CISCO SYSTEMS

Cisco Aironet 1200 Series Access Point Hardware Installation Guide

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CONTENTS

Preface

This section describes the objectives, audience, organization, and conventions of the *Cisco Aironet 1200 Series Access Point Hardware Installation Guide*.

Objectives

This publication explains the steps for initial setup and basic configuration of the access point. This publication also provides troubleshooting information and detailed specifications.

Audience

This publication is for the person installing and configuring a Cisco Aironet 1200 Series Access Point for the first time. The installer should be familiar with network structures, terms, and concepts.

Organization

This guide contains the following sections:

Chapter 1, "Overview," describes the features and specifications of access points.

Chapter 2, "Installation," provides basic installation instructions.

Chapter 3, "Basic Configuration," describes how to enter basic configuration settings.

Chapter 4, "Mounting Instructions," provides mounting instructions for the access point.

Chapter 5, "Troubleshooting," provides solutions to potential problems encountered during setup.

Appendix A, "Translated Safety Warnings," lists translations of the safety warnings in this publication.

Appendix B, "Declarations of Conformity and Regulatory Information," describes the regulatory conventions to which the access point conforms and provides guidelines for operating access points in Japan.

Appendix C, "Console Cable Pinouts,"describes the pinouts for the serial RJ-45 to DB-9 console cable that connects to the access point's serial console port.

Conventions

This publication uses the following conventions to convey instructions and information:

- Commands and keywords are in **boldface** type.

Note   Means *reader take note*. Notes contain helpful suggestions or references to materials not contained in this manual.

Caution   Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Warning   **The warning symbol means danger.** You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. To see translations of the warnings that appear in this publication, refer to Appendix A in this manual.

Related Publications

For more information about access points and related products, refer to the following publications:

- *Quick Start Guide: Cisco Aironet 1200 Series Access Point* describes how to attach antennas and cables, mount the access point, and how to obtain access point documentation. This document is included in the shipping box with your access point.

- *Cisco Aironet 1200 Series Access Point Software Configuration Guide* describes the access point's management system and explains how to configure the access point. This document is available at the Cisco CCO web site at the following URL:

  http://www.cisco.com/univercd/cc/td/doc/product/wireless/index.htm

- *Release Notes for Cisco Aironet 1200 Series Access Point* describes features and caveats for access points running firmware release XX.xx. This document is available on the Cisco CCO web site at the following URL:

  http://www.cisco.com/univercd/cc/td/doc/product/wireless/index.htm

- Cisco Secure Access Control Server for Windows 2000/NT Servers Version 3.0 User Guide provides complete instructions for using Cisco Secure ACS, including steps for configuring Cisco Secure ACS to support access points. This document is available at the following URL:

  http://www.cisco.com/univercd/cc/td/doc/product/access/acs_soft/csacs4nt/csnt30/user/index.htm

- *Cisco Aironet Wireless LAN Client Adapters Installation and Configuration Guide for Windows* provides hardware features, physical and performance characteristics, installation instructions for PC card and PCI card client adapters, and instructions for installing and using the wireless client adapter utilities running the Windows operating system. This document is available on the Cisco CCO web site at the following URL:

  http://www.cisco.com/univercd/cc/td/doc/product/wireless/index.htm

- *Cisco Aironet Wireless LAN Client Adapters Installation and Configuration Guide for Mac OS* provides hardware features, physical and performance characteristics, installation instructions for PC card and PCI card client adapters, and instructions for installing and using the wireless client adapter utilities running the Apple Mac OS X (version 10.1 or later) or Mac OS 9.x operating system. This document is available on the Cisco CCO web site at the following URL:

  http://www.cisco.com/univercd/cc/td/doc/product/wireless/index.htm

- *Cisco Aironet Wireless LAN Adapters Installation and Configuration Guide for Linux* provides hardware features, physical and performance characteristics, installation instructions for PC card and PCI card client adapters, and instructions for installing and using the wireless client adapter utilities running the Linux operating system. This document is available on the Cisco CCO web site at the following URL:

  http://www.cisco.com/univercd/cc/td/doc/product/wireless/index.htm

Obtaining Documentation

The following sections explain how to obtain documentation from Cisco Systems.

World Wide Web

You can access the most current Cisco documentation on the World Wide Web at the following URL:

http://www.cisco.com

Translated documentation is available at the following URL:

http://www.cisco.com/public/countries_languages.shtml

Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package shipped separately from your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual subscription.

Ordering Documentation

Cisco documentation is available in the following ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Networking Products MarketPlace:

  http://www.cisco.com/cgi-bin/order/order_root.pl

- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:

  http://www.cisco.com/go/subscription

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco corporate headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

Documentation Feedback

If you are reading Cisco product documentation on Cisco.com, you can submit technical comments electronically. Click the **Fax** or **Email** option under the "Leave Feedback" at the bottom of the Cisco Documentation home page.

You can e-mail your comments to bug-doc@cisco.com.

To submit your comments by mail, use the response card behind the front cover of your document, or write to the following address:

Cisco Systems
Attn: Document Resource Connection
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Obtaining Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configurations from online tools by using the Cisco Technical Assistance Center (TAC) Web Site. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC Web Site.

Cisco.com

Cisco.com is the foundation of a suite of interactive, networked services that provides immediate, open access to Cisco information, networking solutions, services, programs, and resources at any time, from anywhere in the world.

Cisco.com is a highly integrated Internet application and a powerful, easy-to-use tool that provides a broad range of features and services to help you to

- Streamline business processes and improve productivity
- Resolve technical issues with online support
- Download and test software packages
- Order Cisco learning materials and merchandise
- Register for online skill assessment, training, and certification programs

You can self-register on Cisco.com to obtain customized information and service. To access Cisco.com, go to the following URL:

http://www.cisco.com

Technical Assistance Center

The Cisco TAC is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two types of support are available through the Cisco TAC: the Cisco TAC Web Site and the Cisco TAC Escalation Center.

Inquiries to Cisco TAC are categorized according to the urgency of the issue:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.

- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.

- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.

- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

Which Cisco TAC resource you choose is based on the priority of the problem and the conditions of service contracts, when applicable.

Cisco TAC Web Site

The Cisco TAC Web Site allows you to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC Web Site, go to the following URL:

http://www.cisco.com/tac

All customers, partners, and resellers who have a valid Cisco services contract have complete access to the technical support resources on the Cisco TAC Web Site. The Cisco TAC Web Site requires a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to the following URL to register:

http://www.cisco.com/register/

If you cannot resolve your technical issues by using the Cisco TAC Web Site, and you are a Cisco.com registered, you can open a case online by using the TAC Case Open tool at the following URL:

http://www.cisco.com/tac/caseopen

If you have Internet access, it is recommended that you open P3 and P4 cases through the Cisco TAC Web Site.

Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses issues that are classified as priority level 1 or priority level 2; these classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer will automatically open a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to the following URL:

http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml

Before calling, please check with your network operations center to determine the level of Cisco support services to which your company is entitled; for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). In addition, please have available your service agreement number and your product serial number.

Overview

The Cisco Aironet 1200 Series Access Point (hereafter called the *access point*) delivers a cost-effective, reliable, secure, and easily managed wireless LAN solution for enterprise customers and for small and medium sized businesses. The access point is designed to incorporate new technology enhancements as they become available.

The initial release of the access point supports 2.4-GHz (IEEE 802.11b) operation, but the unit can be field-upgraded with a 5-GHz podule (card bus plug-in module) when they become available. With the 5-GHz podule attached, the access point can support simultaneous 2.4-GHz and 5-GHz network operation.

The access point can contain two wireless LAN transceivers (radios). Each transceiver serves as the center point of a stand-alone wireless network or as the connection point between wireless and wired networks. In large installations, wireless users within radio range of an access point can roam throughout a facility while maintaining uninterrupted access to the network.

This chapter provides information on the following topics:

- Enhancements, page 1-2
- Key Features, page 1-2
- Network Configuration Examples, page 1-7
- Access Point Specifications, page 1-10

Enhancements

The 5-GHz radio podule enhancement for the access point will be available in the near future, which you will be able to easily install.

5-GHz Radio Podule

The 5-GHz radio podule is a plug-in module that connects to the access point card bus connector. The podule contains a wireless LAN transceiver that operates in the 5-GHz frequency range to provide the access point with single or dual band capability. The podule incorporates an Unlicensed National Information Infrastructure (UNII) radio transceiver operating in two of the UNII 5-GHz frequency bands. The podule will be available in two configurations:

- UNII 1 and UNII 2—contains dual integrated omnidirectional and hemispherical diversity antennas
- UNII 2—contains two reverse TNC connectors for remote antenna installations

Key Features

Key features of the access point:

- Single or dual radio operation
    - First release—integrated 2.4-GHz radio
    - Next release—plug-in 5-GHz radio podule for field upgrade
- Dual power source
    - Inline power over Ethernet
    - External power module
- Metal enclosure supports installation within environmental air spaces (enclosure complies with UL 2043 test requirements)
- Industrial temperature rating
- Dual antennas connectors for single or diversity antenna operation
- Backbone LAN
    - 10/100 BASE-T Ethernet port
- Access point control using the console port or an Internet browser
- Three status indicators
- Security lock feature
    - Security cable keyhole to secure the access point using a security cable
    - Security hasp to secure the access point to the mounting bracket using a lock

Power

The access point can receive power through an external power module or through inline power using the Ethernet cable. Using inline power, you do not need to run a separate power cord to the access point. Plug the Ethernet cable into the Ethernet port on the back of the access point and plug the other end into one of the inline power sources. The access point supports the following power sources:

- Inline power
  - A 1200 series power injector
  - A switch with inline power, such as the Cisco Catalyst 3524-PWR-XL switch
  - An inline power patch panel, such as the Cisco Catalyst Inline Power Patch Panel
- A 1200 series power module (Universal power supply)

⚠
Caution   The 1200 series power injectors are designed for use with Cisco Aironet 1200 Series Access Points only. Using the power injector with other Ethernet-ready devices can damage the equipment.

⚠
Caution   The 1200 series power injectors are not tested to UL 2043 and should not be placed in a building's environmental air space, such as above suspended ceilings.

✎
Note   If you need to use a power module or power injector to power the access point, you must use the 1200 series power module or power injector. The 350 series power module and power injector are not compatible with the 1200 series access point.

✎
Note   Only the 1200 series power injector and the power module can support simultaneous operation of both the 2.4-GHz radio and the future 5.0 GHz radio.

✎
Note   When using in-line power from a switch or patch panel do not connect the 1200 series power module to the access point. Using two power sources on the access point might cause the switch or patch panel to shut down the port to which the access point is connected.

✎
Note   Both the Ethernet and console ports use RJ-45 connectors. Be careful not to accidently connect the Ethernet cable to the console port connector.

Antenna Connectors

The access point provides two reverse-polarity TNC (R-TNC) connectors that you can use to connect a single antenna or dual antennas to provide coverage for your wireless LAN area. Diversity coverage using two antennas helps maintain a clear radio signal between the access point and wireless client devices. Just as you can improve signal clarity on your car FM radio at a stoplight by creeping ahead a few inches, the access point can improve signal quality by choosing the antenna that is receiving the best signal from a client device.

Ethernet and Console Ports

Ethernet Port

The Ethernet port accepts an RJ-45 connector, linking the access point to your 10/100 BASE-T Ethernet LAN. The access point can receive power through the Ethernet cable from a switch with inline power, from a power patch panel, or from the access point's 1200 series power injector.

Console Port

The console port provides access to the access point's management system using a terminal emulator program. Use an RJ-45 to DB-9 serial cable (refer to Appendix C, "Console Cable Pinouts") to connect your computer's COM port to the access point's serial console port. Assign the following port settings to a terminal emulator to open the management system pages: 9600 baud, 8 data bits, No parity, 1 stop bit and no flow control.

Metal Enclosure

The access point uses a metal enclosure having adequate fire resistance and low smoke-producing characteristics suitable for operation in a building's environmental air space in accordance with Section 300-22(c) of the NEC, such as above suspended ceilings. The access point also supports an industrial temperature operating range (refer to Access Point Specifications, page 1-10).

Indicators

The three indicators on top of the access point report Ethernet activity, association status, and radio activity. The indicators are labeled as shown in Figure 1-1.

