

IEEE802.11b/g WLAN CardBus Adapter

User's Manual

Version 1.0

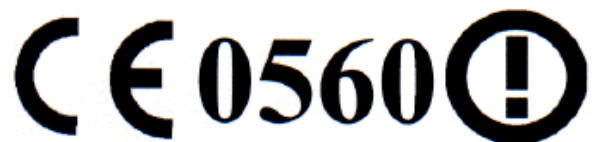
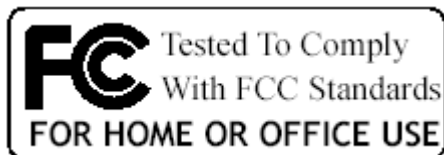


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INFORMATION TO USER

REGULATION INFORMATION

The WLAN 11g CardBus Adapter must be installed and used in strict accordance with the manufacturer's instructions. This device complies with the following radio frequency and safety standards.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Installation and use of this Wireless LAN device must be in strict accordance with the instructions included in the user documentation provided with the product. Any changes or modifications (including the antennas) made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment. The manufacturer is not responsible for any radio or television interference caused by unauthorized modification of this

device, or the substitution of the connecting cables and equipment other than manufacturer specified. It is the responsibility of the user to correct any interference caused by such unauthorized modification, substitution or attachment. Manufacturer and its authorized resellers or distributors will assume no liability for any damage or violation of government regulations arising from failing to comply with these guidelines.

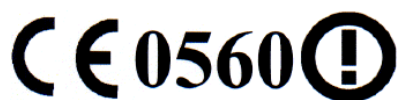
FCC Radiation Exposure Statement : This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure Compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Your device contains a low power transmitter. When device is transmitted it sends out Radio Frequency (RF) signal.

Use only with supplied antenna. Unauthorized antenna, modification, or attachments could damage the transmitter and may violate FCC regulations.

CE Declaration of Conformity

For the following equipment : WLAN 11g CardBus Adapter



Is herewith confirmed to comply with the requirements set out in the Council (European parliament) Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility of Radio and Telecom device (1999/5/EC). For the evaluation regarding this Directive, the following standards were applied:

- EN 300 328 V1.4.1: April 2003,
- EN 301 489-1 V1.4.1: August 2002, EN 301 489-17 V1.2.1: August 2002
- EN 60950-1:2001
- EN 50371: 14 June 2002

WLAN 11g CardBus Adapter is limited in Ch1~Ch11 by specified firmware controlled in U.S.A.

The channel identifiers, channel center frequencies, and regulatory domains of each 22-MHz-wide channel are shown in following Table.

Channel Identifier	Center Frequency (MHZ)	Regulatory Domains					
		Japan	ETSI	North America	Israel	France	Mexico
1	2412	✓	✓	✓			
2	2417	✓	✓	✓			
3	2422	✓	✓	✓	✓		
4	2427	✓	✓	✓	✓		
5	2432	✓	✓	✓	✓		
6	2437	✓	✓	✓	✓		
7	2442	✓	✓	✓	✓		
8	2447	✓	✓	✓	✓		
9	2452	✓	✓	✓	✓		
10	2457	✓	✓	✓		✓	✓
11	2462	✓	✓	✓		✓	✓
12	2467	✓	✓			✓	
13	2472	✓	✓			✓	
14	2484	✓					

1 Introduction

Thank you for your purchase of the WLAN CardBus Adapter. Featuring wireless technology, this wireless networking solution has been designed for both large and small businesses, and it is scalable so that you can easily add more users and new network features depending on your business scale.

FEATURES

- Support for Microsoft Windows 98SE, Me, 2000, XP and Linux.
- Operating distance of up to 300 meters in free space.
- IEEE 802.11b: 1, 2, 5.5, 11Mbps selectable data rate.
- IEEE 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps.
- Support 40-bit or 104-bit WEP, WPA, WPA-PSK, EAP/LEAP, CCX (EAP/LEAP), WPA2-PSK, 802.1x EAP/TLS and 802.1x PEAP security types.
- Easy operation and setting up.

SYSTEM REQUIREMENTS

- Windows System: Windows 98SE, Me, 2000 or XP.
- PCs must have a device driver installed. It allows you to communicate with WLAN CardBus Adapter.

2 Wireless LAN Basics

Wireless LAN network defined by IEEE 802.11b/g standard committee could be Configure as:

- **Ad Hoc wireless LAN**, or
- **Infrastructure wireless LAN**.

Ad Hoc network is a group of notebooks with wireless LAN adapter, called a BSS (Basic Service Set). These notebooks use their wireless LAN adapter to communicate with each other directly.

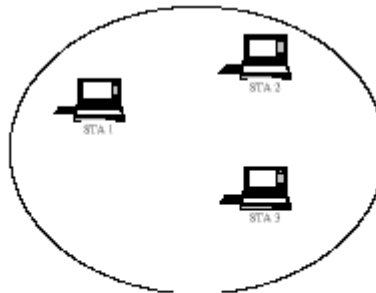


Figure 2-1 Ad Hoc wireless network

The most obvious differentiation between **Infrastructure** wireless network and **Ad Hoc** wireless network is that the notebooks in **Infrastructure** wireless network can make use of the resource in the Internet through **Access Point**.

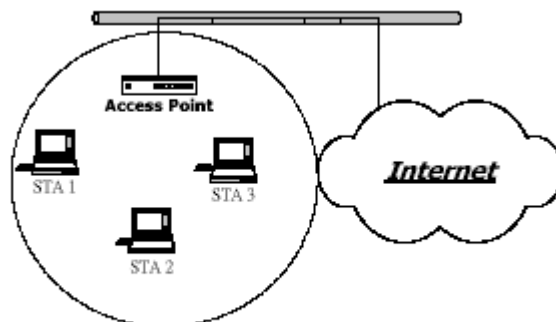


Figure 2-2 Infrastructure wireless network

To set up your notebook's network as the type of "**Ad Hoc**" or "**Infrastructure**" wireless network depends completely on your requirement. Generally, if your network environment has an **Access Point**, it's recommend that you set it as "**Infrastructure**" mode to connect to the **Internet**.

3 IP Address

To use the WLAN CardBus Adapter with a computing device, the WLAN CardBus Adapter must be equipped with a CardBus Interface. All drivers and supporting software for the WLAN CardBus Adapter must be installed and configured first.

