



External-Antenna 1200 and 1250 Airespace AP Quick Installation Guide

System Release 2.1

This Guide contains several sections allowing you to install an AS-1200-BG-EXT, OAW-1250BGE, AS-1200-ABG-EXT, OAW-1250ABGE Airespace Access Point or an AS-1200-ABG-EXT-RE or OAW-1250ABGR Remote Edge Access Point (REAP). These models contain internal 802.11a and 802.11b/g antennas and connectors for optional external 802.11a and 802.11b/g antennas.

When you are installing an AS-1200-BG-INT, OAW-1250BG, AS-1200-ABG-INT, or OAW-1250ABG Airespace Access Point with internal 802.11a and 802.11b/g antennas and no connectors for optional external antennas, please refer to the [Internal-Antenna Airespace Access Point Quick Installation Guide](#).

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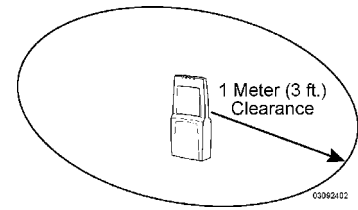
ATTENTION!

While Airespace Access Points have been engineered for easy installation, there are some guidelines that are very important to the end users:

- PLACE Airespace APs NO MORE THAN 140 FEET APART FROM EACH OTHER. Placing Airespace APs further apart almost always results in poor coverage.
- MAKE SURE THAT Airespace APs ARE INSTALLED VERTICALLY. When Airespace APs are installed vertically, either standing up in a plenum or hanging from a ceiling, this creates the largest coverage area per Airespace AP. Hanging Airespace APs from the ceiling provides the best RF coverage.



- DO NOT MOUNT Airespace AP ANTENNAS WITHIN ONE METER (3 FT.) OF ANY METAL OBSTRUCTIONS. THE RF WAVES FROM Airespace APs ARE BLOCKED AND/OR REFLECTED BY METAL OBJECTS, such as metal HVAC ducts, conduit, pipes, bookcases, elevator shafts, stairwells, and metal walls. REFER TO THE [Airespace Access Point Deployment Guide](#) BEFORE MOUNTING Airespace APs NEAR METAL OBSTRUCTIONS.
- WHEN MOUNTING AN Airespace AP IN THE CORNER OF A RIGHT-ANGLE HALLWAY INTERSECTION, MOUNT THE Airespace AP AT A 45-DEGREE ANGLE TO THE TWO HALLWAYS. The Airespace AP internal antennas are not omnidirectional, and cover a larger area when mounted this way.
- External antennas are NOT to be used when installing Airespace APs and REAPs in a plenum.
- MAKE SURE that plenum-mounted Airespace APs and REAPs are powered using Power Over Ethernet (POE) and use only the metal brackets (not the Ceiling-Mount Base or the Hanging-Ceiling Clips) to comply with safety regulations.
- DO NOT MOUNT Airespace APs OUTSIDE BUILDINGS.
- DO NOT MOUNT Airespace APs ON BUILDING PERIMETER WALLS UNLESS THE OPERATOR WANTS TO PROVIDE COVERAGE OUTSIDE THE BUILDING.



Overview

This guide is designed to provide you with the information needed to mount AS-1200-BG-EXT OAW-1250BGE, AS-1200-ABG-EXT, and OAW-1250ABGE Airespace Access Points, and AS-1200-ABG-EXT-RE and OAW-1250ABGR Remote Edge Access Points (REAPs). Airespace APs and REAPs are part of the innovative Airespace Wireless Enterprise Platform (Airespace System), and require no manual configuration after they are mounted.

This document assumes that a site survey has been performed as described in the [Airespace Access Point Deployment Guide](#) document, that Airespace AP and REAP locations and mounting options have been selected, and that you have one Airespace AP or REAP per indicated location.

After the site survey is done, you should have a map indicating the following:

- Airespace AP and REAP locations.
- Airespace AP and REAP mounting options: hanging from a ceiling, in the ceiling plenum, projecting away from the wall, flat against the wall, or using the Ceiling-Mount Bezel Kit.
- Airespace AP and REAP power options: power supplied by the AC-to-DC power supply orderable from the factory, or Power over Ethernet (PoE) from the Airespace WLAN Switch, another network device, or a PoE injector/hub (usually located in a wiring closet).



DANGER: Plenum-mounted Airespace APs and REAPs MUST BE powered using Power Over Ethernet (POE) to comply with safety regulations.

If you do not have a map, make one so you can record the MAC addresses from each location and return them to the person who is planning or managing this wireless network.

Refer to the following sections to install the Airespace APs.

- ▶ **Note:** When mounting Airespace APs and REAPs, make sure to maintain a 20 cm (8 in.) separation between the Airespace APs or REAPs and bystanders to comply with FCC RF exposure regulations. Refer to the [FCC Statements for Airespace APs](#) section for more information.

For more details about Airespace AP and REAP installations, refer to the [Planning Notes](#) section at the end of this document.

Step 1: Collecting Required Tools and Supplies

- One Airespace AP or REAP per location.
- Airespace AP and REAP Mounting Kits, factory-supplied with each Airespace AP.
- Optional Airespace AP and REAP Mounting Kits, factory-orderable.
- Optional AC-to-DC external power supplies, factory-orderable. Note that this option requires the power cable to be run through the plenum in a metal conduit to meet safety requirements.
- Optional external 802.11b/g antennas.
- Map showing Airespace AP and REAP locations, and mounting and power options.
- Screwdrivers, drills, and ladder.
- An assortment of sheet metal and drywall screws and toggle bolts.
- CAT-5 (or higher) cables to connect the Airespace AP and REAP locations and the Airespace WLAN Switch or other network device.
- Optional Kensington MicroSaver Security Cable to secure each Airespace AP and REAP.

Continue with [*Step 2: Configuring the Airespace AP or REAP Before Installation.*](#)

Step 2: Configuring the Airespace AP or REAP Before Installation

The following procedures are designed to make sure that your Airespace AP physical installation goes smoothly and that initial operation is as expected. If you are unable to prepare your Airespace AP for deployment, this Step also describes RMA (Return Material Authorization) procedures.

- ▶ **Note:** Perform either of the following two procedures on each Airespace AP or REAP BEFORE deploying the Airespace AP or REAP in its final location.

