CHAPTER 3

Wireless LAN

Wireless LAN at a Glance (IEEE 802.11 a/b/g)

Product	Features	Page
Cisco Aironet 1130AG Series Access Point	• IEEE 802.11a and 802.11g radios with simultaneous dual band support provides 108 Mbps capacity • Works in conjunction with dual band clients optimizing usage of network bandwidth while providing backwards compatibility with 802.11b clients	3-2
Cisco Aironet 1100 Series Access Point	• Single 802.11g radio supports maximum data rate of 54 Mbps • 2.4 GHz integrated diversity dipole antennas • Easy-to-install, cost-efficient deployment for offices and similar RF environments	3-3
Cisco Aironet 1230AG Series Access Point	• Antenna connectors for both 2.4GHz and 5GHz radios ensure optimal coverage, range, and reliability in particularly warehouses, offices, and other high multipath environments. • Cast aluminum case and rugged features support deployment in industrial environments. • Broad operating temperature range and UL 2043 certification for plenum rating requirements set by local fire codes supports installation in environmental air spaces	3-5
Cisco Aironet 1200 Series Access Points	• Modular design allows single or dual radio configuration for up to 54 Mbps connectivity in both the 2.4 and 5 GHz bands • May be field upgraded to support 802.11a with a hardware upgrade module	3-6
Cisco Aironet 1300 Series Outdoor Access Point/Bridge	• Network connections within a campus area • Outdoor infrastructure for mobile networks, users and public accessibility • Temporary networks for portable or military operations	3-8
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Cisco Aironet 5 GHz 54 Mbps Wireless LAN Client Adapter	• IEEE 802.11a-compliant CardBus adapter that operates in the UNII-1 and UNII-2 bands • Complements the Cisco Aironet 1200 Series 802.11a Access Point, providing a solution that combines performance and mobility with the security and manageability that enterprises require	3-11
Cisco Aironet 350 Series Client Adapters	• Secure network communications • World mode for international roaming • PCMCIA card and PCI form factors • IEEE 802.11b	3-12
Cisco Aironet 1400 Series Wireless Bridge	• Support for both point-to-point or point-to-multipoint configurations • Range and throughput supporting data rates up to 54 Mbps • Enhanced security mechanisms based on 802.11 standards • Ruggedized enclosure optimized for harsh outdoor environments with extended operating temperature range	3-14
Cisco Aironet 350 Series Workgroup Bridge	• Driverless installation of up to eight Ethernet-enabled devices • Optimum wireless performance and range • Standards-based centralized security • IEEE 802.11b	3-16
Cisco Aironet 350 Series Wireless Bridge	• High-speed, high-power radios, delivering building-to-building links of up to 25 miles (40.2 km) • Supports both point-to-point and point-to-multipoint configurations • Simplified installation, improved performance, and upgradeable firmware, ensuring investment protection • IEEE 802.11b	3-17
Cisco Aironet Antennas and Accessories	• A wide array of options • FCC-approved directional and omni-directional antennas • Low-loss cable, mounting hardware, and other accessories available	3-18
CiscoWorks Wireless LAN Solution Engine	A hardware-based wireless LAN management solution that provides template-based configuration with user-defined groups to effectively manage a large number of access points and bridges. • Monitors LEAP authentication servers • Enhances security management through mis-configuration detection on access points and bridges	9-22

Cisco Aironet 1130AG Series Access Point

The Cisco Aironet 1130AG Series is the ideal enterprise access point for offices and similar environments. Helps assure that a network employs the strongest security available. Additional design features include diversity antennas with omni-directional coverage and an unobtrusive form factor.

When to Sell

Sell This Product	When a Customer Needs These Features
Cisco Aironet 1130AG Series Access Point	• When you need a high-capacity and high-security WLAN in the enterprise office • When you need two high-performance radios providing simultaneous support for the 802.11a and 802.11g standards offering 108 Mbps capacity for your growing WLAN • When you need a low-profile access point that blends into the environment and is easy to deploy

Key Features

- IEEE 802.11a and 802.11g radios with simultaneous dual band support provides 108 Mbps capacity. Works with dual band clients to optimize usage of network bandwidth while providing backwards compatibility with 802.11b clients; Complies with 802.11i security standards and is WPA2 certified; Incorporates AES encryption in hardware;
- Provides robust signals to long distances and mitigates the effects of multipath signal propagation for more consistent coverage
- Cisco IOS Software provides intelligent network services for scalable, robust, enterprise connectivity; Cisco Structured Wireless-Aware framework integrates wired and wireless network
- Variable transmit power settings that allows access point coverage to be tuned for differing requirements
- Integrated 4.5 dBi antennas—Complete system deployable out of the box without external antennas; specifically designed to provide omni-directional coverage for offices and similar radio frequency environments. Low 0.5 mW setting supports closer spacing of access points in high density deployments
- Wi-Fi Certified

Specifications

Features	Cisco Aironet 1130AG Series Access Point
Data rates supported	802.11a: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps; 802.11b: 1, 2, 5.5, 11 Mbps; 802.11g: 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps
Network standard	IEEE 802.11a, 802.11b and 802.11g
Uplink	Autosensing 802.3 10/100BaseT Ethernet
Frequency band	802.11a—5.15 to 5.35, 5.725-5.825 GHz (FCC UNII 1, 2 and 3), 5.725 to 5.850 GHz (China), 5.15 to 5.35 GHz (ETSI), 5.15 to 5.25 GHz (TELEC), 5.15 to 5.35, 5.725-5.825 GHz (North America); 802.11b—2.412 to 2.462 GHz (FCC), 2.412 to 2.472 GHz (China), 2.412 to 2.472 GHz (ETSI), 2.412 to 2.484 GHz (TELEC), 2.412 to 2.462 GHz (North America); 802.11g—2.412 to 2.462 GHz (FCC), 2.412 to 2.472 GHz (China), 2.412 to 2.472 GHz (ETSI), 2.412 to 2.484 GHz CCK: (TELEC), 2.412 to 2.472 GHz OFDM: (TELEC), 2.412 to 2.462 GHz (North America)
Wireless medium	802.11a and 802.11g—Orthogonal Frequency Division Multiplexing (OFDM); 802.11b and 802.11g—Direct sequence spread spectrum (DSSS)
Media access protocol	Carrier sense multiple access with collision avoidance (CSMA/CA)
Modulation	OFDM—BPSK @ 6 and 9 Mbps, QPSK @ 12 and 18 Mbps, 16-QAM @ 24 and 36 Mbps, 64-QAM @ 48 and 54 Mbps; DSSS—DBPSK @ 1 Mbps, DQPSK @ 2 Mbps, CCK @ 5.5 and 11 Mbps
Operating channels	802.11a—FCC: 12; China: 4; ETSI: 8; TELEC (Japan): 4; North America: 12; 802.11b—FCC: 11; China: 13; ETSI: 13; TELEC (Japan): 14; North America: 11; 802.11g—FCC: 11; China: 13; ETSI: 13; TELEC (Japan): CCK-14, OFDM-13; North America: 11
Non-overlapping channels	802.11a—Up to twelve; 802.11b/g ñ Three
Receive sensitivity	802.11a— 6 Mbps: -85 dBm, 9 Mbps: -84 dBm, 12 Mbps: -82 dBm, 18 Mbps: -80 dBm, 24 Mbps: -77 dBm, 36 Mbps: -73 dBm, 48 Mbps: -69 dBm, 54 Mbps: -68 dBm; 802.11b—1 Mbps: -94 dBm, 2 Mbps: -92 dBm, 5.5 Mbps: -90 dBm, 11 Mbps: -87 dBm; 802.11g—1 Mbps: -94 dBm, 2 Mbps: -92 dBm, 5.5 Mbps: -90 dBm, 6 Mbps: -85 dBm, 9 Mbps: -84 dBm, 11 Mbps: -87 dBm, 12 Mbps: -82 dBm, 18 Mbps: -80 dBm, 24 Mbps: -77 dBm, 36 Mbps: -73 dBm, 48 Mbps: -69 dBm, 54 Mbps: -68 dBm
Available transmit power settings	OFDM: 50 mW (17 dBm), 32 mW (15 dBm), 25 mW (14 dBm), 10 mW (11 dBm), 5 mW (8 dBm), 3 mW (5 dBm), 1 mW (2 dBm), 0.5 mW (-1 dBm); 802.11b: CCK—100 mW (20 dBm), 50 mW (17 dBm), 25 mW (14 dBm), 10 mW (11 dBm), 5 mW (8 dBm), 3 mW (5 dBm), 1 mW (2 dBm), 0.5 mW (-1 dBm); 802.11g: CCK—100 mW (20 dBm), 50 mW (17 dBm), 25 mW (14 dBm), 10 mW (11 dBm), 5 mW (8 dBm), 3 mW (5 dBm), 1 mW (2 dBm), 0.5 mW (-1 dBm); OFDM—50 mW (17 dBm), 25 mW (14 dBm), 10 mW (11 dBm), 5 mW (8 dBm), 3 mW (5 dBm), 1 mW (2 dBm), 0.5 mW (-1 dBm) Maximum power setting will vary by channel and according to individual country regulations.

Features	Cisco Aironet 1130AG Series Access Point
Range	Indoor (Distance across open office environment): 802.11a (50 mW)—90 ft (27 m) @ 54 Mbps, 95 ft (29 m) @ 48 Mbps, 100 ft (30 m) @ 36 Mbps, 140 ft (42 m) @ 24 Mbps, 180 ft (54 m) @ 18 Mbps, 210 ft (64 m) @ 12 Mbps, 250 ft (76 m) @ 9 Mbps, 300 ft (91 m) @ 6 Mbps; 802.11b (100 mW)—160 ft (48 m) @ 11 Mbps, 220 ft (67 m) @ 5.5 Mbps, 270 ft (82m) @ 2 Mbps, 410 ft (124 m) @ 1 Mbps; 802.11g (50 mW)—90 ft (27 m) @ 54 Mbps, 95 ft (29 m) @ 48 Mbps, 100 ft (30 m) @ 36 Mbps, 140 ft (42 m) @ 24 Mbps, 180 ft (54 m) @ 18 Mbps, 210 ft (64 m) @ 12 Mbps, 250 ft (76 m) @ 9 Mbps, 300 ft (91 m) @ 6 Mbps Outdoor: 802.11a (50 mW)—250 ft (76m) @ 54 Mbps, 600 ft (183 m) @ 18 Mbps, 1300 ft (396 m) @ 6 Mbps; 802.11b (100 mW)—1000 ft (304 m) @ 11 Mbps, 2000 ft (610 m) @ 1 Mbps; 802.11g (50 mW)—250 ft (76m) @ 54 Mbps, 600 ft (183 m) @ 18 Mbps, 1300 ft (396 m) @ 6 Mbps Ranges and actual throughput vary based upon numerous environmental factors so individual performance may differ.
Compliance	Safety—UL 1950, CSA 22.2 No. 950-95, IEC 60950, EN 60950 ; Radio Approvals—FCC Part 15.247, 15.407, RSS-210 (Canada), EN 300.328, EN 301.893 (Europe), ARIB-STD 33 (Japan), ARIB-STD 66 (Japan), ARIB-STD T71 (Japan), AS/NZS 3548, 4268.2 (Australia and New Zealand); EMI and Susceptibility (Class B), FCC Part 15.107 and 15.109, ICES-003 (Canada), VCCI (Japan), EN 301.489-1 and -17 (Europe), Security, 802.1X and TKIP, WPA 2, AES; Other: IEEE 802.11b and IEEE 802.11g, FCC Bulletin OET-65C, RSS-102
SNMP compliance	MIB I and MIB II
Antennas	Integrated 4.5 dBi diversity inverted F antennas GAIN PATTERN
Security architecture client authentication and encryption (Cisco Wireless Security Suite supporting WPA and WPA2)	Authentication: 802.1X support including LEAP, EAP-FAST, PEAP-GTC, PEAP-MSCHAPV2, EAP-TLS, EAP-TTLS and EAP-SIM to yield mutual authentication and dynamic, per-user, per-session encryption keys (WPA and WPA2); MAC address and by standard 802.11 authentication mechanisms Encryption: AES-CCMP encryption (WPA2); TKIP encryption enhancements: key hashing (per-packet keying), message integrity check (MIC) and broadcast key rotation via Cisco TKIP or WPA TKIP; Support for static and dynamic IEEE 802.11 WEP keys of 40 bits and 128 bits
Status LEDs	External: Status LED indicates operating state, association status, error/warning condition, boot sequence and maintenance status Internal: Ethernet LED indicates activity over the Ethernet, status; Radio LED indicates activity over the radios, status
Management and Topology	CiscoWorks CiscoView, Resource Manager Essentials, and Campus Manager
Remote Configuration	BOOTP, DHCP, Telnet, HTTP, FTP, TFTP, and SNMP
Dimensions	7.5 in. (19.1 cm) wide; 7.5 in. (19.1 cm) high; 1.3 in. (3.3 cm) deep
Weight	1.5 lbs. (0.67 kg)
Environmental	32-104× F (0-40× C); 10-90% humidity (non-condensing)
System Memory	32 MB RAM; 16 MB FLASH
Input Power Requirements	100-240 VAC 50-60Hz (power supply) ; 36-57 VDC (device)
Power Draw	12.2 watts, max
Warranty	One year

