

Cisco Aironet 1500 Series

Q. What is the Cisco® Aironet® 1500 Series Lightweight Outdoor Mesh Access Point?

A. The Cisco Aironet 1500 Series is an outdoor wireless mesh platform that integrates Wi-Fi client access and wireless backhaul in a rugged, outdoor enclosure. It is a component of the [Cisco Wireless Mesh Networking Solution](#) and the [Cisco Unified Wireless Network](#) architecture. It supports options for dual-band, simultaneous support for IEEE 802.11a and 802.11b/g standards with the 1510 model or single-band support for IEEE 802.11b/g with the 1505 model. The Cisco Aironet 1500 Series uses an intelligent wireless routing algorithm to create a mesh network with other Cisco Aironet 1500 Series mesh access points. The wireless mesh network self-organizes and self-heals to create and maintain optimal performance in the face of changing network and environmental conditions.

Q. What is the Cisco Aironet 1500 Series used for and where can it be deployed?

A. The Cisco Aironet 1500 Series is used to create metropolitan-scale, outdoor wireless networks, providing access to any Wi-Fi compliant client. The Cisco 1500 Series can be deployed anywhere that power is available.

Q. What are the benefits of the Cisco Aironet 1500 Series?

A. The Cisco Aironet 1500 Series provides wireless access to Wi-Fi-compliant clients over a large, metropolitan-scale area. Mesh access points can be installed anywhere that power is available. Nodes communicate over the wireless network to route traffic between clients and the wired network.

The Cisco Aironet 1500 Series has numerous benefits. The series is:

- Cost-effective
 - Compliant with the IEEE 802.11a (1510 model) and 802.11b/g standards and interoperates with any Wi-Fi-compliant client.
 - Using the wireless network to communicate between nodes, the Cisco Aironet 1500 Series eliminates the need to provision a network connection to each mesh access point.
 - Providing support for 16 broadcast Service Set Identifiers (SSIDs) to create multiple WLANs, the mesh network can be segmented to provide services to multiple user types.
- Easy to use and manage
 - Zero-touch configuration deployment allows access points to be installed without requiring onsite configuration. Access points securely and automatically join the mesh network, deriving a systems-level configuration from Cisco wireless LAN controllers.
 - Based on the Lightweight Access Point Protocol (LWAPP), the Cisco Aironet 1500 Series is part of the Cisco Unified Wireless Network, which centralizes key functions of the WLAN. Designed for large-scale WLANs, it takes a systems-level view toward device and RF management, security, and mobility.
 - The Cisco Aironet 1500 Series operates over Layer 2 or Layer 3, and is fully integrated into the existing network architecture. The same architecture designed for the indoors can be applied to the outdoor network, providing seamless integration as well as seamless roaming.

- An intelligent wireless routing algorithm based on Adaptive Wireless Path Protocol delivers a dynamic, self-configuring, self-healing mesh network. When changes to the network topology or wireless environment occur, the access points automatically reroute traffic in response.
- Cisco wireless LAN controller and the Cisco Wireless Control System (WCS) provide an easy-to-use and intuitive graphical user interface.
- Secure
 - Compliant with 802.11i and Wi-Fi Protected Access 2 (WPA2), the Cisco Aironet 1500 Series provides 802.1X authentication with various Extensible Authentication Protocol (EAP) types and ensures data privacy with hardware-based Advanced Encryption Standard (AES) encryption.
 - Access points join the mesh network securely using X.509 digital certification. Hardware-based AES encryption over the wireless backhaul ensures data privacy.
- The industry leader in performance and scalability
 - With single-radio and dual-radio configurations based on 802.11a and 802.11b/g, the Cisco Aironet 1500 Series allows for a pico-cellular architecture, minimizing interference and providing greater system capacity.
 - Intelligent wireless routing ensures that the wireless backhaul is dynamically organized to provide the optimal performance at all times.
 - Proactive key caching and support for mobility groups provide fast secure Layer 2 and Layer 3 roaming.

Q. What are the common applications for the Cisco Aironet 1500 Series?

A. Common applications for the Cisco Aironet 1500 Series include:

- Extending public Wi-Fi access coverage to outdoor areas or wider areas than existing hotspots.
- Connecting networks within an outdoor campus area for enterprise, government, education, or healthcare deployments.
- Providing an outdoor infrastructure network for transportation, public safety, or government deployments.