Figure 1-1   Indicators on the 1200 Series Access Point
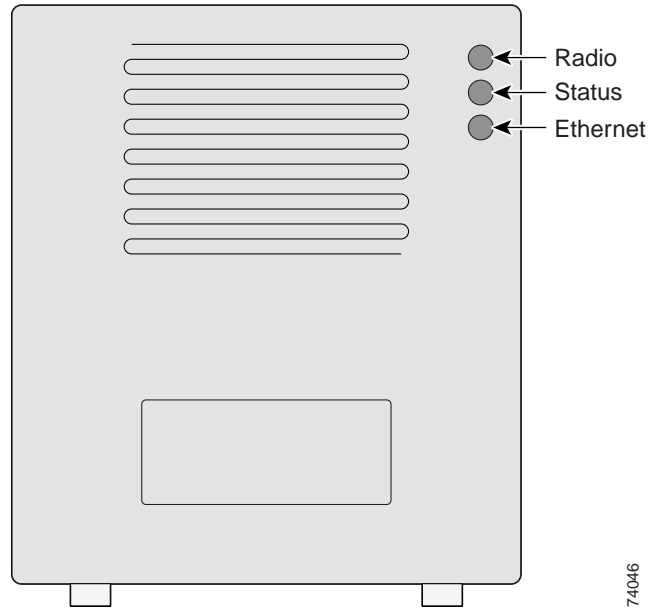
- The Ethernet indicator signals Ethernet traffic on the wired LAN. This indicator blinks green when a packet is received or transmitted over the Ethernet infrastructure. The indicator blinks red when the Ethernet cable is not connected.

- The association status indicator signals operational status. Blinking green indicates that the access point is operating normally but is not associated with any wireless client devices. Steady green indicates that the access point is associated with at least one wireless client device.

- The radio indicator blinks green to indicate radio traffic activity. The light is normally off, but it blinks green whenever a packet is received or transmitted over the access point radio.

Security Lock Feature

The access point provides two methods of securing the access point to help prevent theft (see
Figure 1-2):

- Security hasp

- Security cable keyhole

The security hasp on the mounting bracket allows you to lock the access point to the bracket to make it
more secure. When the access point is properly installed on the mounting bracket, the holes in the
security hasps line up so you can install a padlock. Compatible padlocks are Master Lock models 120T
or 121T.

When using the security hasp with a lock, the access point is secured to the mounting bracket and the
mounting bracket screws along with the 2.4 GHz radio access cover are not accessible.

The security cable keyhole allows you to secure the access point using a standard security cable, such as
the security cables used on laptop computers.

Figure 1-2   Access Point Security Points
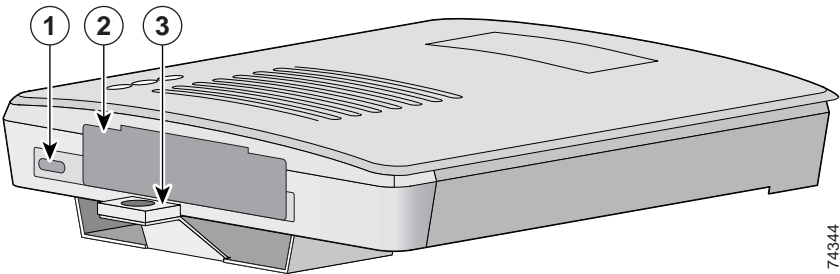
1	Security cable keyhole	**2**	Podule slot access cover
3	Security hasp for padlock		

Network Configuration Examples

This section describes the access point's role in three common wireless network configurations. The access point's default configuration is as a root unit on a wired LAN. The other two possible roles, repeater unit and central unit in an all-wireless network, require specific changes to the default configuration.

Root Unit on a Wired LAN

An access point connected directly to a wired LAN provides a connection point for wireless users. If more than one access point is connected to the LAN, users can roam from one area of a facility to another without losing their connection to the network. As users move out of range of one access point, they automatically connect to the network (associate) through another access point. The roaming process is seamless and transparent to the user. Figure 1-3 shows access points acting as root units on a wired LAN.

Figure 1-3   Access Points as Root Units on a Wired LAN
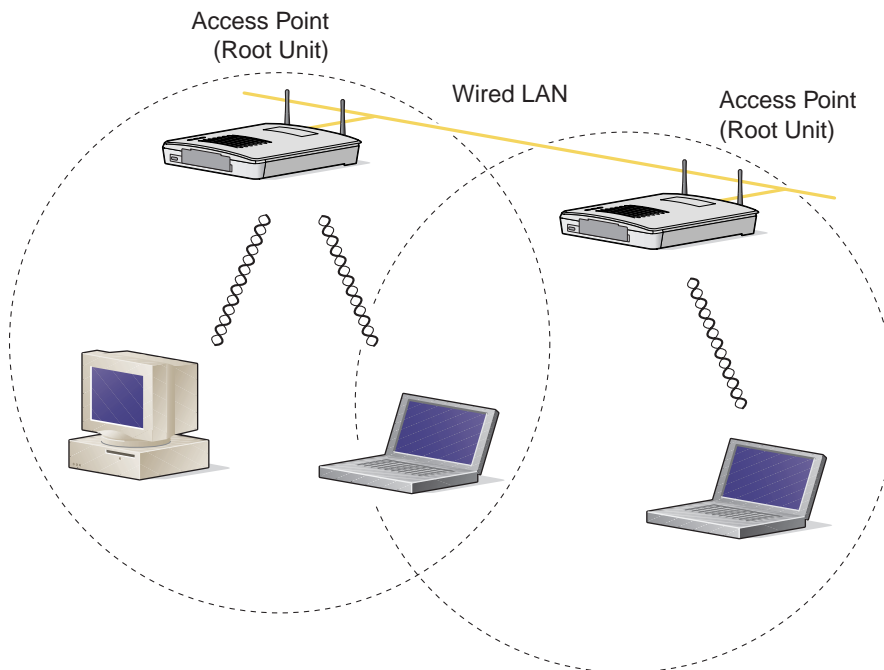
Repeater Unit That Extends Wireless Range

An access point can be configured as a stand-alone repeater to extend the range of your infrastructure or to overcome an obstacle that blocks radio communication. The repeater forwards traffic between wireless users and the wired LAN by sending packets to either another repeater or to an access point connected to the wired LAN. The data is sent through the route that provides the greatest performance for the client. Figure 1-4 shows an access point acting as a repeater.

Figure 1-4   Access Point as Repeater

Access Point
(Root Unit)

Wired LAN

Access Point
(Repeater)

66000

Cisco Aironet 1200 Series Access Point Hardware Installation Guide
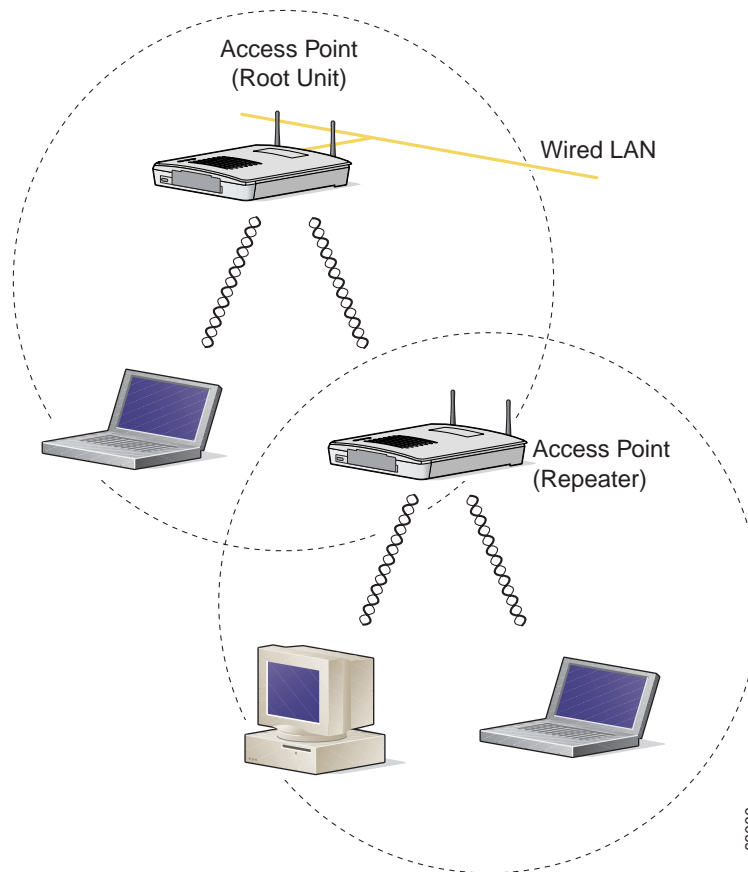
Central Unit in an All-Wireless Network

In an all-wireless network, an access point acts as a stand-alone root unit. The access point is not attached to a wired LAN; it functions as a hub linking all stations together. The access point serves as the focal point for communications, increasing the communication range of wireless users. Figure 1-5 shows an access point in an all-wireless network.

Figure 1-5   Access Point as Central Unit in All-Wireless Network
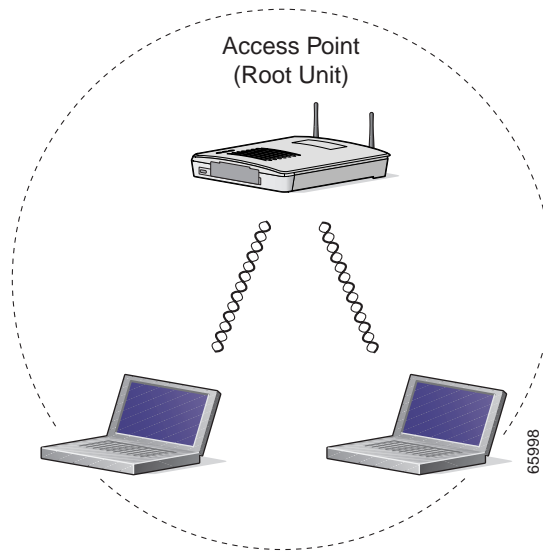
Access Point Specifications

Table 1-1 lists the specifications for the access point.

Table 1-1   ***Access Point Specifications***

Category	Specification	
Physical		
Size	6.56 in. W x 7.20 in. D x 1.44 in. H 16.67 cm W x 18.28 cm D x 3.66 cm H (without 5-GHz Radio Podule)	
Status indicators	Three indicators on the top panel: Ethernet traffic, status, and radio traffic	
Connectors	Back panel (left to right): reverse-TNC antenna connector; power connector (for plug-in AC power module); RJ-45 connector for 10/100 BASE-T Ethernet connections; upside down RJ-45 connector for serial connections; reverse-TNC antenna connector.	
Input Voltage	48VDC nominal. Operational up to 60VDC. Voltage higher than 60VDC can damage the unit.	
Input Current	125 mA (typical) with 2.4-GHz radio (380 mA maximum)	
Operating temperature	–4 to 131°F (–20 to 55°C) for access point with 2.4-GHz radio 32 to 104°F (0 to 40°C) for the 1200 series power injector	
Storage temperature	–40 to 185°F (–40 to 85°C) for access point with 2.4-GHz radio	
Weight	1.6 lbs (0.73 kg) with 2.4-GHz radio (without mounting bracket and 5-GHz radio podule)	
Radio	**2.4-GHz Radio**	**5-GHz Radio**
Power output	100, 50, 30, 20, 5, or 1 mW (Depending on the regulatory domain in which the access point is installed)	(To be specified when radio is released)
Frequency	2.400 to 2.497 GHz (Depending on the regulatory domain in which the access point is installed)	(To be specified when radio is released)

Range	Indoor:
	    150 ft at 11 Mbps
	    350 ft at 1 Mbps
	
	Outdoor:
	    800 ft at 11 Mbps
	    2000 ft at 1 Mbps
		(To be specified when radio is released)

Modulation	Direct Sequence Spread Spectrum (DSSS)	(To be specified when radio is released)
Data rates	1, 2, 5.5, and 11 Mbps	(To be specified when radio is released)

Table 1-1   Access Point Specifications (continued)

Category	Specification	
Antenna	A diversity system with two reverse-TNC connectors (Cisco antennas are sold separately).	(To be specified when radio is released)
Compliance	Operates license-free under FCC Part 15 and complies as a Class B computing device. Complies with DOC regulations. Complies with the following: ETS 300.328, FTZ 2100, MPT 1349, FCC Part 15.107 and 15.109 Class B, ICES-003 Class B (Canada), CISPR 22 Class B, AS/NZS 3548 Class B, VCCI Class B, EN 50082-1, UL 60950, CSA 22.2 No. 60950, EN 60950, IEC 60950, VCCI, and others (see Appendix B).	

The 1200 series access point complies with UL 2043 for products installed in a building's environmental air handling spaces, such as above suspended ceilings.

⚠️

Caution   Cisco Aironet 1200 Series Power Injectors are not tested to UL 2043 and should not be placed in a building's air handling spaces, such as above suspended ceilings.

Installation

This chapter describes the setup of the access point and includes the following sections:

Safety Information

Follow the guidelines in this section to ensure proper operation and safe use of the access point.

FCC Safety Compliance Statement

The FCC, with its action in ET Docket 96-8, has adopted a safety standard for human exposure to RF electromagnetic energy emitted by FCC-certified equipment. When used with approved Cisco Aironet antennas, Cisco Aironet products meet the uncontrolled environmental limits found in OET-65 and ANSI C95.1, 1991. Proper operation of this radio device according to the instructions in this publication will result in user exposure substantially below the FCC recommended limits.