- [Preparing a Version 1.2 Airespace AP](#) for installation in a Version 2.0 Airespace System
- [Preparing a Version 2.0 Airespace AP or REAP](#) or [Alternate Preparing a Version 2.0 Airespace AP or REAP](#) for installation in a Version 2.0 Airespace System

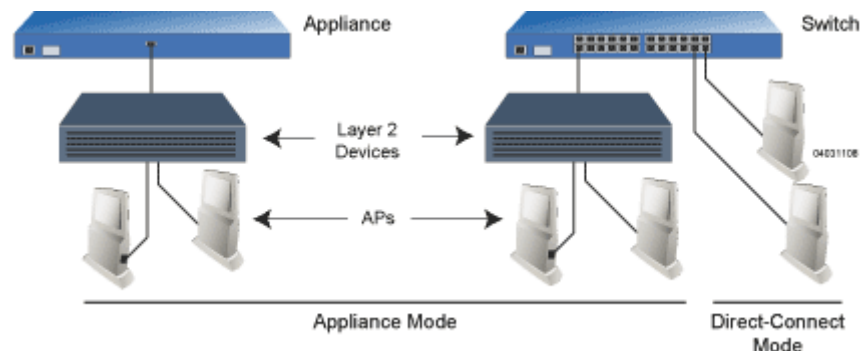
If you are unable to perform either of previous procedures, refer to the [RMA Procedures](#) section in the [Airespace Product Guide](#).

Preparing a Version 1.2 Airespace AP

If your Airespace AP has Airespace Operating System 1.2 or an earlier version loaded on it, or if you do not know what version the Airespace AP has loaded on it, use this procedure. If your Airespace AP is a REAP or has Airespace Operating System 2.0 or later loaded on it, use the [Preparing a Version 2.0 Airespace AP or REAP](#) procedure below.

- ▶ **Note:** This procedure assumes that you are preparing a version 1.2 Airespace AP to interoperate with a version 2.0 Airespace Switch or Appliance. When you are preparing a version 1.2 Airespace AP to interoperate with a version 1.2 Airespace Switch or Appliance, use the procedure found in the version 1.2 [Airespace Access Point Quick Installation Guide](#).

Configuration Setup



Does My Configuration Qualify for this Procedure?

- You must have a version 2.0 Airespace Switch or Appliance on its own subnet that can be reconfigured back and forth between Layer 2 and Layer 3 LWAPP operation. If you do not have a spare or depot Airespace Switch or Appliance that can be reconfigured back and forth between Layer 2 and Layer 3 operation, refer to RMA Procedures later in this document to RMA your version 1.2 Airespace APs.
- Alternatively, you may have a version 2.0 Airespace Switch or Appliance that is part of a mobility group that can be reconfigured back and forth between Layer 2 and Layer 3 operation. If you do not have a mobility group of Airespace Switches and Appliances that can be recon-

figured back and forth between Layer 2 and Layer 3 operation, refer to RMA Procedures later in this document to RMA your version 1.2 Airespace APs.

- If your version 1.2 Airespace AP(s) cannot be configured for any other reason using the following procedure, refer to [RMA Procedures](#) in the [Airespace Product Guide](#).

Configuration Steps for an Airespace AP

1. Configure the Airespace Switch or Appliance in **LWAPP Layer 2 Mode** (use the CLI command *show switchconfig* to determine the mode; if it is set to layer 3, use the CLI command *config switchconfig mode L2* to change it to Layer 2). Make sure the Airespace Switch or Appliance DS Port is connected to the network. Use CLI, Web Browser and/or ACS procedures as described in the [Airespace Switch or Appliance Quick Install Guide](#) and the [Airespace Product Guide](#).
 - Make sure Airespace AP ports are available (either [Direct-Connect Mode](#) or [Appliance Mode](#)).
 - Set the Airespace Switch or Appliance as the Master, so new Airespace APs always associate with it. Use the CLI command *show network config* to determine if the Airespace Switch or Appliance DS Port is the Master. If it is not, make it the Master with the CLI command properly, make sure to use the CLI command *config network master-base disable*.
 - Refer to the [Airespace Product Guide](#) for other settings.

(Note that Layer 3 and Layer 2 LWAPP operation can be switched back and forth as described in the Solutions section of the [Airespace Product Guide](#).)

2. Take the Airespace AP out of the box and plug it into a front-panel 10Base-T connector on the Master Switch ([Direct-Connect mode](#)), or through the same subnet that Airespace Switch or Appliance is on ([Appliance Mode](#)).
3. Apply power to the Airespace AP:
 - Use 802.3af-compliant Power Over Ethernet (PoE) from the Airespace WLAN Switch or from an orderable inline power injector. If you do not have PoE available, use an orderable external AC-to-48 VDC Power Supply plugged into the side of the Airespace AP.
 - After powering up the Airespace AP, the RED Alarm LED comes on for a short period (about 15-20 seconds) and then all the LEDs blink sequentially back and forth, indicating that the Airespace AP is trying to find an Airespace Switch or Appliance to connect to. This can continue for up to five minutes. If the Airespace AP remains in this mode for more than five minutes, the Airespace AP is unable to find the Master Airespace Switch or Appliance. Check the connection between the Airespace AP and the Airespace Switch or Appliance and make sure the Airespace AP and the Airespace Switch or Appliance are on the same subnet.
 - If the power light does not come on, check the power (it can be powered either with Power over Ethernet or a from an orderable Airespace AP External Power Supply).
 - Make sure that a DHCP server is configured in the Airespace Switch or Appliance for the Management Interface using the CLI, Web Browser, or ACS interface, and that the DHCP server is operating correctly.
 - Once the Airespace AP finds the Airespace Switch or Appliance, it attempts to download the new Airespace Operating System code if the Airespace AP code version differs from the Airespace Switch or Appliance code version. While this is happening, the LEDs on the top of the Airespace AP blink on and off together.
4. Once the Airespace Operating System code download is successful, the Airespace AP reboots. The GREEN LED turns on and the two YELLOW LEDs indicate the states of the 802.11a and

802.11b/g networks. If any part of the network is disabled in the Airespace Switch or Appliance, the corresponding YELLOW LED remains off.

