

## Cisco Aironet 1520 Series Lightweight Outdoor Access Point Ordering Guide

The Cisco® Aironet® 1520 Series mesh access points are designed to support a wide variety of applications. There are several access point models and optional accessories available to suit the requirements of a particular deployment. A fully operational system requires the following minimum items:

- Access point
- Power
- 2.4-GHz antennas
- 5 -GHz antenna(s)
- Mounting bracket

Additionally, you may need the following, depending on your particular deployment. Options for the 1520 Series include:

- Fiber module
- Cable modem
- Battery

Use this guide to identify which items you need for your deployment. Note that accessories are available as a configurable option and/or as a spare (an equal sign “=” at the end of the part number indicates that the part is a spare). You may need to remove any option you installed when returning your access point to Cisco. Consult your Cisco representative for additional assistance ordering mesh and other networking equipment.

### Access Points

The 1520 Series is available in several models.

#### Dual-Band Access Points

Dual-band access points in the Cisco Aironet 1520 Series include the 1522AG, 1522HZ, and 1522PC, all of which are equipped with an 802.11a radio and an 802.11b/g radio. In each of these models, the 802.11a radio is used for wireless backhaul across the mesh, while client access is provided by the 802.11b/g radio. As a software configuration, the 802.11a radio may also be used for client access. The 1522AG and 1522HZ access points can be powered by AC power or Power over Ethernet, while the 1522PC can be powered by the Cable Television System (CATV) plant infrastructure. Each of these may also be powered by 12 VDC. The 1522PC can also be configured with a DOCSIS 2.0 cable modem to connect to the cable headend. The 1522HZ is designed for use in hazardous locations with certification for North American Class 1, Div/Zone 2, and ATEX Class 1, Zone 2, and includes special fittings to accommodate those installations.

## Multiband Access Points

Multiband access points in the Cisco Aironet 1520 Series include the 1524SB and 1524PS, both of which have three radios. With the 1524SB, two 5-GHz radios are used to backhaul traffic through the mesh network, while a 2.4-GHz radio is used for client access. As a software configuration, an 802.11a radio can also be used for client access. With the 1524PS, a 5.8-GHz radio provides wireless backhaul, while a 2.4-GHz radio and a 4.9-GHz radio provide access for unlicensed Wi-Fi and licensed public safety clients. Each access point can be powered by AC power, Power over Ethernet, or 12 VDC.

Table 1 lists the part numbers for the various mesh access point models in the 1520 Series.

**Table 1.** Mesh Access Point Models in the Cisco Aironet 1520 Series

SKU	Description
AIR-LAP1522AG-x-K9	802.11a and 802.11b/g mesh access point, AC Power
AIR-LAP1522HZ-x-K9	802.11a and 802.11b/g mesh access point, AC Power, Class 1, Zone/Div 2 certified
AIR-LAP1522PC-x-K9	802.11a and 802.11b/g mesh access point, Power over Cable
AIR-LAP1524SB-x-K9	Dual 802.11a backhaul and 802.11b/g mesh access point, AC Power
AIR-LAP1524PS-x-K9	802.11a, 802.11b and 4.9 Public Safety mesh access point, AC Power

In Table 1, X is a placeholder for the regulatory domain designator. Table 2 lists regulatory domains that are available.

**Table 2.** Regulatory Domains for the Access Points in the Cisco Aironet 1520 Series

	1522AG	1522HZ	1522PC	1524SB	1524PS
-A FCC	x	x	x	x	x
-C China	x			x	
-E ETSI	x	x			
-K Korea	x				
-N North America	x	x	x	x	
-P Japan	x				
-S Singapore	x	x			
-T Taiwan	x				

Please see <http://www.cisco.com/go/aironet/compliance> to determine which regulatory domain is used in your country. Note that the regulatory domain used in your country may differ with the access point model, and that some models are not available for all countries.

The following contents are included with every model:

- Access point
- Grounding lug
- DC terminal block
- Sealant for the antenna connections
- Nonseizing compound for the mounting brackets

In addition to the contents just listed, certain models include the following. The 1522AG, 1522PC, 1524SB, and 1524PS include:

- Liquid tight adaptors (3) for sealing cable ingresses

The 1522HZ includes:

- Couplers (2) for connecting conduit pipes

The access points are designed to withstand power surges on the AC power cord up to 4 kV as per EN61000-4-5 Level 4; lightning arrestors are not required.