Selected Part Numbers and Ordering Information

Cisco Aironet 1130AG Series Access Point

AIR-AP1131AG-A-K9	Cisco Aironet 1130AG Series IEEE 802.11a/b/g Access Point, FCC Configuration
AIR-AP1131AG-C-K9	Cisco Aironet 1130AG Series IEEE 802.11a/b/g Access Point, China Configuration
AIR-AP1131AG-E-K9	Cisco Aironet 1130AG Series IEEE 802.11a/b/g Access Point, ETSI Configuration
AIR-AP1131AG-J-K9	Cisco Aironet 1130AG Series IEEE 802.11a/b/g Access Point, Japan Configuration
AIR-AP1131AG-N-K9	Cisco Aironet 1130AG Series IEEE 802.11a/b/g Access Point, North America Configuration (Excluding-FCC)

For More Information

See the Cisco Aironet Web site: **http://www.cisco.com/go/aironet**

Cisco Aironet 1100 Series Access Points

The Cisco Aironet® 1100 Series offers customers an affordable, easy-to-install, single-band access point that features enterprise-class management, security, and scalability. Legacy Cisco Aironet 1100 Series access points have an 802.11b radio that may be field-upgraded to 802.11g; alternately, the Cisco Aironet 1100 Series may be ordered with a single 802.11g radio that is backward-compatible with 802.11b.

When to Sell

Sell This Product	When a Customer Needs These Features
Cisco Aironet 1100 Series Access Point	• When you need an affordable, easy-to-install single-band 802.11g AP • When a high-performance 2.4 GHz WLAN solution that delivers data rates of up to 11 Mbps (IEEE 802.11b) or 54 Mbps (IEEE 802.11g) with backwards compatibility to legacy 802.11b equipment is needed • When you need a high-quality transmitter and receiver design that provides long range and reliable coverage

Key Features

- Single 802.11b or 802.11g radios available; 802.11b is field upgradable to 802.11g
- Provides end-to-end solution support for Intelligent Network Services
- Variety of mounting options
- With the IEEE 802.11g version, up to 54 Mbps data rates while maintaining full backward compatibility with legacy 802.11b devices
- Provides administrators configuration control to support both 802.11g and legacy 802.11b clients
- Cisco IOS Software operating system provides a familiar user interface
- Integrated diversity dipole antennas
- WiFi-Certified

Specifications

Feature	Cisco Aironet 1100 Series Access Points
Data Rates Supported	1, 2, 5.5, 11 Mbps
Network standard	IEEE 802.11b
Uplink	Autosensing 802.3 10/100BaseT Ethernet
Frequency Band	2.412 to 2.462 GHz (FCC); 2.412 to 2.472 GHz (ETSI); 2.422 to 2.452 GHz (Israel); 2.412 to 2.484 GHz (TELEC)
Network architecture type	Infrastructure, star topology
Wireless Medium	Direct Sequence Spread Spectrum (DSSS)
Modulation	DBPSK @ 1 Mbps; DQPSK @ 2 Mbps; CCK @ 5.5 and 11 Mbps
Operating Channels	802.11b—ETSI: 13; Israel: 4; Americas: 11; TELEC (Japan): 14; 802.11g—ETSI: 13; Americas: 11; TELEC (Japan): CCK-14, OFDM-13
Nonoverlapping Channels	Three
Receive sensitivity	1 Mbps: -94 dBm; 2 Mbps: -91 dBm; 5.5 Mbps: -89 dBm; 11 Mbps: -85 dBm
Available Transmit Power Settings[1]	100 mW (20 dBm); 50 mW (17 dBm); 30 mW (15 dBm); 20 mW (13 dBm); 5 mW (7 dBm);1 mW (0 dBm) Maximum power setting will vary according to individual country regulations
Range (typical @ maximum power setting, 2.2 dBi gain diversity dipole antenna)	Indoor (Distance across open office environment): 90 ft (27 m) @ 54 Mbps, 95 ft (29 m) @ 48 Mbps, 100 ft (30 m) @ 36 Mbps, 140 ft (42 m) @ 24 Mbps, 180 ft (54 m) @ 18 Mbps, 210 ft (64 m) @ 12 Mbps, 220 ft (67 m) @ 11 Mbps, 250 ft (76 m) @ 9 Mbps, 300 ft (91 m) @ 6 Mbps, 310 ft (94 m) @ 5.5 Mbps, 350 ft (107 m) @ 2 Mbps, 410 ft (125 m) @ 1 Mbps; Outdoor: 110 ft (34 m) @ 54 Mbps, 200 ft (60 m) @ 48 Mbps, 225 ft (69 m) @ 36 Mbps, 325 ft (100 m) @ 24 Mbps, 400 ft (122 m) @ 18 Mbps, 475 ft (145 m) @ 12 Mbps, 490 ft (150 m) @ 11 Mbps, 550 ft (168 m) @ 9 Mbps, 650 ft (198 m) @ 6 Mbps, 660 ft (201 m) @ 5.5 Mbps, 690 ft (210 m) @ 2 Mbps, 700 ft (213 m) @ 1Mbps
SMTP Compliance	MIB I and MIB II
Antenna	Integrated 2.2 dBi diversity dipole antennas
Security architecture client authentication (Cisco Wireless Security Suite)	Authentication: 802.1X support, including Cisco LEAP, EAP-FAST, PEAP-GTC, PEAP-MSCHAPv2, EAP-TLS, EAP-TTLS, and EAP-SIM to yield mutual authentication and dynamic, per-user, per-session encryption keys (WPA and WPA2); MAC address and standard 802.11 authentication mechanisms Encryption: AES-CCMP encryption (WPA2); TKIP encryption enhancements: key hashing (per-packet keying), message integrity check (MIC) and broadcast key rotation via Cisco TKIP or WPA TKIP; Support for static and dynamic IEEE 802.11 WEP keys of 40 bits and 128 bits
Software Image Network and Inventory support	CiscoWorks CiscoView, Resource Manager Essentials, and Campus Manager
Remote configuration support	BOOTP, DHCP, Telnet, HTTP, FTP, TFTP, and SNMP
Dimensions	4.1 in. (10.4 cm) wide; 8.1 in. (20.5 cm) high; 1.5 in. (3.8 cm) deep
Weight	10.5 oz. (297 g)
Environmental	32° to 104° F (0° to 40° C); 10-90% humidity (noncondensing)
System Memory	16 MB RAM; 8 MB Flash
Input Power Requirements	100 to 240 VAC 50 to 60Hz (power supply); 33 to 57 VDC (device)
Power Draw	4.9 watts, RMS
Warranty	One year

1. Management Information Base

Selected Part Numbers and Ordering Information

Cisco Aironet 1100 Series Access Point

AIR-AP1120B-A-K9	802.11b AP, Single MPCI Radio, Int Ant, FCC Cnfg
AIR-AP1120B-E-K9	802.11b AP, Single MPCI Radio, Int Ant, ETSI Cnfg
AIR-AP1120B-J-K9	802.11b AP, Single MPCI Radio, Int Ant, Japan Cnfg
AIR-AP1121G-A-K9	802.11g AP, Single MPCI Radio, Int Ant, FCC Cnfg
AIR-AP1121G-E-K9	802.11g AP, Single MPCI Radio, Int Ant, ETSI Cnfg

For More Information

See the Cisco Aironet Web site: **http://www.cisco.com/go/aironet**

Cisco Aironet 1230AG Series Access Point

The 1230AG Series modular access point features both antenna connectors for greater range or coverage versatility using a broad selection of available Cisco antennas, as well as a rugged, metal housing for operation over extended temperature ranges typical of challenging environments.

When to Sell

Sell This Product	When a Customer Needs These Features
Cisco Aironet 1230AG Series Access Point	• When versatility, high-capacity, security, and Enterprise class features is required by industrial WLAN customers • When a versatile antenna and flexible installation options is required for a rugged wireless LAN environment • When simultaneous support of 802.11a and 802.11g standards with 108 Mbps of data rate in the 2.4 and 5Ghz bands is required

Key Features

- Dual 802.11a and 802.11g radios deliver a combined capacity of 108 Mbps
- 2.4 GHz and 5 GHz antenna connectors for greater range or coverage versatility and more flexible installation options using a broad selection of available Cisco antennas
- Supports Cisco IOS Software and is a component of the Cisco Structured Wireless-Aware Network (SWAN) framework, a comprehensive framework that delivers an integrated, end-to-end wired and wireless network
- Hardware-assisted AES encryption provides support for interoperable IEEE 802.11i and WPA2 security
- WiFi-Certified