- Note that the Red LED can light for a short period (10-20 seconds) when the Airespace AP reboots. If the RED LED comes on AND STAYS ON for more than a minute, disconnect the Airespace AP and call Airespace Global Services & Support.
 - Use the CLI command *show ap summary*. If the new Airespace AP appears on the list, it has been configured successfully.
 - From the CLI, Web Browser or ACS interface, configure the Airespace AP with its Primary, Secondary and Tertiary Airespace Switch or Appliance names as described in the [Airespace Product Guide](#).
 - If you will be using the Airespace AP in a mobility group, set the mobility group name using the CLI, Web Browser or ACS interface.
 - If required, use the CLI, Web Browser or ACS interface to customize the Airespace AP-specific 802.11a, 802.11b and 802.11g network settings. Once again, the two YELLOW LEDs indicate the states of the 802.11a and 802.11b/g networks. If any part of the network is disabled, the corresponding YELLOW LED remains off.
5. If everything works (the GREEN LED is on and the RED LED is off), disconnect the Airespace AP and take it to its final destination and install it as described in this document. If your Airespace AP fails this visual test, refer to [RMA Procedures](#) in the [Airespace Product Guide](#) to return your Airespace APs.
6. When you have installed and powered up the Airespace AP in its final destination, verify that the LEDs are in the same state they were in at the end of Step 4.
- If no LEDs are on, the Airespace AP is most likely not receiving power.
 - If the LEDs blink sequentially back and forth for more than five minutes, the Airespace AP is unable to find its Primary, Secondary or Tertiary Airespace Switch or Appliance. Check the connection between the Airespace AP and the Airespace Switch or Appliance, and make sure the Airespace AP and the Airespace Switch or Appliance are either on the same subnet or that the Airespace AP has a route back to its Primary, Secondary and Tertiary Airespace Switches and Appliances.
 - If the Airespace AP is not on the same subnet as the Airespace Switch or Appliance, make sure there is a DHCP server on the same subnet as the Airespace AP. Also, make sure that the route between the Airespace AP and the Airespace Switch or Appliance can process IP fragmented packets.

After you have prepared all Airespace APs, reconfigure the Airespace Switch or Appliance so it is not the Master. A Master Airespace Switch or Appliance should only be used for configuring Airespace APs and not in a working network. Note that the Master Airespace Switch or Appliance is normally not used in a deployed network, so the Master Airespace Switch or Appliance setting is automatically disabled upon reboot or AireOS code upgrade.

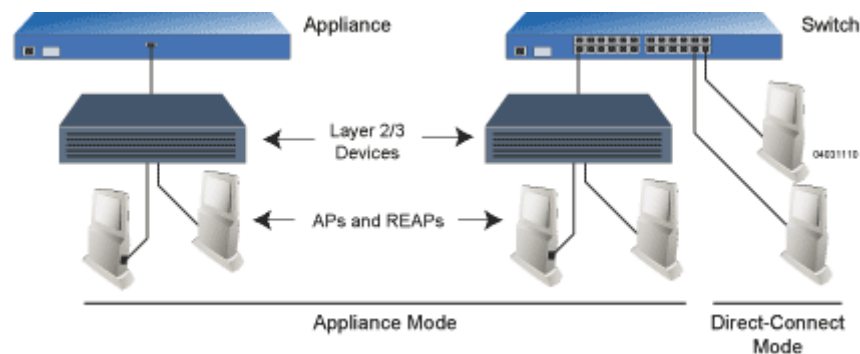
After completing [Step 2: Configuring the Airespace AP or REAP Before Installation](#) for all Airespace APs and REAPs, continue with [Step 3: Preparing Mounting Locations](#).

Preparing a Version 2.0 Airespace AP or REAP

If your Airespace AP has Airespace Operating System 2.0 or a later version (which includes all REAPs) loaded on it, continue with this procedure. If your Airespace AP has Airespace Operating System 1.2 or earlier loaded on it, or if you do not know what version the Airespace AP has loaded, use the [Preparing a Version 1.2 Airespace AP](#) procedure above.

- ▶ **Note:** This procedure assumes that you are preparing a version 2.0 Airespace AP or REAP to interoperate with a version 2.0 Airespace Switch or Appliance. When you are preparing a version 1.2 Airespace AP to interoperate with a version 1.2 Airespace Switch or Appliance, use the procedure found in the version 1.2 [Airespace Access Point Quick Installation Guide](#).

Configuration Setup



Does My Airespace AP Qualify for this Procedure?

- If your 2.0 or later version Airespace AP(s) or REAP(s) cannot be configured for any reason using the following procedure, refer to [RMA Procedures](#) in the [Airespace Product Guide](#).

Configuration Steps for an Airespace AP or REAP

1. Configure the Airespace Switch or Appliance in **LWAPP Layer 3 Mode** (use the CLI command `show switchconfig` to determine the mode; if it is set to layer 3, use the CLI command `config switchconfig mode L2` to change it to Layer 2). Make sure the Airespace Switch or Appliance DS Port is connected to the network. Use CLI, Web Browser and/or ACS procedures as described in the [Airespace Switch or Appliance Quick Install Guide](#) and the [Airespace Product Guide](#).
 - ▶ **Note:** When you are installing a REAP or an Airespace AP, a DHCP server must be accessible by the REAP or an Airespace AP.
 - Make sure Airespace AP ports are available (either [Direct-Connect Mode](#) through the Switch physical ports, or in [Appliance Mode](#) through the Airespace Switch or Appliance Management/AP-Manager Interface).
 - Set the Airespace Switch or Appliance as the Master, so new Airespace APs always associate with it. Use the CLI command `show network config` to determine if the Airespace Switch or Appliance DS Port is the Master. If it is not, make it the Master with the CLI command properly, make sure to use the CLI command `config network master-base disable`.
 - Refer to the [Airespace Product Guide](#) for other settings.
2. Take the Airespace AP or REAP out of the box and plug it into the front panel of the Master Switch ([Direct-Connect Mode](#)), or through the same subnet that Airespace Switch or Appliance is on ([Appliance Mode](#)).
3. Apply power to the Airespace AP:
 - Use 802.3af-compatible Power Over Ethernet (PoE) from the Airespace Switch or Appliance or from an orderable inline power injector. If you do not have PoE available,

use an orderable external AC-to-48 VDC Power Supply plugged into the side of the Airespace AP.