## Power

The following models can be powered by 90-480 VAC or 48 VDC Power over Ethernet:

- 1522AG
- 1524SB
- 1524PS

The 1522HZ powered 90 VAC to 240 VAC.

The following model is powered 90 VAC to 240 VAC:

- 1522PC

The 1522PC can also be powered by Power over Ethernet (PoE) for lab usage. However, if a cable modem is installed, PoE will not power the cable modem.

All models can alternatively be powered by 12 VDC using the supplied terminal block.

## AC Power

The 1522AG, 1524SB, and 1524PS, and 1522PC access points have a 3-pin, threaded AC power connector. Table 3 lists the power cord options available when you use AC power.

**Table 3.** AC Power Cord Options

SKU	Description
AIR-CORD-R3P-40NA	Power cord, 40 ft, North American Plug
AIR-CORD-R3P-40UE	Power cord, 40 ft, European Harmonized, Unterminated
AIR-PWR-ST-LT-R3P	Power cord, 4 ft, Street Light Tap

1522HZ requires discrete wired connection to internal terminal block.

Note that the 1520 Series and 1500 Series AC power connectors are not compatible. You will need to use one of the power cables listed in Table 3 when using an access point in the 1520 Series.

The AIR-CORD-R3P-40UE connects to the access point on one end, and is not terminated on the other end. You will need to source a plug appropriate for your installation.

When AC power is not used (for example, when you use PoE or 12 VDC to power the access point), you should cover the unused connector. A cover is available from Remke (see <http://www.remke.com> for part number 75-0086).

## Power over Ethernet

All access point models support Power over Ethernet. Note, however, that PoE for the 1522PC is for lab bench convenience; if a cable modem is installed in the 1522PC and PoE is used, the cable modem will not be powered.

Note, when powering the access point over Ethernet, the access point does not supply 802.3af PoE to an Ethernet attached device.

When you use Power over Ethernet, use the power injector listed in Table 4.

**Table 4.** Power Injector for Use with Power over Ethernet

SKU	Description
AIR-PWRINJ1500-2	1520 Series Power Injector

Do not use any other power injector or switch provided for Power over Ethernet with the 1520 Series access points. The 1520 Series is approved for use only with the AIR-PWRINJ1500-2. You must also specify the country type power cord for the power injector.

The AIR-PWRINJ1500-2 is for indoor use only. It has built-in surge protection, but you may also need to install a surge protector at the building entry point. Please check with your local electrical regulations.

The 1520 Series access points use a standard RJ-45 Ethernet connector, unlike the military connector used on the 1500 Series. Cisco does not provide an Ethernet cable for the 1520 Series. You will need to source an outdoor-rated, Category 5 or better Ethernet cable and shielded RJ-45 connectors from a local supplier. Liquid tight adapters are provided with the access point to seal this cable entry point from weather.

### Power over Cable

The 1522PC is powered by the CATV plant power supply system over coaxial cable through its F-connector. A cable plant power supply system is built into the 1522PC; it does not need to be separately ordered.

The spare power supply listed in Table 5 is also available as a replacement part.

**Table 5.** Spare Power Supply for the Cisco Aironet 1522PC Access Point

SKU	Description
AIR-1520-CAB-PWR	Cable Power Supply, spare

Note that this power supply system is supported as a field replacement unit only on the 1522PC. It is not supported in other models.

### DC Power

All access points support power from an external 12 VDC +- 600 mV power supply, minimum 50 watts. A terminal block is included with your access point for this purpose, with liquid tight adapters to weather-proof the connection. When using DC, please consult the [Hardware Installation Guide](#) for instructions on how to correct assemble the connector.

Table 6 summarizes the primary power options available to the 1520 Series access points.

**Table 6.** Power Options for the Cisco Aironet 1520 Series

	1522AG	1522HZ	1522PC	1524SB	1524PS
AC power	x	x		x	x
Power over Ethernet	x	x	x*	x	x
Power over Cable			x		
DC power	x	x	x	x	x

\* Note that when POE is used on the 1522PC, and a cable modem is installed, the power injector does not power the cable modem.

The 1520 Series can be installed with redundant power sources. When multiple power sources are available, the access point will use power in the following priority:

1. AC Power or Power over Cable
2. DC Power
3. Power over Ethernet
4. Battery (see the "Battery" section later in this ordering guide)

## Antennas

The 1520 Series access points are equipped with a combination of radios operating in the 2.4- and 5-GHz bands. Some models can also operate in the 4.9-GHz band. The 5-GHz and 4.9-GHz radios use a single transmit and receive stream, while the 2.4-GHz radio performs Maximal Ratio Combining (MRC), which takes advantage of multipath signals received across up to three antennas to improve signal quality.