Specifications

Features	Cisco Aironet 1230AG Series Access Point
Software	Cisco IOS software 12(3)2JA or later
Protocols and Air Interface	IEEE 802.11a/b/g
Uplink	802.3 Ethernet 10/100 Base-T
Radio Module Form Factor	802.11a: CardBus (32-bit); 802.11b or 802.11g: Mini-PCI (32-bit)
Frequency Band	802.11a—5.15 to 5.35 GHz and 5.725-5.825 GHz (FCC), 5.725 to 5.825 GHz (China), 5.15 to 5.35 GHz (ETSI), 5.15 to 5.35 GHz (TELEC), 5.15 to 5.35 GHz and 5.725-5.825 GHz (North America), 5.15 to 5.25 GHz and 5.725 to 5.825 GHz (Singapore), 5.25 to 5.35 GHz 5.725 to 5.825 GHz (Taiwan); 802.11b—2.412 to 2.462 GHz (FCC), 2.412 to 2.472 GHz (ETSI), 2.412 to 2.484 GHz (TELEC), 2.432 to 2.447 GHz (Israel) ; 802.11g—2.412 to 2.462 GHz (FCC), 2.412 to 2.472 GHz (ETSI), 2.412 to 2.484 GHz CCK: (TELEC), 2.412 to 2.472 GHz OFDM: (TELEC), 2.432 to 2.447 GHz (Israel)
Media Access Protocol	Carrier sense multiple access with collision avoidance (CSMA/CA)
Wireless Modulation	802.11a—Orthogonal Frequency Division Multiplexing (OFDM); 802.11b or 802.11g—Direct sequence spread spectrum (DSSS); Orthogonal Frequency Division Multiplexing (OFDM)
Datarates Supported	802.11a—6, 9, 12, 18, 24, 36, 48, 54 Mbps; 802.11b: 1, 2, 5.5, 11 Mbps; 802.11g—1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps
Memory and Processor	IBM PowerPC405 (200 MHz); 16 Mbytes RAM; 8 Mbytes FLASH
Receive Sensitivity	802.11g radio with 100mW maximum transmit power and 72dbm receive sensitivity at 54Mbps; 802.11a radio with 17db maximum transmit power and 72dbm receive sensitivity at 54Mbps
Transmit Power	802.11a: 50 mW (17 dBm), 25 mW (14 dBm), 10 mW (10 dBm), 5 mW (7 dBm) 802.11g: (CCK): 100 mW (20 dBm), 50 mW (17 dBm), 30 mW (15 dBm), 20 mW (13 dBm), 10 mW (10 dBm), 5 mW (7 dBm), 1 mW (0 dBm) 802.11g: (OFDM): 30 mW (15 dBm), 20 mW (13 dBm), 10 mW (10 dBm), 5 mW (7 dBm), 1 mW (0 dBm) Maximum power setting will vary according to individual country regulations.

Range	802.11g: Indoor—54Mbps/xx ft, 6Mbps/xx ft; Outdoor: 54 Mbps/xx ft, 6Mbps/xx ft 802.11a: Indoor—54Mbps/xx ft, 6Mbps/xx ft; Outdoor: 54 Mbps/xx ft, 6Mbps/xx ft
Antenna	2.4 and 5 GHz: Two RP-TNC connectors
Operating Channels	5 GHz Bandó FCC: 12, China: 4, ETSI: 8, Japan (TELEC): 4, North America: 12, Singapore: 8, Taiwan: 8 2.4 GHz Bandó 802.11b: ETSI: 13; Israel: 4; Americas: 11; TELEC (Japan): 14; 802.11g: ETSI: 13; Israel: 4; Americas: 11; Japan (TELEC): 14 CCK, 13 OFDM
Non Overlapping Channels	15 non overlapping (FCC and North America)
SNMP	V1 and v2
Network Management	SSH, HTTPS, TFTP. FTP, Telnet, Console port, CiscoWorksÕetc
LEDs	Three indicators on the top panel report association status, operation, error/warning, firmware upgrade, and configuration, network/modem, and radio status.
Housing	Die cast aluminum
Physical Dimensions	6.562 in. (16.67 cm) wide; 7.232 in. (18.37 cm) deep; 1.660 in. (4.22 cm) high; add 0.517 in. (1.31 cm) to the height for mounting bracket; 27.6 oz (783g) add 6.4 oz (181g) for mounting bracket
Environmental	-4- 122×F (-20-50×C), 10-90% humidity (noncondensing)
Input Power Requirements	90 to 240 VAC ±10% (power supply); 48 VDC ±10%
Power Draw	11 watts, RMS
Approvals and Compliance	Radio Approvals: FCC Part 15.401-15.407, RSS-210 (Canada), EN 301.893 (Europe), ARIB STD-T71 (Japan), AS 4268.2 (Australia), FCC Part 15.247, RSS-210 (Canada), EN 300.328 (Europe), ARIB-STD 33 (Japan), ARIB-STD 66 (Japan), AS/NZS 3548 (Australia and New Zealand) Security: 802.1X and TKIP, WPA and WPA2, AES Other: IEEE 802.11a, IEEE 802.11g, FCC Bulletin OET-65C, RSS-102
EMI	EMI and Susceptibility (Class B): FCC Part 15.107 and 15.109; ICES-003 (Canada); VCCI (Japan) ; EN 301.489-1 and -17 (Europe)
Warranty	One year

Selected Part Numbers and Ordering Information

Part Number	Product Name
AIR-AP1232AG-x-K9	1230AG Series IEEE 802.11a/b/g Access Point

For More Information

See the Cisco Aironet Web site **http://www.cisco.com/go/aironet**

Cisco Aironet 1200 Series Access Points

The Cisco Aironet 1200 Series offers the same versatility, high capacity, security, and enterprise-class features demanded by industrial wireless LAN customers, but when configured as a single-band IEEE 802.11g access point, provides a cost-effective, single-band solution. It protects current and future network infrastructure investments. Customers can confidently deploy 802.11g networks now, and have the option to upgrade to a dual-band 802.11a/g network in the future.

When to Sell

Sell This Product	When a Customer Needs These Features
Cisco Aironet 1200 Series Access Point	• Challenging environments that require the antenna versatility associated with connectorized antennas, as well as a rugged metal enclosure and a broad operating temperature range • Supports installation in environmental air spaces, such as areas above suspended ceilings • IT Professionals or business executives want mobility within the enterprise to increase productivity, as an addition or alternative to wired networks. • Business owners or IT directors need flexibility for frequent LAN wiring changes, either throughout the site or in selected areas. • Any company whose site is not conducive to LAN wiring because of building or budget limitations, such as older buildings, leased space or temporary sites. • Offers future revenue opportunities via 802.11a upgrades.

Key Features

- Single 802.11g radio supports maximum data rate of 54 Mbps
- Supports the Cisco SWAN Framework which extends the security, scalabililty, reliability, ease of deployment, and manageability available in wired networks to the wireless infrastructure.
- Configurable to meet current and future customer-specific requirements
- Enterprise-class security with the Cisco Wireless Security Suite, WPA and WPA2 providing authentication via IEEE 802.1X and encryption via WPA Temporal Key Integrity Protocol (TKIP), Cisco TKIP, or Advanced Encryption Standard (AES)
- Offers investment protection because of its upgrade capability and compatibility with current standards
- Supports inline power over Ethernet or local power
- Wi-Fi Certified

Specifications

Feature	Cisco Aironet 1200 Series Access Points
Data Rates Supported	802.11g: 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps
Network Standard	IEEE 802.11b and IEEE 802.11g
Uplink	Autosensing 802.3 10/100BASE-T Ethernet
Radio Module Form	802.11a: CardBus (32-bit); 802.11b or 802.11g: Mini-PCI (32-bit)
Frequency Band and Operating Channels	Americas (FCC): 2.412 to 2.462 GHz; 11 channels; Japan (TELEC): 2.412 to 2.472 GHz, 13 channels Orthogonal Frequency Division Multiplexing (OFDM); ETSI: 2.412 to 2.484 GHz, 14 channels Complementary Code Keying (CCK) 2.412 to 2.472 GHz; 13 channels; Israel: 2.432 to 2.472 GHz; 9 channels
Nonoverlapping Channels	802.11g: 3
Wireless Modulation	802.11g: Direct sequence spread spectrum (DSSS); OFDM
Receive Sensitivity (Typical)	802.11g: 6 Mbps: -90 dBm, 9 Mbps: -84 dBm, 12 Mbps: -82 dBm, 18 Mbps: -80 dBm, 24 Mbps: -77 dBm, 36 Mbps: -73 dBm, 48 Mbps: -72 dBm, 54 Mbps: -72 dBm
Available Transmit Power	802.11g—CCK: 100 mW (20 dBm), 50 mW (17 dBm), 30 mW (15 dBm), 20 mW (13 dBm), 10 mW (10 dBm), 5 mW (7 dBm), 1 mW (0 dBm)
Range	802.11g—Outdoor: 110 ft (34m) @ 54 Mbps, 200 ft (61 m)@ 48 Mbps, 225 ft (69 m) @ 36 Mbps, 325 ft (99 m) @ 24 Mbps, 400 ft (122 m) @ 18 Mbps, 475 ft (145 m) @ 12 Mbps, 490 ft (149 m) @ 11 Mbps, 550 ft (168 m) @ 9 Mbps, 650 ft (198 m) @ 6 Mbps, 660 ft (201 m) @ 5.5 Mbps, 690 ft (210 m) @ 2 Mbps, 700 ft (213 m) @ 1 Mbps 802.11g—Indoor: 90 ft (27 m) @ 54 Mbps, 95 ft (29 m) @ 48 Mbps, 100 ft (30 m) @ 36 Mbps, 140 ft (43 m) @ 24 Mbps, 180 ft (55 m) @ 18 Mbps, 210 ft (64 m) @ 12 Mbps, 220 ft (67 m) @ 11, Mbps, 250 ft (76 m) @ 9 Mbps, 300 ft (91 m) @ 6 Mbps, 310 ft (94 m) @ 5.5 Mbps, 350 ft (107 m) @ 2 Mbps, 410 ft (125 m) @ 1 Mbps (Ranges and actual throughput vary based upon numerous environmental factors so individual performance may differ)
Compliance	Safety: UL 60950, CAN/CSA C22.2 No. 60950, IEC 60950, UL 2043; Radio Approvals: FCC Part 15.247, RSS-210 (Canada), EN 300.328, ARIB-STD 33 (Japan), ARIB-STD 66 (Japan), AS/NZS 4771 (Australia and New Zealand); EMI and Susceptibility (Class B): FCC Part 15.107 and 15.109, ICES-003 (Canada), VCCI (Japan), EN 301.489-1 and -17 (Europe), AS/NZS 3548; Security: 802.11i, WPA2, WPA, 802.1X, AES, TKIP; Other: IEEE 802.11g, FCC Bulletin OET-65C, RSS-102
Antenna	2.4 GHz Radio: Two RP-TNC connectors; 802.11g approved with AIR-ANT1728, AIR-ANT1729, AIR-ANT2012, AIR-ANT2506, AIR-ANT3213, AIR-ANT3549, AIR-ANT4941, AIR-ANT5959, and AIR-ANT2410Y-R
Network Management	BootP, Secure Shell (SSH) Protocol, Secure HTTP (HTTPS), Trivial File Transfer Protocol (TFTP), FTP, Telnet, console port, Simple Network Management Protocol (SNMP) MIB I and MIB II, CiscoWorks Resource Manager Essentials (RME), CiscoWorks Software Image Manager (SWIM), CiscoWorks Campus Manager, CiscoWorks CiscoView, and CiscoWorks WLSE
LEDs	Three indicators on the top panel report Ethernet activity and status, device operating status, and radio activity and status.
Housing	Die-cast aluminum
Dimensions (H x W x D)	1.660 x 6.562 x 7.232 in. (4.22 x 16.67 x 18.37 cm); add 0.517 in. (1.31 cm) height for mounting bracket
Weight	1.725 lb (0.783 kg); add 0.4 lb (0.181 kg) for mounting bracket
Environmental	-4 to 122×F (-20 to 50×C), 10 to 90 percent humidity (noncondensing)
Memory and Processor	IBM PowerPC405 (200 MHz); 16 MB RAM; 8 MB Flash memory
Input Power Requirements	90 to 240 VAC ±10 percent (power supply); 48 VDC ±10 percent
Power Draw	6W maximum
Warranty	One year

