CISCO SYSTEMS

CISCO AIRONET 802.11A/B/G WIRELESS CARDBUS ADAPTER

The Cisco® Aironet® 802.11a/b/g Wireless CardBus Adapter provides high-performance 54-Mbps connectivity in the 2.4- and 5-GHz bands.

Whether configured to support single 802.11b coverage, single 802.11g coverage, single 802.11a coverage, dual-mode 802.11a/g coverage, or trimode 802.11a/b/g coverage, the Cisco Aironet 802.11a/b/g Wireless CardBus Adapter is Wi-Fi-compliant and combines the freedom of wireless connectivity with 802.11i/Wi-Fi Protected Access 2 (WPA2) encryption for the performance, security, and manageability that businesses require (Figure 1).

Figure 1. The Cisco Aironet 802.11a/b/g Wireless CardBus Adapter

ENTERPRISE-CLASS SECURITY SOLUTION

Designed with enterprise-class security requirements in mind, the Cisco Aironet 802.11a/b/g Wireless CardBus Adapter uses the 802.1X standard for port-based network access. A full array of Extensible Authentication Protocol (EAP) types for user-based authentication, together with enterprise-caliber Advanced Encryption Standard (AES) encryption, provide full 802.11i support. The adapter supports WPA2—the Wi-Fi Alliance certification for interoperable, standards-based wireless LAN security.

The Cisco Aironet 802.11a/b/g Wireless CardBus Adapter supports the most common 802.1X authentication types, including EAP-Flexible Authentication via Secure Tunneling (EAP-FAST), Cisco LEAP, EAP-Transport Layer Security (EAP-TLS), Protected Extensible Authentication Protocol-Generic Token Card (PEAP-GTC), and PEAP-Microsoft Challenge Handshake Authentication Protocol version 2 (PEAP-MSCHAPv2). A wide selection of RADIUS servers, such as the Cisco Secure Access Control Server (ACS) and Cisco Access Registrar server, can be used for enterprise-class centralized user management that includes:

- Strong, mutual authentication to help ensure that only legitimate clients associate with legitimate and authorized network RADIUS servers via authorized access points
- Dynamic per-user, per-session encryption keys that automatically change on a configurable basis to protect the privacy of transmitted data
- Stronger encryption keys provided by Temporal Key Integrity Protocol (TKIP) enhancements such as message integrity check (MIC), per-packet keys via initialization vector hashing, and broadcast key rotation
- RADIUS accounting records for all authentication attempts
- IEEE 802.11i/WPA2 AES support

For more information on wireless security, visit http://www.cisco.com/go/aironet/security.

ENHANCED CLIENT NETWORK MANAGEMENT FEATURES

A new and improved set of client utilities includes the Cisco Aironet Desktop Utility, System Tray Utility, and Client Administration Utility. Together, these utilities provide an intuitive graphical user interface (GUI) for easy configuration, monitoring, and management of the Cisco Aironet 802.11a/b/g Wireless CardBus Adapter. Enhanced client network management features include:

- Profile manager—Allows users to create specific profile settings for various environments, making it simple for telecommuters and business travelers to move from one environment to another (Figure 2).
- Customized profile settings—Lets users individually select the channel, service set identifier (SSID), Wired Equivalent Privacy (WEP) key, and authentication method for different locations.
- Cisco LEAP authentication status screen—Provides status updates regarding the Cisco LEAP authentication process.
- Auto-selection of profiles, including those configured for EAP authentication, provides automatic selection of established profiles without requiring storage of the EAP username and password in the profile.
- System tray icon—Provides easy access to wireless LAN connection information and one-click access to common actions such as manual selection a profile or turning the radio on or off.
- Cisco Aironet Client Monitor—Provides a subset of Cisco Aironet Desktop Utility features, such as status information about the client adapter and access to basic tasks (selecting a profile, for example). This application runs from the system tray icon.
- Troubleshooting utility—Provides step-by-step details on the process of connecting to an access point, as well as highlights on why a connection failed (Figure 3).
- Support for the most popular enterprise operating systems—Windows XP and Windows 2000.