General Safety Guidelines

- Do not touch or move the antenna while the unit is transmitting or receiving.
- Do not hold any component containing a radio such that the antenna is very close to or touching any exposed parts of the body, especially the face or eyes, while transmitting.
- Do not operate the radio or attempt to transmit data unless the antenna is connected; otherwise, the radio may be damaged.
- Use in specific environments:
  - The use of wireless devices in hazardous locations is limited to the constraints posed by the local codes, the national codes and the safety directors of such environments.
  - The use of wireless devices on airplanes is governed by the Federal Aviation Administration (FAA).
  - The use of wireless devices in hospitals is restricted to the limits set forth by each hospital.
- Antenna use:
  - 2.4-GHz high-gain wall-mount or mast-mount antennas are designed to be professionally installed. Please contact your professional installer, VAR, or antenna manufacturer for proper installation requirements.

Warnings

Translated versions of the following safety warnings are provided in Appendix A, "Translated Safety Warnings."

Warning   **In order to comply with FCC radio frequency (RF) exposure limits, dipole antennas should be located at a minimum of 7.9 inches (20 cm) or more from the body of all persons.**

Warning   **Do not operate your wireless network device near unshielded blasting caps or in an explosive environment unless the device has been modified to be especially qualified for such use.**

Warning   **Do not locate the antenna near overhead power lines or other electric light or power circuits, or where it can come into contact with such circuits. When installing the antenna, take extreme care not to come into contact with such circuits, as they may cause serious injury or death. For proper installation and grounding of the antenna, please refer to national and local codes (e.g. U.S.:NFPA 70, National Electrical Code, Article 810, in Canada: Canadian Electrical Code, Section 54).**

Warning   **Do not work on the system or connect or disconnect cables during periods of lightning activity.**

Warning   **Read the installation instructions before you connect the system to its power source.**

Warning   **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S. (240 VAC, 10A international) is used on the phase conductors (all current-carrying conductors).**

Installation Guidelines

This section describes things to keep in mind when installing your access point. Sections include:

- Basic Guidelines
- Installation Above Suspended Ceilings
- Coverage Options
- Site Surveys

Basic Guidelines

Because the access point is a radio device, it is susceptible to common causes of interference that can reduce throughput and range. Follow these basic guidelines to ensure the best possible performance:

- Install the access point in an area where large steel structures such as shelving units, bookcases, and filing cabinets do not obstruct radio signals to and from the access point.
- Install the access point away from microwave ovens. Microwave ovens operate on the same frequency as the access point and can cause signal interference.

Installation Above Suspended Ceilings

The access point uses a metal enclosure having adequate fire resistance and low smoke-producing characteristics suitable for operation in a building's environmental air space in accordance with Section 300-22(c) of the NEC, such as above suspended ceilings. For mounting instructions refer to Chapter 4, "Mounting Instructions."

⚠

Caution   The 1200 series power injectors are not tested to UL 2043 and should not be placed in a building's environmental air space, such as above suspended ceilings.

✎

Note   If you plan to mount the access point in environmental air space and will upgrade to a 5-GHz radio, Cisco recommends that you mount the access point horizontally with its antennas pointing down. Doing so will result in the access point complying with regulatory requirements for environmental air space after the 5-GHz radio is installed.

Coverage Options

The network architecture options of wireless stations and access points provide for a variety of coverage alternatives and flexibility. The network can be designed to provide a wide coverage area with minimal overlap or a narrow coverage area with heavy overlap. A narrow coverage area with heavy overlap improves network performance and protection against downtime if a component fails.

Minimal Overlap Coverage Option

By arranging the access points so that the overlap in a coverage area is minimized, a large area can be covered with minimal cost (see Figure 2-1). The total bandwidth available to each wireless client device depends on the amount of data each mobile station needs to transfer and the number of stations located in each cell. Seamless roaming is supported as a client device moves in and out of range of each access point, thereby maintaining a constant connection to the wired LAN. Each device in the radio network must be configured with the same SSID to provide roaming capability.

Figure 2-1   Minimal Overlap Coverage Option

Wired LAN

74001
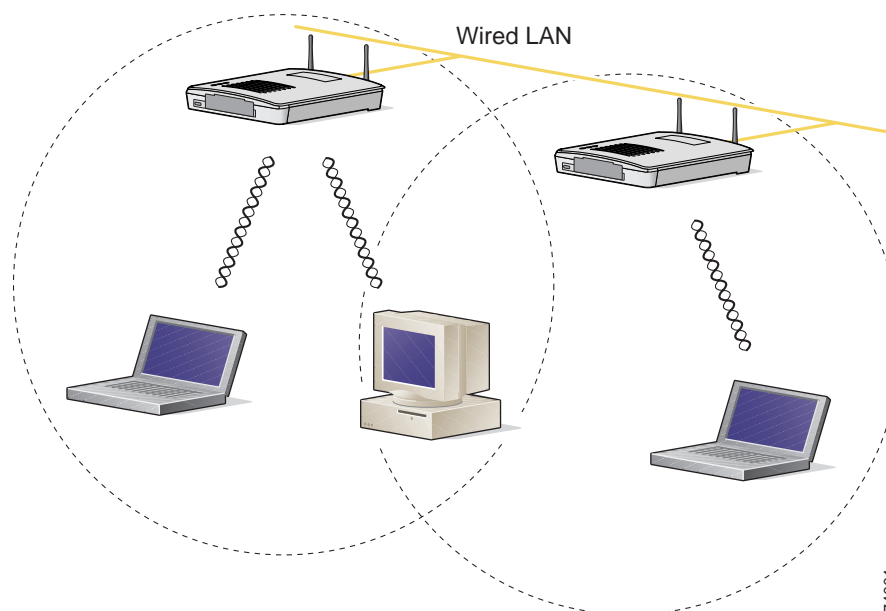
Heavy Overlap Coverage Option

By arranging the access points so the overlap in coverage area is nearly maximized, a large number of mobile stations can be supported in the same wireless infrastructure. However, devices in overlapping coverage areas on the same frequency will detect adjacent cell traffic and delay transmissions that would cause collisions. This configuration reduces the aggregate radio system throughput. Heavy cell overlap is not recommended for maximum system throughput.

Because of the redundancy in coverage overlap, network access is not lost if an access point fails. Upon failure of the access point, the station automatically roams to an operational access point. With this architecture, each device in the RF network must be configured with the same SSID to provide the roaming capability.

Site Surveys

Because of differences in component configuration, placement, and physical environment, every network application is a unique installation. Before installing multiple access points, you should perform a site survey to determine the optimum utilization of networking components and to maximize range, coverage, and network performance.

Consider the following operating and environmental conditions when performing a site survey:

*   Data rates—Sensitivity and range are inversely proportional to data bit rates. The maximum radio range is achieved at the lowest workable data rate. A decrease in receiver threshold sensitivity occurs as the radio data increases.

*   Antenna type and placement—Proper antenna configuration is a critical factor in maximizing radio range. As a general rule, range increases in proportion to antenna height.

*   Physical environment—Clear or open areas provide better radio range than closed or filled areas. Also, the less cluttered the work environment, the greater the range.

*   Obstructions—A physical obstruction such as metal shelving or a steel pillar can hinder performance of wireless devices. Avoid locating the devices in a location where there is a metal barrier between the sending and receiving antennas.

*   Building materials—Radio penetration is greatly influenced by the building material used in construction. For example, drywall construction allows greater range than concrete blocks. Metal or steel construction is a barrier to radio signals.

Unpacking the Access Point

Follow these steps to unpack the access point:

Step 1   Open the shipping container and carefully remove the contents.

Step 2   Return all packing materials to the shipping container and save it.

Step 3   Ensure that all items listed in the "Package Contents" section are included in the shipment. Check each item for damage. If any item is damaged or missing, notify your authorized Cisco sales representative.

Package Contents

Each access point package contains the following items:

*   Cisco Aironet 1200 Series Access Point
*   Cisco Aironet 1200 Series Power Module (Universal power supply)
*   *Quick Start Guide: Cisco Aironet 1200 Series Access Point*
*   Cisco product registration and Cisco documentation feedback cards

Before Beginning the Installation

Before you begin the installation process, please refer to Figure 2-2 to familiarize yourself with the access point's layout and connectors.

Figure 2-2   Access Point Layout and Connectors
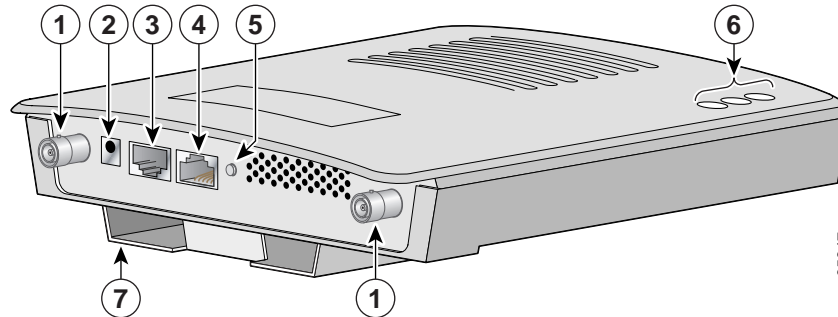
1	2.4-GHz antenna connectors	5	Mode button (possible future feature)
2	48VDC power port	6	Status LEDs
3	Ethernet port (RJ-45)	7	Mounting bracket
4	Console port (RJ-45)		

Installation Summary

During the installation of the access point, you will need to perform the following operations:

- Connect a single antenna or dual diversity antennas (refer to the "Connecting the 2.4-GHz Antenna" section on page 2-8).

- Connect Ethernet and power cables (refer to the "Connecting the Ethernet and Power Cables" section on page 2-8).

- Configure basic settings (refer to Chapter 3, "Basic Configuration").

- Configure security and other access point options. For additional information, refer to the *Cisco Aironet 1200 Series Access Point Software Configuration Guide*.

- Mount the access point to a ceiling or wall. For additional information, refer to Chapter 4, "Mounting Instructions."

Connecting the 2.4-GHz Antenna

The access point supports a single antenna or dual diversity antennas. Two R-TNC antenna connectors are provided on the back of the unit for the 2.4-GHz radio.

If you are using a Cisco Aironet 2 dBi antenna, follow the steps below:

Step 1   Attach an antenna to the 2.4-GHz Right/Primary (R-TNC) antenna connector on the back of the access point and tighten hand tight. If you are using two antennas for diversity coverage, attach the second antenna to the 2.4-GHz Left (R-TNC) antenna connector.

Step 2   Orient the antenna depending on how you intend to mount the access point.

- On a table or desk, orient the antenna straight up.

- On a vertical surface, such as a wall, orient the antenna straight up.

- On a ceiling, orient the antenna straight down.

If you are using another Cisco Aironet antenna, refer to the instructions that came with your antenna.

Connecting the Ethernet and Power Cables

The access point receives power through the Ethernet cable or a1200 series power module. Figure 2-3 shows the power options for the access point.

Figure 2-3   Access Point Power Options
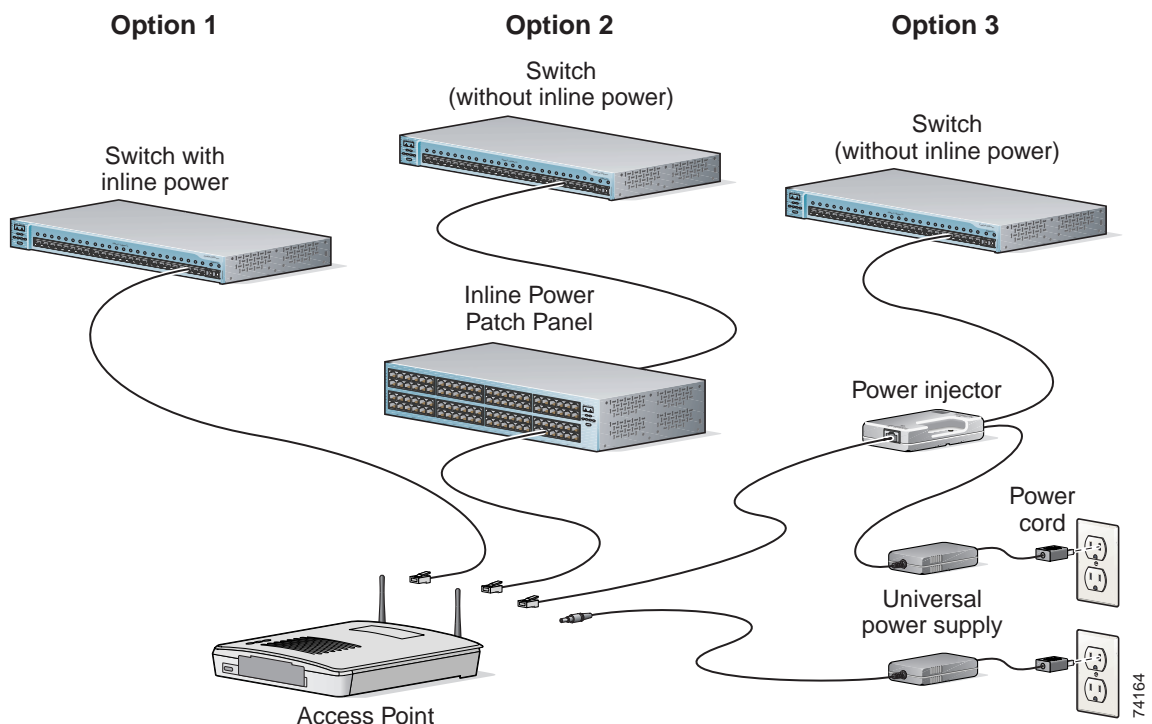
The access point power options are listed below:

- A switch with inline power, such as a Cisco Catalyst 3524-PWR-XL
- An inline power patch panel, such as a Cisco Catalyst Inline Power Patch Panel
- A 1200 series power injector
- A 1200 series power module (Universal power supply)

⚠
Caution   The 1200 series power injectors are not tested to UL 2043 and should not be placed in a building's environmental air space, such as above suspended ceilings.