Selected Part Numbers and Ordering Information[1]

1200 Series Access Points	
AIR-AP1200	AP Platform, Cardbus and MPCI Slots (no radio), Enet Uplink
AIR-AP1220B-A-K9	802.11b AP w/Avail CBus Slot, FCC Cnfg
AIR-AP1220B-E-K9	802.11b AP w/Avail CBus Slot, ETSI Cnfg
AIR-AP1220A-J-K9	802.11a AP w/Avail MPCI Slot, Enet Uplink, TELEC Cnfg
AIR-AP1220B-J-K9	802.11b AP w/Avail CBus Slot, Japan Cnfg
AIR-AP1210	IOS based AP Platform, Cardbus and MPCI Slots (no radio), Enet Uplink
AIR-AP1230B-A-K9	IOS based 802.11b AP w/Avail CBus Slot, FCC Cnfg
AIR-AP1230B-E-K9	IOS based 802.11b AP w/Avail CBus Slot, ETSI Cnfg
AIR-AP1230A-J-K9	IOS based 802.11a AP w/Avail MPCI Slot, Enet Uplink, TELEC Cnfg
AIR-AP1230B-J-K9 I	OS based 802.11b AP w/Avail CBus Slot, Japan Cnfg
AIR-AP1231G-A-K9	802.11g IOS AP w/Avail CBus Slot, FCC Cnfg
AIR-AP1231G-E-K9	802.11g IOS AP w/Avail CBus Slot, ETSI Cnfg
AIR-AP1231G-J-K9	802.11g IOS AP w/Avail CBus Slot, Japan Cnfg

1. This is only a small subset of all parts available via URL listed under "For More Information." Some parts have restricted access or are not available through distribution channels. Resellers: For latest part number and pricing info, see the Distribution Product Reference Guide at: http://www.cisco.com/dprg (limited country availability)

For More Information

See the Cisco Aironet Web site: **http://www.cisco.com/go/aironet**

Cisco Aironet 1300 Series

The Cisco Aironet 1300 Series is an 802.11g access point and bridge that provides high-speed and cost-effective wireless connectivity between multiple fixed or mobile networks and clients.

When to Sell

Sell This Product	When a Customer Needs These Features
Cisco Aironet 1300 Series	• When you need a high-capacity and high-security WLAN in the enterprise office • When you need two high-performance radios providing simultaneous support for the 802.11a and 802.11g standards offering 108 Mbps capacity for your growing WLAN • Provides a flexible, easy-to-use solution meeting requirements of wide-area networking professionals

Key Features

- Network connections within a campus area; Outdoor infrastructure for mobile networks and users; Public access for outdoor areas
- Supports temporary networks for portable or military operations
- Supports the 802.11g standard providing 54-Mbps data rates with secure technology while maintaining full backward compatibility with legacy 802.11b devices
- Easy maintenance and installation by integrating it with your wired network via SWAN solution
- Provides advanced features such as Fast Secure Roaming, QoS, and VLANs based on Cisco IOS Software
- Operates as a wireless bridge, access point, or a workgroup bridge
- Provides ongoing savings of leased-line expenses, a method to connect networks despite physical barriers such as lakes or highways, and rapid deployment of network connections
- Wifi-certified in Access Point mode

Specifications

Compatibility	Access Point—Compatible with any Wi-Fi certified client device for basic capability; Compatible with Cisco Aironet clients and Cisco Compatible clients for extended capability Workgroup Bridge—Supports operation with Cisco Aironet access points and Cisco bridges
Air interface standard[1]	IEEE 802.11b or IEEE 802.11g
Frequency band	2.412 to 2.462 GHz (FCC); 2.412 to 2.472 GHz (ETSI); 2.412 to 2.472 GHz (TELEC)

Wireless modulation	802.11b—Direct Sequence Spread Spectrum (DSSS): Differential Binary Phase Shift Keying (DBPSK) at 1 Mbps; Differential Quadrature Phase Shift Keying (DQPSK) at 2 Mbps; Complementary Code Keying (CCK) at 5.5 and 11 Mbps 802.11g—Orthogonal Frequency Divisional Multiplexing (OFDM): BPSK at 6 and 9 Mbps; QPSK at 12 and 18 Mbps; 16-quadrature amplitude modulation (QAM) at 24 and 36 Mbps; 64-QAM at 48 and 54 Mbps
Media access protocol	Carrier Sense Multiple Access/Collision Avoidance (CSMA/CA)
Operating channels	802.11b/g—ETSI: 13; Americas: 11; TELEC (Japan): 13
Non-overlapping channels	3
Security	Bridge—Authentication: 802.1X support including LEAP to yield mutual authentication and dynamic per-user, per-session encryption keys; Encryption: Cisco TKIP, key hashing (per-packet keying) and message, Integrity Check (MIC), AES-ready Access Point: Authentication: 802.1X support including LEAP, PEAP, EAP Message Digest 5 (EAP MD5), EAP TLS, and EAP FAST to yield mutual authentication and dynamic per-user, per-session encryption keys; Encryption: Cisco TKIP and WPA TKIP; key hashing (per-packet keying) and MIC; AES-ready Workgroup-Bridge—Authentication: 802.1X support including LEAP to yield mutual authentication and dynamic per-user, per-session encryption keys; Encryption: Cisco TKIP, key hashing (per-packet keying) and MIC, AES-ready
Warranty	One year
SNMP compliance	Versions 1 and 2

1. Bridge mode has enhancements to the standard to allow longer-range bridging communication

Specifications (Con.)

Feature	AIR-BR1310G-x-K9	AIR-BR1310G-x-K9-R
Available transmit power settings[1]	802.11b: 100 mW (20 dBm), 50 mW (17 dBm), 30 mW (15 dBm), 20 mW (13 dBm), 10 mW (10 dBm), 5 mW (7 dBm), 1 mW (0 dBm); 802.11g: 30 mW (15 dBm); 20 mW (13 dBm); 10 mW (10 dBm); 5 mW (7 dBm); 1 mW (0 dBm)	Same as AIR-BR1310G-x-K9
Maximum operational receive level	-20 dBm	Same as AIR-BR1310G-x-K9
Maximum survivable receive level	10 dBm	Same as AIR-BR1310G-x-K9
Receive sensitivity (10 percent with 3200-byte packets)	1 Mbps: -94 dBm, 2 Mbps: -91 dBm, 5.5 Mbps: -89 dBm, 11 Mbps: -85 dBm; 6 Mbps: -90 dBm, 9 Mbps: -89 dBm; 12 Mbps: -86 dBm, 18 Mbps: -84 dBm; 24 Mbps: -81 dBm, 36 Mbps: -77 dBm; 48 Mbps: -73 dBm, 54 Mbps: -72 dBm	Same as AIR-BR1310G-x-K9
Access-point role (Outdoor range)	Americas: 865 feet (260 meters) at 54 Mbps, 3465 feet (1055 meters) at 11 Mbps; ETSI: 150 feet (45 meters) at 54 Mbps, 775 feet (235 meters) at 11 Mbps; TELEC: 485 feet (145 meters) at 54 Mbps, 1095 feet (330 meters) at 11 Mbps Note: Access Point with 13 dBi integrated antenna and Cisco clients	Americas: 350 feet (105 meters) at 54 Mbps, 1410 feet (430 meters) at 11 Mbps; ETSI: 195 feet (60 meters) at 54 Mbps, 630 feet (190 meters) at 11 Mbps; TELEC: 195 feet (60 meters) at 54 Mbps, 445 feet (135 meters) at 11 Mbps Note: Access Point with 5.2dBi patch antenna and Cisco clients
Bridge role (Point-to-point range)[2]	Americas: 1.3 miles (2 km) at 54 Mbps, 9 miles (15 km) at 11 Mbps; EMEA: 0.2miles (0.36Km) at 54 Mbps, 2.3 miles (3.5 km) at 11 Mbps; TELEC: 0.7 miles (1.1Km) at 54 Mbps, 3.2 miles (5 km) at 11 Mbps Note: 13 dBi integrated antenna at root and non-root bridge	Americas: 4.5 miles (7 km) at 54 Mbps, 14 miles (23 km) at 11 Mbps; EMEA 5.5 miles (9 km) at 11 Mbps; TELEC: 4.5 miles (7 km) at 54 Mbps, 12 miles (20 km) at 11 Mbps Note: 21-dBi dish antenna at root and non-root bridge
Bridge role (Point-to-multipoint range)[2]	Americas: 1.1 miles (1.8 km) at 54 Mbps, 8 miles (13 km) at 11 Mbps; EMEA: 0.25 miles (0.4Km) at 54 Mbps, 1.1 miles (1.8 km) at 11 Mbps; TELEC: 0.8 miles (1.3Km) at 54 Mbps, 3.6 miles (5.8 km) at 11 Mbps Note: 14-dBi sector antenna at root and 13dBi integrated antenna at non-root	Americas: 2.0 miles (3.3 km) at 54 Mbps, 10 miles (16 km) at 11 Mbps; EMEA: 2.5 miles (4 km) at 11 Mbps; TELEC: 2.0 miles (3.3 km) at 54 Mbps; 9.0 miles (14 km) at 11 Mbps Note: 14-dBi sector at root and 21-dBi dish at non-root

	AIR-BR1310G-x-K9 and AIR-BR1310G-x-K9-R	AIR-PWRINJ-BLR2 and AIR-PWRINJ-BLR2T
Dimensions	8 in. x 8.1 in. x 3.12 in. (20.3 cm x 20.57 cm x 7.87 cm)	4.62 in. x 4.76 in. x 1.07 in. (11.73 cm x 12.09 cm x 2.71 cm)
Weight	2.5 lb (1.25 kg)	2 lb (1 kg)
Operational temperature	-22½ to 131½F (-30½ to 55½C)	Same As AIR-BR1310G-x-K9 and AIR-BR1310G-x-K9-R
Storage temperature	-40½ to 185½F (-40½ to 85½C)	Same As AIR-BR1310G-x-K9 and AIR-BR1310G-x-K9-R
Operational altitude	13,800 ft (4206 m)	Same As AIR-BR1310G-x-K9 and AIR-BR1310G-x-K9-R
Storage altitude	16,000 ft (4877 m)	Same As AIR-BR1310G-x-K9 and AIR-BR1310G-x-K9-R
Humidity	0 to 100% at 100½F (38½C) (condensing)	0 to 90% at 100½F (38½C) (non-condensing)

1. Maximum power setting will vary according to individual country regulations
2. The distances referenced here are approximations and should be used for estimation purposes only.

Selected Part Numbers and Ordering Information

Cisco Aironet 1300 Series

AIR-BR1310G-A-K9	2.4 GHz (802.11g) Outdoor Access Point /Bridge with integrated patch antenna (FCC regulatory domain)
AIR-BR1310G-A-K9-R	(FCC regulatory domain) 2.4 GHz (802.11g) Outdoor Access Point /Bridge with RP-TNC type connector

For More Information

See the Cisco Aironet Web site: **http://www.cisco.com/go/aironet**

Cisco Aironet 802.11a/b/g Wireless Cardbus and PCI Adapters

The Cisco Aironet IEEE 802.11a/b/g Wireless CardBus and PCI Adapters provides high-performance 54 Mbps connectivity in the 2.4 and 5 GHz bands that combines the freedom of wireless connectivity with the performance, security, and manageability that businesses require. Key components of SWAN.