Ask your system administrator for the following information, which you may need to provide during driver installation:

- Your Wireless Client Name.
- Your Wireless SSID.
- Your computer's unique client name and workgroup name.
- For your network account, your user name and password.
- Your IP address, gateway address, and subnet mask if you're not using a DHCP server.

Any computer on a network is identified by a unique network address. There are two methods to assign a network address to a computer on a TCP/IP network:

- Static IP addressing.
- Dynamic IP addressing (DHCP).

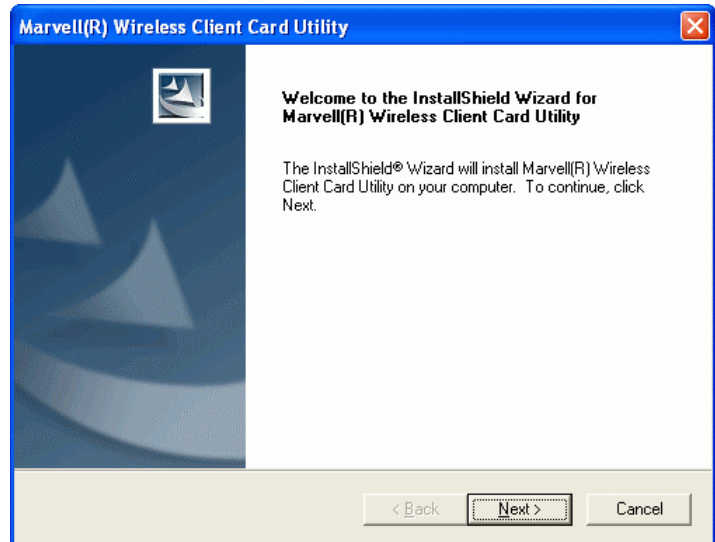
In network with static IP addressing, the network administrator manually assigns an IP address to each computer. Once a static IP address is assigned, a computer uses the same IP address every time it reboots and logs on to the network. You may manually change the IP address in the [Network Properties dialog box](#). Network using static IP address is easy to set up and do not require additional network management software.

In network with dynamic IP addressing, a DHCP server in the network dynamically assigns IP addresses to all clients every time they log on to the network. Network using dynamic IP address requires setting up and running a DHCP Server.

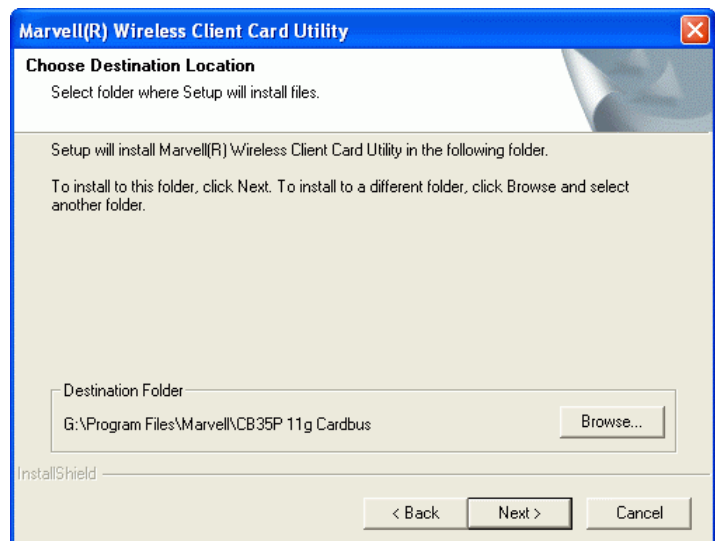
4 Install Drivers and Utility

The installation & driver CD will automatically activate the autorun installation program after you put the CD into your CD drive.

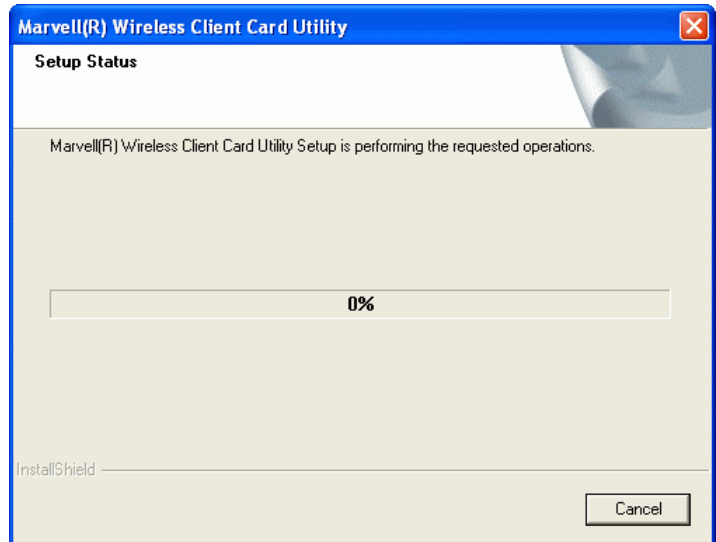
Step 1. Insert the installation & driver CD into your CD-ROM, It will auto run installation program. The Welcome dialog will be displayed, please click **Next** to continue.



Step 2. Click “**Next**” to install at the designated folder. Or, click “**Browse**” to select different folder.



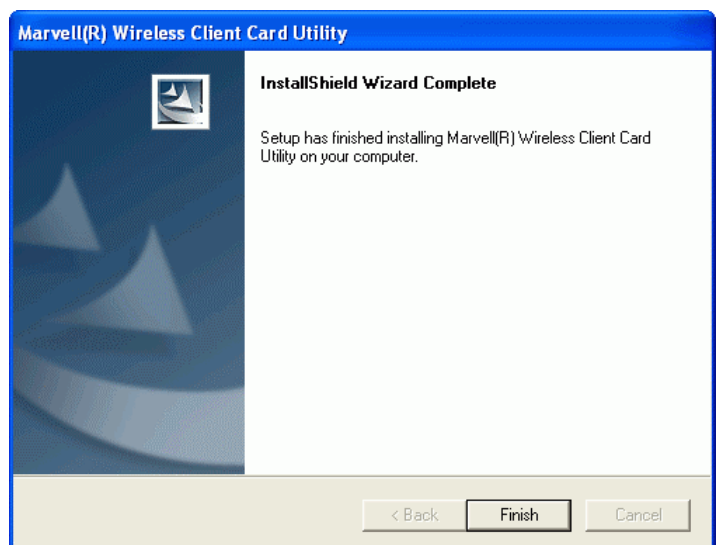
Step 3. Start copying files until it finishes the installation.