- After powering up the Airespace AP, the RED Alarm LED comes on for a short period (about 15-20 seconds) and then all the LEDs blink sequentially back and forth, indicating that the Airespace AP is trying to find an Airespace Switch or Appliance to connect to. This can continue for up to five minutes. If the Airespace AP remains in this mode for more than five minutes, the Airespace AP is unable to find the Master Airespace Switch or Appliance. Check the connection between the Airespace AP and the Airespace Switch or Appliance and make sure the Airespace AP and the Airespace Switch or Appliance are on the same subnet.
 - If the power light does not come on, check the power (it can be powered either with Power over Ethernet or a from an orderable Airespace AP External Power Supply).
 - Make sure that a DHCP server is configured in the Airespace Switch or Appliance for both the Management Interface and AP-Manager Interface using the CLI, Web Browser, or ACS interface, and that the DHCP server is operating correctly.
 - Once the Airespace AP finds the Airespace Switch or Appliance, it attempts to download the new Airespace Operating System code if the Airespace AP code version differs from the Airespace Switch or Appliance code version. While this is happening, the LEDs on the top of the Airespace AP blink on and off together.
4. Once the Airespace Operating System code download is successful, the Airespace AP reboots. The GREEN LED turns on and the two YELLOW LEDs indicate the states of the 802.11a and 802.11b/g networks. If any part of the network is disabled in the Airespace Switch or Appliance, the corresponding YELLOW LED remains off.
- Note that the Red LED can light for a short period (10-20 seconds) when the Airespace AP reboots. If the RED LED comes on AND STAYS ON for more than a minute, disconnect the Airespace AP and call Airespace Global Services & Support.
 - Use the CLI command *show ap summary*. If the new Airespace AP appears on the list, it has been configured successfully.
 - From the CLI, Web Browser or ACS interface, configure the Airespace AP with its Primary, Secondary and Tertiary Airespace Switch or Appliance names as described in the [Airespace Product Guide](#).
 - If you will be using the Airespace AP in a mobility or a WPS group, set the mobility or WPS group name using the CLI, Web Browser or ACS interface.
 - If required, use the CLI, Web Browser or ACS interface to customize the Airespace AP-specific 802.11a, 802.11b and 802.11g network settings. Once again, the two YELLOW LEDs indicate the states of the 802.11a and 802.11b/g networks. If any part of the network is disabled, the corresponding YELLOW LED remains off.
5. If everything works (the GREEN LED is on and the RED LED is off), disconnect the Airespace AP and take it to its final destination and install it as described in this document. If your Airespace AP fails this visual test, refer to [RMA Procedures](#) in the [Airespace Product Guide](#) to return your Airespace APs.

- ▶ **Note:** When you are installing a REAP or a Layer 3 Airespace AP on a different subnet than the Airespace Switch or Appliance, MAKE SURE that a DHCP server is available on the subnet where you will be installing the Airespace AP or REAP, and that the subnet has a route back to the Airespace Switch or Appliance. Also make sure that the route back to the Airespace Switch or Appliance has destination UDP ports 12222 and 12223 open for LWAPP communications. Ensure the route back to the Primary, Secondary and Tertiary Airespace Switches or Appliances allows IP packet fragments. Finally, make sure that if address translation is used, that the Airespace AP and the Airespace Switch or Appliance have a static 1-to-1 NAT to an outside address. (Port Address Translation is not supported.)
6. When you have installed and powered up the Airespace AP or REAP in its final destination, verify that the LEDs are in the same state they were in at the end of Step 4.
- If no LEDs are on, the Airespace AP is most likely not receiving power.
 - If the LEDs blink sequentially back and forth for more than five minutes, the Airespace AP is unable to find its Primary, Secondary or Tertiary Airespace Switch or Appliance. Check the connection between the Airespace AP and the Airespace Switch or Appliance, and make sure the Airespace AP and the Airespace Switch or Appliance are either on the same subnet or that the Airespace AP has a route back to its Primary, Secondary and Tertiary Airespace Switches and Appliances.
 - If the Airespace AP is not on the same subnet as the Airespace Switch or Appliance, make sure there is a DHCP server on the same subnet as the Airespace AP. Also, make sure that the route between the Airespace AP and the Airespace Switch or Appliance can process IP fragmented packets.

After you have prepared all Airespace APs, reconfigure the Airespace Switch or Appliance so it is not the Master. A Master Airespace Switch or Appliance should only be used for configuring Airespace APs and not in a working network. Note that the Master Airespace Switch or Appliance is normally not used in a deployed network, so the Master Airespace Switch or Appliance setting is automatically disabled upon reboot or AireOS code upgrade.

After completing [Step 2: Configuring the Airespace AP or REAP Before Installation](#) for all Airespace APs and REAPs, continue with [Step 3: Preparing Mounting Locations](#).

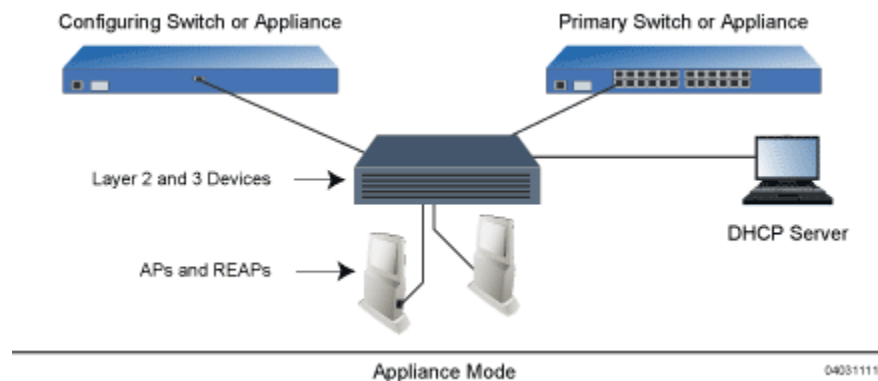
Alternate Preparing a Version 2.0 Airespace AP or REAP

If your Airespace AP has Airespace Operating System 2.0 or a later version (which includes all REAPs) loaded on it, you may choose to use this procedure. If your Airespace AP has Airespace Operating System 1.2 or earlier loaded on it, or if you do not know what version the Airespace AP has loaded, use the [Preparing a Version 1.2 Airespace AP](#) procedure above.

- ▶ **Note:** This procedure assumes that you are preparing a version 2.0 Airespace AP or REAP to interoperate with a version 2.0 Airespace Switch or Appliance. It also assumes that your Airespace Switch or Appliance is already operating in **LWAPP Layer 3 Mode**. It also assumes that you are using the Internet Software Consortium (ISC) DHCP Server V3.0pl1. Finally, it assumes that if you have deployed multiple Airespace Switches and Appliances, that the Airespace Switch or Appliance you use to initialize the Airespace AP is in an existing [Airespace Mobility Group](#) with the [Primary, Secondary, and Tertiary Airespace Switch or Appliance](#) you want to assign to the new Airespace AP or REAP.