When to Sell

Sell This Product	When a Customer Needs These Features
Cisco Aironet 802.11a/b/g Wireless Cardbus Adapter	• Those who want mobility within the enterprise to increase productivity, as an addition or alternative to wired networks or need flexibility for frequent LAN wiring changes • Those whose site is not conducive to LAN wiring because of building or budget limitations, such as older buildings, leased space or temporary sites

Key Features

- Secure network communications using the Cisco Wireless Security Suite
- Includes the Aironet Desktop Utility (ADU), Aironet System Tray Utility (ASTU), and Aironet Client Administration Utility (ACAU)
- World mode for international roaming
- Superior range and throughput
- Supports single 802.11b coverage, single 802.11g coverage, single 802.11a coverage, dual-mode 802.11a/g coverage or tri-mode 802.11a/b/g coverage
- Wi-Fi Certified; Support for WPA
- PCI Adapter—Optimal placement for maximum performance using dual-band 2.4/5 GHz 1 dBi effective gain antenna has a 2-meter cable
- PCI Adapter—Provides a low-profile form factor and two-meter cable length providing flexibility for installation in low-profile devices, such as slim desktops and point-of-sale (POS) devices.

Specifications

Feature	Cisco Aironet 802.11a/b/g Wireless Cardbus Adapter	Cisco Aironet 802.11a/b/g Wireless PCI Adapter
Form Factor	CardBus Type II	Standard and Low Profile Type II PCI
Interface	32-bit Cardbus with standard 68-pin connector; PC-Card Rev. 7.0 compliant	Standard PCI Interface, PCI Rev. 2.3 compliant
Data Rates Supported	1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54 Mbps	Same as Cardbus Adapter
Network Standard	IEEE 802.11a/b/g	Same as Cardbus Adapter
Operating Voltage	3.3 V (±0.3 V)	Same as Cardbus Adapter
Media Access Protocol	Carrier-Sense Multiple Access w/ Collision Avoidance (CSMA/CA)	Same as Cardbus Adapter
Wireless Medium	802.11g: Direct Sequence Spread Spectrum (DSSS) and Orthogonal Frequency Divisional Multiplexing (OFDM); 802.11a: OFDM	Same as Cardbus Adapter
Modulation	802.11b: DSSS--Differential Binary Phase Shift Keying (DBPSK) @ 1 Mbps; Differential Quadrature Phase Shift Keying (DQPSK) @ 2 Mbps; Complementary Code Keying (CCK) @ 5.5 and 11 Mbps 802.11g and 802.11a: OFDM--BPSK @ 6 and 9 Mbps; QPSK @ 12 and 18 Mbps; 16-Quadrature Amplitude Modulation (QAM) @ 24 and 36 Mbps; 64-QAM @ 48 and 54 Mbps	Same as Cardbus Adapter

Frequency Bands	2.40 to 2.4897 GHz; 5.15 to 5.35 GHz (FCC UNII 1 and UNII 2); 5.725 to 5.85 GHz (FCC UNII 3); 5.15 to 5.35 GHz (ETSI); 5.470 to 5.725 (ETSI); 5.15 to 5.25 GHz (Japan)	Same as Cardbus Adapter
Range (With 2.2 dBi dipole antenna for 802.11g and 802.11b and 6 dBi gain patch for 802.11a)	802.11a--Indoor: 45 ft (13 m)@ 54 Mbps, 110 ft (33 m) @ 18 Mbps, 165 ft (50 m) @ 6 Mbps; Outdoor: 100 ft (30 m) @ 54 Mbps, 600 ft (183 m) @ 18 Mbps, 1000 ft (304 m) @ 6 Mbps 802.11b/góIndoor: 90 ft (27 m) @ 54 Mbps, 180 ft (54m) @ 18 Mbps, 160 ft (48 m) @ 11 Mbps, 300 ft (91 m) @ 6 Mbps, @ 410 ft (124 m); Outdoor: 250 ft (76 m) @ 54 Mbps, 600 ft (183 m) @ 18 Mbps, 1000 ft (304 m) @ 11 Mbps, 1300 ft (396 m) @ 6 Mbps, 2000 ft (610 m) @ 1 Mbps	Same as Cardbus Adapter
Antenna[1]	Integrated diversity dual-band 2.4/5 GHz antenna	
Security Architecture Client Authentication (Cisco Wireless Security Suite)	Authentication: WPA and 802.1X support for Cisco LEAP, PEAP-GTC, PEAP-MSCHAPv2, and EAP-TLS; MAC address and by standard 802.11 authentication mechanisms Encryption: Support for static and dynamic IEEE 802.11 WEP keys of 40 bits and 128 bits; Cisco TKIP and WPA TKIP encryption enhancements: key hashing (per-packet keying), message integrity check (MIC) and broadcast key rotation	Same as Cardbus Adapter
Drivers	Windows XP and Windows 2000	Same as Cardbus Adapter
Dimensions	2.05 in. (52.08mm) wide x 4.46 in. (113.35mm) deep x 0.19 in. (4.80mm) high	4.72 in. (119.9mm) Wide x 3.12205 in. (79.3mm) High
Weight	1.6 oz (44.0g)	Standard (frame) PCI w/Antenna: 3.64 oz. (103.2 g), Standard (frame) PCI w/o Antenna: 1.92 oz. (54.7 g), Low Profile PCI w/Antenna: 3.43 oz. (97.5 g), Low Profile PCI w/o Antenna: 1.72 oz. (49.0 g)
Warranty	One Year	Same as Cardbus Adapter

1. For detailed information on antennas, visit **http://www.cisco.com/go/aironet**

For More Information

See the Cisco Aironet Web site: **http://www.cisco.com/go/aironet**

Cisco Aironet 5 GHz 54 Mbps Wireless Client Adapter

The Cisco Aironet 5 GHz 54 Mbps Wireless LAN client adapter is an IEEE 802.11a-compliant CardBus adapter that operates in the UNII-1 and UNII-2 bands. The client adapter complements the Cisco Aironet 1200 Series 802.11a Access Point, providing a solution that combines performance and mobility with the security and manageability that enterprises require.

When to Sell

Sell This Product	When a Customer Needs These Features
Cisco Aironet 5 GHz 54Mbps Wireless LAN Client Adapters	• Industry leading security: IEEE 802.11x support, including LEAP and EAP-TLS, for mutual authentication and dynamic per-user, per session WEP keys • Multiple transmit power settings (20 mW/(13 dBm), 10 mW/(10 dBm), and 5 mW (7 dBm) • End-to-end Cisco branded solution

Key Features

- IEEE 802.11a-compliant CardBus adapter that operates in the UNII-1 and UNII-2 bands
- Complements the Cisco Aironet 1200 Series 802.11a Access Point, providing a solution that combines performance and mobility with the security and manageability that enterprises require
- Uses Cisco Wireless Security Suite for user-based authentication which supports a variety of 802.11x authentication types including LEAP and EAP-Transport Layer Security (EAP-TLS)
- Configure, monitor, and manage using ACU. Includes site-survey tools to assist in the placement of access points

Specifications

Feature	Cisco Aironet 5 GHz 54 Mbps Wireless Client Adapter
Form Factor	CardBus Type II
Interface	32-bit CardBus (PCI)
Operational voltage	3.3 V (+/- 0.33 V)
LED	Status (green) and Activity (amber)
Data Rates Supported	6, 9, 12, 18, 24, 36, 48, 54 Mbps (configurable as fixed or auto selecting to extend range)
Network Standard	IEEE 802.11a
Frequency Band	5.15 to 5.35 GHz (FCC UNII 1 and UNII 2); 5.15 to 5.25 GHz (TELEC); 5.15 to 5.25 GHz (Singapore); 5.25 to 5.35 GHz (Taiwan)
Network architecture type	Infrastructure, star topology
Media Access Protocol	Carrier sense multiple access with collision avoidance (CSMA/CA)
Wireless Medium	Orthogonal Frequency Division Multiplexing (OFDM)
Modulation	(OFDM sub-carrier); BPSK @ 6 and 9 Mbps; QPSK @ 12 and 18 Mbps; 16-QAM @ 24 and 36 Mbps; 64-QAM @ 48 and 54 Mbps
Operating Channels	FCC: 8 channels (UNII-1 4 channels and UNII-2 4 channels); 4 channels for Japan, Singapore, and Taiwan
Available Transmit Power Settings[1]	20 mW (13 dBm);10 mW (10 dBm); 5 mW (7 dBm) Maximum power setting will vary according to individual country regulations.
Current steady state (typical)	·Transmit: 520 mA; Receive: 580 mA; Sleep: 20 mA
Range	Omni directional Antenna: Indoor: 60 ft (18m)@ 54 Mbps, 130 ft (40m) @ 18 Mbps, 170 ft (52m) @ 6 Mbps Outdoor: 100 ft (30m) @ 54 Mbps, 600 ft (183m) @ 18 Mbps, 1000 (304m) @ 6 Mbps Patch Antenna: Indoor: 70 ft (21m) @ 54 Mbps, 150 ft (45m) @ 18 Mbps, 200 ft (61m) @ 6 Mbps Outdoor: 120 ft (36m) @ 54 Mbps, 700 ft (213m) @ 18 Mbps, 1200 ft (355m) @ 6 Mbps
Power Management	3 levels of power consumption available, including: CAM (Constantly Awake Mode), Fast PSP (Power Save Mode), Max PSP (Maximum Power Savings)
Antenna	Integrated 5dBi gain patch antenna
Security architecture client authentication	Cisco Wireless Security Suite including: Authentication: 802.11x support for LEAP and EAP-TLS to yield mutual authentication and dynamic, per-user, per-session WEP keys; MAC address and by standard 802.11 authentication mechanisms Encryption: Support for static and dynamic IEEE 802.11 WEP keys of 40 bits and 128 bits; Pre-standard TKIP WEP enhancements: key hashing (per-packet keying), message integrity check (MIC) and broadcast key rotation
Drivers	Windows, 98/98SE, Windows ME, Windows 2000 and Windows XP
Environmental	-30º to 70ºC; 95% humidity (noncondensing)
Warranty	One year

1. Management Information Base

For More Information

See the Cisco Aironet Web site: **http://www.cisco.com/go/aironet**

Cisco Aironet 350 Series Client Adapters

Wireless client adapters are the key to adding mobility and flexibility to an enterprise—increasing productivity by enabling users to have network and Internet access anywhere within a building without the limitation of wires. The Cisco Aironet 350 Series 802.11b Client Adapters are a complement to Aironet 350 Series infrastructure devices, providing an enterprise-ready solution that combines mobility with the performance, security, and manageability.