Figure 2. Cisco Aironet Desktop Utility (Profile Management) Screen
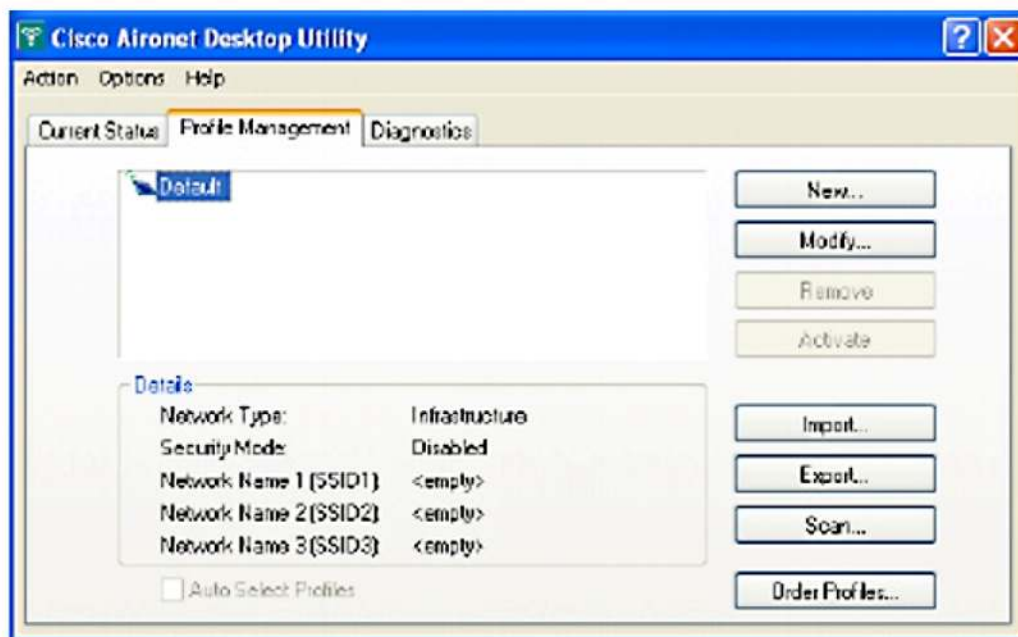
A Cisco Aironet Client Adapter installation wizard for Windows is provided for easy installation of the client firmware, drivers, and utilities. The wizard offers several installation offers—install client utilities and driver; install driver only; or make driver installation diskette(s). For ease of use, the installation wizard image file is a self-extracting (.exe) file.

Figure 3. Troubleshooting Utility Screen
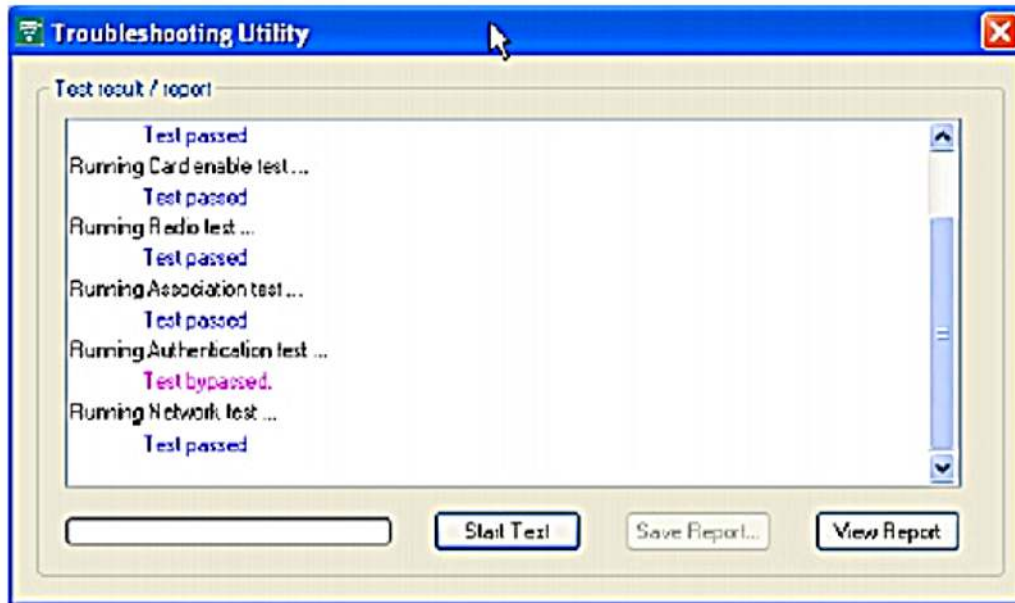
FEATURES AND BENEFITS