Step 4. A dialog box appears warning the software has not passed Windows compatibility testing. Please select **Continue Anyway** to install the device driver.



Step 5. Click "**Finish**" to complete the installation.



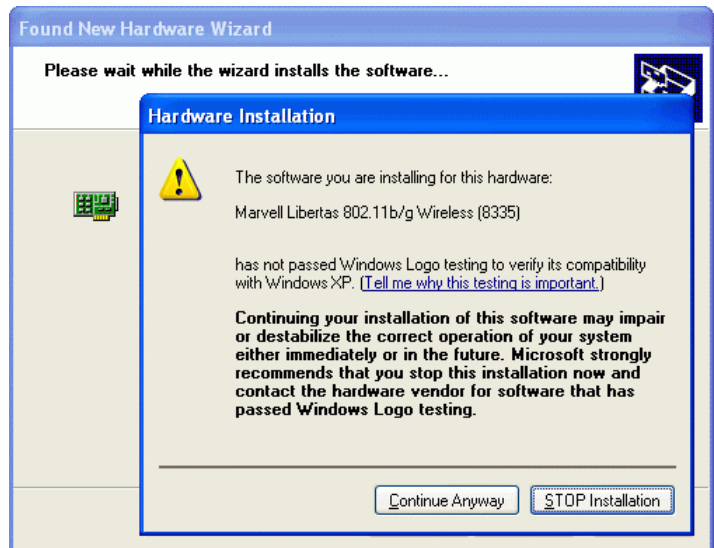
Step 6. After you install the Utility, insert the Cardbus adapter into the PCMCIA slot of your PC, apply just enough pressure to make sure it is fully seated.

Windows will automatically detect the adapter, open a **Found New Hardware Wizard** dialog box.

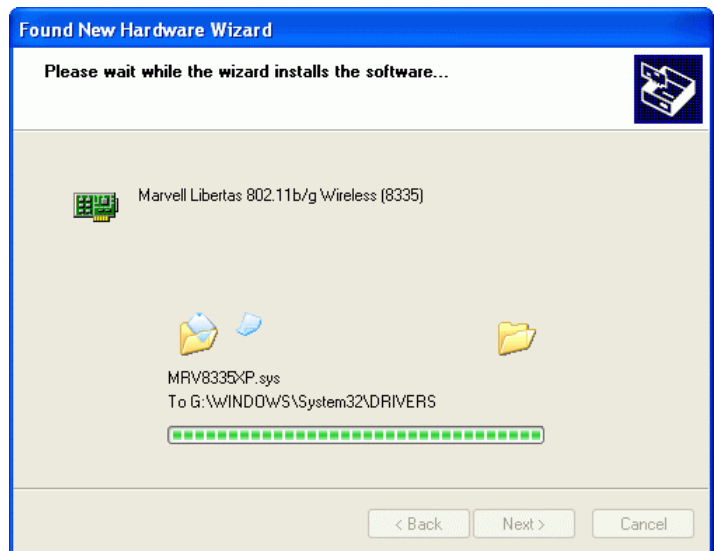
Please click **Next** to continue.



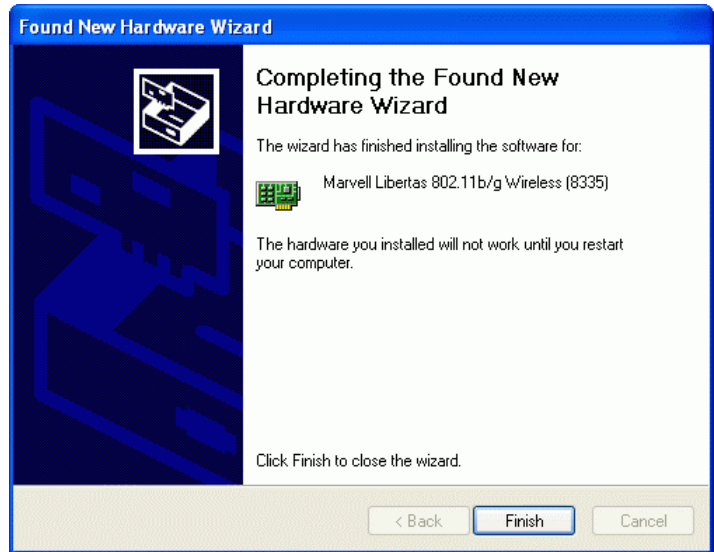
Step 7. A warning message appears again. Select **Continue Anyway** to install the device driver.



Step 8. Please wait a moment to copy the required files.



Step 9. The installation is completed. Click **Finish** to close the wizard.



Step 10. After installation of driver and utility is finished, a new icon should appear on your system tray.



5 Wireless Network Configuration

There are two different utilities to configure your wireless setting on XP, although we provide another choice, but in functional, both of them are similar. You can choose any one of them, which you more like or convenience to use.

5.1 CONFIGURED AT " WINDOWS XP CONFIGURATION "

After finished install driver and utility on your system. Let's starting to setup your wireless adapter. First of all we will see the connection notice in the right corner (Fig 5.1-1)

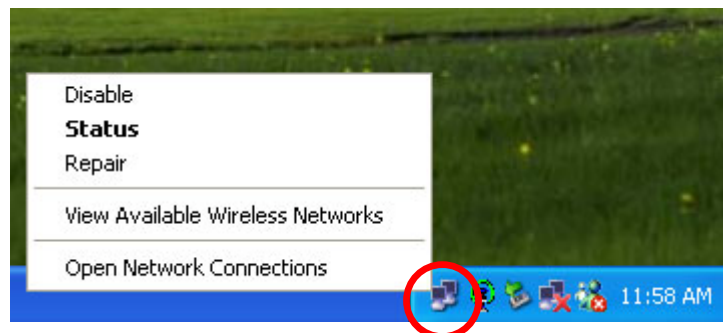


Fig 5.1-1

Click the **View Available Wireless Networks** and it will popup a setup dialog as below (Fig 5.1-2). If there have some efficient access point, which efficient range contains your CardBus Adapter range, then the SSID will show in the "Available networks" list. Select one and click the Connect button.

