|
| ■ **Main Site** | http://www.arubanetworks.com |
| ■ **Support Site** | http://www.arubanetworks.com/support |
| ■ **Software Licensing Site** | https://licensing.arubanetworks.com |
| ■ **Wireless Security Incident Response Team (WSIRT)** | http://www.arubanetworks.com/support/wsirt |
| ■ **Support Email** | support@arubanetworks.com |
| ■ **WSIRT Email** | wsirt@arubanetworks.com |
| Please email details of any security problem found in an Aruba product. | |
| **Telephone Numbers** | |
| ■ **Aruba Corporate** | +1 (408) 227-4500 |
| ■ **FAX** | +1 (408) 227-4550 |
| ■ **Support** | |
| ● United States | 800-WI-FI-LAN  (800-943-4526) |
| ● France | +33 (0) 1 70 72 55 59 |
| ● United Kingdom | +44 (0) 20 7127 5989 |
| ● Germany | +49 (0) 69 38 09 77 22 8 |
| ● All other countries | +1 (408) 754-1200 |

# Introduction

<div style="text-align: right">**1**</div>

The Aruba AP 70 works in conjunction with the Aruba Mobility Controller and can act as a wireless access point or air monitor.

As a wireless Access Point (AP), the Aruba AP 70 provides transparent, secure, high-speed data communications between wireless network devices (fixed, portable, or mobile computers with IEEE 802.11a or IEEE 802.11b/g wireless adapters) and the wired LAN.

As a wireless Air Monitor (AM), a feature unique to Aruba products, the Aruba AP 70 enhances wireless networks by collecting statistics, monitoring traffic, detecting intrusions, enforcing security policies, balancing wireless traffic load, self-healing coverage gaps, and more.

NOTE: Service to all Aruba Networks equipment must be performed by trained service personnel only.

## Front View

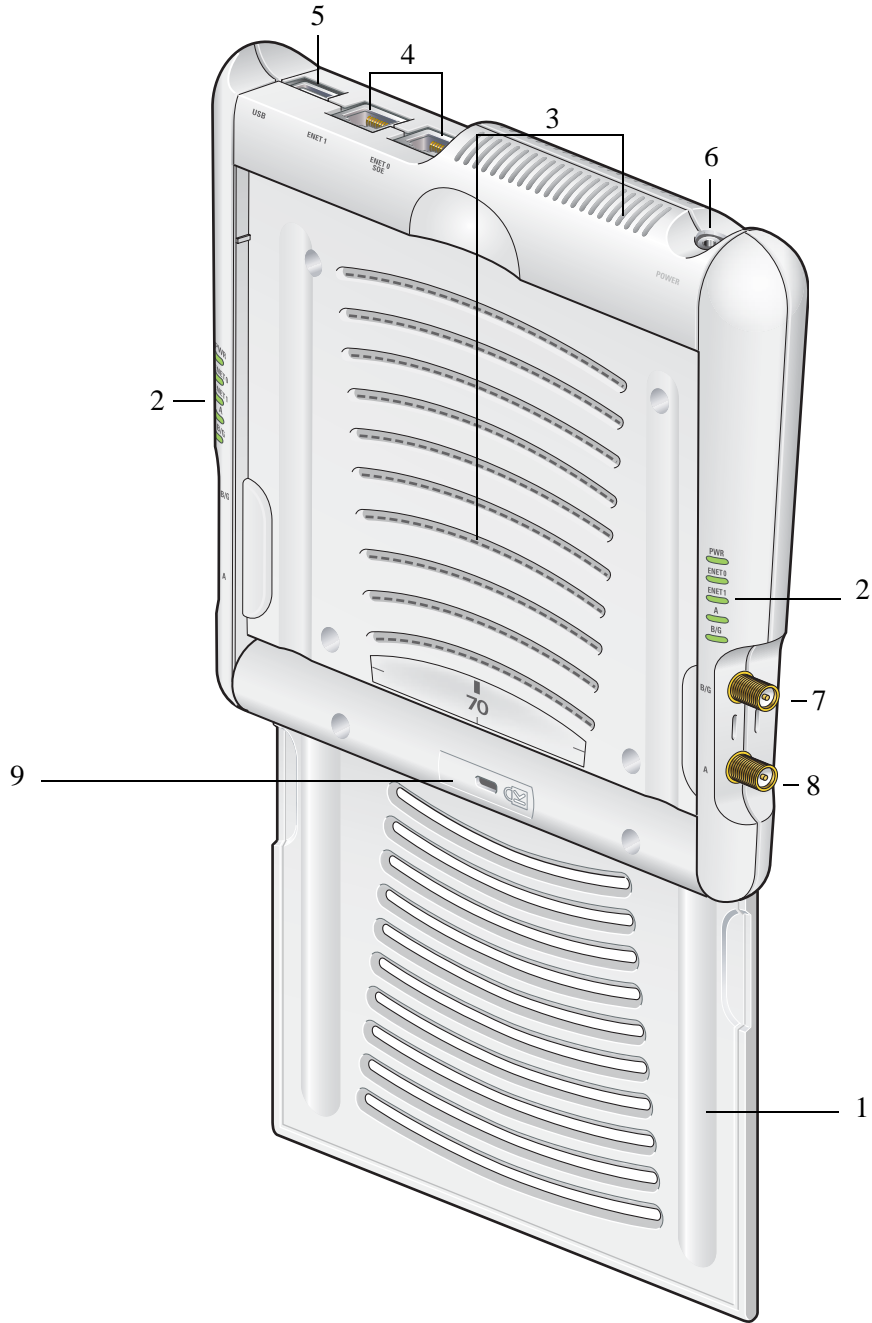This section describes the components on the front of the AP 70 (Figure 1-1).