When you are preparing a version 1.2 Airespace AP to interoperate with a version 1.2 Airespace Switch or Appliance, use the procedure found in the version 1.2 [Airespace Access Point Quick Installation Guide](#).

Configuration Setup



Does My Airespace AP Qualify for this Procedure?

- If your 2.0 or later version later Airespace AP(s) or REAP(s) cannot be configured for any reason using the following procedure, refer to [RMA Procedures](#) in the [Airespace Product Guide](#).

Configuration Steps for an Airespace AP or REAP

- Configure the Internet Software Consortium (ISC) V3.0p11 DHCP Server to provide the vendor-specific Option 43 using the following entries:

```
option controller code 43 = text;
option controller "<Switch IP Address>;"
```

in which **<Switch IP Address>** is the IP address of the Airespace Switch or Appliance you are going to use to prepare the Airespace AP or REAP, or which can be a comma-delimited string of Airespace Switch or Appliance IP addresses.

(These commands direct all unconfigured Airespace APs and REAPs discovery messages to the configuring Airespace Switch or Appliance.)

- Make sure the configuring Airespace Switch or Appliance is in **LWAPP Layer 3 Mode** (use the CLI command `show switchconfig` to determine the mode; if it is set to layer 3, use the CLI command `config switchconfig mode L2` to change it to Layer 2). Make sure that the configuring Airespace Switch or Appliance is in the same mobility group as the planned [Primary, Secondary, and Tertiary Airespace Switch or Appliance](#), and that the configuring Airespace Switch or Appliance DS Port is connected to the network. Use CLI, Web Browser and/or ACS procedures as described in the [Airespace Switch or Appliance Quick Install Guide](#) and the [Airespace Product Guide](#).
- Also make sure that the DHCP server is configured in the Airespace Switch or Appliance for both the Management Interface and AP-Manager Interface using the CLI, Web Browser, or ACS user interface.
 - Note:** When you are installing a REAP or an Airespace AP, a DHCP server must be accessible by the REAP or an Airespace AP.
- Take the Airespace AP or REAP out of the box and plug it into the network so that it can request an IP address from the DHCP server.
- Apply power to the Airespace AP:
 - Use 802.3af-compatible Power Over Ethernet (PoE) from the Airespace Switch or Appliance or from an orderable inline power injector. If you do not have PoE available,

use an orderable AC-to-48 VDC External Power Supply plugged into the side of the Airespace AP.

- After powering up the Airespace AP, the RED Alarm LED comes on for a short period (about 15-20 seconds) and then all the LEDs blink sequentially back and forth, indicating that the Airespace AP is trying to find an Airespace Switch or Appliance to connect to. This can continue for up to five minutes. If the Airespace AP remains in this mode for more than five minutes, the Airespace AP is unable to find the Master Airespace Switch or Appliance. Check the connection between the Airespace AP and the Airespace Switch or Appliance and make sure the Airespace AP and the Airespace Switch or Appliance are on the same subnet.
 - If the power light does not come on, check the power (it can be powered either with Power over Ethernet or a from an orderable Airespace AP External Power Supply).
6. The Airespace AP or REAP requests an IP address from the DHCP server, and the DHCP server returns an IP address for the Airespace AP or REAP, and also returns the **<Switch IP Address>** of the configuring Airespace Switch or Appliance.

Once the Airespace AP or REAP finds the configuring Airespace Switch or Appliance, it attempts to download the new Airespace Operating System code if the Airespace AP code version differs from the configuring Airespace Switch or Appliance code version. While this is happening, the LEDs on the top of the Airespace AP or REAP blink on and off together.

7. Once the Airespace Operating System code download is successful, the Airespace AP or REAP reboots. The GREEN LED turns on and the two YELLOW LEDs indicate the states of the 802.11a and 802.11b/g networks. If any part of the network is disabled in the configuring Airespace Switch or Appliance, the corresponding YELLOW LED remains off.
- Note that the Red LED can light for a short period (10-20 seconds) when the Airespace AP or REAP reboots. If the RED LED comes on AND STAYS ON for more than a minute, disconnect the Airespace AP or REAP and call Airespace Global Services & Support.
 - From the CLI, Web Browser or ACS interface, configure the Airespace AP with its Primary, Secondary and Tertiary Airespace Switch or Appliance names (any of which can be the name of the configuring Airespace Switch or Appliance) as described in the [Airespace Product Guide](#).
 - If required, use the CLI, Web Browser or ACS interface to customize the Airespace AP- or REAP-specific 802.11a, 802.11b and 802.11g network settings. Once again, the two YELLOW LEDs indicate the states of the 802.11a and 802.11b/g networks. If any part of the network is disabled, the corresponding YELLOW LED remains off.
8. If everything works (the GREEN LED is on and the RED LED is off), reboot the Airespace AP or REAP and install it as described in this document. If your Airespace AP or REAP fails this visual test, refer to [RMA Procedures](#) in the [Airespace Product Guide](#) to return your Airespace APs.

- ▶ **Note:** When you are installing a REAP or a Layer 3 Airespace AP on a different subnet than the Airespace Switch or Appliance, MAKE SURE that a DHCP server is available on the subnet where you will be installing the Airespace AP or REAP, and that the subnet has a route back to the Primary, Secondary and Tertiary Airespace Switches or Appliances. Also make sure that the route back to the Airespace Switch or Appliance has destination UDP ports 12222 and 12223 open for LWAPP communications. Ensure the route back to the Primary, Secondary and Tertiary Airespace Switches or Appliances allows IP packet fragments. Finally, make sure that if address translation is used, that the Airespace AP and the Airespace Switch or Appliance have a static 1-to-1 NAT to an outside address. (Port Address Translation is not supported.)

9. When you have installed and powered up the Airespace AP or REAP in its final destination, verify that the LEDs are in the same state they were in at the end of Step 7.
 - If no LEDs are on, the Airespace AP is most likely not receiving power.
 - If the LEDs blink sequentially back and forth for more than five minutes, the Airespace AP is unable to find its Primary, Secondary or Tertiary Airespace Switches or Appliances. Check the connection between the Airespace AP and the Airespace Switch or Appliance, and make sure the Airespace AP and the Airespace Switch or Appliance are either on the same subnet or that the Airespace AP has a route back to its Primary, Secondary and Tertiary Airespace Switches and Appliances.
 - Note that the REAPs at each remote location must be on the same subnet to allow client roaming. Also, if the Airespace AP or REAP is not on the same subnet as the Airespace Switch or Appliance, make sure that a DHCP server is accessible on the same subnet as the Airespace AP or REAP.

