



Installing the 802.11ac Radio Module for Cisco Aironet 3600 Series Access Points

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This document provides instructions for installing the 802.11ac Radio Module (AIR-RM3000AC). The radio module provides IEEE 802.11ac support for Cisco Aironet 3600 access points (hereafter referred to as *access point* or *AP*).

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Overview

The 802.11ac radio in the module complements existing 5-GHz, 802.11n radios in the access point by providing an independent 802.11ac overlay. IEEE 802.11ac is a wireless networking standard that provides high-throughput WLANs on the 5-GHz band. 802.11ac builds on 802.11n in the following ways:

- Shifts its focus solely to the 5-GHz band.
- Increases channel width to 80-MHz channels.
- Increases spectrum efficiency, allowing the radio to transmit data faster (256 QAM), relinquish the spectrum faster, and use less power in the process.

Power Considerations

Installation of the radio module requires an additional 4.6 watts to power the access point. With a module installed, the access point requires slightly more than what is delivered by an 802.3af (15.4w)-capable Power over Ethernet (PoE) port in an upstream networking device.

Power options for the access point include:

- Enhanced PoE, driving up to 20 W from the upstream switch to the access point
- 802.3at PoE+, driving up to 30 W from the upstream switch to the access point
- Universal PoE, driving 60 W (2 x 30 W PoE+) from an appropriate switch; the access point uses one of the PoE+ sources
- Cisco AIR-PWRINJ4 power injector or local 18-Watt Cisco power supply AIR-PWR-B

**Note**

If the module is installed and only 802.3af power is present, the module will come up in Disabled state when you power up the access point.

**Tip**

Disabling the access point 2.4-GHz radio reduces power consumption so you can use 802.3af power with the radio module enabled.

Access Point Radio Considerations

Keep these points in mind after you install the radio module:

- 802.11ac clients are directed through band-steering to connect to the 802.11ac radio module

**Note**

Some 802.11ac client devices do not support DFS channels. If your 802.11ac radio module is operating on DFS channels, some client devices will not be able to associate to the access point.

- 802.11ac is 5-GHz only technology, so the 2.4-GHz band will continue to service 802.11b/g/n clients
- The integrated 802.11n radio in the access point and the 802.11ac radio module operate in tandem on the 5-GHz band to support client devices on the same channels. Operating on the same channels keeps the radios from competing.

- The radio module uses the 802.11ac explicit beamforming standard and does not support Cisco Client Link 2.0, Cisco Compatible Extensions (CCX), or Radio Resource Management (RRM). However, the internal 802.11n radio does support those features delivers them to legacy and 802.11n clients.

Additional Information

You can find additional information on 802.11ac features in the Controller Configuration Guide for releases 7.5 and later, and in the 802.11ac Deployment Guide. Both documents are posted on Cisco.com:

Controller Configuration Guide:

http://www.cisco.com/en/US/partner/products/ps10315/products_installation_and_configuration_guides_list.html

802.11ac Deployment Guide:

http://www.cisco.com/en/US/docs/wireless/technology/apdeploy/2600_2600_3600_DG.pdf

System Requirements

This module is designed for use with Cisco Aironet 3600 series access points. The module is not designed for use with other access points. The radio module is supported on these Cisco wireless LAN controllers running software release 7.5.x or later:

- 2500 Series Wireless Controllers
- Wireless LAN Controller Module (WLCM) on Cisco Services-Ready Engine (SRE) for Cisco Integrated Services Router, Generation 2 (ISR G2)
- Wireless Services Module 2 (WiSM2)
- 5500 Series Wireless Controllers
- Flex 7500 Series Wireless Controllers
- 8500 Series Wireless Controllers

Note: High Availability Not Supported in Software Release 7.5

Controllers do not support High Availability for 802.11ac radios in software release 7.5. The 802.11ac configuration (802.11ac Data Rates and Global 802.11ac mode) on the controller is not synched to the standby controller. This may result in client throughput fluctuations and re-associations when you explicitly disable those configurations on the active controller.

In addition, the 802.11ac Global mode configuration controls whether the radio module is enabled. If 802.11ac Global mode is enabled on one controller but not another, the module might be disabled if the access point joins a controller on which 802.11ac Global mode is disabled.

Installing the Module

Follow these steps to install the module:

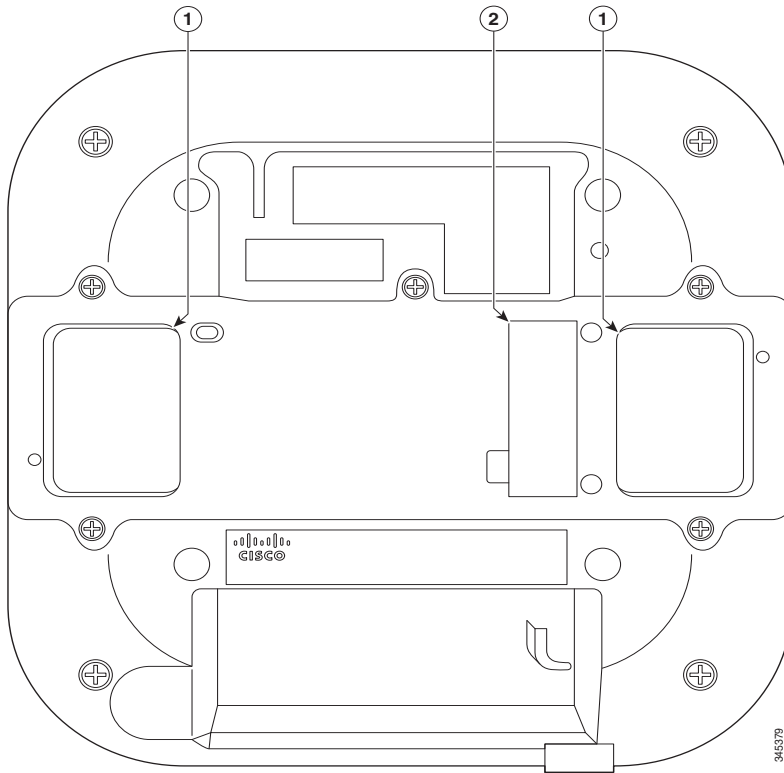
Step 1 Remove the module from the packaging.

Step 2 Power down the access point.



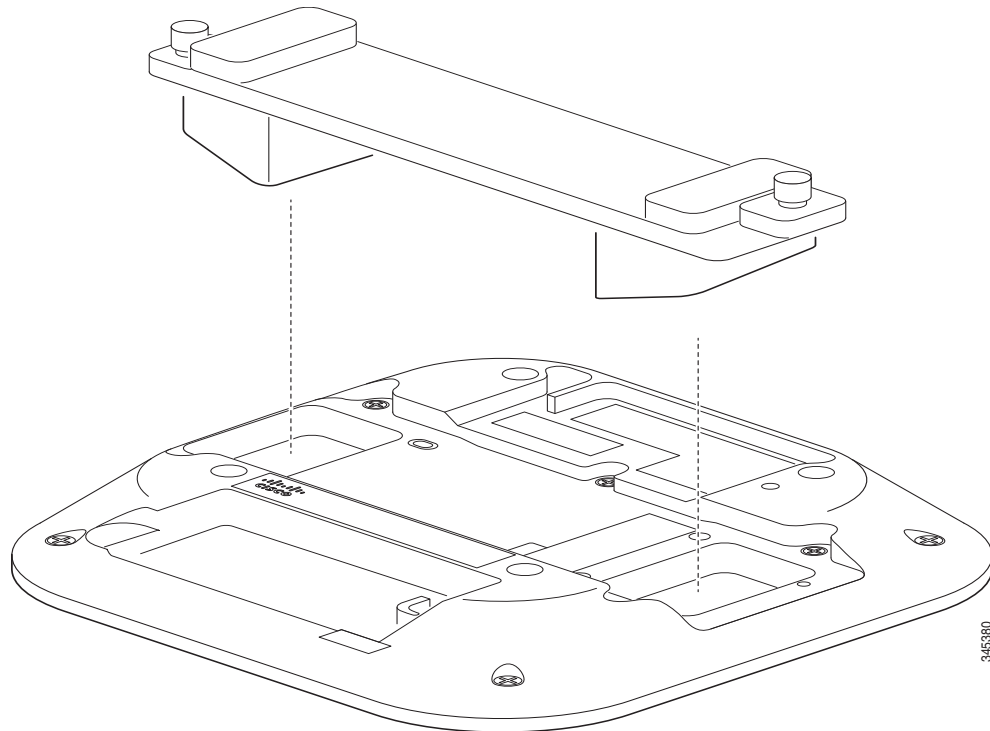
Note If you install a module while the AP is powered on, the AP will reboot.

Step 3 Peel off the Module Port Protective Cover from the back of the access point to reveal the module port connector, labeled 2 in the following figure.
The PCIe connector on the module will go into the AP's module port connector.



1	Openings for module's antennas	2	Removable Module Port Protective Cover
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- Step 4** Align the PCIe connector with the module port connector on the back of the access point and click the module down into place. Press firmly on the center of the module to properly seat the PCIe connector into the AP's module port connector



- Step 5** Screw down the thumb screws on the module, by hand only. Hand tighten each screw until the resistance is obvious and you know you cannot further tighten the screws. If the screws are not fully tightened, the module will not be detected and hence will not operate properly.

**Caution**

Do not use any mechanical tool or device such as pliers or a torque wrench to tighten the screws.

**Caution**

The thumbscrews used to mechanically secure the radio module into the AP are an integral part of the radio module detection circuitry within the AP. Therefore, to ensure reliable radio module detection by the AP the thumbscrews must be installed to their maximum travel depth and tightened to the maximum tightness that can be achieved by hand.

If the thumbscrews are not properly installed and appropriately tightened the radio module may not be detected by the AP and/or the AP may reboot unpredictably, for instance, when subjected to mechanical shock or vibration. However, do not use any tool or device intended to provide mechanical advantage, to tighten the thumbscrews. Doing so can result in permanent damage to the thumbscrews, radio module, or AP.

- Step 6** Power up the access point.
When the access point boots up, it detects the module.

Initial Controller Configuration for the Radio Module

This section describes the configuration required on your wireless LAN controller to support 802.11ac radios.

Enabling 802.11ac Support on the Controller

On the Wireless LAN Controller (WLC) graphical interface, follow these steps to enable support for 802.11ac on the access point.

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- Step 1** Choose **Wireless > 802.11a/n/ac > High Throughput (802.11n/ac)**.
 - Step 2** Make sure that the **Enabled** check box is selected for **11ac Mode** to enable the 802.11ac support on the network.
 - Step 3** Select the check boxes for the MCS 8 and 9 data rates to specify the modulation and coding scheme (MCS) rates at which data can be transmitted between the access point and the client. If you have client devices on your network that use other MCS rates for high throughput, select those rates also.
 - Step 4** Click **Apply**.
 - Step 5** Click **Save Configuration**.
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Configuring Dynamic Channel Assignment

On the Wireless LAN Controller (WLC) graphical interface, follow these steps to allow 802.11ac radios to be configured for 80-MHz channel width operation.

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- Step 1** Choose **Wireless > 802.11a/n/ac > RRM > DCA**.
 - Step 2** For **Channel Width**, select the **80 Mhz** button.
 - Step 3** Click **Apply**.
 - Step 4** Click **Save Configuration**.
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Verifying Radio Module Installation

On your wireless LAN controller, follow these steps to verify that the radio module is installed and operating correctly.

Verifying that the 802.11ac Radio Slot is Operating

On the controller interface, verify that the access point has an extra radio slot for the 802.11ac radio module, that it spans the 80-MHz spectrum, and that 802.11ac client devices have associated with the 802.11ac protocol.

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- Step 1** Choose **Wireless > Access Points > Radios > 802.11a/n/ac**.
 - Step 2** Make sure the access point lists two occupied radio slots, and that one of the slots supports channels across the 80-MHz spectrum (for example, channels 36, 40, 44, and 48).
 - Step 3** Choose **Wireless > Access Points > Radios > 802.11ac Radios > Configure**
 - Step 4** Make sure the interface indicates **Yes** for **11ac Supported**.
 - Step 5** Make sure that 802.11ac client devices associated to the access point using the 802.11ac protocol.
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Removing the Installed Module

Follow these steps to remove the installed module:

Step 1 Power down the access point.

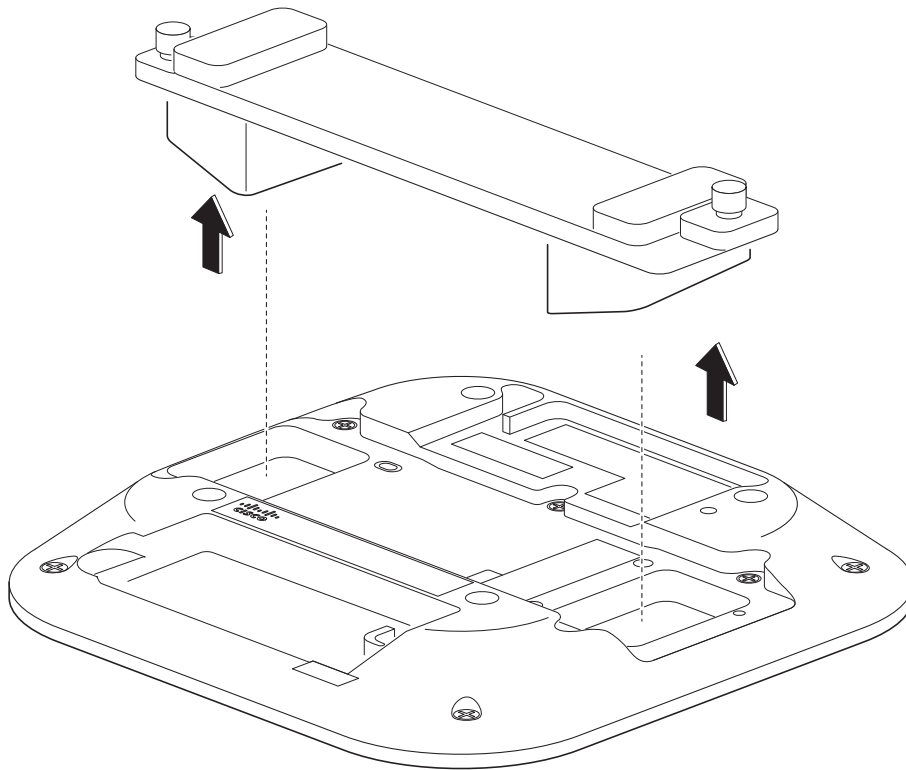


Caution

If you loosen the thumbscrews or try to remove a module while the AP is powered on, the AP will reboot. The thumbscrews are not only used to mechanically secure the radio module into the AP, but are also an integral part of the radio module detection circuitry within the AP.

Step 2 Unscrew the thumb screws on the module, by hand.

Step 3 Pull out the module gently.



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Step 4 Power up the access point.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation:

<http://www.cisco.com/c/en/us/td/docs/general/whatsnew/whatsnew.html>

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