**FIGURE 1-1**    Aruba AP 70 Front View

**1** **Fold-Out Internal Antenna**

The fold-out antenna allows the Aruba 70 to be placed on a flat table or shelf, mounted on a wall, or suspended from a ceiling (an optional mounting kit is available). If you are configuring external antennas, the internal antenna can be left closed.

The serial number and the model number are on the bottom of the fold-out antenna panel.

NOTE:    For best performance, swivel the antenna array so that it is oriented vertically. For more information, see Chapter 2, "AP Installation,".

**2** **Indicator LEDs**

During operation, the Aruba AP 70 LEDs provide the following information:

TABLE 1-1    Aruba AP 70 LEDs

| LED | State | Description |
|-----|-------|-------------|
| PWR | Off | The device is off - no power. |
| | Green-Solid | The device is powered and operating. |
| | Green-Flashing | The device is powered but is not ready for operation (typically, the AP is booting). |
| ENET0/1 | Off | No link on the FE port. No connection to the network.[a] |
| | Green-Solid | Ethernet link detected on the FE port. |
| | Green-Flashing | Transmitting or receiving data across the FE port. Flashing rate is proportional to network activity.[b] |
| A | Off | The wireless interface is disabled or down. |
| | Green-Solid | The wireless interface is enabled and functioning as an Access Point. |
| | Green-Flashing | The wireless interface is enabled and functioning as an Air Monitor. |
| B/G | Off | The wireless interface is disabled or down. |
| | Green-Solid | The wireless interface is enabled and functioning as an Access Point. |
| | Green-Flashing | The wireless interface is enabled and functioning as an Air Monitor. |

a. The ENET1 LED on Aruba AP 70 rev D and earlier models configured for 10Base-T traffic does not illuminate, but traffic is processed normally. The ENET1 LED on Aruba AP 70 rev E and later models (circa March, 2005 and later) illuminates when configured for 10Base-T traffic.
b. The ENET1 LED does not flash when traffic is being processed when configured for 10Base-T half duplex traffic. However, traffic is being processed properly.

NOTE:    LEDs on some Mobility Controller models provide additional status and security information about directly-connected APs. See the *Installation Guide* for the Mobility Controller for more information.

**3    Air Vents**

These vents promote proper air circulation for cooling the device. Do not allow these vents to be obstructed by mounting equipment, network cables, or any other material.

**4    FE Ports**

The ENET0 and ENET1 ports attach the Aruba AP 70 to a 10Base-T/100Base-TX (twisted-pair) Ethernet LAN segment. Both ports support Power over Ethernet (POE). ENET0 also supports Serial Over Ethernet (SOE).

**5    USB Ports**

This port is used to connect the AP to a host computer to support application specific functionality and for future applications in the RF environment such as RFID tracking or spectrum analysis.

**6    DC Power Socket**

This socket is used to connect the optional AC power adapter (not included). If POE is being used to supply power to the Aruba AP 70, the power adapter is not necessary.

**7    B/G Antenna Jack**

For external antenna connection.

**8    A Antenna Jack**

For external antenna connection.

**9    Kensington Security Slot**

This slot is compatible with a Kensington MicroSaver Security Cable (not included), which can be used to prevent the unauthorized removal of the Aruba AP 70 from its installed location. To secure the Aruba AP 70, wrap a security cable around an immovable object, insert the cable's lock into the Kensington Security Slot, and turn the key.

To use the Kensington Security Slot while the Aruba AP 70 is mounted by the mounting slots, the fold-out internal antenna must be in an open position.

See Appendix 3, "Port Specifications" for port and cable specifications.

# Back View

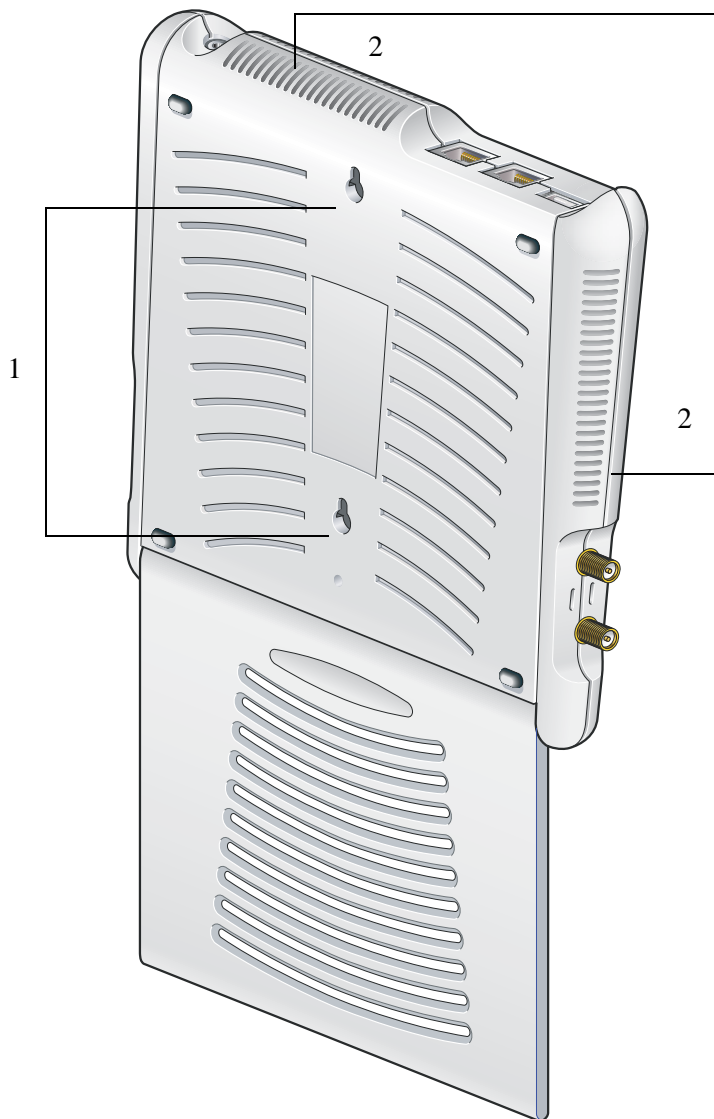This section describes the components on the back of the AP 70 (Figure 1-2).