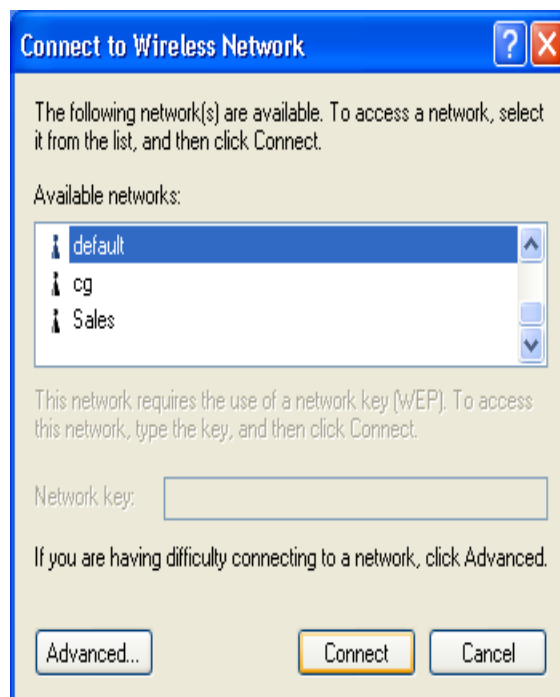


Fig 5.1-2

5.2 CONFIGURED AT " MARVELL WIRELESS UTILITY "

We provide another wireless setting utility for Windows (2000/me/98SE) use. Of course, XP version already prepared.

Double click the **Marvell wireless utility** on your desktop or your system tray.



The Configuration Tab contains several fields where operating parameters of the driver can be viewed or changed. Changes to any of the parameters in this panel can be applied to the driver without a need to restart the PC.

5.2.1 Network Status

The Network Status page (Fig 5.2-1) shows detail link information, signal strength, internet protocol and current channel status.

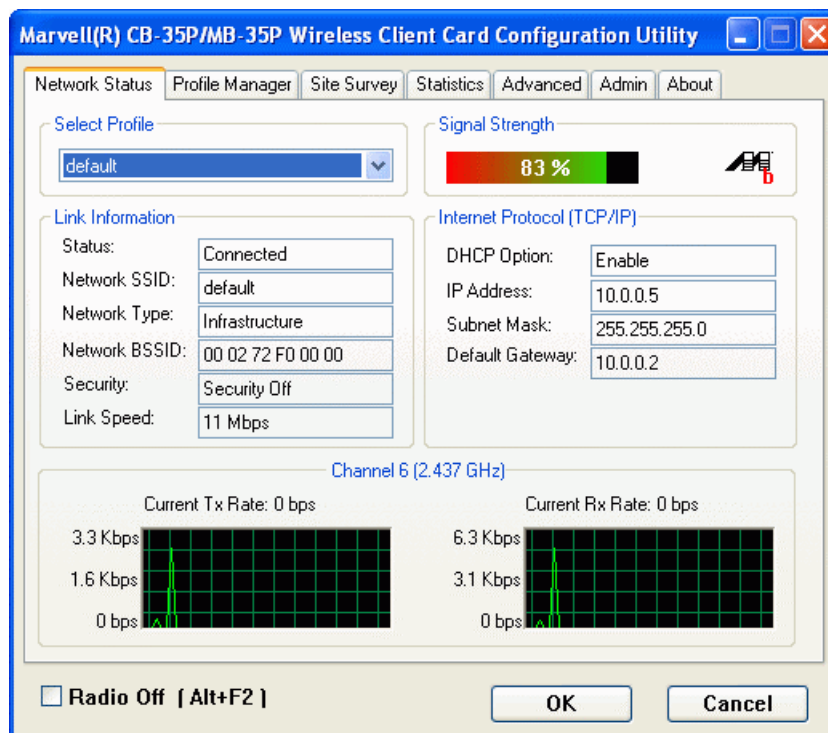


Fig 5.2-1

Link Information:

- Status: Current connection status. If no connection, it will show Disconnected.
- Network SSID: Show name of BSS or IBSS network.
- Network Type: Network type in use, Infrastructure for BSS, Ad-Hoc for IBSS network.

- Network BSSID: Show MAC address of AP or randomly generated of IBSS.
- Security: Display encryption status.
- Link Speed: Show current transmit rate and receive rate.

Internet Protocol (TCP/IP):

- DHCP option: Show enable or disable DHCP function.
- IP Address: Show IP address.
- Subnet Mask: Show subnet mask setting.
- Default Gateway: Show default gateway IP address.

5.2.2 Profile Manager

The Profile Manager page (Fig 5.2-2) allows you to save your favorite wireless setting among your home, office, and other public hotspot. So you can quickly and easily connect to your network when you are in that location. You may save multiple profiles, and activate the correct one at your preference.

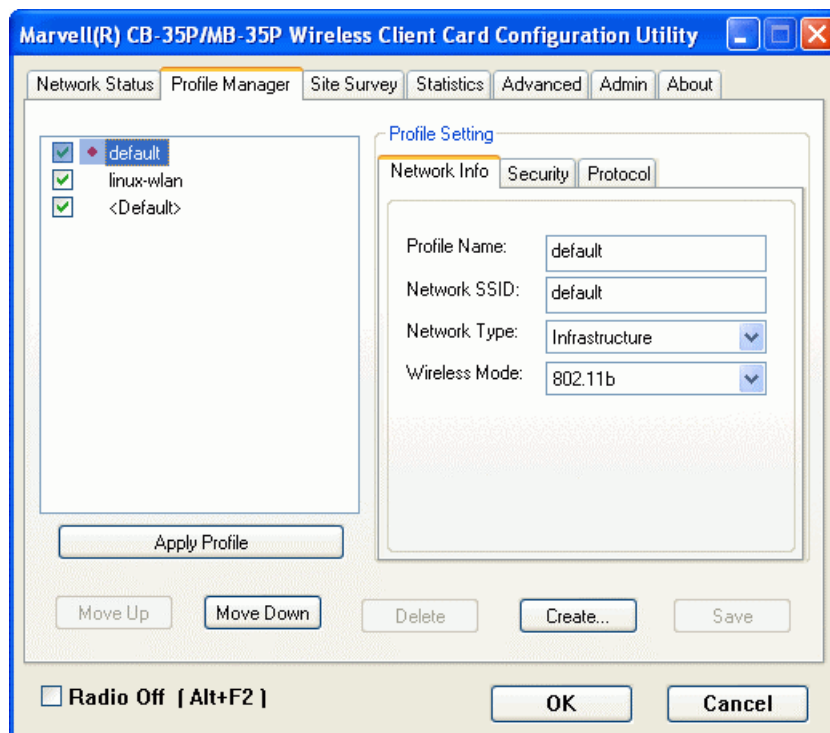


Fig 5.2-2

There are five buttons in Profile manager panel.