When to Sell

Sell This Product	When a Customer Needs These Features
Cisco Aironet 350 Series Client Adapters	• IT Professionals or business executives want mobility within the enterprise to increase productivity, as an addition or alternative to wired networks or need flexibility for frequent LAN wiring changes, either throughout the site or in selected areas • Those whose site is not conducive to LAN wiring because of building or budget limitations, such as older buildings, leased space or temporary sites

Key Features

- Superior range and throughput for IEEE 802.11b networks
- Secure network communications
- Available in PCMCIA and PCI form factors
- World mode for international roaming
- Supports LEAP authentication for secure wireless transmissions
- Full-featured utilities for easy configuration and management
- Compliance with the IEEE 802.11b high-rate standard
- Support for popular operating systems

Specifications

Feature	Cisco Aironet 350 Series Client Adapters
Data Rates Supported	1, 2, 5.5, and 11 Mbps
Network Standard	IEEE 802.11b
System Interface	AIR-PCM35x: PC Card (PCMCIA) Type II; AIR-PCI 35x: peripheral component interconnect (PCI) Bus
Frequency Band	2.4 to 2.4897 GHz
Network Architecture Types	Infrastructure and ad hoc
Wireless Medium	Direct Sequence Spread Spectrum (DSSS)
Media Access Protocol	Carrier sense multiple access with collision avoidance (CSMA/CA)
Modulation	DBPSK @1 Mbps; DQPSK @ 2 Mbps; CCK @ 5.5 and 11 Mbps
Operating Channels	North America: 11; ETSI: 13; Japan: 14
Nonoverlapping Channels	Three
Receive Sensitivity	1 Mbps: -94 dBm; 2 Mbps: -91 dBm; 5.5 Mbps: -89 dBm; 11 Mbps: -85 dBm
Delay Spread	1 Mbps: 500 ns; 2 Mbps: 400 ns; 5.5 Mbps: 300 ns; 11 Mbps: 140 ns
Available Transmit Power Settings[1]	100 mW (20 dBm); 50 mW (17 dBm); 30 mW (15 dBm); 20 mW (13 dBm); 5 mW (7 dBm); 1 mW (0 dBm)
Range (typical)	Indoor: 130 ft (40 m) @ 11 Mbps; 350 ft (107 m) @ 1 Mbps Outdoor: 800 ft (244 m) @ 11 Mbps; 2000 ft (610 m) @ 1 Mbps
Compliance	Operates license free under FCC Part 15 and complies as a Class B device; complies with DOC regulations; complies with ETS 300.328, FTZ 2100, and MPT 1349 standards
Operating Systems Supported	Windows 95, 98, NT 4.0, 2000, ME, XP, CE 2.11, CE 3.0, Mac OS 9.x, and Linux
Antenna	AIR-PCM35x: Integrated diversity dipoles AIR-LMC35x: Two MMCX connectors (antennas optional, none supplied with unit) AIR-PCI35x: External, removable 2.2 dBi Dipole with RP-TNC Connector
Encryption Key Length	128-bit
Authentication Type	EAP-Cisco Wireless LEAP
Status Indicators	Link Status and Link Activity
Dimensions (W x D x H)	AIR-PCM35x: 2.13 in. (5.4 cm) x 4.37 in. (11.1 cm) x 0.1 in. (0.3 cm) AIR-LMC35x: 2.13 in. (5.4 cm) x 3.31 in. (8.4 cm) x 0.1 in. (0.3 cm) AIR-PCI35x: 6.6 in. (16.8 cm) x 3.9 in. (9.8 cm) x .5 in. (1.3 cm)
Weight	AIR-PCM35x: 1.6 oz (45g); AIR-LMC35x: 1.4 oz (40g); AIR-PCI35x: 4.4 oz (125g)
Environmental	AIR-PCM35x and AIR-LMC35x: -22° to 158° F (-30° to 70° C); AIR-PCI35x: 32° to 131° F (0° to 55° C); 10 to 90% (noncondensing)
Input Power Requirements	+5 VDC =/- 5%
Typical Power Consumption (at 100 mW transmit power setting)	Transmit: 450 mA; Receive: 270 mA; Sleep mode: 15 mA

1. Maximum power setting will vary according to individual country regulations.

Selected Part Numbers and Ordering Information[1]

Cisco Aironet 350 Series Client Adapters

AIR-PCM352	350 Series PC Card with Diversity Antennas & 128-bit WEP
AIR-PCI352	350 Series PCI Card with 2.2 dBi Dipole Antenna & 128-bit WEP

1. This may be only a subset of all parts available via URL listed under "For More Information."

For More Information

See the Cisco Aironet Web site: **http://www.cisco.com/go/aironet**

Cisco Aironet 1400 Series Wireless Bridge

The Cisco Aironet 1400 Series Wireless Bridge provides a high-performance and feature-rich solution for connecting multiple LANs in a metro area.

When to Sell

Sell This Product	When a Customer Needs These Features
Cisco Aironet 1400 Series Wireless Bridge	• A cost-effective, high-bandwidth way to connect networks in multiple locations within a metro area • A rapid payback period and a lower total cost of ownership than a leased line • High performance data rates of 54 Mbps at point-to-point ranges of 7.5 miles and 2 miles for point-to-multipoint ranges

Key Features

- Support for both point-to-point or point-to-multipoint configurations
- Industry leading range and throughput, supporting data rates up to 54 Mbps
- Enhanced security mechanisms based on 802.11 standards
- Ruggedized enclosure optimized for harsh outdoor environments with extended operating temperature range
- Integrated or optional external antennas for flexibility in deployment
- Designed specifically for ease-of-installation and operation

Specifications

Feature	AIR-BR1410A-A-K9	AIR-BR1410A-A-K9-N	Power Injector LR
Frequency band	5.725 to 5.825 GHz (FCC UNII 3)	Same as AIR-BR1410A-A-K9	
Wireless modulation	Coded Orthogonal Frequency Division Multiplexing (COFDM)	Same as AIR-BR1410A-A-K9	
Media access protocol	Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA)	Same as AIR-BR1410A-A-K9	
Modulation	BPSK @ 6 and 9 Mbps, QPSK @ 12 and 18 Mbps, 16-QAM @ 24 and 36 Mbps, 64-QAM @ 48 and 54 Mbps	Same as AIR-BR1410A-A-K9	
Non-overlapping channels	4	Same as AIR-BR1410A-A-K9	
Receive sensitivity (10% PER with 3200byte packets)	6 Mbps: -83 dBm, 9 Mbps: -83 dBm,12 Mbps: -81 dBm, 18 Mbps: -80 dBm, 24 Mbps: -77 dBm, 36 Mbps: -74 dBm, 48 Mbps: -70 dBm, 54 Mbps: -68 dBm	Same as AIR-BR1410A-A-K9	
Maximum Operational Receive Level	-19 dBm	Same as AIR-BR1410A-A-K9	
Maximum Survivable Receive Level	0 dBm	Same as AIR-BR1410A-A-K9	
Available transmit power settings	250 mW (24 dBm), 200 mW (23 dBm), 155 mW (22 dBm), 125 mW (21 dBm), 60 mW (18 dBm), 30 mW (15 dBm), 15 mW (12 dBm) Maximum power setting will vary according to individual country regulations	Same as AIR-BR1410A-A-K9	
Point-to-point range1	7.5 miles (13 km) @ 54 Mbps, 16 miles (26 km) @ 9 Mbps	12 miles (19 km) @ 54 Mbps, 23 miles (37 km) @ 9 Mbps, (Antennas are 28 dBi dish)	
Point-to-multipoint range (sector antenna at root)2	2 miles (3 km) @ 54 Mbps, 8 miles (13 km) @ 9 Mbps	4 miles (7 km) @ 54 Mbps, 11 miles (18 km) @ 9 Mbps, (Non-root antenna is 28 dBi dish)	
Antenna	Captured Linear Polarization; 22.5dBi gain: 10 E-plane by 12 H-plane beamwidth	One N-Type connector for professional installations (antennas sold separately)	

Feature	AIR-BR1410A-A-K9	AIR-BR1410A-A-K9-N	Power Injector LR
Security	Cisco Wireless Security Suite, including: Authentication: 802.1x support including LEAP to yield mutual authentication and dynamic per-user, per-session encryption keys Encryption: Support for static and dynamic IEEE 802.11 WEP keys of 40 bits and 128 bits Pre-standard TKIP WEP enhancements: key hashing (per packet keying) and Message Integrity Check (MIC)	Same as AIR-BR1410A-A-K9	
SNMP compliance	v1 and v2	Same as AIR-BR1410A-A-K9	
Status LEDs	Four LEDs: Install, Radio, Status, Ethernet	Same as AIR-BR1410A-A-K9	Four LEDs: Power ON, Injector status, LAN Ethernet status, Bridge Ethernet status
RSSI port	BNC connector DC Voltage port (0VDC to 2.7 VDC)	BNC connector DC Voltage port (0VDC to 2.7 VDC)	NA
Uplink	100 Mbps over dual coaxial cables	100 Mbps over dual coaxial cables	10/100BaseT Ethernet
Configuration support	Telnet, HTTP, FTP, TFTP, SNMP	Telnet, HTTP, FTP, TFTP, SNMP	NA
Compliance	Standards: Safety: UL 60950, CSA C22.2 No. 60950-00, IEC 60950, EN 60950 Radio Approvals: FCC Part 15.207, 15.407, & 15.209 Class B, ICES-003 Class B (Canada), Canada DGTP-010, FCC Bulletin OET-65C, Industry Canada RSS-102, RSP100, RSS 210 Issue 5 EMI and Susceptibility (ClassB): FCC Part 15.107 & 15.109 Class B, ICES-003 Class B (Canada), EN 55022 Class B, EN 55024	Standards: Safety: UL 60950, CSA C22.2 No. 60950-00, IEC 60950, EN 60950, NEMA 4 Radio Approvals: FCC Part 15.207, 15.407, & 15.209 Class B, ICES-003 Class B (Canada), Canada DGTP-010, FCC Bulletin OET-65C, Industry Canada RSS-102, RSP100, RSS 210 Issue 5 EMI and Susceptibility (ClassB): FCC Part 15.107 & 15.109 Class B, ICES-003 Class B (Canada), EN 55022 Class B, EN 55024	Standards: Safety: UL 60950, CSA C22.2 No. 60950-00, IEC 60950, EN 60950 EMI and Susceptibility (ClassB): FCC Part 15.107 & 15.109 Class B, ICES-003 Class B (Canada), EN 55022 Class B, EN 55024
Dimensions	11.4in x 11.4in x 4.2in (29cm x 29cm x 11cm)	11.6in x 11.6in x 3.6in (29cm x 29cm x 9cm)	6.7in x 6.3in x 1.3in (17cm x 16cm x 3cm)
Weight	11 lbs. (5 kg)	10 lbs. (5 kg)	1.4lbs. (0.6kg)
Operational temperature	-30 to +55C (-22 to +131F)	Same as AIR-BR1410A-A-K9	0 to +50C (32 to 122F)
Storage temperature	-40 to +85C (-40 to +185F)	Same as AIR-BR1410A-A-K9	-40 to +70C (-40 to +158F)
Operational altitude	4206 m (13,800 ft.)	Same as AIR-BR1410A-A-K9	Same as AIR-BR1410A-A-K9
Storage altitude	4877 m (16,000 ft.)	Same as AIR-BR1410A-A-K9	Same as AIR-BR1410A-A-K9
Humidity	0 to 100% (condensing)	Same as AIR-BR1410A-A-K9	0 to 90% (non-condensing)
Vibration	0.001 G2/Hz from 5 - 100 Hz	Same as AIR-BR1410A-A-K9	Same as AIR-BR1410A-A-K9
Storage vibration	0.01 G2/Hz from 5 - 100 Hz	Same as AIR-BR1410A-A-K9	Same as AIR-BR1410A-A-K9
Enclosure	Aluminum with environmentally sealed plastic radome	NEMA-4, aluminum	Metal case
AC power	Not Required as uses DC voltage from Power Injector	Same as AIR-BR1410A-A-K9	100 to 240 VAC, +/- 10% (power supply)
DC power	48 VDC +/-2V	Same as AIR-BR1410A-A-K9	Same as AIR-BR1410A-A-K9
Warranty	One year	Same as AIR-BR1410A-A-K9	Same as AIR-BR1410A-A-K9

For More Information

See the Cisco Aironet Web site: **http://www.cisco.com/go/aironet**

Cisco Aironet 350 Series Workgroup Bridge

Designed to meet the needs of remote workgroups, satellite offices, and mobile users, the Cisco Aironet 350 Series Workgroup Bridge brings the freedom and flexibility of wireless connectivity to any Ethernet-enabled device.