Q. What are the radio options for the Cisco Aironet 1500 Series?

A. The Cisco Aironet 1500 Series includes a single-radio option (1505 model) that uses 802.11 b/g for Wi-Fi client access as well as the wireless backhaul, and a dual-radio option (1510 model) that uses 802.11b/g for Wi-Fi client access and 802.11a for the wireless backhaul. The Cisco Aironet 1500 Series can be deployed with other Cisco Aironet 1500 Series outdoor wireless mesh access points in a point-to-point, point-to-multipoint, and wireless mesh architecture. It can also interoperate with the Cisco Aironet 1000 Series remote edge access point (REAP) when operating in bridge mode, or in a point-to-point and point-to-multipoint configuration.

Q. Where can the Cisco Aironet 1500 Series be deployed?

A. The following regions are supported by the Cisco Aironet 1500 Series:

In the 5-GHz band, the series supports the conducted powers for the following regions:

- FCC compliance countries (Asia and United States): The Cisco Aironet 1500 Series provides up to 26 dBm of transmit power using a 17-dBi antenna.

In the 2.4-GHz band, the series supports the conducted powers for the following regions:

- FCC compliance countries (Asia and United States): The Cisco Aironet 1500 Series provides up to 24 dBm of transmit power using antennas with up to 8-dBi gain.

Q. The ETSI configuration of the Cisco Aironet 1510 model is no longer orderable, what is the replacement product?

- A.** For ETSI compliance countries (Asia, EMEA, and EM) the replacement product for the Cisco Aironet 1510 model, AIR-LAP1510AG-E-K9 is the Cisco Aironet 1522 Lightweight Outdoor Mesh Access Point, AIR-LAP1522AG-E-K9.

Product Migration Options

Customers are encouraged to migrate to the Cisco Aironet 1522 Lightweight Outdoor Mesh Access Point. Information about this product can be found at:

<http://www.cisco.com/en/US/products/ps8368/index.html>.

Customers can use the Cisco Technology Migration Plan (TMP) to trade in products and receive credit toward the purchase of new Cisco equipment. For more information about Cisco TMP, go to: <http://www.cisco.com/go/tradein/>. The Cisco TMP application requires all users to have a Cisco.com user ID.

For More Information

For more information about the Cisco Aironet 1522 Lightweight Outdoor Mesh Access Point (ETSI Configuration), visit <http://www.cisco.com/en/US/products/ps8368/index.html>, or contact your local account representative.

For more information about the Cisco End-of-Life Policy, go to:

http://www.cisco.com/en/US/products/prod_end_of_life.html

Q. When would you choose the Cisco Aironet 1505 model versus the Cisco Aironet 1510 model?

- A.** The Cisco Aironet 1505 single-radio option was designed to enable pervasive wireless connectivity in regions or areas where use of the 5 GHz spectrum is restricted by government regulations or institutional policy. It is also designed for deployments that have moderate capacity needs that can be met with a single-band mesh solution. The Cisco Aironet 1510 dual-radio option uses a separate radio for the backhaul to provide enhanced wireless mesh scalability. It delivers high system capacity that allows the mesh network to maximize all available channels, minimize the occurrence of interference from unlicensed devices and minimize latency.

Q. What is the advantage of the 4.9-GHz band of the dual-radio 1510 model?

- A.** Support for the 4.9-GHz band allows licensed public safety agencies to minimize the impact of interference from unlicensed devices. In the United States, the 4.9-GHz band is licensed for public safety applications only.

Q. What is the difference between the Cisco Aironet 1500 and Cisco Aironet 1400 Series?

- A.** The Cisco Aironet 1400 Series is a single 802.11a wireless bridge. It interoperates with another Cisco Aironet 1400 Series bridge in a point-to-point or point-to-multipoint configuration. It provides up to 24 dBm of transmit power using antennas with up to 28-dBi gain for a range of up to 23 miles. The Cisco Aironet 1400 Series is based Cisco IOS®

Software and operates autonomously. It is not available in countries where government regulations prohibit the product from those markets.

The Cisco Aironet 1500 Series is a lightweight mesh access point that connects to wireless LAN controllers. It is based on the Lightweight Access Point Protocol (LWAPP) and operates as part of the Cisco Unified Wireless Network. It provides support for both Wi-Fi client access and a wireless backhaul.