✎
Note   If you use in-line power from a switch or patch panel, do not connect the 1200 series power module to the access point. Using two power sources on the access point might cause the switch or patch panel to shut down the port to which the access point is connected.

✎
Note   If you need to use a power module or power injector to power the access point, you must use the 1200 series power module or power injector. The 350 series power module and power injector are not compatible with the 1200 series access point.

✎
Note   Only the 1200 series power injector and power module can support simultaneous operation of both the 2.4-GHz and the 5.0-GHz radios in the access point.

✎
Note   Both the Ethernet and console ports use RJ-45 connectors. Be careful to avoid accidently connecting the serial cable to the Ethernet port connector.

Follow these steps to connect the Ethernet and power cables to the access point:

Step 1   If you are using in-line power from a switch or patch panel, connect an Ethernet cable from the access point to the device that supplies power.

Step 2   If you are using in-line power from a 1200 series power injector, follow these additional steps:

   a.   Connect an Ethernet cable from the access point into the end of the 1200 series power injector labeled *To AP/Bridge*.

   b.   Connect an Ethernet cable from the end of the 1200 series power injector labeled *To Network* to the your 10/100 Ethernet LAN.

   c.   Plug the female end of the AC power cord into the 1200 series power module (Universal power supply) and plug the male end into a suitable AC power receptacle.

Step 3   If you are using a 1200 series power module, follow these additional steps:

   a.   Connect an Ethernet cable from the access point to your 10/100 Ethernet LAN.

   b.   Plug the female end of the power cord into the 1200 series power module (Universal power supply) and plug the male end into a suitable power receptacle.

   c.   Plug the power connector into the back of the access point.

At startup, all three LEDs on the top of the access point slowly blink amber, red, and green in sequence; the sequence takes a few minutes to complete. During normal operation, the LEDs blink green. Refer to Chapter 5, "Troubleshooting," for LED descriptions.

Follow the steps in Chapter 3, "Basic Configuration," to assign basic settings to the access point.

Basic Configuration

This chapter describes initial configuration of the access point using the serial interface and the Internet browser-based management system. You can also reach the management system through a Telnet session. Consult the *Cisco Aironet 1200 Series Access Point Software Configuration Guide* for complete instructions on using these interfaces.

This chapter includes the following sections:

Before You Start

Before configuring the access point, you need to obtain the following information (possibly from your network administrator):

- The service set identifier (SSID) for the access point.

- A system name for the access point. The name should describe the location or principal users of the access point. The access point default system name is AIR-AP1200-xxxxxx, where *xxxxxx* is the last 6 digits of the access point MAC address.

- If your network does not use DHCP or BOOTP to assign IP addresses, you will need the following :

  - IP address for the access point

  - IP address for the default gateway

  - IP subnet mask for the access point

- The access point's MAC address, which is printed on the label on the bottom of the access point.

- Security settings for the wireless network, such as WEP, LEAP, and MIC settings. Configuring the access point security settings are described in the *Cisco Aironet 1200 Series Access Point Software Configuration Guide*.

Summary of Configuration Steps

You use the Express Setup page to assign basic settings to the access point. For instructions on setting up security, filtering, and other access point features, refer to the *Cisco Aironet 1200 Series Access Point Software Configuration Guide*.

You will follow these general steps to enter the access point's basic settings:

1. Connect the Ethernet and power cables to the access point as described in the "Installation Summary" section on page 2-7.

2. Use an Internet browser to open the access point's management system by browsing to the access point's IP address or use a terminal emulator and the serial console port.

   If your network uses a DHCP server and you are using a Windows operating system (Windows 95, 98, NT, 2000, ME, or XP), you can use the IP Setup Utility (IPSU) to find the access point's DHCP-assigned IP address. For other operating systems, you must use the serial console port. The "Using the IP Setup Utility" section on page 3-3 describes how to obtain, install, and use IPSU.

   To use the console port, you must connect an RJ-45 to DB-9 serial cable (refer to Appendix C, "Console Cable Pinouts") to your computer's COM port and to the console port on the back of the access point and use a terminal emulator to open the management system. The "Using a Terminal Emulator" section on page 3-8 describes how to use a terminal emulator to assign basic settings.

3. Enter basic settings on the Express Setup page as described in the "Entering Basic Settings" section on page 3-6.

4. Mount the access point to the ceiling or wall. For mounting instructions, refer to the *Chapter 4, "Mounting Instructions."*

5. Enter security and other access point option settings. For information, refer to the *Cisco Aironet 1200 Series Access Point Software Configuration Guide*.

Using the IP Setup Utility

The IP Setup utility (IPSU) allows you to find the access point's IP address when it has been assigned by a DHCP server. You can also use IPSU to set the access point's IP address and SSID if they have not been changed from the default settings.

> **Note**   IPSU can be used only on the following operating systems: Windows 95, 98, NT, 2000, ME, or XP. For other operating systems, you must use the access point console port and a terminal emulator program to configure the access point.

The sections below explain how to install the utility, how to use it to find the access point's IP address, and how to use it to set the IP address and the SSID.

Obtaining and Installing IPSU

IPSU is available on the Cisco web site. Follow these steps to obtain and install IPSU:

Step 1   Use your Internet browser to access the Cisco Software Center at the following URL:

http://www.cisco.com/public/sw-center/sw-wireless.shtml

Step 2   Locate the access point utilities section and click on your access point series, such as *Cisco Aironet 1200 Series*.

Step 3   Click on the file, **IPSUvxxxxx.exe**. The *vxxxxxx* identifies the software package version number.

Step 4   Read and accept the terms and conditions of the Software License Agreement.

Step 5   Download and save the file to a temporary directory on your hard drive and then exit the Internet browser.

Step 6   Double-click **IPSUvxxxxxx.exe** in the temporary directory to expand the file.

Step 7   Double-click **Setup.exe** and follow the steps provided by the installation wizard to install IPSU.

The IPSU icon appears on your computer desktop.

Finding the Access Point's IP Address

If your access point receives an IP address from a DHCP server, you can use IPSU to find its IP address. You must run IPSU from a computer on the same subnetwork as the access point. Follow these steps to find the access point's IP address:

Step 1   Double-click the **IPSU** icon on your computer desktop to start the utility. The IPSU screen appears (see Figure 3-1).

Figure 3-1   IPSU Get IP Address Screen
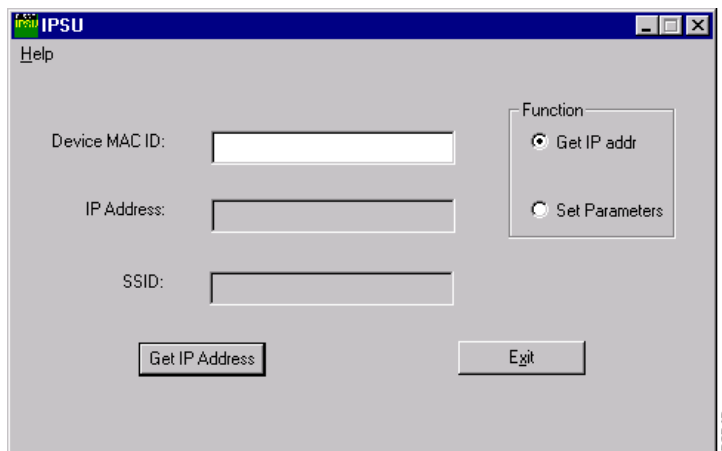
Step 2   When the utility window opens, make sure the *Get IP addr* radio button in the Function box is selected.

Step 3   Enter the access point's MAC address in the Device MAC ID field. The access point's MAC address is printed on the label on the bottom of the unit. It should contain six pairs of hexadecimal digits. Your access point's MAC address might look like the following example:

000164xxxxxx

> **Note**   The MAC address field is not case-sensitive.

Step 4   Click **Get IP Address**.

Step 5   When the access point's IP address appears in the IP Address field, write it down.

If IPSU reports that the IP address is 10.0.0.1, the default IP address, then the access point did not receive a DHCP-assigned IP address. To change the access point IP address using IPSU, refer to the "Setting the Access Point's IP Address and SSID" section on page 3-5. To change the access point IP address using the console port, refer to the "Assigning Basic Settings" section on page 3-9.

Setting the Access Point's IP Address and SSID

If you want to change the default IP address of the access point, you can use IPSU. You can also set the access point's SSID at the same time.

> **Note** The computer you use to assign an IP address to the access point must have an IP address of its own.

> **Note** IPSU can change the access point's IP address and SSID only from their default settings. After the IP address and SSID have been changed, IPSU cannot change them again (see the "Using an Internet browser" section on page 3-6 or the "Using a Terminal Emulator" section on page 3-8.)

Follow these steps to assign an IP address and an SSID to the access point:

Step 1 Double-click the **IPSU** icon on your computer desktop to start the utility.

Step 2 Click the **Set Parameters** radio button in the Function box (see Figure 3-2).

Figure 3-2   IPSU Set Parameters Screen
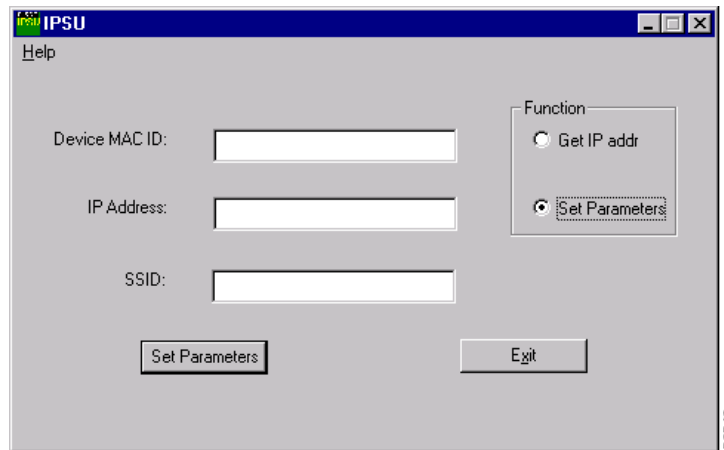
Step 3 Enter the access point's MAC address in the Device MAC ID field. The access point's MAC address is printed on the label on the bottom of the unit. It should contain six pairs of hexadecimal digits. Your access point's MAC address might look like the following example:

004096xxxxxx

> **Note** The MAC address field is not case-sensitive.

Step 4 Enter the IP address you want to assign to the access point in the IP Address field.

Step 5 Enter the SSID you want to assign to the access point in the SSID field.

> **Note** You cannot set the SSID without also setting the IP address. However, you can set the IP address without setting the SSID.

Step 6   Click **Set Parameters** to change the access point's IP address and SSID settings.

Step 7   Click **Exit** to exit IPSU.

Entering Basic Settings

You can open the access point's management system through your Internet browser or through the access point's console port using a terminal emulator. Each method is described in this section.

Using an Internet browser

Follow these steps to enter basic settings with an Internet browser:

Step 1   Enter or paste the access point's IP address in the browser's address or location field; for example: if you are using Netscape, the field is labeled *Netsite* or *Location*; if you are using Microsoft Internet Explorer, the field is labeled *Address*. Press **Enter**.

Step 2   When the access point's Summary Status page appears, click **Setup**. When the Setup page appears, click **Express Setup**. The Express Setup Screen (see Figure 3-3) appears.

✎
Note   If the access point is new and its factory configuration has not been changed, the Express Setup page appears instead of the Summary Status page when you first browse to the access point.