Table 1 lists the features and benefits of the Cisco Aironet 802.11a/b/g Wireless CardBus Adapter.

Table 1. Product Features and Benefits

Feature	Benefit
Cisco Wireless Security Suite	IEEE 802.1X support, including Cisco LEAP, PEAP-GTC, PEAP-MSCHAPv2, and EAP-TLS for mutual authentication with dynamic per-user, per-session encryption keys via TKIP enhancements. Full support for WPA. Ready for IEEE 802.11i/WPA2 AES support.
Enhanced Client Network Management Features	Bundled with comprehensive, easy-to-use client network management utilities to provide a secure, intuitive, and convenient way to manage and configure the adapter.
Cisco LEAP Single Sign-on	Convenient option to use login credentials for LEAP sign-on on the user's network, eliminating the need to enter a second set of credentials.
Site Survey Utility	The site survey utility can assist in conducting site surveys, as well as troubleshooting existing RF wireless LANs. The utility operates at the RF level and is used to determine the best placement and coverage (overlap) for the network's infrastructure devices.
Cisco Wireless Domain Services (WDS)	Cisco WDS is a collection of Cisco IOS® Software features that enhance wireless LAN client mobility and simplify wireless LAN deployment and management. Cisco WDS includes radio management aggregation, fast secure roaming, client tracking, and WAN link remote site survivability.
Fast Secure Roaming	Allows authenticated client devices to roam securely from one access point to another, within or across subnets, without any perceptible delay during reassociation. Provides support for latency-sensitive applications such as voice over IP (VoIP), enterprise resource planning (ERP), and Citrix.

PRODUCT SPECIFICATIONS

Table 2 lists product specifications for the Cisco Aironet 802.11a/b/g Wireless CardBus Adapter.

Table 2. Product Specifications

Feature	Description
Part Numbers	• AIR-CB21AG-A-K9 • AIR-CB21AG-E-K9 • AIR-CB21AG-J-K9 • AIR-CB21AG-P-K9 • AIR-CB21AG-W-K9 • AIR-CB21AG-A-K9-40 (40-unit bulk pack) *Regulatory domains:* • A=Americas • E=ETSI • J=TELEC (Japan) • P=Japan2 • W=Rest-of-world Customers are responsible for verifying approval for use in their individual countries. Please see http://www.cisco.com/go/aironet/compliance to verify approval and to identify the regulatory domain that corresponds to a particular country.
Form Factor	CardBus Type II
Interface	• 32-bit CardBus with standard 68-pin connector • PC-Card Rev. 7.0-compliant
Data Rates Supported	1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54 Mbps
Network Standard	IEEE 802.11a/b/g
Operating Voltage	3.3V (±0.3V)
LED	Status (green) and Activity (amber)
Media Access Protocol	Carrier-Sense Multiple Access with Collision Avoidance (CSMA/CA)
Wireless Medium	*802.11g:* • Direct Sequence-Spread Spectrum (DSSS) and Orthogonal Frequency Divisional Multiplexing (OFDM) *802.11a:* • OFDM
Modulation	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 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