**FIGURE 1-2** Aruba AP 70 Back View

**1** **Mounting Slots**

The keyhole-shaped slots on the back of the chassis are used for mounting the Aruba AP 70.

**2** **Air Vents**

These vents promote proper air circulation for cooling the device. Do not allow these vents to be obstructed by mounting equipment, network cables, or any other material.

# The Aruba AP Deployment Process

Deploying an Aruba AP typically consists of four stages:

1. Run Aruba's automated RF Plan site-survey software (available separately) to determine how many Aruba APs are needed and where they will be installed.

2. Ensure that the APs can locate the Mobility Controller when they are installed and connected to the network.

   This is covered in Chapter 2, "AP Installation".

3. Install the APs by connecting the AP to an Ethernet port and, optionally, to a power source.

   This is covered in Chapter 2, "AP Installation".

4. On the Mobility Controller, provision the APs.

   For AP configuration information, refer to the *ArubaOS User Guide.*

# AP Installation

<span style="float:right">**2**</span>

This chapter explains how to enable APs to connect to an Aruba Mobility Controller, and how to install and connect the Aruba AP 70.

## Enabling APs to Connect to the Mobility Controller

Before you install APs in a network environment, you must ensure that the APs will be able to locate and connect to the Mobility Controller when powered on. Specifically, you need to ensure the following:

- When connected to the network, each AP is assigned a valid IP address

- APs are able to locate the Mobility Controller

NOTE: Aruba APs use Trivial File Transfer Protocol (TFTP) the first time they boot to obtain their software image and configuration from the Mobility Controller. After the initial boot, the APs use FTP to obtain software images and configurations from the Mobility Controller.

### Enable APs to Obtain IP Addresses

Each Aruba AP requires a unique IP address on a subnetwork that has connectivity to a Mobility Controller. Aruba recommends using the Dynamic Host Configuration Protocol (DHCP) to provide IP addresses for APs; the DHCP server can be an existing network server or an Aruba Mobility Controller configured as a DHCP server.

You can use an existing DHCP server in the same subnetwork as the AP to provide the AP with its IP information. You can also configure a device in the same subnetwork to act as a relay agent for a DHCP server on a different subnetwork. Refer to the vendor documentation for the DHCP Server or relay agent for information.

If an AP is on the same subnetwork as the master Mobility Controller, you can configure the Mobility Controller as a DHCP server to assign an IP address to the AP. The Mobility Controller must be the only DHCP server for this subnetwork. See the ArubaOS User Guide for information on how to enable DHCP server capability on a Mobility Controller:

# Locate the Mobility Controller

An Aruba AP can discover the IP address of the Mobility Controller in one of the following ways:

- From a DNS server

- From a DHCP server

- Using the Aruba Discovery Protocol (ADP)

## From a DNS Server

Aruba APs are factory-configured to use the host name `aruba-master` for the Mobility Controller. For the DNS server to resolve this host name to the IP address of the Mobility Controller, you must configure an entry on the DNS server for the name `aruba-master`.

For information on how to configure a host name entry on the DNS server, refer to the vendor documentation for your server.

NOTE: Aruba recommends using a DNS server to provide APs with the IP address of the master Mobility Controller because it involves minimal changes to the network and provides the greatest flexibility in the placement of APs.

## From a DHCP Server

You can configure a DHCP server to provide the Mobility Controller's IP address. You need to configure the DHCP server to send the Mobility Controller's IP address using the DHCP vendor-specific attribute option 43. Aruba APs identify themselves with a vendor class identifier set to `ArubaAP` in their DHCP request. When the DHCP server responds to the request, it will send the controller's IP address as the value of option 43.

For more information on how to configure vendor-specific information on a DHCP server, see the *ArubaOS User Guide* or refer to the vendor documentation for your server.

## Using the Aruba Discovery Protocol (ADP)

ADP is enabled by default on all Aruba APs and Mobility Controllers. To use ADP, all Aruba APs and Mobility Controllers must be connected to the same Layer-2 network. If the devices are on different networks, a Layer-3 compatible discovery mechanism, such as DNS, DHCP, or IGMP forwarding, must be used instead.

With ADP, APs send out periodic multicast and broadcast queries to locate the Mobility Controller. You may need to perform additional network configuration, depending on whether the APs are in the same broadcast domain as the Mobility Controller:

- If the APs are in the same broadcast domain as the Mobility Controller, the controller automatically responds to the APs' queries with its IP address.

■   If the APs are not in the same broadcast domain as the Mobility Controller, you need to enable multicast on the network (ADP multicast queries are sent to the IP multicast group address 224.0.82.11) for the controller to respond to the APs' queries. You also need to make sure that all routers are configured to listen for Internet Group Management Protocol (IGMP) join requests from the Mobility Controller and can route these multicast packets.

See the *ArubaOS User Guide* for more information about enabling ADP on the Mobility Controller.

# Mounting the Aruba AP 70

Mount the Aruba AP 70 at its intended service location.

The Aruba AP 70 Access Points are intended only for installation in Environment A as defined in IEEE 802.3.af. All interconnected equipment must be contained within the same building, including the interconnected equipment's associated LAN connections.

Select a location as close as possible to the center of the intended coverage area. If necessary, use the Aruba RF Plan site survey tool to determine the optimum locations for your access points and air monitors.