Table 7 identifies the type (2.4 or 5 GHz) of antennas and the number of each type used by the 1520 Series.

**Table 7.** Number of 2.4- and 5-GHz Antennas Supported by the 1520 Series

	1522AG	1522HZ	1522PC	1524SB	1524PS
<b>2.4 GHz*</b>	3 antennas	3 antennas	2 antennas	3 antennas	3 antennas
<b>5 GHz</b>	1 antenna	1 antenna	1 antenna	2 antennas	1 5.8-GHz antenna 1 4.9-GHz antenna

\* The 2.4-GHz radio can operate with fewer than the listed number of antennas. However, optimal performance is achieved when using the maximum number possible. Moreover, using less than the total number of antennas supported leaves the unused antenna connectors exposed to the weather; they will need to be covered.

Antennas must support your desired radio operating range, which varies by regulatory domain and model. Please see the appendix for the frequency range your access point operates.

Table 8 describes the antennas available for the 1520 Series, listing part numbers for both 2.4-GHz and 5-GHz antennas, as well as gain and other details. All antennas are white or off-white except where noted.

**Table 8.** Antennas for the Cisco Aironet 1520 Series

SKU	Operating Range (GHz)	Gain	Dimensions	Pattern
<b>2.4-GHz Antennas</b>				
AIR-ANT2420V-N (gray)	2.4 – 2.5	2 dBi	5 in	Omnidirectional
AIR-ANT2450V-N	2.4 – 2.5	5 dBi	11 in	Omnidirectional
AIR-ANT2480V-N	2.4 – 2.5	8 dBi	19.5 in	Omnidirectional
<b>4.9-and 5-GHz Antennas</b>				
AIR-ANT5140V-N (gray)	4.9 – 5.850	4 dBi	5 in	Omnidirectional
AIR-ANT5180V-N	4.9 – 5.850	8 dBi	11 in	Omnidirectional
AIR-ANT5114P-N	4.9 – 5.850	14 dBi	4.13 in x 4.13 in	25° azimuth x 29° elevation
AIR-ANT5117S-N	4.9 – 5.850	17 dBi	24.5 in x 2.5 in	90° azimuth x 8° elevation
AIR-ANT58G10SSA-N	5.725 – 5.850	9.5 dBi	2.75 in x 6 in x 5.75 in	60° azimuth x 60° elevation

For additional antenna specifications, see the Cisco Aironet Antenna and Accessories Reference Guide at [http://www.cisco.com/en/US/products/hw/wireless/ps469/products\\_data\\_sheets\\_list.html](http://www.cisco.com/en/US/products/hw/wireless/ps469/products_data_sheets_list.html). The access points are provided with a moldable sealant to protect the antenna connector from weather. Consult your installation guide for proper installation.

## Mounting Brackets

The 1520 Series mesh access points can be mounted to poles or CATV plant strands. The mounting brackets are not provided with the access point. Order them using one of the SKUs listed in Table 9.

**Table 9.** Mounting Brackets for the Cisco Aironet 1520 Series

SKU	Description
AIR-ACCPMK1520	Pole Mount Bracket
AIR-ACCSMK1520	Strand mount bracket

Note that the 1520 Series and 1500 Series mounting brackets are not compatible. You must use one of the mounting brackets listed in Table 9 when installing your 1520 Series access point.

The pole mount kit is adjustable for any pole angle: horizontal, vertical, and any angle in between. It can also be used to mount the access point to a flat surface, such as a wall.

To prevent the mounting bracket and access point from fusing together, anti-seizing compound is included with the access point. The pole mount kit includes two stainless-steel-band straps and buckles to fit poles up to 16 inches in diameter. For larger poles, consult a local provider. The banding can be secured using the tool listed in Table 10.

**Table 10.** Banding Installation Tool for the Cisco Aironet 1520 Series

SKU	Description
AIR-BAND-INST-TL	Band installation tool

## Network Connection

The 1520 Series access points can connect to the network wirelessly or through a wired Ethernet, fiber, or cable model connection.

### Wireless

An access point that connects to the network through another access point over a wireless backhaul is known as a mesh access point (MAP). The backhaul radio is built in, and no wired connection is needed for MAPs.