When to Sell

Sell This Product	When a Customer Needs These Features
Cisco Aironet 350 Series Workgroup Bridge	• Connectivity to a network for remote workgroups located in an area that may be difficult or not practical for wiring • Provides in road to remote offices and branches

Key Features

- Supports WEP security architecture and provides up to 128-bit encryption
- Receive a single-session, single-user encryption key from the RADIUS server via the associated AP with a username and password stored statically or in dynamic memory within the workgroup bridge; Standards-based centralized security
- Easily connect up to eight devices; Driverless installation
- Based upon an IEEE 802.11x standard utilizing EAP
- Optimum wireless performance and range
- Full-featured utilities and robust management
- WiFi-Certified

Specifications

Feature	Cisco Aironet 350 Series Workgroup Bridge
Data Rates Supported	1, 2, 5.5, and 11 Mbps
Client Interface	10BaseT Ethernet
Clients Supported	Direct: One Via hub: Eight
Network Architecture Types	Infrastructure (via Cisco Aironet Access Point or Bridge)
Frequency Band	2.4 to 2.4897 GHz
Wireless Medium	Direct Sequence Spread Spectrum (DSSS)
Media Access Protocol	Carrier sense multiple access with collision avoidance (CSMA/CA)
Modulation	DBPSK @1 Mbps; DQPSK @ 2 Mbps; CCK @ 5.5 and 11 Mbps
Operating Channels	North America: 11; ETSI: 13; Japan: 14
Nonoverlapping Channels	Three
Receive Sensitivity	1 Mbps: -94 dBm; 2 Mbps: -91 dBm; 5.5 Mbps: -89 dBm; 11 Mbps: -85 dBm
Delay Spread	1 Mbps: 500 ns; 2 Mbps: 400 ns; 5.5 Mbps: 300 ns; 11 Mbps: 140 ns
Available Transmit Power Settings[1]	100 mW (20 dBm); 50 mW (17 dBm); 30 mW (15 dBm); 20 mW (13 dBm); 5 mW (7 dBm); 1 mW (0 dBm)
Range (typical)	Indoor: 130 ft (40 m) @ 11 Mbps; 350 ft (107 m) @ 1 Mbps Outdoor: 800 ft (244 m) @ 11 Mbps; 2000 ft (610 m) @ 1 Mbps
Compliance	Operates license free under FCC Part 15 and complies as a Class B device; complies with DOC regulations; complies with EN 300.328 standards
SNMP Compliance	MIB I and MIB II
Antenna	AIR-WGB352C: One nonremovable 2.2-dBi dipole AIR-WGB352R: Two RP-TNC connectors (antennas optional, none supplied with unit)
Encryption Key Length	AIR-WGB352x: 128-bit
Remote Configuration Support	Telnet, HTTP, FTP, TFTP, and SNMP
Dimensions (W x D x H)	6.30 in. (16 cm) x 4.72 in. (12 cm) x 1.45 in. (3.7 cm)
Weight	12.3 oz (350g)
Environmental	Temperature: 32° to 122° F (0° to 50° C); 10 to 90% (Noncondensing)
Input Power Requirements	North American: 120 VAC @ 60 Hz; Universal: 90 to 264 VAC @ 47 to 63 Hz

1. Maximum power setting will vary according to individual country regulations.

Selected Part Numbers and Ordering Information

Cisco Aironet 350 Series Workgroup Bridge

AIR-WGB352C	350 Series Workgroup Bridge with Captured Antenna & 128-bit WEP
AIR-WGB352R	350 Series Workgroup Bridge with Dual RP-TNC & 128-bit WEP

For More Information

See the Cisco Aironet Web site: **http://www.cisco.com/go/aironet**

Cisco Aironet 350 Series Wireless Bridge

The Cisco Aironet 350 Series Wireless Bridge enables high-speed long-range outdoor links between buildings and is ideal for installations subject to plenum rating and harsh environments. The 802.11b wireless bridge delivers high data rates and superior throughput for data-intensive, line-of-sight applications. The bridges connect hard-to-wire sites, noncontiguous floors, satellite offices, school or corporate campus settings, temporary networks, and warehouses.

When to Sell

Sell This Product	When a Customer Needs These Features
Cisco Aironet 350 Series Ethernet Bridge	• Any company who needs to connect sites into a single LAN, even when separated by obstacles such as freeways, railroads and bodies of water that are normally inaccessible via cabling. • Business owners who want a low-cost, easy-to-deploy solution for connecting line-of-sight networks located in different buildings or want multiple buildings on a campus to share a single high-speed line to the Internet • Any company who needs equipment for harsh indoor environments or outdoor NEMA enclosures • Increase revenue opportunity with site surveys and installations.

Key Features

- High-speed (11-Mbps), high-power (100-mW) radios, delivering building-to-building links of up to 25 miles (40.2 km)
- A metal case for durability and plenum rating and an extended operating temperature rating for harsh environments
- Supports both point-to-point and point-to-multipoint configurations allowing multiple sites to share a single, high-speed connection to the Internet
- Broad range of supported antennas
- Simplified installation, improved performance, and upgradeable firmware, ensuring investment protection
- Configurable as an access point
- Extended operating temperature range of -20° to 55° C

Specifications

Feature	Cisco Aironet 350 Series Wireless Bridge
Data Rates Supported	1, 2, 5.5, and 11 Mbps
Frequency Band	2.4 to 2.497 GHz
Wireless Medium	Direct Sequence Spread Spectrum (DSSS)
Media Access Protocol	Carrier sense multiple access with collision avoidance (CSMA/CA)
Modulation	DBPSK @1 Mbps; DQPSK @ 2 Mbps; CCK @ 5.5 and 11 Mbps
Operating Channels	North America: 11; ETSI: 13; Japan: 14
Nonoverlapping Channels	Three
Receive Sensitivity	1 Mbps: -94 dBm; 2 Mbps: -91 dBm; 5.5 Mbps: -89 dBm; 11 Mbps: -85 dBm
Delay Spread	1 Mbps: 500 ns; 2 Mbps: 400 ns; 5.5 Mbps: 300 ns; 11 Mbps: 140 ns
Available Transmit Power Settings[1]	100 mW (20 dBm); 50 mW (17 dBm); 30 mW (15 dBm); 20 mW (13 dBm); 5 mW (7 dBm); 1 mW (0 dBm)
Range[2]	18 miles (28.9 km) @ 11 Mbps; Up to 25 miles (40.2 km) @ 2 Mbps

Feature	Cisco Aironet 350 Series Wireless Bridge
Compliance	Operates license-free under FCC Part 15 and complies as a Class B device; complies with DOC regulations; complies with ETS 300.328, FTZ 2100, and MPT 1349 standards; complies with UL 2043 (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.)
SNMP Compliance	MIB I and MIB II
Antenna	Two RP-TNC connectors (antennas optional, none supplied with unit)
Encryption Key Length	128-bit
Security	128-bit WEP in bridge mode; IEEE 802.11x (includes EAP and RADIUS) in AP mode
Status Indicators	Three indicators on the top panel provide information concerning association status, operation, error/warning, firmware upgrade, and configuration, network/modem, and radio status
Automatic Configuration Support	BOOTP and DHCP
Remote Configuration Support	Telnet, HTTP, FTP, TFTP, and SNMP
Local Configuration	Direct console port (with supplied serial cable)
Bridging Protocol	Spanning Tree
Dimensions	6.74 x 6.25 x 1.31 in. (17.1 x 15.9 x 3.3 cm)
Weight	1.43 lbs (.648 kg)
Environmental	Temperature: -4× to 131× F (-20× to 55× C) 10 to 90% (noncondensing)
Enclosure	Metal case (for plenum rating); UL 2043 certified
Input Power Requirements	24VDC 10% to 60 VDC (Ethernet line power)

1. Maximum power setting will vary according to individual country regulations
2. Typical and contingent on antenna used

Selected Part Numbers and Ordering Information[1]

Cisco Aironet 350 Series Wireless Bridge

AIR-BR350-x-K9	350 Series 11Mbps DSSS Bridge with 128-bit WEP

Cisco Aironet 350 Series Wireless Bridge Basic Maintenance

CON-SNT-PKG2	SMARTnet Maintenance for AIR-BR350-A-K9

1. This is only a small subset of all parts available via URL listed under "For More Information." Some parts have restricted access or are not available through distribution channels.

For More Information

See the Cisco Aironet Web site: **http://www.cisco.com/go/aironet**

Cisco Aironet Antennas and Accessories

Every wireless LAN deployment is different. When engineering an in-building solution, varying facility sizes, construction materials, and interior divisions raise transmission and multipath considerations. Cisco has the widest range of antennas, cable, and accessories available from any wireless manufacturer. Cisco offers a complete range of 2.4 GHz and 5 GHz antennas for access point and bridge equipment that enable a customized wireless solution for almost any installation

Key Features

- Client Adapter Antennas—To extend the transmission range for more specialized applications, a variety of optional, higher-gain antennas are provided that are compatible with selected client adapters
- Access Point Antennas—Compatible with all Cisco RP-TNC-equipped access points; Available with different gain and range capabilities, beam widths, and form factors
- Bridge Antennas—Available in directional configurations for point-to-point transmission and omnidirectional configuration for point-to-multipoint implementations

- Low-loss cable extends the length between any Cisco Aironet bridge and the antenna. With a loss of 6.7 dB per 100 feet (30m), low-loss cable provides installation flexibility without a significant sacrifice in range
- Complete range of antennas for 5 GHz bridging applications

Specifications

Access Point Antennas

Feature	AIR-ANT5959	AIR-ANT2410Y-R	AIR-ANT2012	AIR-ANT3213
Description	Diversity omni-directional ceiling mount	Yagi mast or wall mount	Diversity patch wall mount	Pillar mount diversity omni
Application	Indoor unobtrusive antenna, best for ceiling mount. Excellent throughput and coverage solution in high multipath cells and dense user population	Indoor/Outdoor directional antenna for use with Access Points or Bridges	Indoor/Outdoor, unobtrusive medium range antenna	Indoor, unobtrusive medium-range antenna
Approximate Indoor Range[1]	6 Mbps: 295 ft (90 m) 54 Mbps: 88 ft (27 m)	6 Mbps: 548 ft (167 m) 54 Mbps: 165 ft (50 m)	6 Mbps: 418 ft (127 m) 54 Mbps: 126 ft (38 m)	6 Mbps: 379 ft (121 m) 54 Mbps: 114 ft (35 m)
Cable Length	3 ft. (0.91m)	3 ft. (0.91 m)	3 ft. (0.91m)	3 ft. (0.91m)
Dimensions	5.3 x 2.8 x 09. in. (13.5 x 7.1 x 2.3 cm)	7.25 x 5 in. (18.4 x 12.7 cm)	4.78 x 6.66 x .82 in. (12.14 x 16.92 x 2.08 cm)	10 x 1 in. (25.4 x 2.5 cm)
Weight	0.3 lbs. (0.14kg)	8 oz.	9.6 oz. (272g)	1 lb. (460g)

1. All range estimations are based on an integrated client adapter antenna associating with an access point under ideal indoor conditions. The distances referenced here are approximations and should be used for estimation only.