Figure 3-3   Express Setup Screen

Step 3   Enter a system name for the access point in the System Name field. A descriptive system name makes it easy to identify the access point on your network. The default system name is *AIR-AP1200-xxxxxx*, where *xxxxxx* is the last 6 digits of the access point MAC address.

Step 4   Select a configuration server protocol from the Configuration Server Protocol drop-down arrow menu. The configuration server protocol you select should match your network's method of IP address assignment. The **Configuration Server** link takes you to the Boot Server Setup page, which you use to configure the access point to work with your network's BOOTP or DHCP servers for automatic assignment of IP addresses.

The Configuration Server Protocol drop-down menu options include:

- None—Your network does not have an automatic system for IP address assignment.

- BOOTP—With Bootstrap Protocol, IP addresses are assigned based on MAC addresses.

- DHCP—With Dynamic Host Configuration Protocol, IP addresses are "leased" for predetermined periods of time.

Step 5   Enter an IP address in the Default IP address field.

- If DHCP is not enabled, the IP address entered will be the access point's static IP address.

- If DHCP or BOOTP is enabled, the address you enter in this field provides the IP address only when no server responds with an IP address for the access point.

Step 6   Enter an IP subnet mask in the Default IP Subnet Mask field to identify the subnetwork so the access point's IP address can be recognized on the LAN.

- If DHCP or BOOTP is not enabled, this field is the subnet mask.

- If DHCP or BOOTP is enabled, this field provides the subnet mask only when no server responds to the access point's DHCP or BOOTP request.

Step 7   Enter the IP address of your default internet gateway in the Default Gateway field. The entry 255.255.255.255 indicates no gateway. Clicking the Gateway link takes you to the Routing Setup page, which you use to configure the access point to communicate with the IP network routing system.

Step 8   Enter an SSID for the access point in the Radio Service Set ID (SSID) field. The SSID is a unique identifier that client devices use to associate with the access point. The SSID can be any alphanumeric entry from 2 to 32 characters long.

Step 9   Select a network role for the access point from the Role in Radio Network drop-down arrow. The menu contains the following options:

- Root Access Point—A wireless LAN transceiver that connects an Ethernet network with wireless client stations. Use this setting if the access point will be connected to the wired LAN.

- Repeater Access Point—An access point that transfers data between a client and another access point. Use this setting for access points not connected to the wired LAN.

- Site Survey Client—A station with a wireless connection to an access point. Use this setting for diagnostics, such as when you need to test the access point by having it communicate with another access point.

Step 10   Select an Optimize Radio Network For option to assign either preconfigured settings or customized settings for the access point radio:

- Throughput—Maximizes the data volume handled by the access point but might reduce the access point's range.

- Range—Maximizes the access point's range but might reduce throughput.

- Custom—The access point will use the settings you enter on the AP Radio Hardware page. Click the Custom link to go to the AP Radio Hardware page.

Step 11 To automatically configure the access point to be compatible with other devices on your wireless LAN, select an Ensure Compatibility With option:

- 2-Mbps clients—Select this setting if your network contains Cisco Aironet devices that operate at 2 Mbps.

- non-Aironet 802.11—Select this setting if there are non-Cisco Aironet devices on your wireless LAN.

Step 12 To use Simplified Network Management Protocol (SNMP), enter a community name in the SNMP Admin. Community field. This name automatically appears in the list of users authorized to view and make changes to the access point's management system.

Click the **SNMP** link to go to the SNMP Setup page, where you can edit other SNMP settings.

You can define other SNMP communities with User Management (for additional information refer to the *Cisco Aironet 1200 Series Access Point Software Configuration Guide*).

Step 13 Click **OK** and the Setup page appears.

Using a Terminal Emulator

This section provides instructions for using the console port and Microsoft's HyperTerminal to set basic access point settings; other terminal emulator programs are similar. Typically, you would use the serial interface when the access point is initially being configured with basic settings and is easily accessible. When the access point is initially configured and mounted in an elevated operating location, the browser interface is more convenient to use to make access point configuration changes.

Selecting Pages and Settings

With the serial interface, when you enter names and settings that appear in brackets you jump to that page or setting. HyperTerminal jumps to the page or setting as soon as it recognizes a unique name, so you need to enter only the first few characters in the page or setting name. For example: to jump from the home page to the Setup page, you only need to type **s**.

Applying Changes to the Configuration

The serial interface's auto-apply feature is on by default, so changes you make to any page are applied automatically when you move to another management page. To apply changes and stay on the current page, type **apply** and press **Enter**.

Assigning Basic Settings

Follow these steps to assign basic settings to the access point using the console port and a terminal emulator program:

Step 1   Connect a RJ-45 to DB-9 serial cable (Cisco part number AIR-CONCAB1200 or refer to Appendix C, "Console Cable Pinouts") to the COM port on your computer and to the console port on the back of the access point. Figure 3-4 shows the location of the access point's console port.

> **Note**   Both the Ethernet and console ports use RJ-45 connectors. Be careful to avoid accidently connecting the serial cable to the Ethernet port connector.

Figure 3-4   Connecting the Serial Cable

DB-9 to RJ-45
serial cable

RJ-45 serial
connector

74005
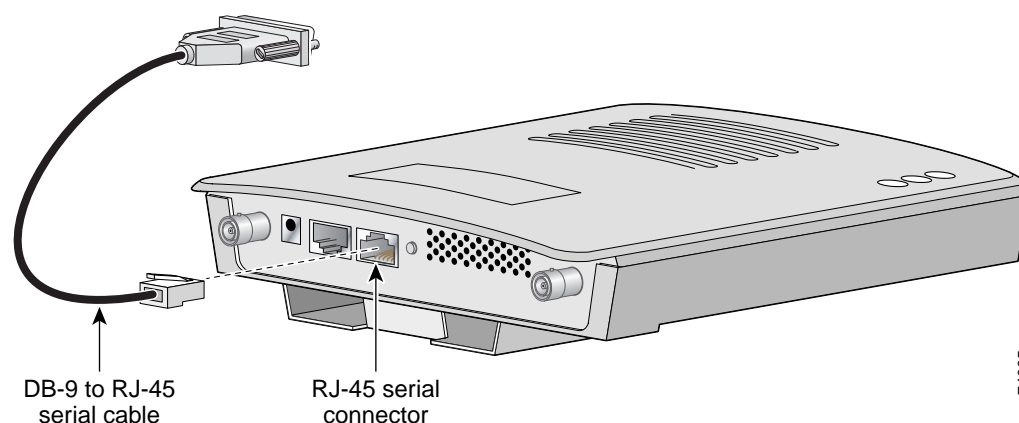
Step 2   Open your terminal emulator program.

Step 3   Enter these settings for the connection into your terminal emulator program:

- Bits per second (baud rate): **9600**
- Data bits: **8**
- Parity: **No parity**
- Stop bits: **1**
- Flow control: **Xon/Xoff**

Step 4   Press = to display the home page of the access point.

If the access point is new and its factory configuration has not been changed, the Express Setup page appears. Go to Step 5.

If the access point has been configured, the Summary Status page appears. Perform the following additional steps:

a. Type **s** and the Setup screen appears.

b. Type **ex** and the Express Setup screen appears.

c. Go to Step 5.

Step 5   Type **na** to select System Name. Enter a system name for the access point and press **Enter**. A descriptive system name makes it easy to identify the access point on your network.

Step 6   Type **t** and then press **Enter** to select Terminal Type. To specify the type of console interface, perform one of the following steps:

    a. Type **t** and then press **Enter** to select teletype display on the console interface.

    b. Type **a** and then press **Enter** to select ANSI display on the console interface.

Step 7   Type **pr** and then press **Enter** to select Config Server Protocol. To select the type of protocol, perform one of the following steps:

- Type **n** to select none and press **Enter** after you make your selection.
- Type **b** to select BOOTP and press **Enter** after you make your selection.
- Type **d** to select DHCP and press **Enter** after you make your selection.

Step 8   Type **ad** and then press **Enter** to select IP Address. Enter an IP address for the access point.

- If DHCP or BOOTP is not enabled, your entry is the access point's static IP address.
- If DHCP or BOOTP is enabled, your entry provides the IP address only when the DHCP or BOOTP server does not responds.

Step 9   Type **su** and then press **Enter** to select IP Subnet Mask. Enter an IP subnet mask to identify the subnetwork so the access point's IP address can be recognized on the LAN.

- If DHCP or BOOTP is not enabled, your entry is the static subnet mask.
- If DHCP or BOOTP is enabled, your entry provides the subnet mask only when the DHCP or BOOTP server does not respond.

Step 10   Type **g** and then press **Enter** to select Default Gateway. Enter the IP address of your default gateway. The entry *255.255.255.255* indicates no gateway.

- If DHCP or BOOTP is not enabled, your entery is the static default gateway address.
- If DHCP or BOOTP is enabled, your entry provides the default gateway IP address only when a DHCP or BOOTP server does not respond.

Step 11   Type **ra** and then press **Enter** to select Radio Service Set ID (SSID). Enter an SSID for the access point. The SSID is a unique identifier that client devices use to associate with the access point. The SSID can be any alphanumeric entry from 2 to 32 characters long.

Step 12   Type **ro** and then press **Enter** to select Role in Radio Network. The network roles include the following options:

- Root Access Point—Type **ro** and then press **Enter** to select this setting. A wireless LAN transceiver that connects an Ethernet network with wireless client stations. Use this setting if the access point will be connected to the wired LAN.
- Repeater Access Point—Type **re** and then press **Enter** to select this setting. An access point that transfers data between a client and another access point. Use this setting for access points not connected to the wired LAN.
- Site Survey Client—Type **s** and then press **Enter** to select this setting. A station with a wireless connection to an access point. Use this setting for diagnostics, such as when you need to test the access point by having it communicate with another access point.

Step 13   Type **op** and then press **Enter** to select Optimize Radio Network For. These options assign either preconfigured settings or customized settings for the access point radio:

- Throughput—Type **t** and then press **Enter** to select this setting. Maximizes the data volume handled by the access point but might reduce the access point's range.

- Range—Type **r** and then press **Enter** to select this setting. Maximizes the access point's range but might reduce throughput.

- Custom—Type **c** and then press **Enter** to select this setting. The access point will use the settings you enter on the AP Radio Hardware page. For additional information on the AP Radio Hardware page, refer to the *Cisco Aironet 1200 Series Access Point Software Configuration Guide*.

Step 14   Use the Ensure Compatibility With setting to automatically configure the access point to be compatible with other devices on your wireless LAN:

- 2-Mbps clients—Type **2** and then press **Enter** to select this setting. Select this setting if your network contains Cisco Aironet devices that operate at 2 Mbps.

- non-Aironet 802.11—Type **no** and then press **Enter** to select this setting. Select this setting if there are non-Cisco Aironet devices on your wireless LAN.

Step 15   Type **sn** and then press **Enter** to select SNMP Admin. Community. Enter an SNMP community name. This name automatically appears in the list of users authorized to view and make changes to the access point's management system.

You can define other SNMP communities with User Management. For additional information on SNMP, refer to the *Cisco Aironet 1200 Series Access Point Software Configuration Guide*.

Step 16   Type **ap** and press **Enter** to apply your basic settings.

Default Basic Settings

Table 3-1 lists the default settings on the access point's Express Setup page.

Table 3-1   Default Settings on the Express Setup Page

Setting Name	Default Value
System Name	AP1200-xxxxxx (the last six characters of the unit's MAC address)
Terminal Type (on serial interface only)	teletype
Config Server Protocol	DHCP
IP address	10.0.0.1
IP Subnet Mask	255.255.255.0
Default Gateway	255.255.255.255
SSID	tsunami
Role in Radio Network	Root Access Point
Optimize Radio Network For	Throughput
Ensure Compatibility With	(blank)
SNMP Admin. Community	(blank)

4

Mounting Instructions

This chapter provides instructions for mounting the access point to suspended ceilings, vertical surfaces, or horizontal surfaces using the access point mounting bracket.

The following sections are included in this chapter:

Overview

You can mount the access point on any of the following surfaces:

- Horizontal or vertical flat surfaces, such as walls or ceilings
- Suspended ceilings

The access point ships with a detachable mounting bracket and the necessary mounting hardware. Because it is detachable, you can use the mounting bracket as a template to mark the positions of the mounting holes for your installation. You then install the mounting bracket and attach the access point when you are ready. Refer to Figure 4-1 to locate the various mounting holes for the method you intend to use.

> **Note**   The Cisco Aironet 1200 Series Access Point provides adequate fire resistance and low smoke-producing characteristics suitable for operation in a building's environmental air space in accordance with Section 300-22(C) of the National Electrical Code (NEC), such as above suspended ceilings.

> **Note**   If you plan to mount the access point in environmental air space and will upgrade to a 5-GHz radio, Cisco recommends that you mount the access point horizontally with its antennas pointing down. Doing so will result in the access point complying with regulatory requirements for environmental air space after the 5-GHz radio is installed.