Q. What is the difference between the Cisco Aironet 1500 Series and Cisco Aironet 1300 Series?

A. The Cisco Aironet 1300 Series is a single 802.11b/g wireless access point or bridge. It is available in either a lightweight version, or as an autonomous version that may be field-upgraded to lightweight operation. It can be used to provide access to 802.11b/g Wi-Fi clients in either lightweight or autonomous mode. In autonomous mode, it can also operate as a bridge or workgroup bridge. It does not operate as a bridge or workgroup bridge when in lightweight mode. As a bridge, the Cisco Aironet 1300 Series provides up to 20 dBi of transmit power using antennas with up to 21-dbi gain for a range of up to 14 miles.

Q. Is the Cisco Aironet 1500 Series compatible with the Cisco Aironet 1400 Series and Cisco Aironet 1300 Series?

A. The Cisco Aironet 1500 Series is LWAPP-based and will not interoperate with autonomous Cisco Aironet wireless bridges or access points such as the Cisco Aironet 1400 Series and the Cisco Aironet 1300 Series in autonomous mode. In addition, it will not bridge to the Cisco Aironet 1300 Series in lightweight mode because in lightweight mode, the Cisco Aironet 1300 Series operates only as an access point (and not a bridge). The Cisco Aironet 1500 Series will, however, co-exist in the same WLAN as a Cisco Aironet 1300 Series in lightweight mode (for example, within the same wireless LAN controller or across multiple controllers within the same mobility group), allowing a wireless client to roam seamlessly between the Cisco Aironet 1500 Series on the outdoor network and 1300 Series Access Points on the indoor network.

Q. Is the Cisco Aironet 1500 Series compatible with other vendors' wireless bridges or access points?

A. The Cisco Aironet 1500 Series mesh access points work together as a system to intelligently form a wireless mesh that dynamically optimizes the wireless routes, and self-heals in response to changing network and environmental conditions. It will not interoperate over wireless with other vendors' wireless bridges or access points. It will, however, interoperate with any Wi-Fi certified client, including Cisco Compatible WLAN clients, for wireless access.

Q. What accessories are needed to deploy the Cisco Aironet 1500 Series?

A. The Cisco Aironet 1500 Series requires:

- Power
- A 2.4-GHz antenna
- A 5-GHz antenna (1510 model)

If the access point is installed on a streetlight, a pole-mounting bracket is required.

If the access point is installed on a rooftop and connected to the network, an Ethernet cable is required. A power injector may be used to provide Power over Ethernet (PoE) to rooftop access points. A pole mount bracket may also be required, depending on the chosen installation method.

Q. What antenna options are available for the connectorized Cisco Aironet 1500 Series?

A. The Cisco Aironet 1500 Series is certified for use with the antenna types listed in Table 1, up to the listed antenna gains. The maximum allowed antenna gain varies by country. See the [Hardware Installation Guide](#) for maximum limits.

Table 1. Maximum Allowable Antenna Gains

Frequency Band	Antenna Type	Maximum Gain
2.4 GHz	Omnidirectional	8 dBi
2.4 GHz (ETSI)	Omnidirectional	5.5 dBi
5 GHz ¹	Omnidirectional	7 dBi
5 GHz ¹	Patch	17 dBi
5 GHz (ETSI) ¹	Patch	14 dBi

Cisco offers a subset of antennas for the Cisco Aironet 1500 Series, as shown in Table 2.

Table 2. Orderable Antennas for the Cisco Aironet 1500 Series

Part Number	Description
AIR-ANT2455V-N=	2.4-GHz, 5.5-dBi omnidirectional antenna with N connector
AIR-ANT5175V-N= ²	5-GHz, 7.5-dBi omnidirectional antenna with N connector
AIR-ANT58G10SSA-N ²	5.8-GHz, 9.5-dBi sector antenna with N connector

Table 3 lists the third-party antennas that are approved for use with the Cisco Aironet 1500 Series.