An access point that also acts as the gateway for mesh nodes is known as a root access point (RAP), and connects to the network through a wired connection, either Ethernet, fiber or cable modem. (Note that a remotely located RAP may also connect to the network by connecting a separate wireless bridge to its Ethernet port, labeled "POE-In.") Liquid-tight adapters are provided with your access point to prevent water ingress.

### Ethernet

The 1520 Series access points support 10/100/1000 Gigabit Ethernet using a shielded RJ-45 connector with minimum Category 5 cable. Please see your local supplier for an outdoor-rated cable and shielded connectors.

### Fiber

Alternatively, the 1520 Series access point can use one of the temperature-rated fiber Small Form-Factor Pluggable (SFP) modules listed in Table 11.

**Table 11.** Fiber SFPs for the Cisco Aironet 1520 Series

SKU	Description
GLC-FE-100BX-URGD	100BaseBX10-U Rugged SFP module
GLC-LX-SM-RGD	1000BaseLX single-mode Rugged SFP module
GLC-SX-MM-RGD	1000BaseSX multimode Rugged SFP module

Note the fiber SFP needs to be installed in the access point. See the hardware installation guide for instructions.

### Cable Modem

The 1522PC model supports an optional DOCSIS 2.0 cable modem (Table 12) to connect to the cable headend. The cable modem can be configured to the access point when ordering the 1522PC, can be customer installed, or can be replaced in the field. Note the cable modem is only a configurable option for the 1522PC and is not supported in other models.

**Table 12.** The DOCSIS 2.0 Cable Modem for the Cisco Aironet 1522PC Access Point

SKU	Description
AIR-1520-CM-D2	DOCSIS 2.0 Cable Modem

Table 13 summarizes the backhaul options available for each model.

**Table 13.** Network Connections Types for the Cisco Aironet 1520 Series

	1522AG	1522HZ	1522PC	1524SB	1524PS
Wireless (MAP)	x	x	x	x	x
Ethernet	x	x	x	x	x
Fiber	x	x	x	x	x
Cable modem			x		

The 1520 Series can be installed with redundant network connections. When multiple network connections are available, the access point will connect in the following priority:

1. Fiber
2. Cable Modem
3. Ethernet
4. Wireless

### Battery

The 1520 Series access points can be deployed with a rechargeable lithium-Ion battery for backup power during power outages. The battery provides approximately 2 to 3 hours of power with typical traffic volume (50 percent duty cycle). Actual battery time will vary depending on several factors, including traffic volume, the number of radios installed, temperature, and whether an auxiliary device draws power over Ethernet.

Note that the battery cannot be used with the 1522HZ or 1522PC models (Table 14).

**Table 14.** Models in the Cisco Aironet 1520 Series That Can Use a Battery

	1522AG	1522HZ	1522PC	1524SB	1524PS
Battery	x			x	x

The battery can be configured to the access point when ordering, customer installed, or replaced in the field (Table 15).

**Table 15.** Battery for the Cisco Aironet 1520 Series

SKU	Description
AIR-1520-BATT-6AH	1520 Series Battery Backup Unit

## Other Requirements and Resources

### Software Release Requirements

The 1520 Series requires the minimum software releases notes in Table 16.

**Table 16.** Minimum Software Releases

Model	Minimum Software Release	
<b>1522AG</b>	-A and N	4.1.190.1 or 5.2 or later*
	All other reg. domains	4.1.191.24M or 5.2 or later*
<b>1522HZ</b>	-A and N	4.1.190.1 or 5.2 or later*
	All other reg. domains	4.1.191.24M or 5.2 or later*
<b>1522PC</b>	-A and N	4.1.190.1 or 5.2 or later*
	All other reg. domains	4.1.191.24M or 5.2 or later*
<b>1524SB</b>	-A, C and N	6.0 or later
<b>1524PS</b>	-A	4.1.192.22M or 5.2 or later*

\*These access points are supported in the separate 4.1.19x.x Mesh Software Release train, or with Release 5.2 or later. These access points are **not** supported in the 4.2, 5.0, or 5.1 Release trains.

Note that additional functionality is available to the access points with more recent releases. Please see the applicable release notes for more information about features available with newer releases.

### Authorized Technology Provider

For deployments of greater than 20 outdoor mesh access points, you must engage a Cisco Authorized Technology Provider (ATP) Partner. For deployments smaller than 20 access points, you must engage an Advanced Wireless LAN Specialized Partner. To locate an Advanced Wireless LAN or ATP Partner, see your Cisco representative, or see <http://www.cisco.com/go/partnerlocator> for more information.