> **Note**   When mounting the access point in a building's environmental air space, you must use Ethernet cable suitable for operation in environmental air space in accordance with Section 300-22(C) of the National Electrical Code (NEC).

Figure 4-1   Mounting Bracket
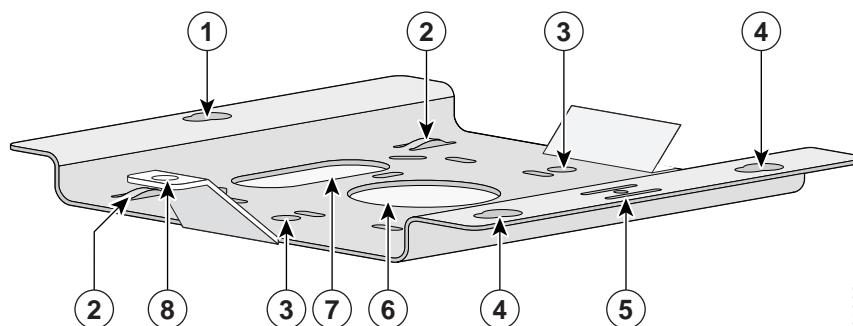
1	Access point mount	**5**	Locking detent
2	Cable tie points	**6**	Wall cable access
3	Ceiling mount holes	**7**	Suspended ceiling cable access
4	Access point mounts	**8**	Security hasp

A mounting hardware kit is provided that contains the hardware and fasteners necessary to mount the access point. Refer to the Table 4-1 to identify the materials you need to mount your access point, then go to the section containing the specific mounting procedure.

Table 4-1   Material Needed to Mount Access Point

Mounting Method	Materials Required	In Kit
Horizontal or vertical surface	Four #8 x 1 in. (25.4 mm) screws Four wall anchors 3/16 in. (4.7 mm) or 3/32 in. (2.3 mm) drill bit Drill Standard screwdriver	Yes Yes No No No
Suspended ceiling	Two caddy fasteners with studs Two plastic spacers Two 1/4–20 Keps nuts with built-in washers Standard screwdriver Appropriate wrench or pliers	Yes Yes Yes No No

Mounting on a Horizontal or Vertical Surface

Follow these steps to mount the access point on a horizontal or vertical surface.

Step 1 Use the mounting bracket as a template to mark the locations of the four mounting holes.

Step 2 Drill one of the following sized holes at the locations you marked:

- 3/16 in. (4.7 mm) if you are using wall anchors

- 1/8 in. (6.3 mm) if you are not using wall anchors

Step 3 Install the anchors into the wall if you are using them. Otherwise, go to step 4.

Step 4 Secure the mounting bracket to the surface using the #8 fasteners.

> **Note**   On a vertical surface, mount the bracket with its security hasp facing down.

Step 5 Attach the access point to the mounting bracket.

> **Note**   You can make your installation more secure by mounting it to a stud or major structural member and using the appropriate fasteners.

Mounting on a Suspended Ceiling

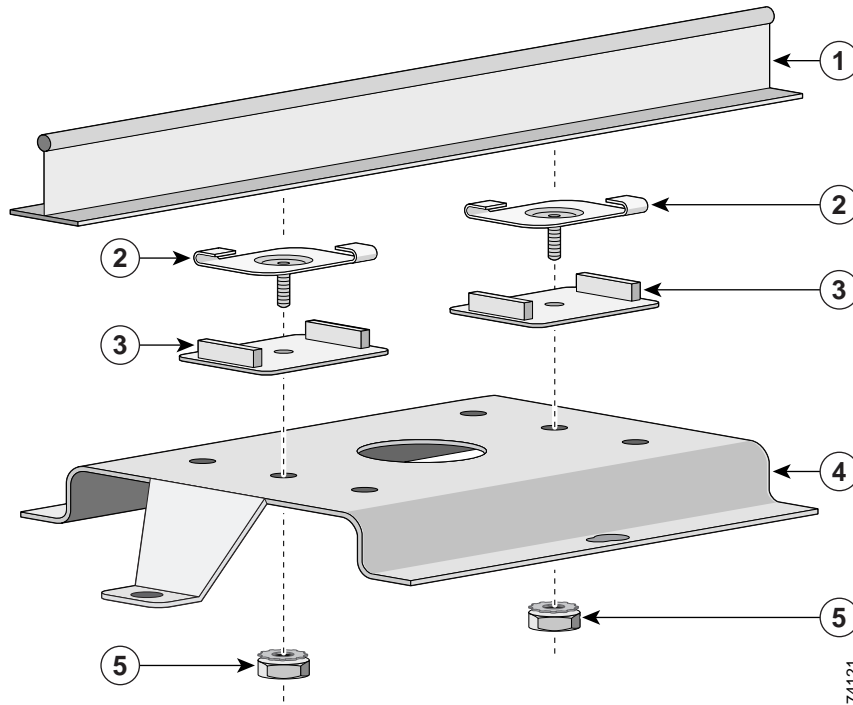**Note**   To comply with NEC code, a #10-24 grounding lug is provided on the mounting bracket.

You should review Figure 4-2 before beginning the mounting process.

Figure 4-2   Mounting Bracket Parts

1	Suspended ceiling T-rail	**4**	Mounting bracket
2	Caddy fastener	**5**	Keps nut (contains an attached lock washer)
3	Plastic spacer		

Follow these steps to mount your access point on a suspended ceiling.

Step 1   Determine the location where you want to mount the access point.

Step 2   Attach two caddy fasteners to the suspended ceiling T-rail.

Step 3   Use the mounting bracket to adjust the distance between the caddy fasteners so that they align with the holes in the mounting bracket.

Step 4   Use a standard screwdriver to tighten the caddy fastener studs in place on the suspended ceiling T-rail. Do not overtighten.

Step 5   Install a plastic spacer on each caddy fastener stud. The spacer's legs should contact the suspended ceiling T-rail.

Step 6   Attach the mounting bracket to the caddy fastener studs and start a Keps nut on each stud.

Step 7   Use a wrench or pliers to tighten the Keps nuts. Do not overtighten.

Step 8   Attach the access point to the mounting bracket.

Attaching the Access Point to the Mounting Bracket

Follow these steps to attach the access point to the mounting bracket.

Step 1   Line up the three mounting pins on the access point with the large ends of the keyhole-shaped holes on the mounting bracket.

Step 2   Insert the access point into the keyhole shaped holes and maintain a slight pressure to hold it in place.

Step 3   Slide the access point's mounting pins into the small ends of the keyhole-shaped holes on the mounting bracket and push the connector end of the access point. You will hear a click when the locking detent contacts the access point and locks it into place.

Step 4   Attach and adjust the antenna(s) or antenna cables.

Step 5   Connect the Ethernet cable to the access point's Ethernet port.

Step 6   Insert the 1200 series power module cable connector into the access point's 48VDC power port (if you are using a local power source).

Securing the Access Point to the Mounting Bracket

The security hasp on the mounting bracket allows you to lock the access point to the bracket to make it more secure. When the access point is properly installed on the mounting bracket, the holes in the security hasps line up so you can install a padlock.

Known compatible padlocks are Master Lock models 120T or 121T.

Troubleshooting

This chapter provides troubleshooting procedures for basic problems with the access point. For additional diagnostic and troubleshooting information, refer to the *Cisco Aironet 1200 Series Access Point Software Configuration Guide*. For the most up-to-date, detailed troubleshooting information, refer to the Cisco TAC website at the following URL (select **Top Issues** and then select **Wireless Technologies**):

http://www.cisco.com/tac

Sections in this chapter include:

Checking the Top Panel Indicators

If your access point is not communicating, check the three indicators on the top panel. You can use them to quickly assess the unit's status. Figure 5-1 shows the indicators.

Figure 5-1   Indicators on the 1200 Series Access Point
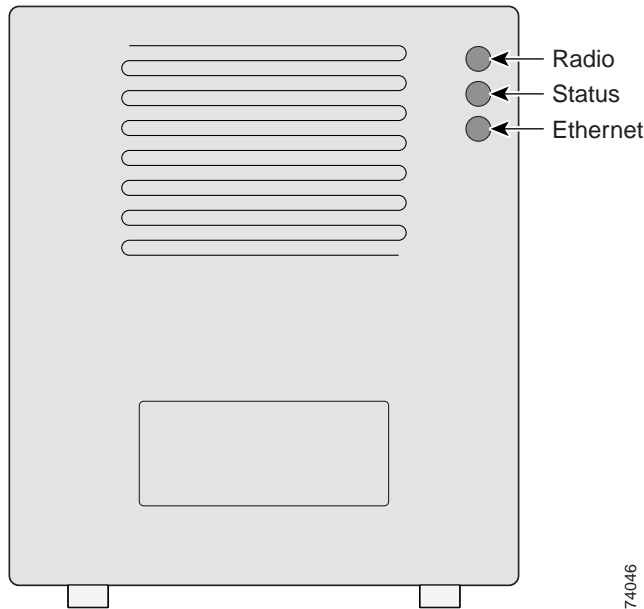
The indicators signals have the following meanings:

- The Ethernet indicator signals traffic on the wired LAN, or Ethernet infrastructure. This indicator blinks green when a packet is received or transmitted over the Ethernet infrastructure.

- The status indicator signals operational status. Blinking green indicates that the access point is operating normally but is not associated with any wireless devices. Steady green indicates that the access point is associated with a wireless client.

  For repeater access points, blinking 50% on, 50% off indicates the repeater is not associated with the root access point; blinking 7/8 on, 1/8 off indicates that the repeater is associated with the root access point but no client devices are associated with the repeater; steady green indicates that the repeater is associated with the root access point and client devices are associated with the repeater.

- The radio indicator blinks green to indicate radio traffic activity. The light is normally off, but it blinks green whenever a packet is received or transmitted over the access point's radio.

Table 5-1 lists the meanings of the indicator signals.

Table 5-1   Top Panel Indicator Signals

Message type	Ethernet indicator	Status indicator	Radio indicator	Meaning
Association status	–	Steady green	–	At least one wireless client device is associated with the unit.
	–	Blinking green	–	No client devices are associated; check the unit's SSID and WEP settings.
Operational	–	Steady green	Blinking green	Transmitting/receiving radio packets.
	Blinking green	Steady green	–	Transmitting/receiving Ethernet packets.
	–	Steady green	Blinking amber	Maximum retries or buffer full occurred on the radio.
Error/warning	Blinking amber	Steady green	–	Transmit/receive Ethernet errors.
	Blinking red	–	–	Ethernet cable is disconnected.
	–	Blinking amber	–	General warning.
Failure	Steady red	Steady red	Steady red	Firmware failure; disconnect power from the unit and reapply power.
Firmware upgrade	–	Steady red	–	Unit is loading new firmware.

Checking Basic Settings

Mismatched basic settings are the most common causes of lost connectivity with wireless clients. If the access point does not communicate with client devices, check the following areas.

SSID

Wireless clients attempting to associate with the access point must use the same SSID as the access point. The default SSID is *tsunami*.

WEP Keys

The WEP key you use to transmit data must be set up exactly the same on your access point and any wireless devices with which it associates. For example, if you set WEP Key 3 on your wireless LAN adapter to 0987654321 and select it as the transmit key, you must also set WEP Key 3 on the access point to exactly the same value. The access point does not need to use Key 3 as its transmit key, however.

Refer to the *Cisco Aironet 1200 Series Access Point Software Configuration Guide* for instructions on setting the access point's WEP keys.

Security Settings

Wireless clients attempting to authenticate with your access point must support the same security options configured in the access point, such as EAP or LEAP, MAC address authentication, Message Integrity Check (MIC), WEP key hashing, and 802.1X protocol versions.

If a wireless client is unable to authenticate with your access point, contact the system administrator for proper security settings in the client adapter and for the wireless client adapter driver and firmware versions that are compatible with the access point settings.

Refer to the *Cisco Aironet 1200 Series Access Point Software Configuration Guide* for instructions on setting and verifying the access point's security options.

Resetting to the Default Configuration

If you forget the password that allows you to configure the access point, you may need to completely reset the configuration. Follow the steps below to delete the current configuration and return all access point settings to the factory defaults.

Note   The following steps reset *all* configuration settings to factory defaults, including passwords, WEP keys, the IP address, and the SSID. If you do not need to reset the entire configuration, use the Configuration Reset buttons on the System Configuration Setup page in the web-browser interface. Consult the *Cisco Aironet 1200 Series Access Point Software Configuration Guide* for more information on the reset buttons in the Internet browser interface.

Step 1   Use a DB-9 to RJ-45 serial cable (refer to Appendix C, "Console Cable Pinouts") to connect the COM port on your computer to the serial port on the back of the access point.

Note   Both the Ethernet and console ports use RJ-45 connectors. Be careful to avoid accidently connecting the serial cable to the Ethernet port connector.

