Airspace Access Point (AP) Installation Guide

Airespace System 1.0: March 17, 2003

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Legal Information

Disclaimer

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U.S.A. Government Restricted Rights

(tbd)

Applicable Laws

(tbd)

FCC Statements

This equipment has been tested and found to comply with the limits for a Class A 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 his own expense.

RF Radiation Hazard Warning

To ensure compliance with FCC RF exposure requirements, this device must be installed in a location such that the antenna of the device will be greater than 20 cm (8 in.) from all persons. Using higher gain antennas and types of antennas not covered under the FCC certification of this product is not allowed.

Note: No 802.11a external antennas are currently certified or available in this release. Contact Airespace, Inc. for a list of FCC-approved 802.11b external antennas.

Installers of the radio and end users of the system must adhere to the installation instructions provided in this manual.

Non-Modification Statement

Use only the supplied internal antenna, or external antennas supplied by the manufacturer. Unauthorized antennas, modifications, or attachments could damage the badge and could violate FCC regulations and void the user's authority to operate the equipment.

Table of Contents

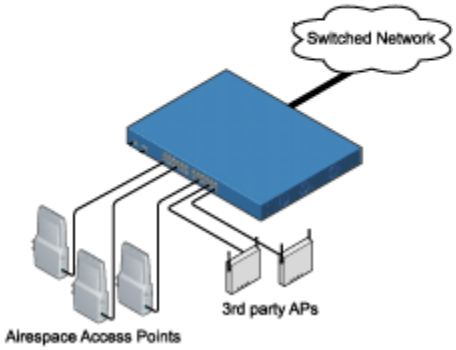
About this Guide

The Airespace Access Point (AP) Installation Guide allows installation planners, network administrators, and installers to work together to install Airespace APs in a target environment. Refer to the following sections for more information about the Airespace AP.

About the Airespace Access Point

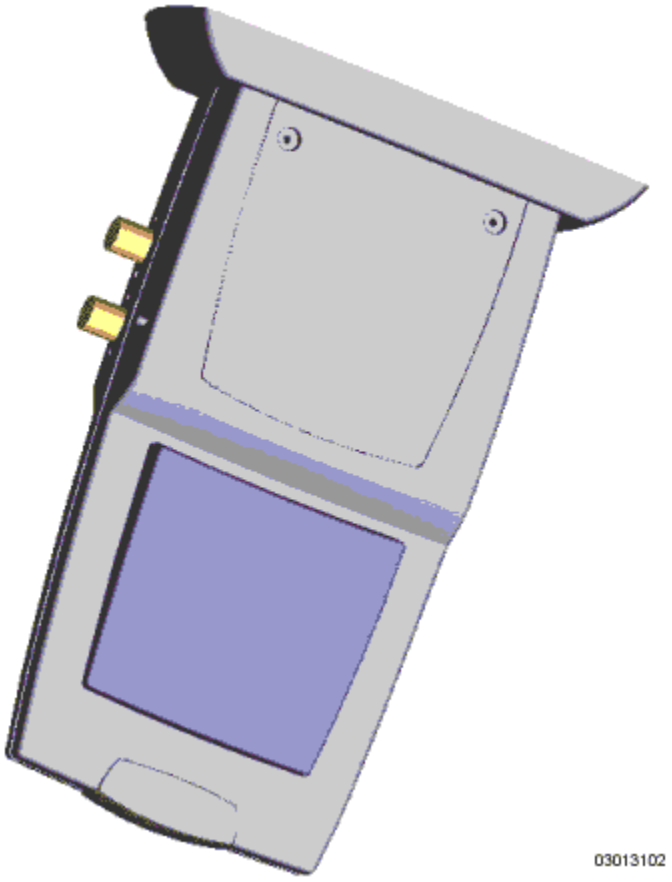
The Airespace AP is a part of the innovative Airespace System. When associated with an Airespace 4000 Switch as shown in the following figure, the Airespace AP provides advanced 802.11a and/or 802.11b AP functions in a single sleek enclosure, including unmatched scalability and security solutions for enterprises and Wireless ISPs. In the Airespace System, most of the processing power is removed from a traditional AP to the Airespace Switch.

Airespace Switch and APs



The following figure shows an Airespace AP with the optional ceiling mount base.

Airespace AP with Ceiling Mount Base



Refer to the following for more information on Airespace APs:

- Airespace AP Models
- Airespace AP 802.11a Radio Cards
- Internal and External Airespace AP Antennas
- About Ethernet Cabling
- Airespace AP LEDs
- Airespace AP Connectors
- Airespace AP Power Requirements
- Airespace AP External Power Converter
- About Power Over Ethernet (PoE)
- Airespace AP Physical Security
- Airespace AP Automatic Software Upgrades
- Airespace AP Specifications
- Installing Airespace APs

About Airespace AP Models and Upgrade Card

The Airespace AP includes one 802.11a radio (1200A), one 802.11b radio (1200B), or one 802.11a and one 802.11b radio (1200AB). As an added feature, the 1200B Airespace AP can be updated by the customer with an 802.11a radio, allowing for current 802.11b coverage and future 802.11a coverage by the same Airespace AP. Refer to the Airespace AP 802.11a Radio Card section for information on the field-installable radio that adds 802.11a capability to an existing 802.11b Airespace AP.

The Airespace AP comes in the following configurations:

- Model 1200A - Airespace AP with one 802.11a radio and two high-gain internal antennas
- Model 1200B - Airespace AP with one 802.11b radio and four high-gain internal antennas; can be upgraded to a 1200AB by adding an 802.11a Radio Card
- Model 1200AB - Airespace AP with one 802.11a and one 802.11b radio and four high-gain internal antennas

The following upgrade card is also available:

- 802.11a Radio Card - Add this card to a 1200B to create a 1200AB Airespace AP

The Airespace AP is shipped with a color-coordinated ceiling mount base, and projection and flush wall mount brackets. These brackets and base allow quick mounting to ceiling, wall or pole:

- Ceiling Mounting Kit - Allows you to mount the Airespace AP on any horizontal surface
- Flush Wall Mount Kit - Allows you to mount the Airespace AP on a wall with one internal antenna disabled; handy for installations requiring a directional transmission pattern or an external antenna.

Note: No 802.11a external antennas are currently certified or available in this release. Contact Airespace, Inc. for a list of FCC-approved 802.11b external antennas.

- Projection Wall Mount Kit - Allows you to mount the Airespace AP on a wall with both (or all four) internal antennas enabled; handy for installations requiring an omnidirectional transmission pattern

About the Airespace AP 802.11a Radio Card

The 1200B (802.11b) Airespace AP can be upgraded to a 1200AB (802.11a and 802.11b) Airespace AP by adding a professionally-installed 802.11a radio card.

The 802.11a radio supports diversity between the internal antennas and a factory-supplied external antenna.

Refer to the Airespace AP 802.11a Radio Card Quick Install Guide for professional installer instructions.

- **Note:** No 802.11a external antennas are currently certified or available in this release. Contact Airespace, Inc. for a list of FCC-approved 802.11b external antennas.
- **Note:** The Airespace APs must use the factory-supplied internal or external antennas to avoid violating FCC regulations and voiding the user's authority to operate the equipment.

About Internal and External Airespace AP Antennas

The 1200A Airespace AP enclosure contains one 802.11a radio which drives two fully-enclosed high-gain antennas which provide a large 360-degree coverage area. When equipped with a factory-supplied external antenna, the 802.11a radio supports receive and transmit diversity between the internal antennas and the external antenna.

- **Note:** No 802.11a external antennas are currently certified or available in this release. Contact Airespace, Inc. for a list of FCC-approved 802.11b external antennas.

The diversity function provided by Airespace radios can result in lower multipath fading, fewer packet retransmits, and higher throughput to and from clients.

- **Note:** The Airespace APs must use the factory-supplied internal or external antennas to avoid violating FCC regulations and voiding the user's authority to operate the equipment.

The 1200AB Airespace AP enclosure contains one 802.11a and one 802.11b radio and four fully-enclosed high-gain antennas which provide large 360-degree 802.11a and 802.11b coverage areas. Note that the 802.11b radio supports receive and transmit diversity between the internal antennas, while the 802.11a radio supports diversity between the internal antennas and a factory-supplied external antenna.

The 1200B Airespace AP enclosure contains one 802.11b radio and a slot for an 802.11a radio card, and four high-gain antennas, which provide large 360-degree 802.11b (and future 802.11a) coverage areas. The 802.11b radio supports receive and transmit diversity between the internal antennas. Note that the 802.11a radio supports diversity between the internal antennas and a factory-supplied external antenna.

- **Note:** No 802.11a external antennas are currently certified or available in this release. Contact Airespace, Inc. for a list of FCC-approved 802.11b external antennas.

The Airespace APs have reverse-polarity TNC jacks for installations requiring factory-supplied external directional or high-gain antennas. The Airespace AP has one 802.11a external antenna jack and two 802.11b external antenna jacks, which allow the Airespace AP radios to provide transmit and receive diversity using external antennas. This option can create more flexibility in Airespace AP and antenna placement.

- **Note:** No 802.11a external antennas are currently certified or available in this release. Contact Airespace, Inc. for a list of FCC-approved 802.11b external antennas.

About Airespace AP LEDs

Each Airespace AP is equipped with four LEDs across the top of the case. They can be viewed from nearly any angle. The LEDs indicate power and fault status, radio slot 1 link activity, and radio slot 2 link activity.

This LED display thus gives a quick overview of the Airespace AP status. For more detailed troubleshooting instructions, refer to the Troubleshooting the Airespace AP section (to be determined).

About Airespace AP Connectors

The Airespace AP has the following external connectors:

- One RJ-45 jack, used for connecting the Airespace AP to the Airespace Switch.
- One 48 VDC power input jack, used to plug an optional factory-supplied external power adapter into the Airespace AP.
- Three reverse-polarity TNC antenna jacks, used to plug optional external antennas into the Airespace AP--two for an 802.11b radio, and one for an 802.11a radio.

Note: No 802.11a external antennas are currently certified or available in this release. Contact Airespace, Inc. for a list of FCC-approved 802.11b external antennas.

The Airespace AP communicates with an Airespace Switch using standard CAT5 (Category 5) or higher 10/100 Mbps unshielded twisted pair cable with RJ-45 connectors. Plug the CAT5 cable into the RJ-45 jack on the side of the Airespace AP.

Note that the Airespace AP can receive power over the CAT5 cable from the Airespace Switch or other equipment. Refer to About Power Over Ethernet for more information about this option.

The Airespace AP can be powered from an optional factory-supplied external AC-to-48 VDC power adapter. If you are powering the Airespace AP using an external adapter, plug the adapter into the 48 VDC power jack on the side of the Airespace AP.

The Airespace AP includes two 802.11a and two 802.11b high-gain internal antennas, which provide omnidirectional coverage. However, the Airespace AP can also use optional factory-supplied external high-gain and/or directional antennas; one for an 802.11a radio and two for an 802.11b radio. When used with external antennas, each Airespace AP radio supports diversity, if enabled. When you are using external antennas, plug them into the reverse-polarity TNC jacks on the side of the Airespace AP.

Note: No 802.11a external antennas are currently certified or available in this release. Contact Airespace, Inc. for a list of FCC-approved 802.11b external antennas.

Note: The Airespace APs must use the factory-supplied internal or external antennas to avoid violating FCC regulations and voiding the user's authority to operate the equipment.

About Airespace AP Physical Security

The side of the Airespace AP housing includes a slot for a Kensington MicroSaver Security Cable. You can use any MicroSaver Security Cable to ensure that your Airespace AP stays where you mounted it!

About Power Over Ethernet

Airespace equipment supports 802.3af-compliant Power over Ethernet (PoE), which can reduce the cost of discrete power supplies, additional wiring, conduits, outlets, and installer time. PoE also frees installers from having to mount the Airespace APs near AC outlets, which allows more flexibility in positioning Airespace APs for maximum coverage. Finally, systems with fewer wires generally have lower failure rates.

When you are using PoE, the installer runs a single CAT5 cable from each Airespace AP to the PoE-equipped Airespace Switch or other network element, or to a PoE power hub. When the PoE equipment determines that the Airespace AP is a powered device, it sends 48 VDC over unused pairs in the Ethernet cable to the Airespace AP.

Airespace APs can receive power from the Airespace Switch, or any other network device conforming to the IEEE 802.3af standard.

When a Airespace Switch is operated in Appliance Mode, it can be ordered without PoE, as the switching element it is connected through can be equipped with internal PoE or an external PoE hub. When a Airespace Switch is operated in Direct Connect Mode, it can be ordered with internal PoE or an external PoE hub. Contact Airespace for recommended external PoE hubs.

Installing Airespace APs

Installing Airespace APs is a two-part process. First, you must plan where the Airespace APs are to be located to provide the desired coverage, and then you install the Airespace APs in the desired locations. Continue with the following:

- Planning Airespace AP Locations
- Mounting Airespace APs

Planning Airespace AP Locations

This planning section provides information necessary for the installer to quickly and easily plan, install, and test Airespace AP Radio Frequency coverage in an end-user environment.

Before you start the Airespace AP Planning process, please read the Planning Notes. Once you have read the Planning Notes, continue with the following steps:

1 Collecting Tools and Materials
2 Preparing Optional Trial Assemblies
3 Surveying the Site
4 Determining Airespace AP Coverage and Locations
5 Positioning Airespace APs
6 Verifying Airespace AP Coverage
7 Where to Go From Here

Mounting Airespace APs

After completing the steps in the Planning Airespace AP Locations section, mount Airespace APs as follows. Refer to the following figure for installation details.

Note: When mounting Airespace APs, make sure to maintain a 20 cm (8 in.) separation between the Airespace APs and any persons to comply with FCC RF exposure regulations. Refer to the FCC Statements section for more FCC information.

1 Collect the following supplies:

- Screwdrivers, drills, and ladder.
- An assortment of sheet metal and drywall screws and toggle bolts.
- Airespace AP Vertical Mount Kits, one per Airespace AP as required.
- Airespace AP Wall Mount Kits, one per Airespace AP as required.
- CAT5 cables between the Airespace AP locations and the planned Airespace Switch location.

2 Using the mounting kits supplied with each Airespace AP, mount the Airespace AP in its final location. The following figure shows the an Airespace AP and the ceiling mount. (Mounting details to be determined.)

3 Mark the final mounting locations on the maps or floorplans, including the "Front" direction, if the Airespace AP is to be used with diversity disabled.

4 Copy the MAC Address(es) from the bottom of each Airespace AP onto the maps or floorplans.

5 If the CAT5 cabling that will connect the Airespace APs to the Airespace Switch is available, plug it into the Airespace AP now.

Airespace AP and Ceiling Mount Assembly