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 AP 70 can be mounted on a wall or suspended from above (not shown) using one of the optional mounting kits (dimensions vary) in the following ways:
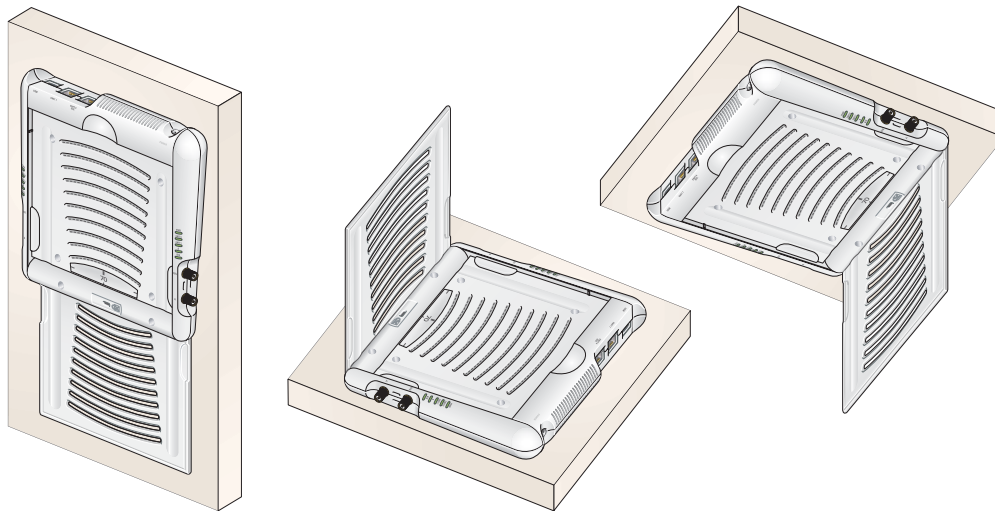


**FIGURE 2-1**    Aruba AP 70 Mounting Options

**NOTE:**    For dimensions, see Appendix 4, "Product Specifications". Allow 5 cm (2") additional space on the right-hand side for cables. Measurements for the Aruba AP 70 depend on attached antennas, which vary.

## Free-Standing Placement

To place the Aruba AP 70 indoors on a flat table or shelf:

1.  Flip open the Aruba AP 70 internal antenna.

2.  Place the device on a sturdy table or shelf.

⚠️ **CAUTION:**    Do not place the Aruba AP 70 in any place where it could fall on people or equipment. For more secure installation, use one of the optional mounting kits.

3.  Orient the antennas.

    For best performance, swivel the antenna array so that it is oriented vertically. Once mounting is complete, connect the required cables (see instructions on page 13).

# Using the Built-In Mounting Slots

The keyhole-shaped slots on the back of the Aruba AP 70 can be used to attach the device upright to an indoor wall or shelf.

> ⚠️ **CAUTION:** Do not use the mounting slots to hang the Aruba AP 70 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 AP 70 upright using the mounting slots, perform the following steps.

1. Install two screws in the wall or shelf as shown in Figure 2-2:

**Screw/Nail Positions**
(fastened to wall or shelf)

**Screw/Nail Dimensions**
Maximum        Minimum

10 cm
(3 15/16")

5.6 mm
1.6 mm
4.0 mm clearance from surface
2.4 mm

4.8 mm
2.4 mm clearnace from surface

7/32"
1/16"
5/32" clearance from surface
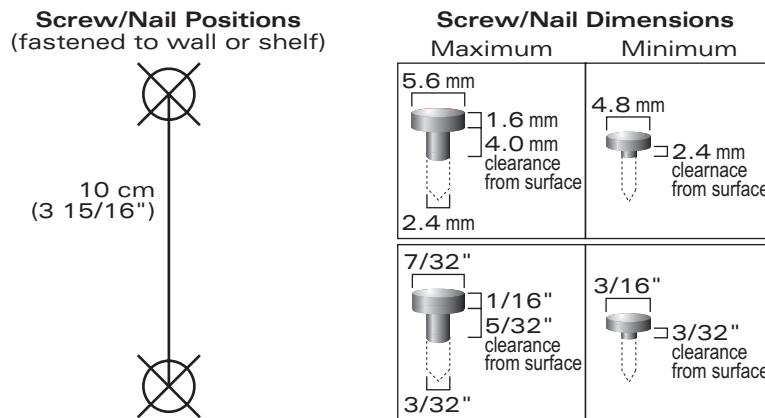3/32"

3/16"
3/32" clearance from surface

**FIGURE 2-2**    Mounting Screw Specifications

If attaching the device to drywall, we recommend using appropriate wall anchors (not included) as shown in Figure 2-3 on page 12.

2. Align the Aruba AP 70 mounting slots to capture the surface screws.
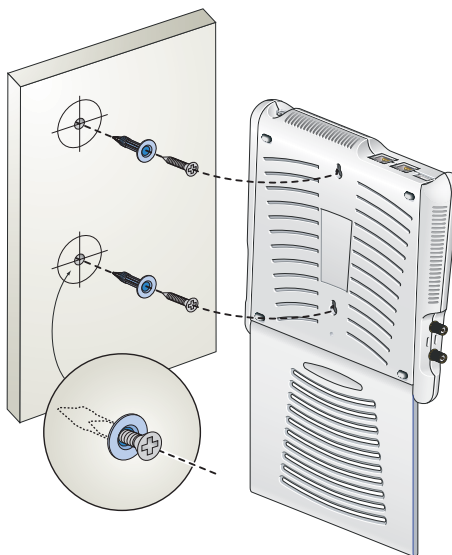


**FIGURE 2-3**     Hanging the Aruba AP 70 on Screws

3. Secure the Aruba AP 70, if desired.

   To prevent the unauthorized removal of the Aruba AP 70 from its installed location, use a Kensington MicroSaver Security Cable (not included). Wrap the security cable around an immovable object, insert the cable's lock into the Kensington Security Slot on the back of the Aruba AP 70, and turn the key.

4. Orient the antennas.

   For best performance, swivel the antenna array so that it is oriented vertically (see Figure 2-1 on page 10). Once mounting is complete, connect the required cables (see instructions on page 13).