Step 2   Open a terminal-emulation program on your computer.

Note   These instructions describe Microsoft HyperTeminal; other programs are similar.

Step 3   In the Connection Description window, enter a name and select an icon for the connection and click **OK**.

Step 4   In the Connect To window, select the port to which the cable is connected and click **OK**.

Step 5   In the Port Settings window, enter the following settings:

- Bits per second (baud rate): **9600**

- Data bits: **8**

- Parity: **No parity**

- Stop bits: **1**

- Flow control: **Xon/Xoff**

Step 6   Click **OK**, and press **Enter**.

Step 7   When the Summary Status screen appears, reboot the access point by unplugging the power connector or the Ethernet cable (when using in-line power) and then plugging it back in.

Step 8   When the access point reboots and the Summary Status screen reappears, type **:resetall**, and press **Enter**.

Step 9   Type **yes**, and press **Enter** to confirm the command.

Note   The **resetall** command is valid for only 2 minutes immediately after the access point reboots. If you do not enter and confirm the resetall command during that 2-minute period, reboot the access point again.

Step 10   After the access point reboots and the Express Setup screen appears, reconfigure the access point by using the terminal emulator or an Internet browser.

Translated Safety Warnings

This appendix provides translations of the safety warnings that appear in this publication. These translated warnings apply to other documents in which they appear in English. The following safety warnings appear in this appendix:

Dipole Antenna Installation Warning

Warning	**In order to comply with FCC radio frequency (RF) exposure limits, dipole antennas should be located at a minimum of 7.9 inches (20 cm) or more from the body of all persons.**
Waarschuwing	**Om te voldoen aan de FCC radiofrequentie (RF) blootstellingslimieten dienen dipoolantennes zich minstens 20 cm of meer van de lichamen van alle personen bevinden.**
Varoitus	**FCC:n antamien radiotaajuuksille altistumista koskevien rajoitusten mukaan dipoliantennien on sijaittava vähintään 20 cm:n päässä kaikista henkilöistä.**
Attention	**Pour se conformer aux limites d'exposition à la fréquence radio préconisées par la FCC (Federal Communications Commission), les antennes dipôles doivent se situer à un minimum de 20 cm de toute personne.**
Warnung	**Um die in den FCC-Richtlinien festgelegten Expositionshöchstgrenzen für Radiofrequenzen (RF) nicht zu überschreiten, sollten Dipolantennen mindestens 20 cm (7,9 Zoll) vom Körper aller Person entfernt aufgestellt werden.**
Avvertenza	**Per conformarsi ai limiti FCC di esposizione a radiofrequenza (RF), le antenne a dipolo devono stare ad una distanza minima di 20 cm dal corpo di ogni persona.**
Advarsel	**I henhold til eksponeringsgrensene for radiofrekvenser (RF), skal dipole antenner befinne seg på en avstand av minst 20 cm eller mer fra mennesker.**
Aviso	**Para estar de acordo com as normas FCC de limites de exposição para freqüência de rádio (RF), as antenas dipolo devem estar distantes no mínimo 20 cm (7,9 pol) do corpo de qualquer pessoa.**
¡Advertencia!	**Para cumplir con los límites de exposición de radio frecuencia (RF) de la Comisión Federal de Comunicaciones (FCC) es preciso ubicar las antenas dipolo a un mínimo de 20 cm (7,9 pulgadas) o más del cuerpo de las personas.**
Varning!	**För att följa FCC-exponeringsgränserna för radiofrekvens (RF), bör dipolsantenner placeras på minst 20 cm avstånd från alla människor.**

Explosive Device Proximity Warning

Warning	**Do not operate your wireless network device near unshielded blasting caps or in an explosive environment unless the device has been modified to be especially qualified for such use.**
Waarschuwing	**Gebruik dit draadloos netwerkapparaat alleen in de buurt van onbeschermde ontstekers of in een omgeving met explosieven indien het apparaat speciaal is aangepast om aan de eisen voor een dergelijk gebruik te voldoen.**
Varoitus	**Älä käytä johdotonta verkkolaitetta suojaamattomien räjäytysnallien läheisyydessä tai räjäytysalueella, jos laitetta ei ole erityisesti muunnettu sopivaksi sellaiseen käyttöön.oen.**
Attention	**Ne jamais utiliser un équipement de réseau sans fil à proximité d'un détonateur non blindé ou dans un lieu présentant des risques d'explosion, sauf si l'équipement a été modifié à cet effet.**
Warnung	**Benutzen Sie Ihr drahtloses Netzwerkgerät nicht in der Nähe ungeschützter Sprengkapseln oder anderer explosiver Stoffe, es sei denn, Ihr Gerät wurde eigens für diesen Gebrauch modifiziert und bestimmt.**
Avvertenza	**Non utilizzare la periferica di rete senza fili in prossimità di un detonatore non protetto o di esplosivi a meno che la periferica non sia stata modificata a tale proposito.**
Advarsel	**Ikke bruk den trådløse nettverksenheten nært inntil uisolerte fenghetter eller i et eksplosivt miljø med mindre enheten er modifisert slik at den tåler slik bruk.**
Aviso	**Não opere o dispositivo de rede sem fios perto de cápsulas explosivas não protegidas ou num ambiente explosivo, a não ser que o dispositivo tenha sido modificado para se qualificar especialmente para essa utilização.**
¡Advertencia!	**No utilizar un aparato de la red sin cable cerca de un detonador que no esté protegido ni tampoco en un entorno explosivo a menos que el aparato haya sido modificado con ese fin.**
Varning!	**Använd inte den trådlösa nätverksenheten i närheten av oskyddade tändhattar eller i en explosiv miljö om inte enheten modifierats för att kunna användas i sådana sammanhang.**

Installation and Grounding Warning

Warning Do not locate the antenna near overhead power lines or other electric light or power circuits, or where it can come into contact with such circuits. When installing the antenna, take extreme care not to come into contact with such circuits, as they may cause serious injury or death. For proper installation and grounding of the antenna, please refer to national and local codes (e.g. U.S.:NFPA 70, National Electrical Code, Article 810, in Canada: Canadian Electrical Code, Section 54).

Waarschuwing Zorg dat de antenne niet in de buurt wordt geplaatst van langs het plafond lopende stroomkabels of andere voorzieningen voor licht of elektriciteit of op een plaats waar contact met dergelijke stroomvoorzieningen mogelijk is. Wees bij het installeren van de antenne uiterst voorzichtig dat u niet in contact komt met hierboven vermelde stroomvoorzieningen, aangezien dit kan leiden tot ernstig lichamelijk of dodelijk letsel. Voor het juist installeren en aarden van de antenne, dient u de nationale en plaatselijke verordeningen te raadplegen (bijv. in de VS: NFPA 70, National Electrical Code, Article 810, in Canada: Canadian Electrical Code, Section 54).

Varoitus Älä sijoita antennia lähelle voimajohtoja, muita sähkövalo- tai virtapiirejä tai paikkaa, jossa se voi joutua kosketuksiin sellaisten piirien kanssa. Kun asennat antennia, varo, ettet joudu kosketuksiin mainittujen piirien kanssa, sillä seurauksena voi olla vakava vamma tai kuolema. Katso antennin asennus- ja maadoitustiedot kansallisista ja paikallisista sähkösäännöksistä (esimerkiksi Yhdysvalloissa NFPA 70, National Electrical Code, Article 810 ja Kanadassa Canadian Electrical Code, Section 54).

Attention Ne placez pas l'antenne à proximité d'une ligne aérienne ou d'autres circuits d'éclairage ou d'alimentation, ou dans un endroit où elle risque d'être en contact avec des circuits de ce type. Lors de son installation, assurez-vous bien qu'elle ne touche pas de tels circuits car cela risquerait d'entraîner des blessures graves voire mortelles. Pour une installation et mise à la terre correctes de l'antenne, veuillez consulter les codes nationaux et locaux (e. g. États-Unis : National Electrical Code, Article 810 ; Canada : Code électrique canadien, Section 54).

Warnung Plazieren Sie die Antenne nicht in der Nähe von Starkstrom-Freileitungen oder Schwach- bzw. Starkstromkreisen oder an Stellen, wo sie damit in Kontakt kommen könnte. Gehen Sie bei der Installation der Antenne besonders vorsichtig vor, damit Sie nicht in Kontakt mit derartigen Stromkreisen kommen, da dies zu schweren Verletzungen sogar mit Todesfolge führen kann. Wenden Sie sich bitte an nationale und lokale Ämter für Elektrosicherheit, um die Antenne sachgerecht zu installieren und zu erden.

Avvertenza Non sistemare l'antenna nelle vicinanze della circuiti elettrici generali o di altri circuiti di ailluminazione o di alimentazione, o dove questa possa venire a contatto con tali circuiti. Durante l'installazione dell'antenna, prestare particolare attenzione a non entrare in contatto con tali circuiti, in quanto questo potrebbe provocare seri danni o morte. Per un'accurata installazione e sistemazione al suolo dell'antenna, fare riferimento ai codici nazionali e locali (es. U.S.A.: NFPA 70, Codice Elettrico Nazionale, Articolo 810, Canada: Codice Elettrico Canadese, Sezione 54).

Advarsel	**Plasser ikke antennen nær de overliggende strømledningene eller andre lys- eller strømkretser, eller der den kan komme i kontakt med slike kretser. Ved installering av antennen, må du være ytterst forsiktig slik at du ikke kommer i kontakt med slike kretser. Dette kan føre til alvorlig skade eller dødsfall. For riktig installasjon og jording av antennen, se statlige og lokale forskrifter (for eksempel i USA: NFPA 70, National Electrical Code, Article 810 og i Canada: Canadian Electrical Code, Section 54).**
Aviso	**Não coloque a antena perto de linhas de alimentação, de outros circuitos ou onde possa entrar em contato com esses circuitos. Ao instalar a antena, tenha muito cuidado para não tocar nesses circuitos, visto que podem provocar ferimentos graves ou até a morte. Para obter informações sobre como instalar e aterrar corretamente a antena, consulte a legislação local e nacional (por ex., NFPA 70, National Electrical Code, Artigo 810, Canadá: Canadian Electrical Code, Seção 54).**
¡Advertencia!	**No coloque la antena cerca de cables de tendido eléctrico u otros circuitos, ni donde pueda entrar en contacto con dichos circuitos. Al instalar la antena, extreme las precauciones para no entrar en contacto con circuitos de esas características, ya que puede sufrir heridas graves e incluso la muerte. Para una correcta instalación y conexión a tierra de la antena, consulte los códigos nacionales y locales (p.ej., Estados Unidos: NFPA 70, National Electrical Code, Artículo 810, Canadá: Canadian Electrical Code, Apartado 54).**
Varning!	**Placera inte antennen nära överhängande kraftledningar, andra elljus- eller strömkretsar eller där den kan komma i kontakt med sådana kretsar. Vid installation av antennen måste du vara mycket försiktig så att du inte kommer i kontakt med sådana kretsar, eftersom de kan orsaka allvarlig kroppsskada eller dödsfall. För riktig installation och jordning av antennen, undersök landets and den lokala omgivningens koder (t.ex. U.S.: NFPA 70, National Electrical Code, Article 810, Canada: Canadian Electrical Code, Section 54).**

Lightning Activity Warning

Warning	**Do not work on the system or connect or disconnect cables during periods of lightning activity.**
Waarschuwing	**Tijdens onweer dat gepaard gaat met bliksem, dient u niet aan het systeem te werken of kabels aan te sluiten of te ontkoppelen.**
Varoitus	**Älä työskentele järjestelmän parissa äläkä yhdistä tai irrota kaapeleita ukkosilmalla.**
Attention	**Ne pas travailler sur le système ni brancher ou débrancher les câbles pendant un orage.**
Warnung	**Arbeiten Sie nicht am System und schließen Sie keine Kabel an bzw. trennen Sie keine ab, wenn es gewittert.**
Avvertenza	**Non lavorare sul sistema o collegare oppure scollegare i cavi durante un temporale con fulmini.**
Advarsel	**Utfør aldri arbeid på systemet, eller koble kabler til eller fra systemet når det tordner eller lyner.**
Aviso	**Não trabalhe no sistema ou ligue e desligue cabos durante períodos de mau tempo (trovoada).**
¡Advertencia!	**No operar el sistema ni conectar o desconectar cables durante el transcurso de descargas eléctricas en la atmósfera.**
Varning!	**Vid åska skall du aldrig utföra arbete på systemet eller ansluta eller koppla loss kablar.**

Installation Warning

Warning	Read the installation instructions before you connect the system to its power source.
Waarschuwing	Raadpleeg de installatie-aanwijzingen voordat u het systeem met de voeding verbindt.
Varoitus	Lue asennusohjeet ennen järjestelmän yhdistämistä virtalähteeseen.
Attention	Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.
Warnung	Lesen Sie die Installationsanweisungen, bevor Sie das System an die Stromquelle anschließen.
Avvertenza	Consultare le istruzioni di installazione prima di collegare il sistema all'alimentatore.
Advarsel	Les installasjonsinstruksjonene før systemet kobles til strømkilden.
Aviso	Leia as instruções de instalação antes de ligar o sistema à sua fonte de energia.
¡Advertencia!	Ver las instrucciones de instalación antes de conectar el sistema a la red de alimentación.
Varning!	Läs installationsanvisningarna innan du kopplar systemet till dess strömförsörjningsenhet.