- **Move up:** Move up an existing profile.
- **Move down:** Move down an existing profile.
- **Create:** Create a new profile.
- **Delete:** Delete an existing profile.
- **Save:** Save an existing profile.

5.2.2.1 Network Info

- Profile Name: Show profile name. You can modify the name.
- Network SSID: Show Name of BSS or IBSS network.
- Network Type: There are two types, infrastructure and 802.11 ad-hoc modes.
- Wireless Mode: There are two modes, 802.11b and 802.11g modes.

5.2.2.2 Authentication Mode

If there are several wireless network coexist, we must consider with data encryption or authentication. It depend on your Access Point security setting, one of them not match, them the connection will be failed.

Authentication modes are available as following: Open System, Shared Key, Auto Switch, WPA-PSK, WPA (802.1x EAP/TLS), WPA (802.1x PEAP), WPA (EAP/LEAP), CCX (EAP/LEAP), WPA2-PSK, WPA2 (802.1x EAP/TLS) and WPA2 (802.1x PEAP).

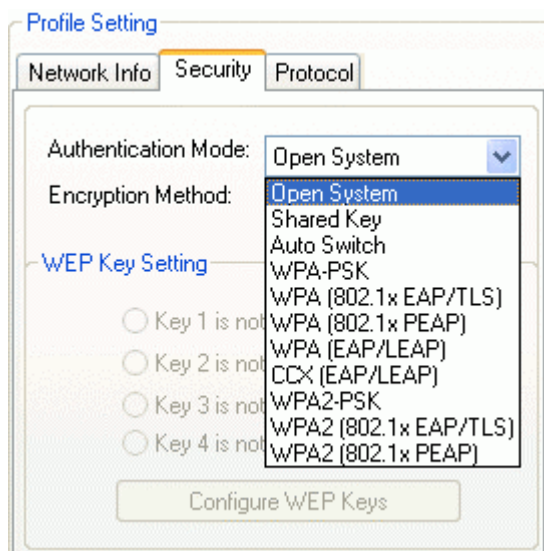


Fig 5.2-3

5.2.2.3 Encryption Method

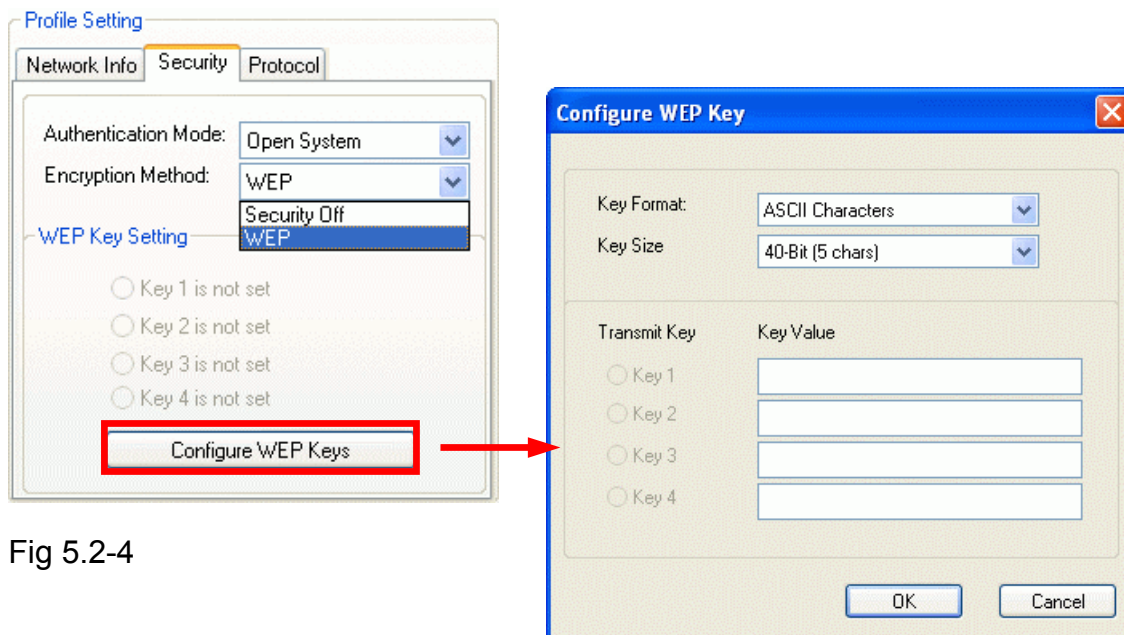


Fig 5.2-4

If you want to enable the encryption function, please set the encryption to WEP. WEP encrypts each frame transmitted from the radio using one of the Keys entered from this panel.

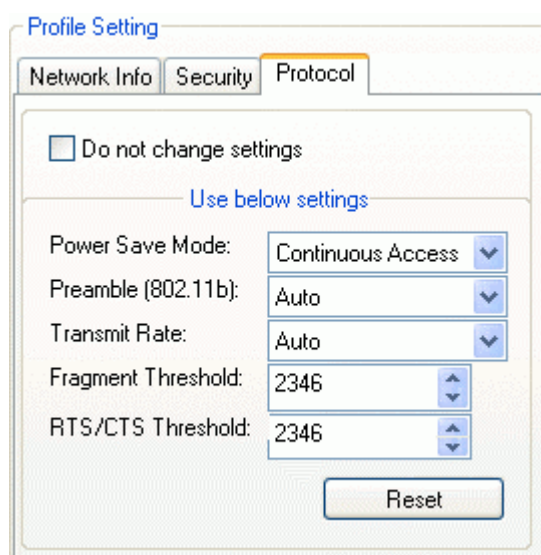
When an encrypted frame is received it will only be accepted if it decrypts correctly. This will only happen if the receiver has the same WEP Key used by the transmitter.