Access Point Antennas (cont.)

Feature	AIR-ANT1728	AIR-ANT4941	AIR-ANT3549	AIR-ANT1729
Description	High gain omnidirectional ceiling mount	2.2 dBi dipole antenna	Patch wall mount	Patch wall mount
Application	Indoor medium-range antenna, typically hung from crossbars of drop ceilings	Indoor omni-directional coverage	Indoor, unobtrusive, long-range antenna (may also be used as a medium-range bridge antenna)	Indoor, unobtrusive, medium-range antenna (may also be used as a medium-range bridge antenna)
Approximate Indoor Range[1]	6 Mbps: 379 ft (116 m) 54 Mbps: 114 ft (35 m)	6 Mbps: 300 ft (91 m) 54 Mbps: 90 ft (27 m)	6 Mbps: 507 ft (155 m) 54 Mbps: 153 ft (47 m)	6 Mbps: 403 ft (123 m) 54 Mbps: 121 ft (37 m)
Cable Length	3 ft. (0.91m)	N/A	3 ft. (0.91m)	3 ft. (0.91m)
Dimensions	Length: 9 in. (22.86 cm) Diameter: 1 in. (2.5 cm)	5.5 in. (14 cm)	5 x 5 in. (12.4 x 12.4 cm)	4 x 5 in. (9.7 x 13 cm)
Weight	4.6 oz. (131g)	1.1 oz. (31 g)	5.3 oz. (150g)	4.9 oz. (139g)

1. All range estimations are based on an integrated client adapter antenna associating with an access point under ideal indoor conditions. The distances referenced here are approximations and should be used for estimation only.

Access Point Antennas (Con.)

Feature	AIR-ANT5135D-R	AIR-ANT5145V-R	AIR-ANT5160V-R
Application	Indoor omnidirectional coverage	Indoor medium-range antenna	Indoor medium-range antenna
Gain	3.5 dBi	4.5 dBi	6 dBi
Approximate Range[1]	6 Mbps: 675 ft (206 m) 54 Mbps: 75 ft (21 m)	6 Mbps: 732 ft (223 m) 54 Mbps: 82 ft (25 m)	6 Mbps: 822 ft (251 mm) 54 Mbps: 92 ft (28 m)
Beam Width	360 degrees H 40 degrees E	360 degrees H 50 degrees E	360 degrees H 17 degrees E
Cable Length	N/A	3 ft. (0.91 m)	3 ft. (0.91 m)
Dimensions	5 1/3" x 0.6"	6 3/4" x 4.2"	12" length x 1" diameter
Weight	1 oz	11.5 oz	5.3 oz

1. All range estimations are based on an integrated client adapter antenna associating with an access point under ideal indoor conditions. The distances referenced here are approximations and should be used for estimation only.

Bridge Antennas

Feature	AIR-ANT2506	AIR-ANT24120	AIR-ANT2414S-R	AIR-ANT1949	AIR-ANT3338
Description	Omnidirectional Mast mount	High-gain omnidirectional Mast mount	Vertically polarized sector; -15 dBc, 0 to 30°; Declination lower; side lobe null fill; Mast mount	Yagi mast mount	Solid dish
Application	Outdoor short-range point-to-multipoint applications	Outdoor medium-range point-to-multipoint applications	Outdoor long range point-to-multipoint applications	Outdoor medium-range directional connections	Outdoor long-range directional connections

Feature	AIR-ANT2506	AIR-ANT24120	AIR-ANT2414S-R	AIR-ANT1949	AIR-ANT3338
Approximate Indoor Range[1]	2 Mbps: 3.3 miles (5.31 km)	2 Mbps: 15.81 miles (25.43 km)	2 Mbps: 16.71 miles (26.89 km)	2 Mbps: 18.33 miles (29.49 km)	2 Mbps: 26.49 miles (42.62 km)
	11 Mbps: 1.66 miles (2.66 km)	11 Mbps: 7.92 miles (12.75 km)	11 Mbps: 8.89 miles (14.30 km)	11 Mbps: 11.19 miles (18.01 km)	11 Mbps: 20.1 miles (32.33 km)
	54 Mbps: .21 miles (.34 km)	54 Mbps: 1.0 miles (1.6 km)	54 Mbps: 1.26 miles (2.02 km)	54 Mbps: 1.41 miles (2.27 km)	54 Mbps: 4.46 miles (7.17 km)
Cable Length	3 ft. (0.91m)	1 ft. (0.30m)	5 ft (3 m)	1.5 ft. (0.46m)	2 ft. (0.61m)
Dimensions	Length: 13 in. (33 cm)	Length: 42 in. (103 cm)	Length: 36 in. (91 cm)	Length: 18 in. (46 cm)	Diameter 24 in. (61 cm)
	Diameter: 1 in. (2.5 cm)	Diameter: 1.5 in. (3 cm)	Width: 6 in. (15 cm)	Diameter: 3 in. (7.6 cm)	
Weight	6 oz. (17g)	1.5 lb. (0.68 kg)	6.5 lb. (3 kg)	1.5 lb. (0.68 kg)	11 lb. (5 kg)

1. All range estimations are based on an integrated client adapter antenna associating with an access point under ideal indoor conditions. The distances referenced here are approximations and should be used for estimation only.

Low-Loss/Ultra Low-Loss Antenna Cable

Feature	AIR-CAB020LL-R	AIR-CAB050LL-R	AIR-CAB100ULL-R	AIR-CAB150ULL-R
Cable Length	20 ft. (6m)	50 ft. (15m)	100 ft. (30m)	150 ft. (46m)
Transmission Loss	1.3 dB	3.4 dB	4.4 dB	6.6 dB

Cisco Aironet Accessories

Feature	AIR-ACC2537-060	AIR-ACC3354 AIR-ACC2537-060	AIR-ACC245LA-R AIR-ACC3354
Description	60 in. (152 cm) bulkhead extender	Lightning arrestor 60 in. (152 cm) bulkhead extender	Yagi articulating mount
Application	Flexible antenna cable that extends access point cabling typically within an enclosure	Helps prevent damage due to lightning-induced surges or static electricity; Flexible antenna cable that extends access point cabling typically within an enclosure	Helps prevent damage due to lightning-induced surges or static electricity; Helps prevent damage due to lightning-induced surges or static electricity

Cisco Aironet 1400 Wireless Bridge Antennas (5 GHz)

Feature	AIR-ANT58G9VOA-N	AIR-ANT58G10SSA-N	AIR-ANT58G28SDA-N
Description	Omni-directional Mast mount	Sector antenna Mast mount	Dish antenna Mast mount
Application	Outdoor short-range point-to-multipoint applications	Outdoor medium-range point-to-point and point-to-multipoint applications	Outdoor long-range directional connections
Gain (including supplied jumper cable)	9.0 dBi	9.5 dBi	28.0 dBi
Polarization	Vertical	Vertical or horizontal Field configurable	Vertical or horizontal Field configurable
Elevation adjustment	None	None	+/- 12.5 degrees
Approximate range at 9 Mbps6	8 miles (13 km) (with 22.5 dBi captive antenna on the remote site)	Same as AIR-ANT58G9VOA-N	23 miles (37 km) (with 28 dBi antennas on each end)
Approximate range at 54 Mbps6	2 miles (3 km) (with 22.5 dBi captive antenna on the remote site)	Same as AIR-ANT58G9VOA-N	12 miles (19 km) (with 28 dBi antennas on each end)
Beam width	360 H, 6 V	60 H, 60 V	5.7 H, 6 V
Supplied jumper cable length	4.9 ft. (1.5 m)	Same as AIR-ANT58G9VOA-N	Same as AIR-ANT58G9VOA-N
Dimensions	Length: 18 in. (46 cm) Diameter: 1 in. (2.5 cm)	Length: 2.5 in. (6.4 cm) Width: 2.5 in. (6.4 cm) Depth: 1.75 in. (4.5 cm)	Diameter: 29 in. (74 cm) Depth: 14.5 in. (36.8 cm)
Weight	2.0 lb. (0.9 kg)	1.25 lb. (0.6 kg)	9.5 lb. (4.3 kg)

Cisco Aironet Bridge Accessory

Feature	AIR-ACCRWM1400	AIR-ACCBRGB=	AIR-ACCMFM1400=
Description	Roof/Wall mount kit	Grounding block	Multifunction mount
Application	Allows mounting to flat surfaces Includes full elevation and azimuth adjustment	Helps prevent damage due to lightning-induced surges or static electricity	Allows mounting to poles with a diameter between 1.5 in. and 2.5 in. Includes both elevation and polarization adjustment

Cisco Aironet Power Injector Cables

Feature	AIR-CAB020DRG6-F=	AIR-CAB050DRG6-F=	AIR-CAB100DRG6-F
Cable length	20 ft. (6m)	50 ft. (15m)	100 ft. (30m)

Selected Part Numbers and Ordering Information[1]

Cisco Aironet Accessories	
AIR-ACC2662	Yagi Antenna Articulating Mount
AIR-ACC3354	Lightning Arrestor w/ grounding ring
AIR-CAB020LL-R	20 ft. (6m) low-loss antenna cable
AIR-CAB050LL-R	50 ft. (15m) low loss antenna cable
AIR-CAB100ULL-R	100 ft. (30m) low loss antenna cable
AIR-CAB150ULL-R	150 ft. (46m) low loss antenna cable
Cisco Aironet Antennas	
AIR-ANT1728	5.2 dBi Omni Ceiling Mount Antenna
AIR-ANT1729	6 dBi Patch Wall Mount Antenna
AIR-ANT1949	13.5 dBi Yagi Mast Mount Antenna
AIR-ANT2012	6.5 dBi Diversity Patch Wall Mount Antenna
AIR-ANT2506	5.2 dBi Omnidirectional Mast Mount Antenna
AIR-ANT3195	3 dBi Patch Wall Mount Antenna
AIR-ANT3213	5.2 dBi Pillar-Mount Diversity Omni Antenna
AIR-ANT3338	21 dBi Solid Dish Antenna
AIR-ANT3351	2.2 dBi POS Diversity Dipole Antenna
AIR-ANT3549	8.5 dBi Hemispherical Patch Antenna
AIR-ANT24120	12 dBi Omnidirectional Mast Mount Antenna
AIR-ANT4941	2.2 dBi Dipole Antenna (Standard Rubber Duck)
AIR-ANT5959	2.0dBi Diversity Omni Ceiling Mount Antenna
AIR-ANT2414S-R	14dBi Sector Mast Mount Antenna
AIR-ANT5135	3.5 dBi dipole antenna
AIR-ANT5145	4.5 dBi omni
AIR-ANT5160	6 dBi omni

1. This is only a small subset of all parts available via URL listed under “For More Information.” Some parts have restricted access or are not available through distribution channels. Resellers: For latest part number and pricing info, see the *Distribution Product Reference Guide* at: http://www.cisco.com/dprg (limited country availability).

For More Information

See the Aironet Antennas & Accessories Web site **http://www.cisco.com/go/antenna**