Circuit Breaker (15A) Warning

Warning	This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S. (240 VAC, 10A international) is used on the phase conductors (all current-carrying conductors).
Waarschuwing	Dit produkt is afhankelijk van de installatie van het gebouw voor kortsluit-(overstroom)beveiliging. Controleer of er een zekering of stroomverbreker van niet meer dan 120 Volt wisselstroom, 15 A voor de V.S. (240 Volt wisselstroom, 10 A internationaal) gebruikt wordt op de fasegeleiders (alle geleiders die stroom voeren).
Varoitus	Tämä tuote on riippuvainen rakennukseen asennetusta oikosulkusuojauksesta (ylivirtasuojauksesta). Varmista, että vaihevirtajohtimissa (kaikissa virroitetuissa johtimissa) käytetään Yhdysvalloissa alle 120 voltin, 15 ampeerin ja monissa muissa maissa 240 voltin, 10 ampeerin sulaketta tai suojakytkintä.
Attention	Pour ce qui est de la protection contre les courts-circuits (surtension), ce produit dépend de l'installation électrique du local. Vérifier qu'un fusible ou qu'un disjoncteur de 120 V alt., 15 A U.S. maximum (240 V alt., 10 A international) est utilisé sur les conducteurs de phase (conducteurs de charge).

Warnung	**Dieses Produkt ist darauf angewiesen, daß im Gebäude ein Kurzschluß- bzw. Überstromschutz installiert ist. Stellen Sie sicher, daß eine Sicherung oder ein Unterbrecher von nicht mehr als 240 V Wechselstrom, 10 A (bzw. in den USA 120 V Wechselstrom, 15 A) an den Phasenleitern (allen stromführenden Leitern) verwendet wird.**
Avvertenza	**Questo prodotto dipende dall'installazione dell'edificio per quanto riguarda la protezione contro cortocircuiti (sovracorrente). Verificare che un fusibile o interruttore automatico, non superiore a 120 VCA, 15 A U.S. (240 VCA, 10 A internazionale) sia stato usato nei fili di fase (tutti i conduttori portatori di corrente).**
Advarsel	**Dette produktet er avhengig av bygningens installasjoner av kortslutningsbeskyttelse (overstrøm). Kontroller at det brukes en sikring eller strømbryter som ikke er større enn 120 VAC, 15 A (USA) (240 VAC, 10 A internasjonalt) på faselederne (alle strømførende ledere).**
Aviso	**Este produto depende das instalações existentes para protecção contra curto-circuito (sobrecarga). Assegure-se de que um fusível ou disjuntor não superior a 240 VAC, 10A é utilizado nos condutores de fase (todos os condutores de transporte de corrente).**
¡Advertencia!	**Este equipo utiliza el sistema de protección contra cortocircuitos (o sobrecorrientes) deló propio edificio. Asegurarse de que se utiliza un fusible o interruptor automático de no más de 240 voltios en corriente alterna (VAC), 10 amperios del estándar internacional (120 VAC, 15 amperios del estándar USA) en los hilos de fase (todos aquéllos portadores de corriente).**
Varning!	**Denna produkt är beroende av i byggnaden installerat kortslutningsskydd (överströmsskydd). Kontrollera att säkring eller överspänningsskydd används på fasledarna (samtliga strömförande ledare) för internationellt bruk max. 240 V växelström, 10 A (i USA max. 120 V växelström, 15 A).**

Declarations of Conformity and Regulatory Information

This appendix provides declarations of conformity and regulatory information for the Cisco Aironet 1200 series access points.

This appendix contains the following sections:

- Manufacturers Federal Communication Commission Declaration of Conformity Statement
- Department of Communications—Canada
- European Community, Switzerland, Norway, Iceland, and Liechtenstein
- Declaration of Conformity for RF Exposure
- Guidelines for Operating Cisco Aironet Access Points and Bridges in Japan

Manufacturers Federal Communication Commission Declaration of Conformity Statement

FC Tested To Comply
With FCC Standards

FOR HOME OR OFFICE USE

Models:	AIR-AP1200B w/AIR-MP20B-A-K9, AIR-AP1220B-A-K9
FCC Certification number:	LDK 102042 (AIR-AP12xx)
Manufacturer:	Cisco Systems, Inc. 170 West Tasman Drive San Jose, CA 95134-1706 USA

This device complies with Part 15 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.

This equipment has been tested and found to comply with the limits of a Class B 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 residential environment. This equipment generates, uses, and radiates radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference. However, there is no guarantee that interference will not occur. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.

- Increase separation between the equipment and receiver.

- Connect the equipment to an outlet on a circuit different from which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician.

⚠️

Caution   The Part 15 radio device operates on a non-interference basis with other devices operating at this frequency when using the antennas listed in Table B-1. Any changes or modification to said product not expressly approved by Cisco could void the user's authority to operate this device.

Table B-1   Access Point Antennas

Cisco Part Number	Model	Gain
AIR-ANT1949	Yagi	13.5
AIR-ANT4121	Omni-directional	12.0
AIR-ANT3549	Patch	8.5
AIR-ANT2012	Spatial diversity	6.5
AIR-ANT1729	Patch	6.0
AIR-ANT2506	Omni-directional	5.1
AIR-ANT3213	Omni-directional	5.0
AIR-ANT1728	Omni-directional	5.0
AIR-ANT3195	Patch	3.0
AIR-ANT5959	Omni-directional	2.0
AIR-ANT4941	Dipole	2.2

Department of Communications—Canada

Canadian Compliance Statement

This Class B Digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numerique de la classe B respecte les exigences du Reglement sur le material broilleur du Canada.

This device complies with Class B Limits of Industry Canada. 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.

The device is certified to the requirements of RSS-139-1 and RSS-210 for 2.4-GHz spread spectrum devices. The use of this device in a system operating either partially or completely outdoors may require the user to obtain a license for the system according to the Canadian regulations. For further information, contact your local Industry Canada office.

European Community, Switzerland, Norway, Iceland, and Liechtenstein

Declaration of Conformity with Regard to the R&TTE Directive 1999/5/EC

Deutsch:	Dieses Great entspricht den grundlegenden Anforderingen und den weiteren entsprechenden Vorgaben der Richtlinie 1999/5/EU.
Dansk:	Dette udstyr er i overensstemmelse med de væsentlige krav og andre relevante bestemmelser i Direktiv 1999/5/EF.
English:	This equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Español:	Este equipo cumple con los requisitos esenciales asi como con otras disposiciones de la Directiva 1999/5/CE.
Ἑλληνας:	Αυτός ο εξοπλισμός είναι σε συμμόρφωση με τις ουσιώδεις απαιτήσεις και άλλες σχετικές διατάξεις της Οδηγίας 1999/5/EC.
Français:	Cet equipment est conforme aux exigencies essentielles et aux autres dispositions pertinantes de la Directive 1999/5/EC.
Íslenska:	Þetta tæki er samkvæmt grunnkröfum og öðrum viðeigandi ákvæðum Tilskipunar 1999/5/EC.
Italiano:	Questo apparato é conforme ai requisiti essenziali ed agli altri principi sanciti dalla Direttiva 1999/5/CE.

50341

Nederlands:	Dit apparaat voldoet aan de essentiele eisen en andere van toepassing zijnde bepalingen van de Richtlijn 1999/5/EC.
Norsk:	Dette utstyret er i samsvar med de grunnleggende krav og andre relevante bestemmelser i EU-direktiv 1999/5/EF.
Português:	Este equipamento está em conformidade com os requisitos essenciais e outras provisões relevantes da Directiva 1999/5/EC.
Suomi:	Tämä laite täyttää direktiivin 1999/5/EY oleelliset vaatimukset ja on siinä asetettujen muiden laitetta koskevien määräysten mukainen.
Svenska:	Denna utrustning är i överensstämmelse med de väsentliga kraven och andra relevanta bestämmelser i Direktiv 1999/5/EC.

50342

This equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

The Declaration of Conformity related to this product can be found at the following URL: http://www.ciscofax.com

For the 1200 series, the following standards were applied:

- Radio: EN 300.328-1, EN 300.328-2
- EMC: EN 301 489-1, EN 301 489-17
- Safety: EN 60950

The following CE mark is affixed to the 1200 series equipment:

$C\epsilon$ ⓘ

The above CE mark is required as of April 8, 2000 but might change in the future

Note   This equipment is intended to be used in all EU and EFTA countries. Outdoor use may be restricted to certain frequencies and/or may require a license for operation. For more details, contact Cisco Corporate Compliance.

Note   Combinations of power levels and antennas resulting in a radiated power level of above 100 mW eirp are considered as not compliant with the above mentioned directive and are not allowed for use within the European community and countries that have adopted the European R&TTE directive 1999/5/EC and/or the CEPT recommendation Rec 70.03. For more details on legal combinations of power levels and antennas, contact Cisco Corporate Compliance.

Declaration of Conformity for RF Exposure

The radio module has been evaluated under FCC Bulletin OET 65C and found compliant to the requirements as set forth in CFR 47 Sections 2.1091, 2.1093, and 15.247 (b) (4) addressing RF Exposure from radio frequency devices. For antennas AIR-ANT4121 and AIR-ANT1949, the equipment should be positioned more than 2 m from your body or nearby persons. For all other approved antennas the equipment should be installed more than 20 cm from your body or nearby persons.

Guidelines for Operating Cisco Aironet Access Points and Bridges in Japan

This section provides guidelines for avoiding interference when operating Cisco Aironet access points and bridges in Japan. These guidelines are provided in both Japanese and English.

Japanese Translation

　この機器の使用周波数帯では、電子レンジ等の産業・科学・医療用機器のほか工場の製造ライン等で使用されている移動体識別用の構内無線局（免許を要する無線局）及び特定小電力無線局（免許を要しない無線局）が運用されています。

１　この機器を使用する前に、近くで移動体識別用の構内無線局及び特定小電力無線局が運用されていないことを確認して下さい。

２　万一、この機器から移動体識別用の構内無線局に対して電波干渉の事例が発生した場合には、速やかに使用周波数を変更するか又は電波の発射を停止した上、下記連絡先にご連絡頂き、混信回避のための処置等(例えば、パーティションの設置など)についてご相談して下さい。

３　その他、この機器から移動体識別用の特定小電力無線局に対して電波干渉の事例が発生した場合など何かお困りのことが起きたときは、次の連絡先へお問い合わせ下さい。

連絡先：03-5549-6500

43768

English Translation

This equipment operates in the same frequency bandwidth as industrial, scientific, and medical devices such as microwave ovens and mobile object identification (RF-ID) systems (licensed premises radio stations and unlicensed specified low-power radio stations) used in factory production lines.

1. Before using this equipment, make sure that no premises radio stations or specified low-power radio stations of RF-ID are used in the vicinity.

2. If this equipment causes RF interference to a premises radio station of RF-ID, promptly change the frequency or stop using the device; contact the number below and ask for recommendations on avoiding radio interference, such as setting partitions.

3. If this equipment causes RF interference to a specified low-power radio station of RF-ID, contact the number below.

Contact Number: 03-5549-6500

Console Cable Pinouts

This appendix identifies the pinouts for the serial console cable that connects to the access point's serial console port. The appendix contains the following sections:

Overview

The access point requires a special serial cable that connects the access point serial console port (RJ-45 connector) to your PC's COM port (DB-9 connector). This cable can be purchased from Cisco (part number AIR-CONCAB1200) or can be built using the pinouts in this appendix.

Console Port Signals and Pinouts

Use the console RJ-45 to DB-9 serial cable to connect the access point's console port to the COM port of your PC running a terminal emulation program.

Note   Both the Ethernet and console ports use RJ-45 connectors. Be careful to avoid accidently connecting the serial cable to the Ethernet port connector.

Table C-1 lists the signals and pinouts for the console RJ-45 to DB-9 serial cable.

Table C-1   Signals and Pinouts for a Console RJ-45 to DB-9 Serial Cable

Console Port		PC COM Port	
RJ-45		**DB-9**	
Pins	Signals[1]	Pins	Signals
-	-	9	RI
1	NC	8	CTS
2	NC	7	DSR
3	TXD	6	RXD
4	GND	5	GND
5	GND	4	GND
6	RXD	3	TXD
7	NC	2	DTR
8	NC	1	RTS

1. NC indicates not connected.