5.2.2.4 Protocol Setting

You can change your general setting in profile setting page.

The settings include:

- Power Saving Mode: There are two modes, **Continuous Access** mode and **Max Power Save** mode.
- Preamble (802.11b): The available preamble type includes **Long**, **Short** and **Auto**.
- Transmit Rate: Manually force the Transmit using selected rate. Default is Auto.
- Fragment Threshold: User can



adjust the RTS threshold number by sliding the bar or key in the value directly. The default value is 2346.

- RTS/CTS Threshold: User can adjust the RTS/CTS threshold number by sliding the bar or key in the value directly. The default value is 2346.

5.2.3 Site Survey

The Site Survey page (Fig 5.2-5) shows the network SSID, MAC address, Security, Channel, Signal and Network Type. Please wait system to scan or click Refresh, all Access Point and Ad-hoc devices within detectable range will be found and their related information will be displayed in the list.

You can assign Access Point or Ad-hoc devices which you want connect to. We also can change presently connection just double click SSID from the list.

Definition of each field:

- SSID: Name of BSS or IBSS network.
- MAC Address: MAC address of AP or randomly generated of IBSS.
- Security: Display encryption status.
- Channel: Channel in use.
- Signal: Receive signal strength of specified network.
- Network Type: Network type in use, Infrastructure for BSS, Ad-Hoc for IBSS network.

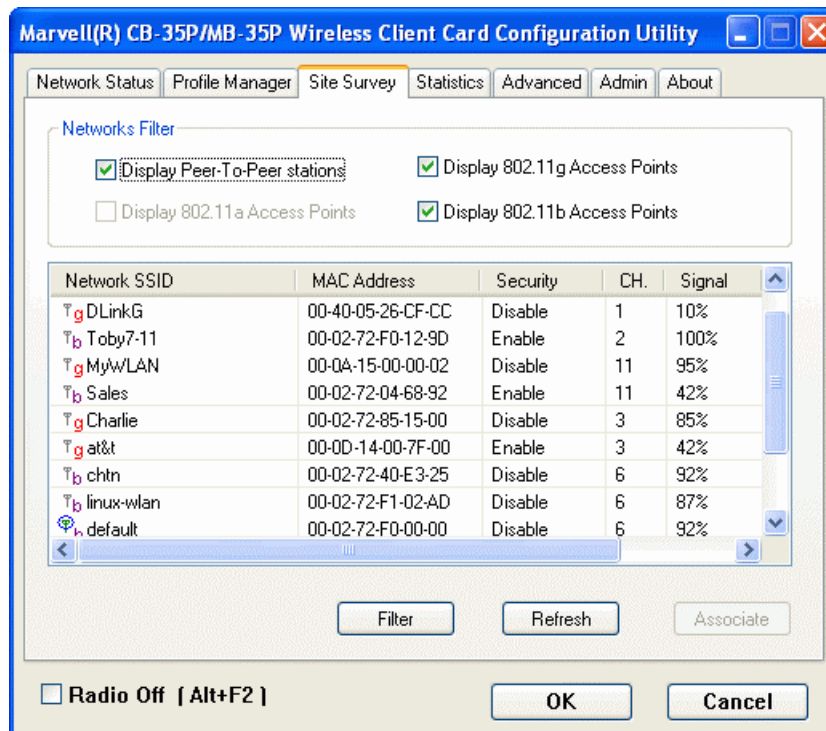


Fig 5.2-5

5.2.4 Statistics

Statistics page displays the detail counter information based on 802.11 MIB counters. This page translates that MIB counters into a format easier for user to understand. Figure 5.2-6 shows the detail page layout.

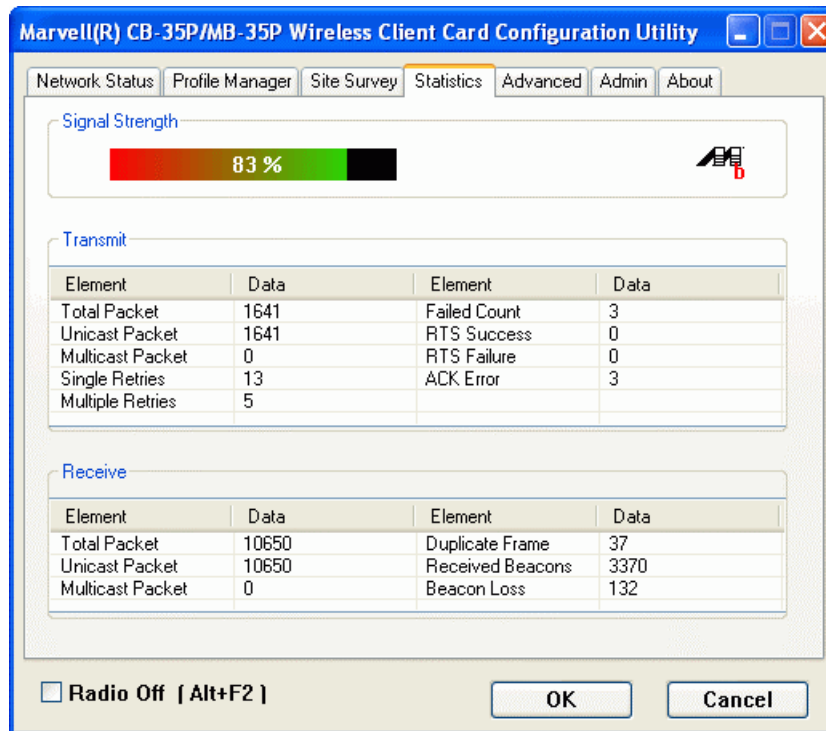


Fig 5.2-6

5.2.5 Advanced Setting

Select the Advanced page (Fig 5.2-7).