After completing [Step 2: Configuring the Airespace AP or REAP Before Installation](#) for all Airespace APs and REAPs, continue with [Step 3: Preparing Mounting Locations](#).

Step 3: Preparing Mounting Locations

On your map, you should have the Airespace AP locations, mounting options, and power options.

- ▶ **Note:** MAKE SURE that plenum-mounted Airespace APs and REAPs use only the metal Projection-Mount and Flush-Mount brackets (not the Ceiling-Mount Base or the Hanging-Ceiling Clips) and are powered using Power Over Ethernet (POE) to comply with safety regulations.

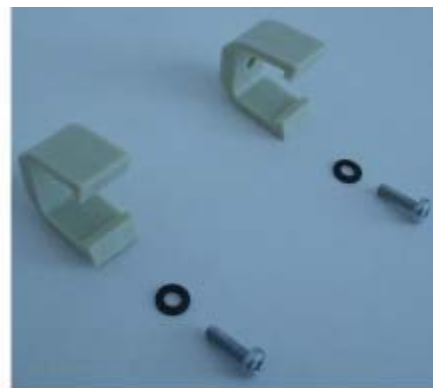
Also, external antennas are NOT to be used when installing Airespace APs and REAPs in a plenum.

- Find the required mounting locations.
- Use the ceiling-mount base to mark the wall or ceiling locations for sheet metal, drywall, or other screws. Make sure you leave enough space around the Airespace AP and base to plug the CAT-5 cable, optional external antenna cable(s), optional power supply cable, and optional Kensington MicroSaver Security Cable into the sides of the Airespace AP.

Figure - Factory-Supplied Mounting Options



A. Ceiling-Mount Base



B. Hanging-Ceiling Clips

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- Alternatively, attach the hanging ceiling clips to the Airespace AP. Make sure you leave enough space around the Airespace AP to plug the CAT-5 cable, optional external antenna cable(s), optional power supply cable, and optional Kensington MicroSaver Security Cable into the sides of the Airespace AP.
- Alternatively, use the optional mounting bases and/or brackets to mark the wall or ceiling locations for sheet metal, drywall, or other screws. Make sure you leave enough space around the Airespace AP and brackets to plug the CAT-5 cable, optional external antenna cable(s), optional power supply cable, and optional Kensington MicroSaver Security Cable into the sides of the Airespace AP.

Figure - Factory-Orderable Mounting Brackets



A. Projection-Mount Bracket



B. Flush-Mount Bracket

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- If necessary, drill holes for the various cables where they can be mostly hidden from casual view. When you are mounting the Airespace AP using an optional separately-orderable projection-mount L-bracket (the one with two long legs), the cables can be routed through the 5/8-inch (15.9 mm) holes in the bracket.
- Route the CAT-5, optional power supply, optional external antenna cable(s), and optional Kensington MicroSaver Security cables to where they can plug into the Airespace AP. Make sure to leave about 6 inches (15 cm) of slack in the cables for future modifications.
- Attach the brackets to the wall or ceiling, or install screws for ceiling-mount base:
 - Where you are going to use the projection-mount or flush-mount bracket, use customer-supplied sheet metal, drywall, or other screws to attach the bracket to the ceiling or wall.
 - Where you are going to use the ceiling-mount base, install customer-supplied sheet metal, drywall, or other screws with 1/4 inch (6.35 mm) or smaller heads protruding from the ceiling about 0.1 inch (2.5 mm).

You are now ready to install the Airespace APs. Continue with [Step 4: Mounting the Airespace APs](#).

Step 4: Mounting the Airespace APs

Using the supplied or optional separately-orderable Airespace AP mounting kits, mount each Airespace AP in its indicated location, oriented as shown on the map. Note that you can mount the Airespace APs in the ceiling plenum or below the ceiling, but the Airespace APs perform best when mounted below the ceiling.

Note that the Airespace System supports Antenna Sectorization, which can be used to increase the number of clients and/or client throughput in a given air space. Installers can mount two Airespace APs back-to-back and the Airespace System operator can disable the second antenna in both Airespace APs to create a 360-degree coverage area with two sectors.

The Airespace APs can be mounted in one of the following configurations:

- Ceiling-Mount Base -- Refer to [Ceiling Mount Base](#).
- Ceiling-Mount Clips -- Refer to [Ceiling-Mount Clips](#).
- Projection Wall Mount -- Refer to [Projection Wall Mount](#).
- Flush Wall Mount -- Refer to [Flush Wall Mount](#).
- Ceiling-Mount Bezel -- Refer to the [Airespace AP Ceiling-Mount Bezel Kit Quick Installation Guide](#).

Ceiling Mount Base

When you are mounting the Airespace AP in the middle of a ceiling (flat sides toward the room or hallway), use the ceiling-mount base to mount the Airespace AP as shown in the following figure and as described below:

Figure - Assembling the Airespace AP and Ceiling-Mount Base



03032002

- Copy the MAC address(es) from the label(s) on the Airespace AP onto the corresponding location on the map. MAC addresses have the format 00B85xxxxxx.
- Attach the ceiling-mount base to the bottom of the Airespace AP using the factory-supplied machine screws and washers.
- Position the ceiling-mount base so its keyhole slots are partly on the drywall, sheet metal, or other screw heads installed in [Step 3: Preparing Mounting Locations](#).
 - ▶ **Note:** If the screws do not securely hold the ceiling-mount base, remove the Airespace AP and adjust the screws until they hold the ceiling-mount base securely.
- Attach the cables to the sides of the Airespace AP.
 - ▶ **Note:** When the Airespace AP is powered up and is associated with an Airespace Switch or Appliance (Green/Power and Yellow/802.11b/g and/or Yellow or Amber/802.11a LEDs lit), the Airespace AP is broadcasting its beacon signal(s). When this happens, complete the installation as quickly as possible to remove yourself from within 8 inches (20 cm) of the Airespace AP to comply with FCC RF radiation exposure guidelines.

- Slide the ceiling-mount base onto the drywall, sheet metal, or other screw heads until it snugs into place.