Feature	Description			
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) • 5.47 to 5.725 (ETSI) • 5.15 to 5.25 GHz (Japan)			
Delay Spread	• 350 ns @ 1 Mbps • 300 ns @ 2 Mbps • 200 ns @ 5.5 Mbps • 400 ns @ 6 Mbps • 250 ns @ 9 Mbps • 130 ns @ 11 Mbps • 250 ns @ 12 Mbps • 220 ns @ 18 Mbps • 160 ns @ 24 Mbps • 100 ns @ 36 Mbps • 90 ns @ 48 Mbps • 70 ns @ 54 Mbps			
Receive Sensitivity 802.11g (typical)	• −94 dBm @ 1 Mbps • −93 dBm @ 2 Mbps • −92 dBm @ 5.5 Mbps • −86 dBm @ 6 Mbps • −86 dBm @ 9 Mbps • −90 dBm @ 11 Mbps • −86 dBm @ 12 Mbps • −86 dBm @ 18 Mbps • −84 dBm @ 24 Mbps • −80 dBm @ 36 Mbps • −75 dBm @ 48 Mbps • −71 dBm @ 54 Mbps			
Receive Sensitivity 802.11a (typical)	*5150 to 5250 MHz* • −87 dBm @ 6 Mbps • −87 dBm @ 9 Mbps • −87 dBm @ 12 Mbps • −87 dBm @ 18 Mbps • −82 dBm @ 24 Mbps • −79 dBm @ 36 Mbps • −74 dBm @ 48 Mbps • −72 dBm @ 54 Mbps	*5250 to 5350 MHz* • −89 dBm @ 6 Mbps • −89 dBm @ 9 Mbps • −89 dBm @ 12 Mbps • −85 dBm @ 18 Mbps • −82 dBm @ 24 Mbps • −79 dBm @ 36 Mbps • −74 dBm @ 48 Mbps • −72 dBm @ 54 Mbps	*5725 to 5805 MHz* • −84 dBm @ 6 Mbps • −84 dBm @ 9 Mbps • −84 dBm @ 12 Mbps • −83 dBm @ 18 Mbps • −82 dBm @ 24 Mbps • −79 dBm @ 36 Mbps • −72 dBm @ 48 Mbps • −65 dBm @ 54 Mbps	*5.470 to 5.725 GHz* • −87 dBm @ 6 Mbps • −87 dBm @ 9 Mbps • −87 dBm @ 12 Mbps • −87 dBm @ 18 Mbps • −82 dBm @ 24 Mbps • −79 dBm @ 36 Mbps • −74 dBm @ 48 Mbps • −72 dBm @ 54 Mbps

Feature	Description		
Available Transmit Power Settings (Maximum power setting will vary according to individual country regulations.)	802.11b/g: • 20 dBm (100 mW) @ 1, 2, 5.5, and 11 Mbps • 18 dBm (63 mW) @ 1, 2, 5.5, 6, 9, 11, 12, 18, and 24 Mbps • 17 dBm (50 mW) @ 1, 2, 5.5, 6, 9, 11, 12, 18, 24, and 36 Mbps • 15 dBm (30 mW) @ 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, and 48 Mbps • 13 dBm (20 mW) @ 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps • 10 dBm (10 mW) @ 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps	802.11a: • 16 dBm (40 mW) @ 6, 9, 12, 18, and 24 Mbps • 14 dBm (25 mW) @ 6, 9, 12, 18, 24, and 36 Mbps • 13 dBm (20 mW) @ 6, 9, 12, 18, 24, 36, 48, and 54 Mbps • 11 dBm (13 mW) @ 6, 9, 12, 18, 24, 36, 48, and 54 Mbps • 10 dBm (10 mW) @ 6, 9, 12, 18, 24, 36, 48, and 54 Mbps	

Power Consumption Steady State		*Transmit:*	*Receive:*	*Standby:*
	802.11a	554 mA maximum	318 mA maximum	203 mA average
	802.11b	539 mA maximum	327 mA maximum	203 mA average
	802.11g	530 mA maximum	282 mA maximum	203 mA average

| **Range**

(Typical with Cisco Aironet 802.11a/b/g Wireless CardBus Adapter at maximum transmit power communicating with a Cisco Aironet 1231 Access Point configured with a 2.2-dBi dipole antenna for 802.11b/g, and a 6-dBi gain patch for 802.11a.) | *Indoor* (typical)
54 Mbps
18 Mbps
11 Mbps
6 Mbps
1 Mbps | *802.11a*
45 ft (13 m)
110 ft (33 m)
165 ft (50 m) | *802.11b/g*
90 ft (27 m)
180 ft (54m)
160 ft (48 m)
300 ft (91 m)
410 ft (124 m) |
| | *Outdoor* (typical)
54 Mbps
18 Mbps
11 Mbps
6 Mbps
1 Mbps | *802.11a*
100 ft (30 m)
600 ft (183 m)
1000 ft (304 m) | *802.11b/g*
250 ft (76 m)
600 ft (183 m)
1000 ft (304 m)
1300 ft (396 m)
2000 ft (610 m) |