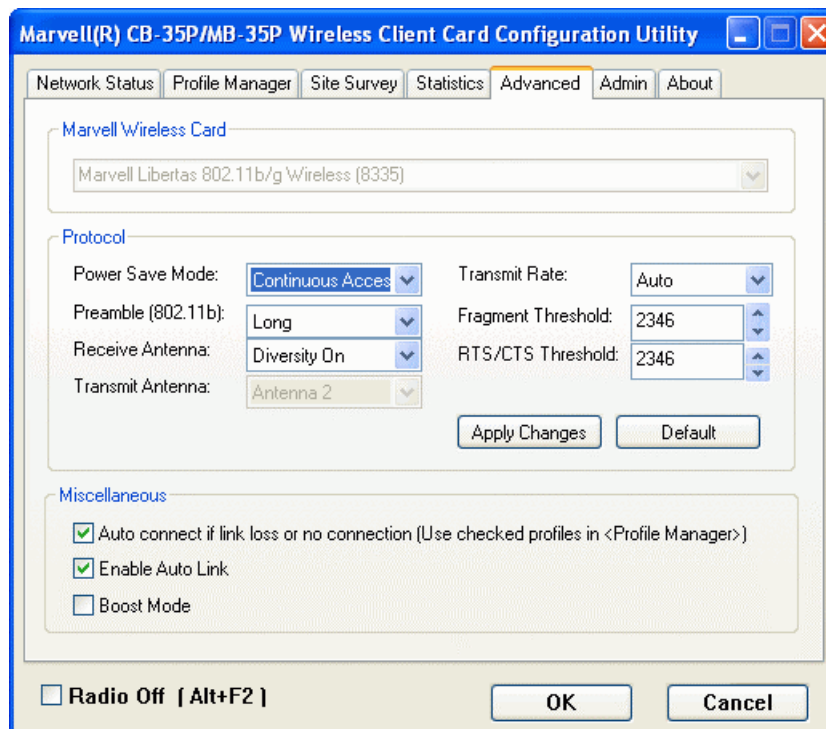


Fig 5.2-7

You can change your settings as following.

- Power Saving Mode: There are two modes, [Continuous Access](#) mode and [Max Power Save](#) mode.
- Preamble (802.11b): The available preamble type includes [Long](#), [Short](#) and [Auto](#).
- Receive Antenna: User can choose [Diversity On](#) and [Diversity Off](#).
- Transmit Rate: Manually force the Transmit using selected rate. Default is Auto.
- Fragment Threshold: User can adjust the RTS threshold number by sliding the bar or key in the value directly. The default value is 2346.
- RTS/CTS Threshold: User can adjust the RTS/CTS threshold number by sliding the bar or key in the value directly. The default value is 2346.

5.2.6 Administration

In this page, you can import profiles from file and export profiles shown in profile manager page.



Fig 5.2-8

5.2.7 About Information

The About page (Fig 5.2-9) will display the utility and driver information of this CardBus adapter and so on.

Users must use this version number when reporting their problems for technical support.

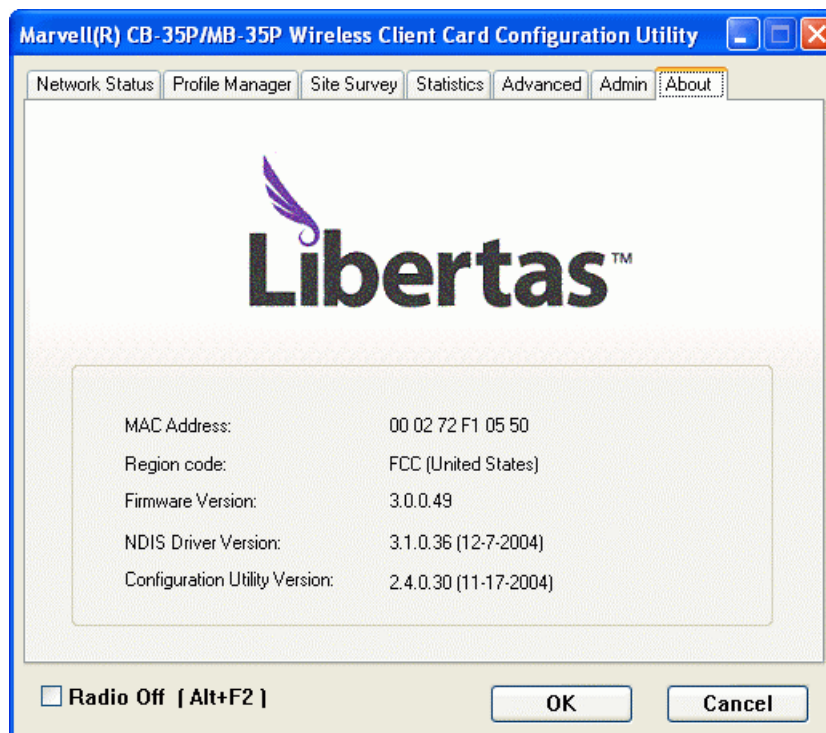


Fig 5.2-9

6 Technical Specifications

Standard	IEEE802.11b/g
Frequency Band	2.412GHz ~ 2.484GHz unlicensed ISM band
Spread Spectrum	DSSS (Direct Sequence Spread Spectrum)
Modulation method	IEEE802.11g: OFDM IEEE802.11b: CCK / DQPSK / DBPSK
Data Rate	IEEE802.11g: 54, 48, 36, 24, 18, 12, 9, 6Mbps IEEE802.11b: 11, 5.5, 2, 1Mbps
Operation mode	Ad hoc Infrastructure (Access Points is needed)
Transmitter Output Power	EIRP: 18 dBm Output power before antenna: 15dBm \pm 1dBm
Receive Sensitivity	-85dBm@11Mbps(ERP-DSSS/CCK) -71dBm@54Mbps(ERP-OFDM)
Operating Range	300m, depending on surrounding environment
Antenna	Diversity
Power consumption	Transmit: < 300mA Receive: < 250mA
Security	40-bit or 104-bit WEP, WPA, WPA-PSK, EAP/LEAP, CCX (EAP/LEAP), WPA2-PSK, 802.1x EAP/TLS and 802.1x PEAP
Operating system supported	Windows 98Se, Me, 2000 and XP
Management	Windows-based utility for configuration and status monitoring
Regulation	FCC part 15B/C for North America; CE
Dimension	121(L) x 54(W) x 5.95(H) mm
Weight	38 g
Operating Temperature	0 ~ 55°C
Storage Temperature	-20 ~ 70°C
Humidity	5 ~ 90% (non-condensing)

7 Troubleshooting

Symptom :

The LED is off.