## Using the Optional Mounting Kits

Use the optional mounting kit to attach the Aruba AP 70 to a wall, shelf, or ceiling. For installation, see the *Aruba AP 70 Mounting Kit Installation Notes* provided with each kit.

# Connecting Required Cables

The Aruba AP 70 Access Points are intended only for installation in Environment A as defined in IEEE 802.3.af. All interconnected equipment must be contained within the same building, including the interconnected equipment's associated LAN connections.

## Selecting an FE Cable

The 10/100 Mbps Ethernet (FE) port is used to connect the AP to a 10Base-T/100Base-TX (twisted-pair) Ethernet LAN segment. The appropriate FE cable depends on the features required of the FE port:

- SPOE

  When connecting the AP to a device that supports Serial and Power Over Ethernet (SPOE), use an 8-conductor, Category 5 UTP, straight-through FE cable.

  The Aruba 5000 (with Line Card LC-5000-24FE-2GE-SPOE), the Aruba 2400, and the Aruba 800 support SPOE.

- POE

  If the connecting device supports only Power Over Ethernet (POE), use a 4- or 8-conductor, Category 5 UTP, straight-through FE cable.

- Network Only

  If the connecting device does not support POE, use a 4- or 8-conductor, Category 5 UTP, FE cable. The ENET0 port detects MDI/MDX and automatically adjusts for straight-through or crossover cables.

The maximum length for FE cables is 100 meters (325 feet).

When the Aruba AP 70 is installed in an air-handling space, such as above suspended ceilings, as described in National Electrical Code (2002) Article 300.22(C), and Canadian Electrical Code, Sections 2-128, 12-010(3) and 12-100, Part 1, CSA C22.1, POE is required. Also, any FE cable 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.

Install cables in accordance with all applicable local and national regulations and practices.

See Appendix 3, "Port Specifications" for port and cable details.

# Connecting Cables and Power

⚠️ **CAUTION:** To prevent personal injury or damage to equipment, be sure to comply with electrical grounding standards during all phases of installation and operation of the AP. Do not allow the Aruba AP 70 or its attachments to be connected to or make contact with metal or power outlets on a different electrical ground than the device to which it is connected. Also, never connect the AP or Mobility Controller to external storm grounding sources.

To connect the FE port on the AP 70:

1. Connect one end of the FE cable directly to the Aruba AP 70 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 hub, router, or Mobility Controller that has a routable path to the Mobility Controller.

   **NOTE:** If the connecting device supplies POE, a straight-through cable must connect the Aruba AP 70 directly to the powering device without any intervening hubs, routers, or other networking equipment.

3. Connect power, if necessary.

   The Aruba AP 70 can receive electrical power using the following options:

   ● POE

   If connecting the Aruba AP 70 to a device that supplies IEEE 802.3af compliant POE no additional power connection is necessary.

   ● Power Outlet

   **NOTE:** When the Aruba AP 70 is installed in an air-handling space, as described in NEC (2002) Article 300.22(C), POE must be used instead of a power outlet.

   If local regulations and practices permit, connect the optional AC power adapter (not included) to the DC power socket on the Aruba AP 70 and plug it into an appropriate power outlet.

   ⚠️ **CAUTION:** To prevent personal injury or damage to equipment, use only the AC power adapter certified for this device in the country where it is used.

# Port Specifications

## FE Ports

The ENET0 and ENET1 10/100 Mbps Ethernet ports attach the Aruba 70 to a 10Base-T/100Base-TX (twisted pair) LAN segment. Both ports support Power over Ethernet (PoE). ENET0 also supports Serial over Ethernet (SoE) and auto-sensing MDI/MDX.

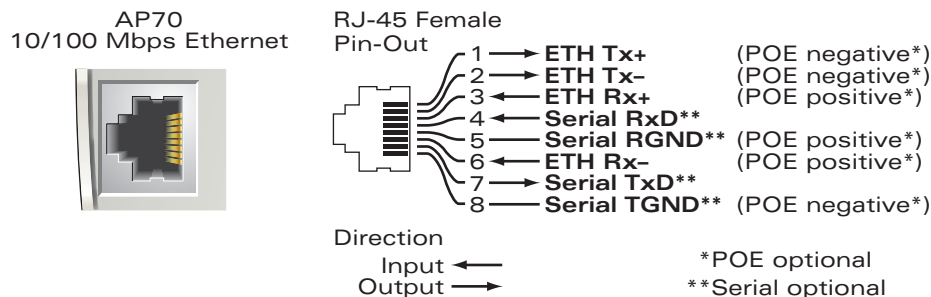The port pin-outs are shown in Figure A-1:



**FIGURE A-1** Aruba AP 70 FE Port

The appropriate cable depends on the level of connectivity required of the FE port:

- If the connecting device supports Serial and Power Over Ethernet (SPOE), use an 8-conductor, Category 5 UTP, straight-through FE cable with a male RJ-45 connector.

The Aruba 5000 (with Line Card LC-5000-24FE-2GE-SPOE), the Aruba 2400, and the Aruba 800 support SPOE.

- If the connecting device supports only Power Over Ethernet (POE, including IEEE 802.3af POE as well as "inline" or "midspan" POE devices), use an 8- or 4-conductor, Category 5 UTP, straight-through FE cable with male RJ-45 connectors.

- If the connecting device does not support Serial or POE, use a 4- or 8-conductor, Category 5 UTP, FE cable with male RJ-45 connectors. The ENET0 port detects MDI/MDX and automatically adjusts for straight-through or crossover cables.

The maximum length for FE cables is 100 meters (325 feet).

When the Aruba AP 70 is installed in an air-handling space, as described in NEC (2002) Article 300.22 (C), POE is required. Also, any FE cable 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.

Install cables in accordance with all applicable local regulations and practices.