Compliance			
Safety	• UL 60950 • CSA 22.2 No. 60950 • IEC 60950 • EN 60950		
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) • TELEC 33 and 66 (Japan) AS/NZS 3548 (Australia and New Zealand)		

Feature	Description
EMI and Susceptibility (Class B)	• FCC Part 15.107 and 15.109 • ICES-003 (Canada) • VCCI (Japan) • EN 301.489-1 and -17 (Europe)
Other	• IEEE 802.11a/b/g • Cisco Compatible Wireless (based on Cisco Compatible Extensions v1.0 and v2.0) • Wi-Fi • WHQL • FCC Bulletin OET-65C • RSS-102
Power Management	Power management levels available: • CAM (Constantly Awake Mode) • Fast PSP (Power Save Mode) • Max PSP (Maximum Power Savings)
Antenna	Integrated dual-band 2.4/5-GHz, 1-dBi, effective-gain antenna on a two-meter cable
Security Architecture Client Authentication	Cisco Wireless Security Suite supporting WPA and WPA2, including: *Authentication* • 802.1X support, including Cisco LEAP, EAP-FAST, PEAP-GTC, PEAP-MSCHAPv2), and EAP-TLS 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-Counter Mode with Cipher Block Chaining Message Authentication Code Protocol (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 and 128 bits
Drivers	Microsoft Windows XP and Windows 2000
Dimensions (WxDxH)	2.05 in. (52.08 mm) x 4.46 in. (113.35 mm) x 0.19 in. (4.80 mm)
Weight	1.6 oz (44.0 g)
Environmental	*Nonoperating (storage) temperature:* • 0 to 85°C *Operating temperature:* • 0 to 70°C *Humidity (noncondensing):* • 10 to 90 percent
Warranty	One year
Wi-Fi Certification	

SYSTEM REQUIREMENTS

Table 3 lists system requirements for the Cisco Aironet 802.11a/b/g Wireless CardBus Adapter.

Table 3.   System Requirements

Features	Description
Compatible Interface	32-bit CardBus with standard 68-pin connector
Supported Operating Systems	Microsoft Windows XP and Windows 2000

ORDERING INFORMATION

Table 4 lists ordering information for the Cisco Aironet 802.11a/b/g Wireless CardBus Adapter. To place an order, visit the Cisco Ordering Website at http://www.cisco.com/en/US/ordering/index.shtml.

Table 4.   Ordering Information

Product Name	Part Number
AIR-CB21AG-A-K9	Cisco Aironet 802.11a/b/g CardBus Adapter; FCC configuration
AIR-CB21AG-A-K9-40	Cisco Aironet 802.11a/b/g CardBus Adapter; FCC configuration (40-pack)
AIR-CB21AG-E-K9	Cisco Aironet 802.11a/b/g CardBus Adapter; ETSI configuration
AIR-CB21AG-J-K9	Cisco Aironet 802.11a/b/g CardBus Adapter; TELEC configuration
AIR-CB21AG-W-K9	Cisco Aironet 802.11a/b/g CardBus Adapter; rest-of-world configuration

SERVICE AND SUPPORT

Cisco offers a wide range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you protect your network investment, optimize network operations, and prepare your network for new applications to extend network intelligence and the power of your business. For more information about Cisco services, visit Cisco Technical Support Services or Cisco Advanced Services.

FOR MORE INFORMATION

For more information about the Cisco Aironet 802.11a/b/g Wireless CardBus Adapter, visit http://www.cisco.com/go/wireless or contact your local account representative.

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