Remedy :

Make sure the PC Card is inserted properly. Otherwise contact your vendor.

Symptom :

The LED is always on not blinking.

Remedy :

Make sure that you have installed the driver from attached CD. Otherwise contact your vendor.

Symptom :

The LED is blinking but the PC Card icon does not appear in your icon tray.

Remedy :

Make sure that you have installed the Utility from the attached CD.

Symptom :

The PC Card is linking, but can't share files with others.

Remedy :

Make sure the **file and printer sharing** function is enabled. You can enable the function by checking the icon of **My Computer → Control Panel → Network → file and printer sharing → I want to be able to give others to access to my files.**

Symptom :

Slow or poor performance.

Remedy :

Try to select another channel for the communicating group or move your device closer to the Access Point.

8 Glossary

IEEE 802.11 Standard

The IEEE 802.11 Wireless LAN standards subcommittee, which is formulating a standard for the industry.

Access Point

An internetworking device that seamlessly connects wired and wireless networks together.

Ad Hoc

An Ad Hoc wireless LAN is a group of computers, each with a WLAN adapter, connected as an independent wireless LAN. Ad Hoc wireless LAN is applicable at a departmental scale for a branch or SOHO operation.

BSSID

A specific Ad Hoc LAN is called a Basic Service Set (BSS). Computers in a BSS must be configured with the same BSSID.

DHCP

Dynamic Host Configuration Protocol - a method in which IP addresses are assigned by server dynamically to clients on the network. DHCP is used for Dynamic IP Addressing and requires a dedicated DHCP server on the network.

Direct Sequence Spread Spectrum

This is the method the wireless adapters use to transmit data over the frequency spectrum. The other method is frequency hopping. Direct sequence spreads the data over one frequency range (channel) while frequency hopping jumps from one narrow frequency band to another many times per second.

ESSID

An Infrastructure configuration could also support roaming capability for mobile workers. More than one BSS can be configured as an Extended Service Set (ESS). Users within an ESS could roam freely between BSSs while served as a continuous connection to the network wireless stations and Access Points within an ESS must be configured with the same ESSID and the same radio channel.

Ethernet

Ethernet is a 10/100Mbps network that runs over dedicated home/office wiring. Users must be wired to the network at all times to gain access.

Gateway

A gateway is a hardware and software device that connects two dissimilar systems, such as a LAN and a mainframe. In Internet terminology, a gateway is another name for a router. Generally a gateway is used as a funnel for all traffic to the Internet.

IEEE

Institute of Electrical and Electronics Engineers

Infrastructure

An integrated wireless and wired LAN is called an Infrastructure configuration. Infrastructure is applicable to enterprise scale for wireless access to central database, or wireless application for mobile workers.

ISM Band

The FCC and their counterparts outside of the U.S. have set aside bandwidth for unlicensed use in the so-called ISM (Industrial, Scientific and Medical) band. Spectrum in the vicinity of 2.4 GHz, in particular, is being made available worldwide. This presents a truly revolutionary opportunity to place convenient high-speed wireless capabilities in the hands of users around the globe.

Local Area Network (LAN)

A LAN is a group of computers, each equipped with the appropriate network adapter card connected by cable/air that share applications, data, and peripherals. All connections are made via cable or wireless media, but a LAN does not use telephone services. It typically spans a single building or campus.

Network

A network is a system of computers that is connected. Data, files, and messages can be transmitted over this network. Networks may be local or wide area networks.

Protocol

A protocol is a standardized set of rules that specify how a conversation is to take place, including the format, timing, sequencing and/ or error checking.

SSID

A Network ID unique to a network. Only clients and Access Points that share the same SSID are able to communicate with each other. This string is case-sensitive.

Simple Network Management Protocol (SNMP)

Simple Network Management Protocol is the network management protocol of TCP/IP. In SNMP, agents-which can be hardware as well as software-monitor the activity in the various devices on the network and report to the network console workstation. Control information about each device is maintained in a structure known as a management information block.

Static IP Addressing

A method of assigning IP addresses to clients on the network. In networks with Static IP address, the network administrator manually assigns an IP address to each computer. Once a Static IP address is assigned, a computer uses the same IP address every time it reboots and logs on to the network, unless it is manually changed.

Transmission Control Protocol / Internet Protocol (TCP/IP)

TCP/IP is the protocol suite developed by the Advanced Research Projects Agency (ARPA). It is widely used in corporate Internet works, because of its superior design for WANs. TCP governs how packet is sequenced for transmission the network. The term "TCP/IP" is often used generically to refer to the entire suite of related protocols.

Transmit / Receive

The wireless throughput in Bytes per second averaged over two seconds.

Wide Area Network (WAN)

A WAN consists of multiple LANs that are tied together via telephone services and / or fiber optic cabling. WANs may span a city, a state, a country, or even the world.

Wired Equivalent Privacy (WEP)

Now widely recognized as flawed, WEP was a data encryption method used to protect the transmission between 802.11 wireless clients and APs. However, it used the same key among all communicating devices. WEP's problems are well-known, including an insufficient key length and no automated method for distributing the keys. WEP can be easily cracked in a couple of hours with off-the-shelf tools.

Wi-Fi Protected Access (WPA)

The Wi-Fi Alliance put together WPA as a data encryption method for 802.11 wireless LANs. WPA is an industry-supported, pre-standard version of 802.11i utilizing the Temporal Key Integrity Protocol (TKIP), which fixes the problems of WEP, including using dynamic keys.

Temporal Key Integrity Protocol (TKIP)

The Temporal Key Integrity Protocol, pronounced tee-kip, is part of the IEEE 802.11i encryption standard for wireless LANs. TKIP is the next generation of WEP, the Wired Equivalency Protocol, which is used to secure 802.11 wireless LANs. TKIP provides per-packet key mixing, a message integrity check and a re-keying mechanism, thus fixing the flaws of WEP.

Wi-Fi Alliance

The Wi-Fi Alliance is a nonprofit international association formed in 1999 to certify interoperability of wireless Local Area Network products based on IEEE 802.11 specification. The goal of the Wi-Fi Alliance's members is to enhance the user experience through product interoperability. The organization is formerly known as WECA.

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