### Cisco Unified Wireless Networking Architecture

The 1520 Series is part of the Cisco Unified Wireless Network. It operates in conjunction with the Cisco Wireless LAN Controller. The following controllers support the Cisco 1520 Series access points:

- Wireless Services Module (WiSM) for the Cisco Catalyst® 6500 Series/7600 Series
- Wireless LAN Controller Module (WLCM) for Integrated Services Routers
- Cisco 5500 Series Wireless Controller
- Cisco 4400 Series Wireless LAN Controller
- Cisco Catalyst 3750G Integrated Wireless LAN Controller
- Cisco 2100 Series Wireless LAN Controller

**Note:** For deployments using a release of the format 4.1.19x.x, only the Cisco 4400, 2106, and WiSM controllers are supported.

Additional manageability and mobility services can be enabled when employing the Cisco Wireless Control System Software and Cisco Mobility Services Engine.

### Cisco Technology Developer Program

Related solutions are available through our Cisco Technology Developer Partner Program partners. Visit <http://www.cisco.com/go/ctdp> for more information.

## Appendix

### Frequency Band and Operating Channels

Cisco 1522		
<p>-A (Americas (FCC)):</p> <ul style="list-style-type: none"> <li>• 2.401 to 2.473 GHz; 11 channels</li> <li>• 4.940 to 4.990 GHz; <ul style="list-style-type: none"> <li>◦ 5 MHz—10 channels</li> <li>◦ 10 MHz—5 channels</li> <li>◦ 20 MHz—2 channels</li> </ul> </li> <li>• 5.250 to 5.850 GHz; 16 channels (excludes channel 120, 124, 128)</li> </ul> <p>-C (China):</p> <ul style="list-style-type: none"> <li>• 2.401 to 2.483 GHz; 13 channels</li> <li>• 5.725 to 5.850 GHz; 5 channels</li> </ul>	<p>-E (ETSI):</p> <ul style="list-style-type: none"> <li>• 2.401 to 2.483 GHz; 13 channels</li> <li>• 5.470 to 5.725 GHz; 8 channels</li> </ul> <p>-K (Korea):</p> <ul style="list-style-type: none"> <li>• 2.401 to 2.483 GHz; 13 channels</li> <li>• 5.250 to 5.560 GHz; 10 channels</li> </ul> <p>-N (Non-FCC):</p> <ul style="list-style-type: none"> <li>• 2.401 to 2.473 GHz; 11 channels</li> <li>• 5.725 to 5.850 GHz; 5 channels</li> </ul>	<p>-P (Japan2):</p> <ul style="list-style-type: none"> <li>• 2.401 to 2.495 GHz; 14 channels</li> <li>• 4.910 to 5.090 GHz; 6 channels</li> </ul> <p>-S (Singapore):</p> <ul style="list-style-type: none"> <li>• 2.401 to 2.483 GHz; 13 channels</li> <li>• 5.725 to 5.850 GHz; 5 channels</li> </ul> <p>-T (Taiwan):</p> <ul style="list-style-type: none"> <li>• 2.401 to 2.473 GHz; 11 channels</li> <li>• 5.470 to 5.850 GHz; 16 channels</li> </ul>
Cisco 1524SB		
<p>-A (Americas (FCC)):</p> <ul style="list-style-type: none"> <li>• 2.401 to 2.473 GHz; 11 channels</li> <li>• 5.725 to 5.850 GHz; 5 channels</li> </ul>	<p>-C (China):</p> <ul style="list-style-type: none"> <li>• 2.401 to 2.473 GHz; 13 channels</li> <li>• 5.725 to 5.850 GHz; 5 channels</li> </ul>	<p>-N (Non-FCC):</p> <ul style="list-style-type: none"> <li>• 2.401 to 2.473 GHz; 11 channels</li> <li>• 5.725 to 5.850 GHz; 5 channels</li> </ul>
Cisco 1524PS		
<p>-A (Americas (FCC)):</p> <ul style="list-style-type: none"> <li>• 2.401 to 2.473 GHz; 11 channels</li> <li>• 4.940 to 4.990 GHz; <ul style="list-style-type: none"> <li>◦ 5 MHz—10 channels</li> <li>◦ 10 MHz—5 channels</li> <li>◦ 20 MHz—2 channels</li> </ul> </li> <li>• 5.725 to 5.850 GHz; 5 channels</li> </ul>		



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