You have installed the Airespace AP. Repeat [Step 4: Mounting the Airespace APs](#) for each Airespace AP location, and then continue with [Step 5: Returning MAC Information](#).

Ceiling-Mount Clips

When you are mounting the Airespace AP on the extruded aluminium rails of a hanging ceiling, use the ceiling-mount clips to mount the Airespace AP as shown in the following figure and as described below:

Figure - Assembling the Airespace AP and Ceiling-Mount Clips



- Copy the MAC address(es) from the label(s) on the Airespace AP onto the corresponding location on the map. MAC addresses have the format 00B85xxxxxx.
- Attach the ceiling-mount clips to the bottom of the Airespace AP using the factory-supplied machine screws and washers.
- Snap the ceiling-mount clips onto a hanging ceiling rail.

Figure - Clipping the Airespace AP and Ceiling-Mount Clips to a Hanging-Ceiling Rail



- Attach the cables to the sides of the Airespace AP.
 - ▶ **Note:** Make sure the cables are routed away from the Airespace AP antennas.
 - ▶ **Note:** When the Airespace AP is powered up and is associated with an Airespace Switch or Appliance (Green/Power and Yellow/802.11b/g and/or Yellow or Amber/802.11a LEDs lit), the Airespace AP is broadcasting its beacon signal(s). When this happens, complete the installation as quickly as possible to remove yourself from within 8 inches (20 cm) of the Airespace AP to comply with FCC RF radiation exposure guidelines.

You have installed the Airespace AP. Repeat [Step 4: Mounting the Airespace APs](#) for each Airespace AP location, and then continue with [Step 5: Returning MAC Information](#).

Projection Wall Mount

When you are mounting the Airespace AP out from a wall (flat sides along the wall or hallway), use an optional separately-orderable factory-orderable projection-mount L-bracket.

- Before proceeding, gently screw the two factory-supplied screws and spring washers into the bottom of the Airespace AP. Make sure the spring washers have their convex (high center sections) pointing toward the screw heads.
 - ▶ **Note:** The Airespace AP threaded holes have precision-depth threads. Do not over-tighten the screws, or the bracket will not fit under the screw heads.

Figure - Assembling the Mounting Screws and Spring Washers to the Airespace AP



A. Screws and Spring Washers



B. Completed Assembly

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- Copy the MAC address(es) from the label(s) on the Airespace AP onto the corresponding location on the map. MAC addresses have the format 00B85xxxxx.
- You have already attached the projection-mount L-bracket to the wall in [Step 3: Preparing Mounting Locations](#).
- Slide the screws into the keyhole slots on the mounting bracket as shown in the following figure.
 - ▶ **Note:** If the screws do not securely hold the bracket, remove the Airespace AP and adjust the screws until they securely hold the bracket.

Figure - Assembling the Airespace AP to the Projection-Mount Bracket



- Attach the cables to the sides of the Airespace AP.
 - ▶ **Note:** Make sure the cables are routed away from the Airespace AP antennas.
 - ▶ **Note:** When the Airespace AP is powered up and is associated with an Airespace Switch or Appliance (Green/Power and Yellow/802.11b/g and/or Yellow or Amber/802.11a LEDs lit), the Airespace AP begins broadcasting its beacon signal(s). When this happens, complete the installation as quickly as possible to remove yourself from within 8 inches (20 cm) of the Airespace AP to comply with FCC RF radiation exposure guidelines.

You have installed the Airespace AP. Repeat [Step 4: Mounting the Airespace APs](#) for each Airespace AP location, and then continue with [Step 5: Returning MAC Information](#).

Flush Wall Mount

When you are mounting the Airespace AP against a wall (flat side toward the inside of the building), use an optional separately-orderable factory-orderable flush-mount bracket.

- Before proceeding, gently screw the two factory-supplied screws and spring washers into the bottom of the Airespace AP. Make sure the spring washers have their convex (high center sections) pointing toward the screw heads.
 - ▶ **Note:** The Airespace AP threaded holes have precision-depth threads. Do not over-tighten the screws, or the bracket will not fit under the screw heads.

Figure - Assembling the Mounting Screws and Spring Washers to the Airespace AP



A. Screws and Spring Washers



B. Completed Assembly

04022105

- Copy the MAC address(es) from the label(s) on the Airespace AP onto the corresponding location on the map. MAC addresses have the format 00B85xxxxx.
- You have already attached the flush-mount bracket to the wall in [Step 3: Preparing Mounting Locations](#).
- Slide the screws into the keyhole slots on the mounting bracket as shown in the following figure.
 - ▶ **Note:** Make sure the side of the Airespace AP with the door is facing away from the wall. This ensures that the correct antenna is facing the building, and makes future upgrades easier.
 - ▶ **Note:** If the screws do not securely hold the bracket, remove the Airespace AP and adjust the screws until they securely hold the bracket.

Figure - Assembling the Airespace AP to the Flush-Mount Bracket



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- Attach the cables to the sides of the Airespace AP.
 - ▶ **Note:** Make sure the cables are routed away from the Airespace AP antennas.
 - ▶ **Note:** When the Airespace AP is powered up and is associated with an Airespace Switch or Appliance (Green/Power and Yellow/802.11b/g and/or Yellow or Amber/802.11a LEDs lit), the Airespace AP begins broadcasting its beacon signal(s). When this happens, complete the installation as quickly as possible to remove yourself from within 8 inches (20 cm) of the Airespace AP to comply with FCC RF radiation exposure guidelines.

You have installed the Airespace AP. Repeat [Step 4: Mounting the Airespace APs](#) for each Airespace AP location, and then continue with [Step 5: Returning MAC Information](#).

Step 5: Returning MAC Information

When you have completed the installations as outlined in [Step 4: Mounting the Airespace APs](#), return the MAC addresses and their locations on the maps or floor plans to the network planner or manager. The Airespace Control System Software (ACS Software) operators will use the MAC address and location information to create maps for precise wireless Airespace Operating System management.

Also return any unused mounting kit hardware and external power supplies to the network planner or manager for use in future deployments.

- ▶ **Note:** Please remind the Network Planner or Manager that now is a good time to register the Airespace APs.

Planning Notes

- [About Cables](#)
- [About External Antennas](#)
- [About Mounting Options](#)
- [About Physical Security](#)
- [FCC Statements for Airespace APs](#)
- [Industry Canada Required User Information for Airespace APs](#)
- [Safety Considerations](#)

About Cables

- You will run one CAT-5 Ethernet cable from the Airespace AP to the Airespace WLAN Switch, another network device, or a PoE injector/hub.