Table 3. Third-Party Antennas Approved for Use with the Cisco Aironet 1500 Series

Manufacturer	Part Number	Description
Cushcraft	S2406BP7NM	2.4 to 2.5-GHz, 8-dBi omnidirectional antenna
Cushcraft ¹	S49014WP	4.9 to 5.99-GHz, 14-dBi panel antenna
Cushcraft ¹	S54717P	5.47 to 5.85-GHz, 17-dBi panel antenna

Q. What are the power options for the Cisco Aironet 1500 Series?

A. The power options for the Cisco Aironet 1500 Series are:

- **AIR-PWR-ST-LT-TAP=**—If the access point is installed on a pole top, a streetlight power tap is available from Cisco. The streetlight power tap supports 105 to 260 VAC.
- **AIR-PWRINJ1500=, AIR-ETH1500-150=**—If the access point is installed on a rooftop and is connected to the network, a power injector is available. Use the power injector with the outdoor-rated Ethernet cable for the Cisco Aironet 1500 Series. Do not use a power injector other than the AIR-PWRINJ1500=. The Cisco Aironet 1500 Series is not compliant with 802.3af and will not work with other power injectors.
- **AIR-CORD1500-15NA=**—This is a 15-foot power cord, with a three-pronged North American plug at the end of it. It may be used for a lab environment, for a rooftop installation or a pole top installation. For rooftop installations, if the Cisco Aironet 1500 Series is connected to the network, you will still need to use the Ethernet cable (AIR-ETH1500-150=). The power cord provides an alternative to using a power injector. Note that this part will be orderable in the second quarter of 2006.

¹ Cisco Aironet 1510 model (IEEE 802.11a support)

² Cisco Aironet 1510 model (IEEE 802.11a support)

- **AIR-CORD1500-40NA**—This is a 40-foot power cord, with a three-pronged North American plug at the end of it. It may be used for a lab environment, for a rooftop installation or a pole top installation. For rooftop installations, if the Cisco Aironet 1500 Series is connected to the network, you will still need to use the Ethernet cable (AIR-ETH1500-150=). The power cord provides an alternative to using a power injector. Note that this part will be orderable in the second quarter of 2006.
- **AIR-CORD1500-40UE**—This is a 40-foot power cord, with an unterminated end. It is a three-wire cable that follows the European harmonization requirements. For customers in Denmark and Switzerland, you must configure a plug to your power cord. For all other countries, you may need to supply a country-specific plug. This cord may be used for a lab environment, for a rooftop installation, or a pole top installation. For rooftop installations, if the Cisco Aironet 1500 Series is connected to the network, you will still need to use the Ethernet cable (AIR-ETH1500-150=). The power cord provides an alternative to using a power injector. Note that this part will be orderable in the second quarter of 2006.

Q. What mounting options are available for the Cisco Aironet 1500 Series?

- A.** The Cisco Aironet 1500 Series ships with a universal mounting plate that can be used to install it on a flat surface. An optional pole-mount bracket (AIR-ACCPMK1500), used with the universal mounting plate, is available for mounting the Cisco Aironet 1500 Series to streetlight poles.

Q. In which countries is the Cisco Aironet 1500 Series available?

- A.** Please visit this site for latest country availability:
http://www.cisco.com/application/pdf/en/us/guest/products/ps5861/c1650/cdccont_0900aecd80537b6a.pdf

Q. Can I service an 802.11a user on the 1510 model backhaul link?

- A.** No. When the 802.11a radio on the 1510 model is set to provide wireless backhaul, it does not support client access.

Q. Does the Cisco Aironet 1500 Series support QoS?

- A.** Yes, the Cisco Aironet 1500 Series supports 802.11e prioritization to clients and for traffic forwarded over the wireless backhaul.

Q. What controllers can I use with the Cisco Aironet 1500 Series?

- A.** The Cisco Aironet 1500 Series is compatible with the Cisco [2000](#) and [4400](#) Series wireless LAN controllers, the [Cisco Catalyst® 6500 Series Wireless Services Module \(WiSM\)](#), the [Cisco Catalyst 3750 Series Integrated Wireless LAN Controllers](#), and the [Cisco Wireless LAN Controller Module](#) for Integrated Services Routers.

Q. Which IEEE 802.11 standards are supported by the Cisco Aironet 1500 Series?

- A.** The Cisco Aironet 1500 Series supports the IEEE 802.11a (1510 model only), 802.11b/g, 802.11e, and 802.11i WPA and WPA2 industry standards.

Q. How is the Cisco Aironet 1500 Series managed?

- A.** The Cisco Aironet 1500 Series derives system-level management information on device configuration, security policies, and RF parameters from Cisco wireless LAN controllers. Cisco's controllers use Lightweight Access Point Protocol (LWAPP) to define an innovative architecture for large-scale wireless LANs that centralizes certain functions of the 802.11 protocol and considers individual indoor and outdoor access points to be part of a larger system.