# Serial Breakout Adapter

The optional serial breakout adapter is used to separate the serial communications lines from the Aruba AP 70 FE+SPOE port. This allows the administrator to connect a local serial console directly to the AP and access the `apboot` prompt for manual provisioning.

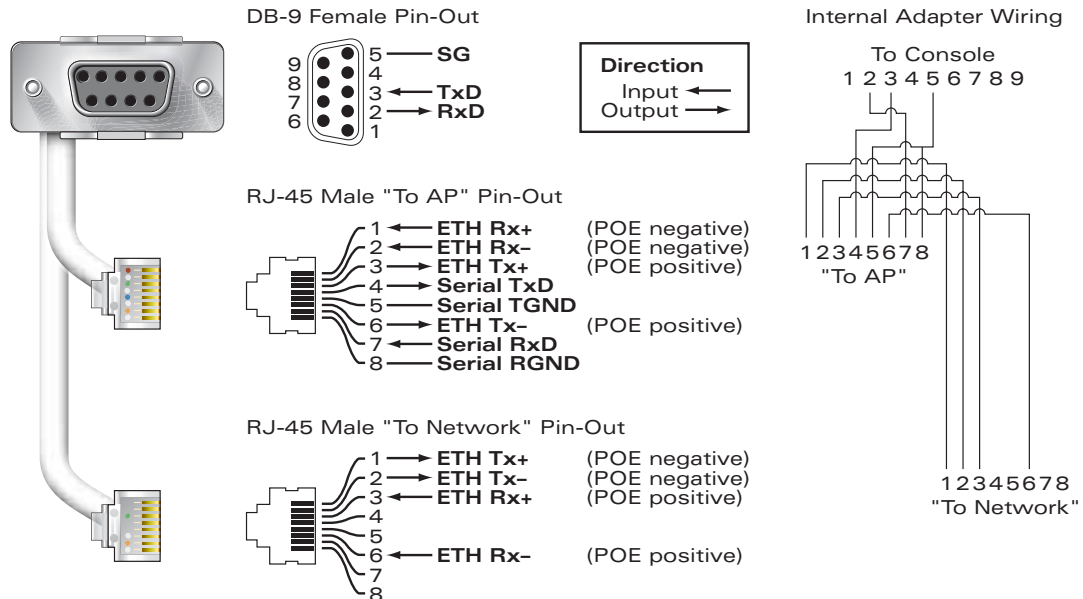The serial breakout adapter pin-outs are shown in Figure A-2:

**FIGURE A-2**     Aruba Serial Breakout Adapter

# DB-9 Specification

The DB-9 connector attaches to the serial port of a console terminal. Communication settings for the port are specified in Table A-1:

**TABLE A-1**    Console Terminal Settings

| Baud Rate | Data Bits | Parity | Stop Bits | Flow Control |
|-----------|-----------|--------|-----------|--------------|
| 9600 | 8 | None | 1 | None |

# "To AP" Specifications

The RJ-45 connector labeled "To AP" attaches to the Aruba AP 70 FE port either directly (if the AP is physically available) or indirectly (if the AP is already deployed).

When connecting indirectly, use a straight-through FE coupler to attach the "To AP" connector to the FE cable leading directly to the AP's FE port with no intervening hubs, routers, or other network equipment. The cable must be 8-conductor, Category 5 UTP, straight-through FE cable with a maximum length of 100 meters (325 feet).

The Aruba AP 70 and serial breakout adapter are plenum rated. When is installed in an air-handling space, as described in NEC (2002) Article 300.22(C), any connecting FE cable 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.

Install cables in accordance with all applicable local regulations and practices.

# "To Network" Specifications

The RJ-45 connector labeled "To Network" attaches to an FE LAN segment. This connection is optional unless IEEE 802.11af Power Over Ethernet (POE) is used to power the AP during manual provisioning.

A straight-through FE coupler may be used to attach the "To Network" connector to a LAN FE cable. The appropriate cable depends on the level of connectivity required of the FE port.

■    If the connecting device supports IEEE 802.3af Power Over Ethernet (POE), use a 4- or 8-conductor, Category 5 UTP, straight-through FE cable with male RJ-45 connectors.

The Aruba 5000 (with Line Card LC-5000-24FE-2GE-SPOE), the Aruba 2400, and the Aruba 800 support SPOE.

■    Otherwise, use a 4- or 8-conductor, Category 5 UTP, FE cable with male RJ-45 connectors. The ENET0 port detects MDI/MDX and automatically adjusts for straight-through or crossover cables.

> **NOTE:** Only IEEE 802.3af Power Over Ethernet is supported for manual provisioning. "Inline" or "midspan" POE devices will not work with the Aruba serial breakout adapter.

The maximum length for FE cables is 100 meters (325 feet).

The Aruba AP 70 and serial breakout adapter are plenum rated. When is installed in an air-handling space, as described in NEC (2002) Article 300.22(C), the connecting FE cable 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.

Install cables in accordance with all applicable local regulations and practices.

# USB Port

This Universal Serial Bus port is compliant with Universal Serial Bus Specification rev. 2.0. The USB port pin outs are:

| Pin | Description |
| --- | --- |
| 1 (counting from the outside edge) | Power |
| 2 | Signal (negative) |
| 3 | Signal (positive) |
| 4 | Ground |

# Product Specifications

## Compliance

This section lists compliance information on a country-by-country basis.

### United States

The following compliance statements apply for use of this product in the United States.



**FCC - Class B**

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 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.

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- Reorient 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.

**RF Radiation Exposure Statement**

This equipment complies with FCC RF radiation exposure limits set forth for fixed indoor use only. This equipment should be installed and operated with a minimum distance of 38.5 centimeters (15.2 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.

**Radio Frequency Interference Requirements**

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.

The use of this device operating either partially or completely outdoors may require the user to obtain a license for the system according to the Canadian regulations. For further information, contact your local Industry Canada office.

**RSS-210**

This device, when operated in the 5150-5250 MHz frequency range, is only for indoor use.

> ⚠️ CAUTION: High power radars are allocated as primary users (meaning they have priority) in the 5250-5350 MHz and 5650-5850 MHz frequency ranges, and these radars could cause interference and/or damage to LE-LAN devices.

## Japan

**Indoor Restriction for 5GHz Frequency Range**

> 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 Directive 1999/5/EC as well as with EN55022 Class B and EN55024 standards.

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

## Product Label

The product label is affixed to the chassis of the Aruba AP 70. The symbols on the label are explained in this chapter.

# Certifications

**TABLE B-1** Certifications

| Item | Measurement |
| --- | --- |
| Electromagnetic Compatibility | FCC Part 15 Class B, FCC Part 15 Class C 15.207/15.247 |
| | FCC Part 15 Class E 15.407 |
| | RSS 210 (CAN) |
| | ICES-003 Class B |
| | VCCI Class B |
| | TELEC ARIB STD-T66 |
| | EN 61000-3, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11, EN 55022, EN 55024 (89/336/EEC), 73/23/ECC, and 89/336/EEC |
| | The CE approval mark on back of the product indicates that it meets European Directives 73/23/EEC and 89/336/EEC |
| | R&TTE Directive: EN 300 328, EN 301 489, EN 301 893 |
| | AS/NZS 3548 Class B CIPPR22 Class B |
| | RFS 29 (NZ) |
| Safety | UL Listed (UL60950) UL Listed (Canadian Electrical Code/CSA 22.2 No. 60950) EN60950 / IEC60950 National Electrical Code Section 300-22(C) Canadian Electrical Code, Part 1, CSA C22.1 Sections 2-128, 12-010(3), and 12-100 |
| | UL 2043 Plenum Rating |

# Product Features

- Wireless dual-band transceiver
- Varied antenna options:
    - The Aruba AP 70 has a built-in array with dual, tri-band, omnidirectional antennas for reception diversity.
- Protocol-independent networking functionality
- Supports IEEE 802.11a or IEEE 802.11b/g operation as an AP
- Supports IEEE 802.11a and IEEE 802.11b/g operation as an AM
- Compatible with IEEE 802.3af Power Over Ethernet (POE)
- Seamless connectivity to wired LANs augment existing networks quickly and easily
- Can be centrally managed, configured, and upgraded through the Mobility Controller to take advantage of network changes and security improvements

## Ethernet Compatibility

The Aruba AP 70 attaches to 10/100 Mbps Ethernet (FE) LAN segments that utilize 10Base-T/100Base-TX (twisted-pair) wiring. The device appears as an Ethernet node and performs a routing function by moving packets between the wired LAN and remote workstations on the wireless infrastructure.

## Radio Characteristics

The Aruba AP 70 can be configured to support IEEE 802.11a or IEEE 802.11b/g operation as an AP, and supports both IEEE 802.11a and IEEE 802.11b/g operation as an AM:

- 802.11a provides a high data rate and reliable wireless connectivity

    802.11a operation uses a radio modulation technique known as Orthogonal Frequency Division Multiplexing (OFDM), and a shared collision domain (CSMA/CA). It operates in the 5 Ghz Unlicensed National Information Infrastructure (UNII) band. Data is transmitted over a half-duplex radio channel operating at up to 54 Megabits per second (Mbps).

- 802.11b provides an alternative to wired LANs that can dramatically cut costs

    802.11b operation uses the IEEE 802.11 High-Rate Direct Sequence (HRDS) specification, and a shared collision domain (CSMA/CA). It operates in the 2.4 Ghz Industrial/Scientific/Medical (ISM) band. The ISM band is available worldwide for unlicensed use. Data is transmitted at speeds of up to 11 Mbps.

- 802.11g provides a high data rate and is backwards compatible with 802.11b.

802.11g operation uses ODFM and a shared collision domain (CSMA/CA). It operates in the 2.4 Ghz Industrial/Scientific/Medical (ISM) band. The ISM band is available worldwide for unlicensed use. Data is transmitted at speeds of up to 54 Mbps.

# Power Over Ethernet

The Aruba AP 70 supports the IEEE 802.3af standard for Power Over Ethernet (POE). With this feature, the Aruba AP 70 can accept electrical power from a compatible POE-capable device (such as the Aruba 5000 (with Line Card LC-5000-24FE-2GE-SPOE), Aruba 2400, or Aruba 800) directly over the FE cable. POE eliminates the need to provide separate power outlets in environments that are difficult or undesirable to wire for electricity.

The Aruba AP 70 also supports "inline" and "midspan" POE devices for normal operation. Inline power is POE that is integrated into FE ports and provides POE directly to devices. Non-POE ports can have POE added by means of a mid-span device that provides POE. The non-POE port is connected to a mid-span POE port, and this mid-span port is connected to the device that requires POE.

# Physical Description

## Package Contents

The Aruba AP 70 package includes:

- One Aruba AP 70 Access Point
- Assorted documentation

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.

## Optional Items

The following optional items can also be ordered for the Aruba AP 70:

- Detachable antennas (Aruba AP 70 only)
- AC power adapter (5 VDC, 3 A) and power cord
- Serial breakout adapter for direct access to the AP console
- Mounting kit (modular cradle for walls and suspended ceilings)

Check with your Aruba sales representative for the availability of optional items.

The following specifications apply to the Aruba AP 70 Access Points.

# AP 70 Specifications

TABLE B-2    Aruba AP 70 802.11 Specifications

| Description | 802.11a | 802.11b | 802.11g |
|---|---|---|---|
| Integral Antenna | Dual, diversity supporting omni-directional, high gain as follows: 2.4-2.5 Ghz 4.46 dBi 5.150 Ghz 7.21 dBi 5.350 Ghz 6.49 dBi 5.850 Ghz 5.23 dBi | | |
| Frequency Band | • 5.150 ~ 5.250 Ghz (low band)<br>• 5.250 ~ 5.700 Ghz (ETSI)<br>• 5.500~ 5.825 Ghz (high band)<br>• 5.725 ~ 5.825 Ghz (high band) | • 2.4 ~ 2.483 Ghz (US, Canada & ETSI)<br>• 2.4 ~ 2.497 Ghz (Japan)<br>Complete country list available at http://www.arubanetworks.com/products/aps/certification | • 2.412 ~ 2.462 Ghz (US, Canada)<br>• 2.412 ~ 2.472 Ghz (ETSI)<br>• 2.412 ~ 2.484 Ghz (Japan)<br>Complete country list available at http://www.arubanetworks.com/products/aps/certification |
| Radio Technology | Orthogonal Frequency Division Multiplexing (OFDM) | Direct Sequence Spread Spectrum (DSSS) | Orthogonal Frequency Division Multiplexing (OFDM) |
| Modulation Type |  BPSK, QPSK, 16-QAM, 64-QAM | CCK, BPSK, QPSK | CCK, BPSK, QPSK, 16-QAM, 64-QAM |
| Transmit Power | Configurable by system administrator/ professional installer | Configurable by system administrator/ professional installer | Configurable by system administrator |
| Media Access Control | CSMA/CA with ACK | CSMA/CA with ACK | CSMA/CA with ACK |

TABLE **B-2**    Aruba AP 70 802.11 Specifications    (Continued)

| Description | 802.11a | 802.11b | 802.11g |
|---|---|---|---|
| Operating Channels | • US & Canada: 8 external antenna 12 internal antenna<br>• ETSI: 19<br>• Japan: 4<br><br>Complete country list available at http://www.arubanetworks.com/products/aps/certification | • US & Canada: 11<br>• ETSI: 13<br>• Japan: 14<br>• Complete country list available at http://www.arubanet-works.com/products/aps/certification | • US & Canada: 11<br>• ETSI: 13<br>• Japan: 14<br><br>Complete country list available at http://www.arubanetworks.com/products/aps/certification |
| Data Rates | 6, 9, 12, 18, 24, 36, 48, 54 Mbps per channel | 1, 2, 5.5, 11 Mbps per channel | 6, 9, 12, 18, 24, 36, 48, 54 Mbps per channel |

TABLE **B-3**    Aruba AP 70 Characteristics

| Description | |
|---|---|
| Maximum Clients | 64 |
| Multi-mode Radio Band | Selectable via software |
| Manageability: | ■ Management of all 802.11 parameters<br>■ Network Wide AP Management via:<br>　• CLI<br>　• WEB GUI<br>　• SNMPv3<br>■ Access Point Profiles,  Management by:<br>　• Geographical Location<br>　• BSSID<br>　• Radio Type |
| Encryption Support (AP and Mobility Controller) | 40bit / 64bit / 128bit / 152bit WEP, TKIP, AES, WPA, WPA2.0 |

**TABLE B-3**    Aruba AP 70 Characteristics    (Continued)

| Description | |
|---|---|
| Physical (HxWxD): | ■ Antenna Retracted: 167 x190 x 30 mm (6.57 x 7.48 x 1.18 in) |
| | ■ Antenna Deployed: 293 x 190 x 30 mm (11.54 x 7.48 x 1.18 in) |
| | Weight 510 grams (18 oz) |
| Interfaces (Electrical): | ■ 2 x 10/100 Base-TX RJ-45 auto-sensing Ethernet interfaces: |
| | Port ENET0 |
| | ● Supports auto-sensing MDI/MDX |
| | ● Supports Power Over Ethernet 48V DC / 250mA (802.3af compliant) |
| | ● Supports Serial Over Ethernet |
| | Port ENET1 |
| | ● Does not support auto-sensing |
| | ● Supports Power Over Ethernet 48V DC / 250mA (802.3af compliant) |
| | ● Does not support Serial Over Ethernet |
| | ■ USB ver 2.0 Interface |
| Interfaces (Mechanical): | ■ Standard Kensington MicroSaver Security Cable Interface (cable not supplied) |
| | ■ Wall, wall gang box, ceiling mount kit interface (optional - part number AP-70-MNT) |
| Visual Indicators (LEDs) | ■ Ready -- Power on/off |
| | ■ Ethernet (0/1) Link status / Activity |
| | ■ (Radio Mode) 802.11a +b/g access point/air monitor mode |
| Power Requirements | ■ External AC power or POE |
| | ■ 5V DC / 3A supplied externally via optional, country-specific AC adapter kits |
| | ■ 48V DC / 250mA Power Over Ethernet (802.3af compliant) |

**TABLE B-3**    Aruba AP 70 Characteristics    (Continued)

| Description | |
|---|---|
| Output Power | 100 mW maximum (or lower as configured on the Aruba Mobility Controller to comply with local regulatory requirements) |
| Power Consumption | 12W maximum |
| Operating Environment | ■ 0 °C to 50 °C (32 °F to 122 °F) AP<br>■ 0 °C to 40 °C (32 °F to 104 °F) AC Mains Power Adapter Kit |
| Storage Environment | ■ 0 °C to 70 °C (32 °F to 158 °F) AP<br>■ -20 °C to 70 °C (-4 °F to 158 °F) AC Mains Power Adapter Kit |
| Humidity | ■ 5 to 95%, non-condensing AP<br>■ 15 to 85% RH AC Mains Power Adapter Kit<br>■ 5 to 90% RH Storage Humidity AC Mains Power Adapter Kit |
| Altitude | 3,048 m (10,000 feet) maximum |
| Standards Compliance | ■ Ethernet IEEE 802.3 / IEEE 802.3u<br>■ Power Over Ethernet IEEE 802.3af<br>■ Wireless IEEE 802.11a/b/g<br>■ USB 2.0 |

# Proper Disposal of Aruba Equipment

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/

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