When the Airespace AP will be mounted below the ceiling using the ceiling mount or wall mount brackets, you may have to drill a hole into the ceiling plenum to run the CAT-5 cable to the wiring closet. When the CAT-5 cable cannot be run through the ceiling plenum, find another path to route the cable from the Airespace AP to the wiring closet.

When the Airespace AP will be mounted above the ceiling using the ceiling mount or wall mount brackets, run the CAT-5 cable to the wiring closet through the ceiling plenum. When the CAT-5 cable cannot be run through the ceiling plenum, find another path to route the cable from the Airespace AP to the wiring closet.

- When you are powering the Airespace AP from AC power, route the power supply cable from the AC electrical outlet to the Airespace AP. Make sure you secure the AC power plug so it will be difficult for people to pull on the power cord or unplug the power supply from the AC power outlet.
- When you are powering the Airespace AP from a PoE source (Airespace WLAN Switch, another network device, or a PoE injector/hub), you do not need to route a separate power cable to the Airespace AP, because the Airespace AP will receive its power across the CAT-5 Ethernet cable. Return the power supply to the wireless network planner/manager.

About External Antennas

- Refer to the [Airespace AP External and Internal Antennas](#) section in the [Airespace Product Guide](#) for an overview of the external 802.11a and 802.11b/g external antennas usable with the Airespace APs.
 - ▶ **Note:** As described in the [Internal-Antenna Airespace Access Point Quick Installation Guide](#), the AS-1200-BG-INT and AS-1200-ABG-INT Airespace APs are designed to be used exclusively with the internal high-gain antennas, and have no jacks for external antennas.
 - ▶ **Note:** External antennas are NOT to be used when installing Airespace APs and REAPs in a plenum.
- When you are attaching external antennas to the AS-1200-A-EXT, AS-1200-BG-EXT, or AS-1200-ABG-EXT Airespace AP, use cables with female reverse-TNC connectors to connect antennas to the ports on the side of the Airespace AP. See the following figure for antenna port markings.

Figure - Airespace AP External Antenna Port Markings



A. 2.4 GHz/802.11b Left External Antenna Port



B. 5 GHz/802.11a and 2.4 GHz/802.11b Right External Antenna Ports

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About Mounting Options

- ⊘ **DANGER:** Plenum-mounted Airespace APs and REAPs **MUST BE** powered using Power Over Ethernet (POE) to comply with safety regulations.
- ▶ **Note:** Because the Airespace AP internal antennas have been designed to reduce inter-floor interference, it is strongly recommended that you mount the Airespace AP standing or hanging straight up or down.
- ▶ **Note:** You can mount the Airespace APs in the ceiling plenum or below the ceiling using the ceiling mount base or wall mount brackets, but the Airespace APs perform best when mounted below the ceiling.
- ▶ **Note:** External antennas are **NOT** to be used when installing Airespace APs and REAPs in a plenum.

- When you are mounting the Airespace AP in the middle of a ceiling, ceiling plenum, or hallway, you will typically use the color-coordinated ceiling-mount base to stabilize the Airespace AP after it is mounted. Use the mounting base to mark the sheet metal, drywall, or other screw locations.

The mounting base attaches to the bottom of the Airespace AP with two supplied screws, and then the assembly slides and locks onto two sheet metal, drywall, or other screws.

- When you are mounting the Airespace AP out from a wall (flat sides along the room or hallway), use the projection-mount L-bracket supplied with the Airespace AP. Use the L-bracket to mark the sheet metal, drywall, or other screw locations.
- When you are mounting the Airespace AP against a wall (flat Side A toward the inside of the building), use the flush-mount bracket supplied with the Airespace AP. The flush-mount L-bracket is the one with one long and one short leg. Use the L-bracket to mark the sheet metal, drywall, or other screw locations.

About Physical Security

Regardless of mounting, the Airespace AP can be secured with a Kensington MicroSaver Security Cable. If required, use any MicroSaver Security Cable to attach either side of your Airespace AP to a solid beam, pipe, or support.

FCC Statements for Airespace APs

- [1200 Airespace AP FCC Statements](#)
- [1250 Airespace AP FCC Statements](#)

1200 Airespace AP FCC Statements

This section includes the following FCC statements for the 1200 Airespace AP:

- [Class A Statement](#)
- [RF Radiation Hazard Warning](#)
- [Non-Modification Statement](#)
- [Deployment Statement](#)

Class A Statement

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.

Installers of the radio and end users of the Airespace Wireless Enterprise Platform 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.

Deployment Statement

This product is certified for indoor deployment only. Do not install or use this product outdoors.

1250 Airespace AP FCC Statements

- [Federal Communication Commission Interference Statement](#)
- [FCC Radiation Exposure Statement](#)

Federal Communication Commission Interference Statement

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 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.

This device 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.

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

IEEE 802.11b or 802.11g operation of this product in the U.S.A. is firmware-limited to channels 1 through 11.

FCC Radiation Exposure Statement

Note: This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm (7.87 inches) between the radiator and your body.

If this device is going to be operated in 5.15 ~ 5.25 GHz frequency range, then it is restricted in indoor environment only.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Industry Canada Required User Information for Airespace APs

This device has been designed to operate with antennae having maximum gains of 7.8 dBi (2.4 GHz) and 7.4 dBi (5 GHz).

Antennae having higher gains is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 ohms.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.

Safety Considerations

- The 1200 and 1250 Airespace APs with or without external antenna ports are only intended for installation in Environment A as defined in IEEE 802.3af. All interconnected equipment must be contained within the same building including the interconnected equipment's associated LAN connections.
- For AS-1200-BG-EXT, OAW-1250BGE, AS-1200-ABG-EXT, OAW-1250ABGE Airespace APs and Remote Edge Access Points (REAPs) provided with optional external antenna ports, make sure that all external antennas and their associated wiring are located entirely indoors. The Airespace APs and REAPs and their optional external antennas are not suitable for outdoor use.
- MAKE SURE that plenum-mounted Airespace APs and REAPs are powered using Power Over Ethernet (PoE) to comply with safety regulations.
- External antennas are NOT to be used when installing Airespace APs and REAPs in a plenum.
- Suitable for use in environmental air 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.

Notes: