



WIRELESS

CB-85/MB-85/EC-85/MC-85

WLAN Client Cards

IEEE 802.11a/g/b and draft-802.11n/EWC compliant

User Guide

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Section 1. Introduction

1.1 Overview

This document describes the functions of the Marvell Client Card Configuration Utility for the following Marvell® IEEE 802.11a/g/b and high throughput WLAN client cards:

- Marvell CB-85 CardBus WLAN Client Card
- Marvell MB-85 Mini PCI WLAN Client Card
- Marvell EC-85 PCI Express WLAN Client Card
- Marvell MC-85 PCI Express WLAN Client Mini Card

Marvell high throughput client cards are both IEEE 802.11a/g/b and draft-802.11n/EWC compliant.



Notes

- For information on installing the Marvell Configuration Utility, the Marvell client card, and the Marvell Windows driver, see the *CB-85/MB-85/EC-85/MC-85 Installation Guide*.
- For a list of acronyms used throughout this document see [Appendix B. "Acronyms and Abbreviations" on page 57](#).

1.2 Wireless Networks

The Marvell client cards operate similar to Ethernet cards, except that a radio replaces the wires between communication devices. All existing applications that operate over Ethernet operate over a Marvell wireless network without any modification or need for special wireless networking software. The Marvell client cards support the following network technologies:

- Ad-Hoc (peer-to-peer group) mode
- Access Point (AP) Infrastructure mode

1.2.1 Ad-Hoc Mode

In Ad-Hoc mode (also referred to as peer-to-peer mode), wireless clients send and receive information to other wireless clients without using an AP. In comparison to Infrastructure mode, this type of WLAN connection only contains wireless clients. Ad-Hoc mode is useful for establishing a network where wireless infrastructure does not exist or where services are not required. Two or more computers can establish an Ad-Hoc network when within range of one another. Each computer dynamically connects to one another without additional configuration. Ad-Hoc mode is used to connect network computers at home or in small offices. It is also used to set up a temporary wireless network for meetings.

1.2.2 Infrastructure Mode

In Infrastructure mode, wireless devices communicate with other wireless devices or devices on the LAN side wired network through APs. When communicating through wired networks, client cards send and receive information through APs. The AP receives the information and redirects it for clients to then receive the information.

Access Points are typically strategically located within an area to provide optimal coverage for wireless clients. A large WLAN uses multiple APs to provide coverage over a wide area. APs connect to a LAN through a wired Ethernet connection. APs send and receive information from the LAN through this wired connection. Most corporate WLANs operate in Infrastructure mode because they require access to the wired LAN in order to use services such as file servers or printers.

Section 2. Marvell Configuration Utility Overview

2.1 Overview

The Marvell Client Card Configuration Utility is a Windows® based application that allows configuration and management of the Marvell high throughput client cards. The Marvell Configuration Utility sets up profiles and performs other wireless network management tasks. For information on installing the Marvell Configuration Utility see the *Installation Guide*.

2.2 Windows XP and Windows Server 2003 Users

For Windows XP and Windows Server 2003, either use the Windows Zero Configuration Utility or the Marvell Configuration Utility to configure the Marvell client card. Both utilities cannot be used at the same time. When launching the Marvell Configuration Utility, the Marvell Configuration Utility disables the Windows Zero Configuration Utility automatically. While exiting, the Marvell Configuration Utility recovers the Windows Zero Configuration Utility.



Note

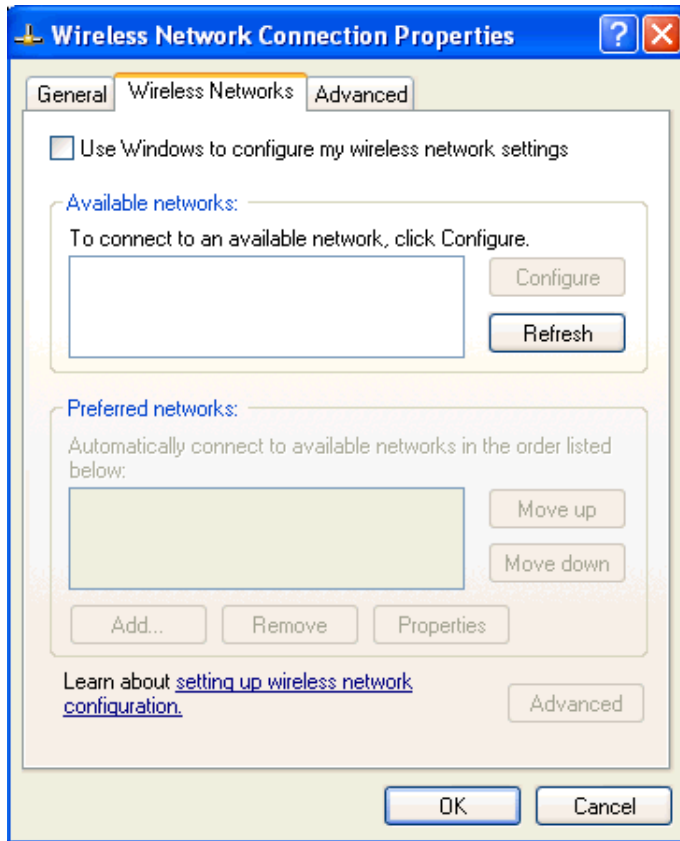
When using the Marvell Configuration Utility on Windows XP or Windows Server 2003, Marvell recommends turning off the Windows wireless configuration feature. For further information on this feature, refer to Windows documentation.

2.2.1 Disabling Windows Zero Configuration Utility

To disable the Windows Zero Configuration Utility (if not already disabled while running the setup program for the Marvell Configuration Utility):

1. From Control Panel, click **Network Connections**.
2. Right-click the icon for the Marvell client card, and select **Properties**.
3. Click the **Wireless Networks** tab.
4. Clear the **Use Windows to configure my wireless settings** check box to disable the Windows Zero Configuration Utility.

Figure 1: Windows Zero Configuration Utility Disabled

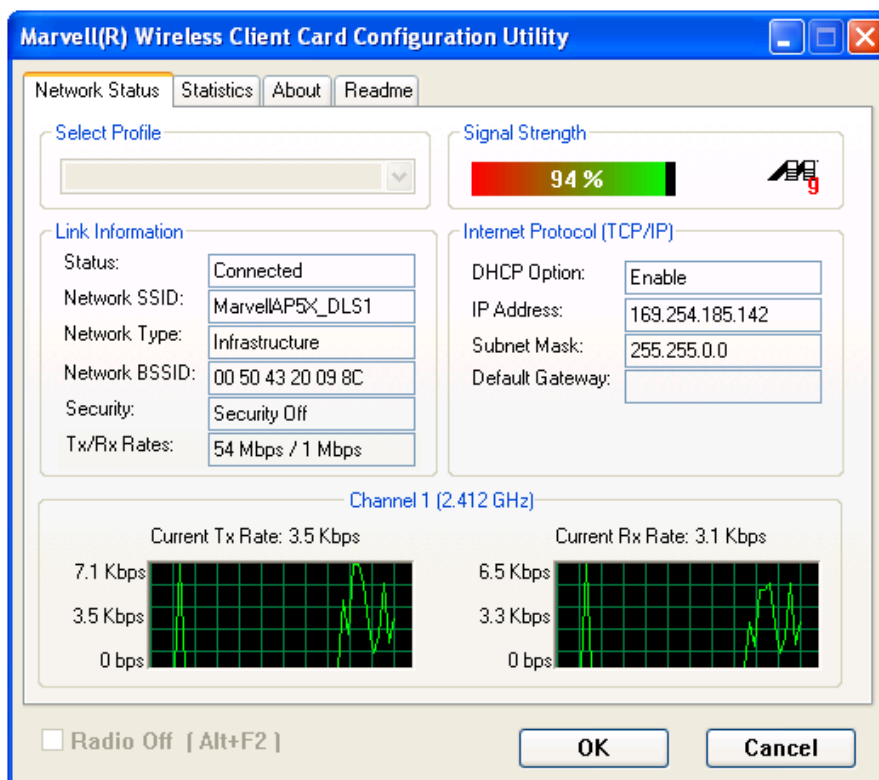


2.2.1.1 Marvell Configuration Utility Tabs

When Windows Zero Configuration Utility is enabled, the Marvell Configuration Utility enters Monitor mode. When in Monitor mode, the Marvell Configuration Utility has the following properties:

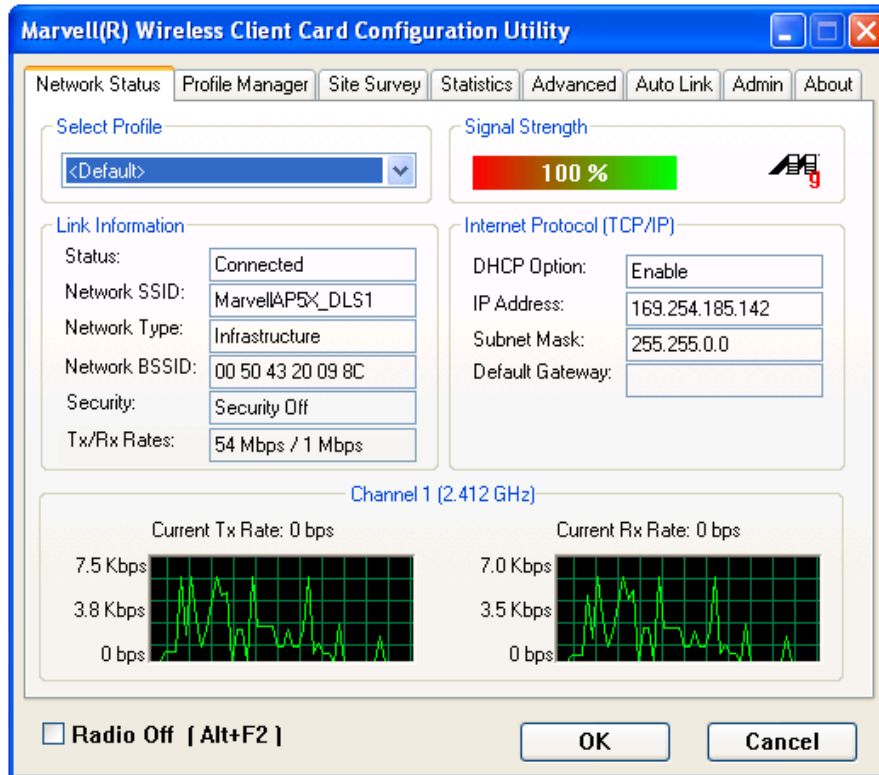
- Limited tab display (**Network Status**, **Statistics**, **About**, and **Readme** tabs)
- Information reporting only (the utility cannot be used to configure the client card)

Figure 2: Marvell Configuration Utility (Windows Zero Configuration Utility Enabled)



When Windows Zero Configuration Utility is disabled, all tabs available through the Marvell Configuration Utility are active, as shown in [Figure 3](#).

Figure 3: Marvell Configuration Utility (Windows Zero Configuration Utility Disabled)



2.2.2 Marvell Configuration Utility

Once installed, the Marvell Configuration Utility is accessed from the **Start menu** or from the **Desktop**.

Start menu:

- **Start > Marvell Configuration Utility**
- **Start > Programs > Marvell > Marvell Configuration Utility**

Desktop:

- Double-click the Marvell Configuration Utility icon.

Figure 4: Marvell Configuration Utility Icon



2.2.2.1 Tray Status Icons

Different icons in the system tray indicate the status of the wireless connection.

Figure 5: Tray Status Icons Window



2.3 Security

Implementing a security infrastructure to monitor physical access to WLAN networks is more difficult than monitoring access on wired networks. Unlike wired networks where a physical connection is required, anyone within the range of a wireless AP can send and receive frames, as well as listen for frames being sent.

IEEE 802.11 defines a set of standards and protocols for use in minimizing the security risks on wireless networks. Three of these security standards are as follows:

- **802.1x**—802.1x authentication provides authenticated access to 802.11 wireless networks and to wired Ethernet networks. 802.1x minimizes wireless network security risks by providing user and computer identification, centralized authentication, and encryption services based on the Wired Equivalent Privacy (WEP) algorithm. 802.1x supports the Extensible Authentication Protocol (EAP). EAP allows the use of different authentication methods, such as smart cards and certificates.
- **Wi-Fi Protected Access (WPA)**—WPA is a security implementation based on a subset of the 802.11i standard. WPA provides enhanced security for wireless networks when used with the Temporal Key Integrity Protocol (TKIP) and the Message Integrity Check (MIC) algorithms.
- **Wi-Fi Protected Access 2 (WPA2)**—Next generation Wi-Fi security, based on the final 802.11i standard. WPA2 offers the strongest available security in the form of Advanced Encryption Standard (AES) level encryption, plus faster roaming between APs.

SECURITY CONFIGURATIONS

The Marvell Configuration Utility supports the following security protocols:

- Authentication Modes
 - Open System
 - Shared Key
 - Auto Switch
 - 802.1x
 - WPA-PSK
 - WPA2-PSK
 - WPA
 - WPA2
 - Cisco Compatible extension (CCX)
- Encryption Methods
 - Security Off
 - WEP (including support for Cisco® Message Integrity Check (CMIC) and Key Integrity Protocol (CKIP))
 - TKIP
 - AES
- 802.1x Authentication Protocol
 - EAP/Transport Layer Security (TLS) (equivalent to Microsoft “Smart Card or other Certificate”)
 - Protected EAP (PEAP)
 - EAP Tunneled TLS Authentication Protocol (TTLS)
 - Light EAP (LEAP)
- WEP Key Size
 - 64 bits WEP (40-bit key)
 - 128 bits WEP (104-bit key)

Section 3. Marvell Configuration Utility User Interface

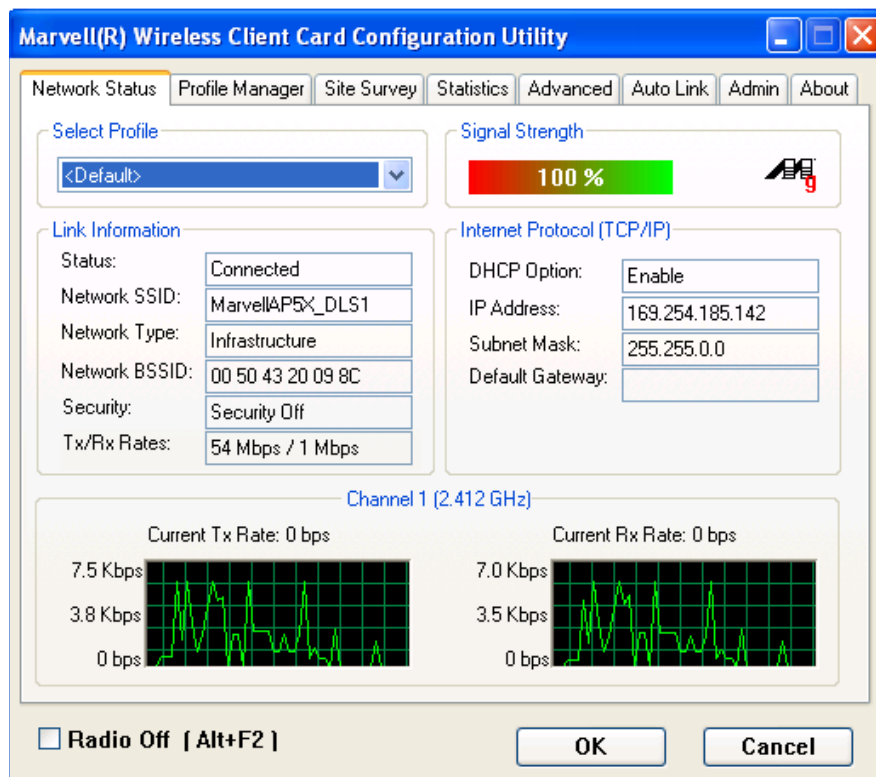
The Marvell Client Card Configuration Utility allows configuration of Marvell high throughput client cards through the following tabs:

- **Network Status**—displays the status of the network to which the user is connected. The Marvell Configuration Utility initializes on this page.
- **Profile Manager**—displays the current profiles and allows the user to set attributes for network type, security options, and protocols, as well as create/modify/delete profiles.
- **Site Survey**—displays site survey information.
- **Statistics**—displays the statistics of the current session.
- **Advanced**—used to set protocol parameters.
- **AutoLink**—to set AutoLink connection
- **Admin**—used to import and export profiles.
- **About**—provides the information for the driver version number, firmware version number, Marvell Configuration Utility version number, and Medium Access Controller (MAC) address of the client card.

3.1 Network Status Tab

The **Network Status** tab displays the status of the network. When the Marvell Configuration Utility initializes, it displays the **Network Status** tab.

Figure 6: Network Status Tab

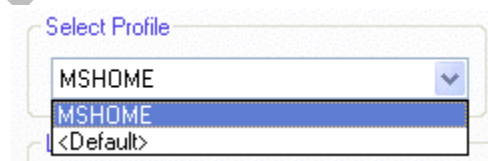


3.1.1 Select Profile

The **Select Profile** section displays the name of the profile in use. Additional information about the profile is provided in the **Profile Manager**.

Select one of the profiles previously defined by clicking the **down arrow** and highlighting a profile from the pull-down list.

Figure 7: Select Profile Section



Profiles are created, modified, and deleted through the **Profile Manager**.



Note

This feature is disabled when Windows Zero Configuration Utility is enabled.

3.1.2 Link Information

The **Link Information** section contains the current information about the wireless connection.

Figure 8: Link Information Section

Link Information	
Status:	Connected
Network SSID:	MSHOME
Network Type:	Infrastructure
Network BSSID:	00 0D 3A 24 02 49
Security:	Security Off
Tx/Rx Rates:	54 Mbps / 1 Mbps

Table 1: Link Information Section Description

Field	Description
Status	Status of the wireless network connection: • Card Unplugged Client card is not plugged in, or client card is plugged in but not recognized. • Connected Client card is plugged in and connected to a wireless network. • No Connection Client card is plugged in, but no wireless connection. • No Radio Client card is plugged in, but the radio is turned off. Clear the Radio Off check box to turn the radio on. • Scanning for Scanning for available APs and wireless stations in the area. • Waiting for peer Waiting for a peer station to connect to the wireless network (Ad-Hoc network only).
Network SSID	Network SSID label (i.e., Network Name). The Network Name is a text string of up to 32 characters.

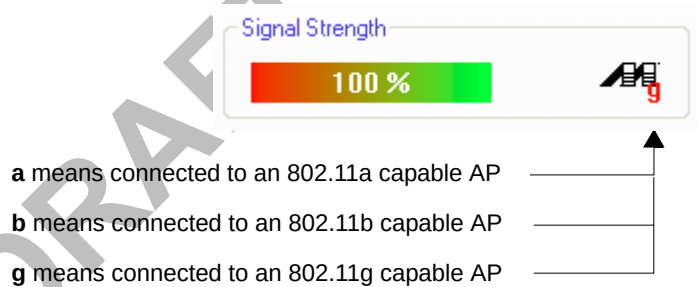
Table 1: Link Information Section Description (Continued)

Field	Description
Network Type	Type of environment connected to: • Infrastructure Mode In this mode, wireless clients send and receive information through APs. When a wireless client communicates with another, it transmits to the AP. First the AP receives the information and rebroadcasts it, then other devices receive the information. The APs are strategically located within an area to provide optimal coverage for wireless clients. A large WLAN uses multiple APs to provide coverage over a wide area. APs can connect to a LAN through a wired Ethernet connection. APs send and receive information from the LAN through the wired connection. • Ad-Hoc Mode In this mode, wireless clients send and receive information to other wireless clients without using an AP. This type of WLAN only contains wireless clients. Use Ad-Hoc mode to connect network computers at home or in small office, or to set up a temporary wireless network for a meeting.
Network BSSID	Network Basic Service Set Identifier. The BSSID is a 48-bit identity used to identify a particular BSS within an area. In Infrastructure BSS networks, the BSSID is the MAC address of the AP. In independent BSS or Ad-Hoc networks, the BSSID is generated randomly.
Security	Reports the type and level of security set. The security level is set through the Profile Setting of the Profile Manager tab. Configure security settings also through the Site Survey tab when connecting to a network.
Tx/Rx Rates	Current Tx Rate and Rx Rate of the channel being monitored.

3.1.3 Signal Strength / Wireless Mode Indicator

The color-coded **Signal Strength** bar displays the signal strength of the last packet received by the client card.

Figure 9: Signal Strength Bar



Signal strength is reported as a percentage. A signal in the red indicates a bad connection. A signal in the green indicates a good connection.

The Wireless Mode indicator shows the data rates the client card operates. There are three modes:

- 802.11a
- 802.11b
- 802.11g (backward compatible to 802.11b)

3.1.4 Internet Protocol (TCP/IP)

The Internet Protocol specifies the format of packets, also called datagrams, and the addressing scheme. Most networks combine IP with a higher-level protocol called TCP, which establishes a virtual connection between a destination and a source.

Figure 10: Internet Protocol Section

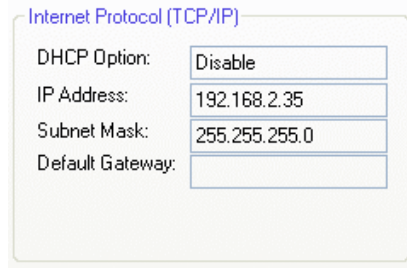


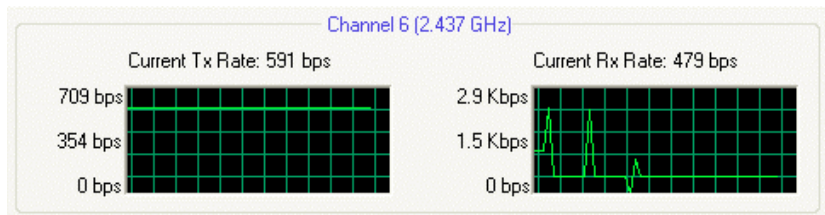
Table 2: Internet Protocol Section Description

Field	Description
DHCP Option	Dynamic Host Configuration Protocol. Either enabled or disabled.
IP Address	An identifier for a computer or device on a TCP/IP network. The format of an IP address is a 32-bit numeric address written as four numbers separated by periods. Each number can be 0 to 255.
Subnet Mask	A mask used to determine what subnet an IP address belongs to. An IP address has two components, the network address and the host address. The first two numbers represent the Class B network address, and the second two numbers identify a particular host on this network.
Default Gateway	The default node on a network that serves as an entrance to another network. In enterprises, the gateway is the computer that routes the traffic from a workstation to the outside network that is serving the Web pages. In homes, the gateway is the ISP that connects the user to the Internet.

3.1.5 Actual Throughput Performance

This section of the **Network Status** tab displays the Current Tx Rate and the Current Rx Rate of the channel being monitored.

Figure 11: Actual Throughput Performance Section



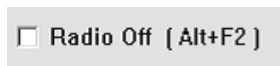
Note

These are actual throughput diagrams (without the WLAN overhead delivered by the client card).

3.1.6 Radio On/Off Check Box

Selecting the **Radio Off** check box turns off the radio. Clearing the check box turns on the radio.

Figure 12: Radio On/Off Check Box



Another way to turn the radio on or off is to right-click the **Configuration Utility** icon in **System Tray** and select **Turn Radio Off** to turn the radio off. When the radio is off, select **Turn Radio On** to turn the radio back on.

Figure 13: Radio On/Off in the System Tray



The system hot key **Alt+F2** can also be used to turn the radio on/off.

When the radio is off, there is no radio activity, and the following tabs are disabled:

- Profile Manager
- Site Survey
- Statistics
- Advanced
- AutoLink



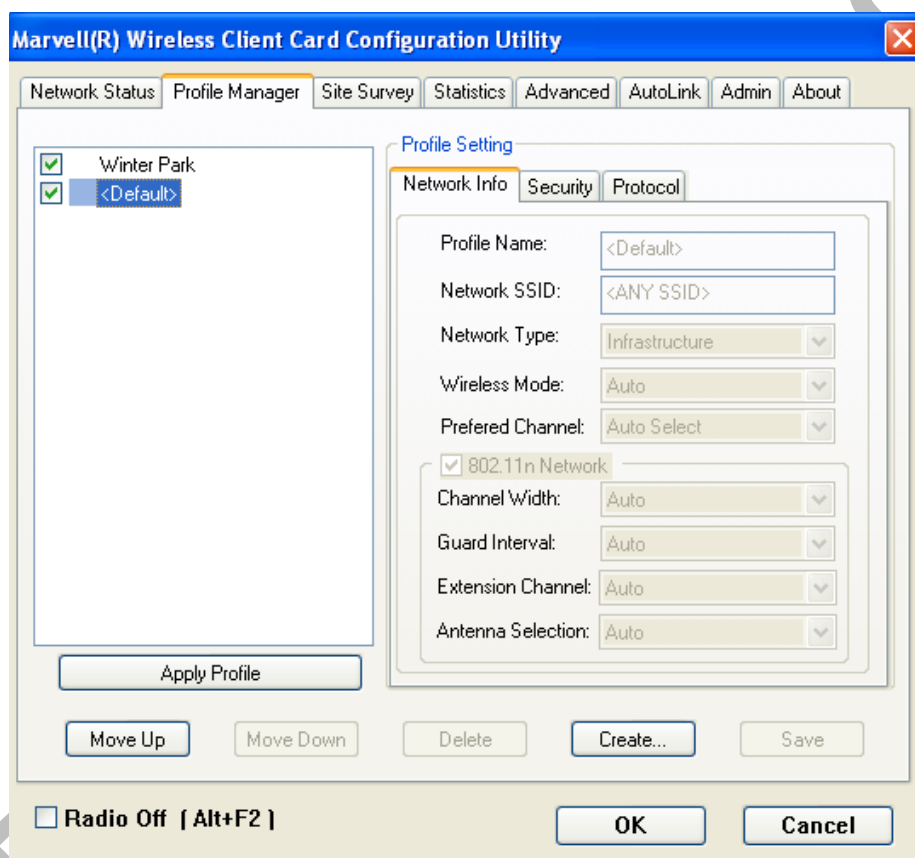
Note

This feature is disabled when Windows Zero Configuration Utility is enabled.

3.2 Profile Manager Tab

The **Profile Manager** tab displays the profiles available and allows you to create, modify, and delete profiles.

Figure 14: Profile Manager Tab



Note

The Profile Manager tab is not accessible when Windows Zero Configuration Utility is enabled.

PROFILE MANAGER—PROFILE LIST

The section on the left side of this tab lists all of the profiles available. Highlighting a profile selects it. If the check box next to the profile is selected, that profile is used in auto-configuration mode when the link is lost. If it is not selected, that profile is excluded in auto-configuration. The buttons associated with this window are as follows.

Table 3: Profile List Section Description

Button	Description
Apply Profile	Applies the profile selected. Apply the profile by double-clicking the desired profile.
Move Up / Down	Moves the list up and down in the window. All profiles with the Network Type set to Infrastructure are displayed before the profiles with the Network Type set to Ad-Hoc. In auto-configuration mode, the selected profiles at the top of the list have higher priority than selected profiles at the bottom of the list.
Delete	Deletes a profile
Create	Creates a profile
Save	Saves changes made to a selected profile

PROFILE MANAGER—PROFILE SETTING

The Profile Settings are used to set, modify, and display information about the profile selected in the **Profile List** section. The information is divided into three tabs:

- Network Info
- Security
- Protocol

3.2.1 Profile Setting—Network Info Tab

The **Profile Manager** initially displays the **Network Info** tab.

Figure 15: Network Info Tab (Infrastructure Network)

The screenshot shows the 'Profile Setting' window with the 'Network Info' tab selected. The 'Network Type' is set to 'Infrastructure'. The '802.11n Network' checkbox is checked. The settings are as follows:

Field	Value
Profile Name	Winter Park
Network SSID	Winter Park
Network Type	Infrastructure
Wireless Mode	Auto
Preferred Channel	Auto Select
802.11n Network	☒
Channel Width	Auto
Guard Interval	Auto
Extension Channel	Auto
Antenna Selection	Auto

Figure 16: Network Info Tab (Ad-Hoc Network)

The screenshot shows the 'Profile Setting' window with the 'Network Info' tab selected. The 'Network Type' is set to 'Ad-Hoc'. The '802.11n Network' checkbox is checked. The settings are as follows:

Field	Value
Profile Name	Winter Park
Network SSID	Winter Park
Network Type	Ad-Hoc
Wireless Mode	802.11a
Preferred Channel	Auto Select
802.11n Network	☒
Channel Width	Auto
Guard Interval	Auto
Extension Channel	Auto
Antenna Selection	Auto

The **Network Info** tab fields are as follows.

Table 4: Network Info Tab Description

Field	Description
Profile Name	Name of profile selected
Network SSID	Network SSID label
Network Type	• Infrastructure When an Infrastructure network is selected, the Profile Setting displays the Wireless Mode field. • Ad-Hoc When an Ad-Hoc network is selected, the Profile Setting displays an additional Preferred Channel field.
Wireless Mode	• Auto Connects to 802.11a network, 802.11g network, or 802.11b network (Infrastructure network only). • 802.11a Connects to 802.11a only. • 802.11g Connects to either 802.11g network or 802.11b network. • 802.11b Connects to 802.11b network only.
Preferred Channel	Channel being used (Ad-Hoc network only)
802.11n Network	Enables/disables draft-802.11n/EWC functionality. If enabled, the Modulation and Coding Scheme (MCS) index and 802.11n options can be configured.
Channel Width	Sets the channel bandwidth. Available options are Auto, 20 MHz, and 40 MHz. The default is Auto.
Guard Interval	Sets the Guard Interval. Available options are Auto, Standard, and Short. The default is Auto.
Extension Channel	Sets the extension channel mode when bandwidth is 40 MHz. Available options are Auto, None, Lower, and Upper. The default is Auto.
Antenna Selection	Sets the antenna selections. Available options are Auto, Antenna A, Antenna B, 2 by 2, and 2 by 3. The default is Auto.



Note

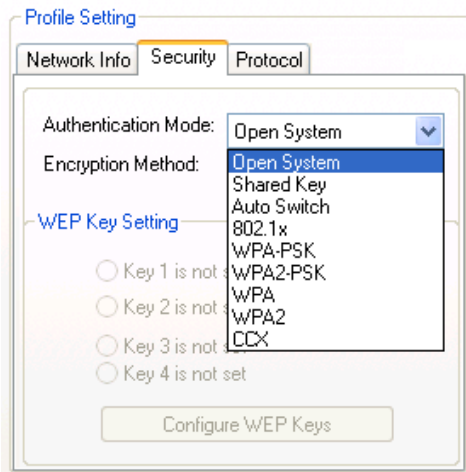
The fields **Wireless Mode** and **Preferred Channel** are used only when an Ad-Hoc network is started by the client card. These two attributes are ignored if the client card is connected to an existing Ad-Hoc network with the same desired SSID.

3.2.2 Profile Setting—Security Tab

Clicking the **Security** tab displays the following security options:

- Authentication Mode
- Encryption Method (Security off, WEP, TKIP, and AES)
- WEP Key Setting (Passphrase Key or Authentication Protocol)

Figure 17: Security Tab—Authentication Modes



3.2.2.1 Non-EAP Authentication Modes

The Marvell Configuration Utility currently supports the following non-EAP authentication modes:

- Open System—Open Authentication (no key or a pre-shared WEP key is required).
- Shared Key—Shared Authentication (a pre-shared WEP key is required)
- Auto Switch—Auto Select Authentication modes (Open System or Shared Key, WEP key required)
- WPA-PSK—WPA Pre-Shared Key
- WPA2-PSK—WPA2 Pre-Shared Key

3.2.2.2 EAP Authentication Modes

The Marvell Configuration Utility currently supports the following EAP authentication modes:

- 802.1x (TLS/PEAP)
- WPA (TLS/PEAP/LEAP)
- WPA2 (TLS/PEAP/LEAP)
- CCX (LEAP)

3.2.2.2.1 WPA-PSK/WPA2-PSK SUPPORT

In Infrastructure mode, if WPA-PSK/WPA2-PSK is selected as the Authentication Mode, the encryption method AES or TKIP can be selected.

Figure 18: Security Tab—WPA-PSK/WPA2-PSK Authentication

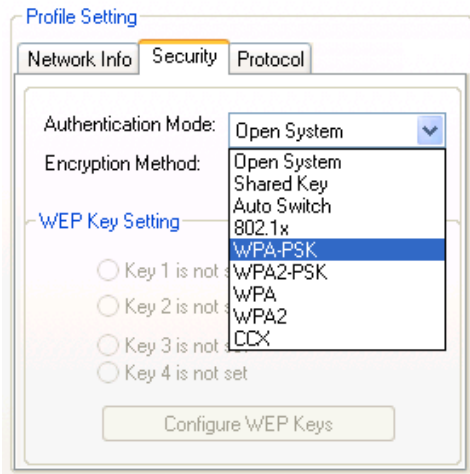
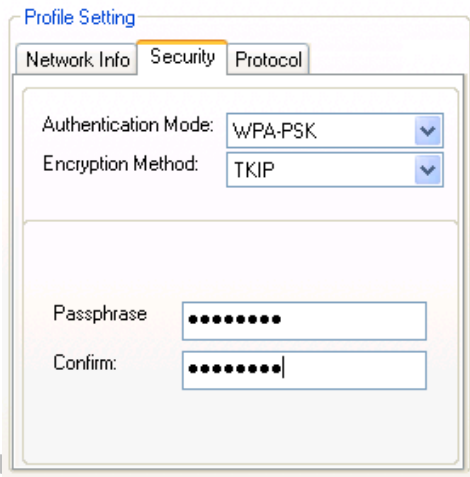


Figure 19: Security Tab—WPA-PSK/WPA2-PSK with TKIP



Enter the network passphrase into the **Passphrase** and **Confirm** boxes.



Note

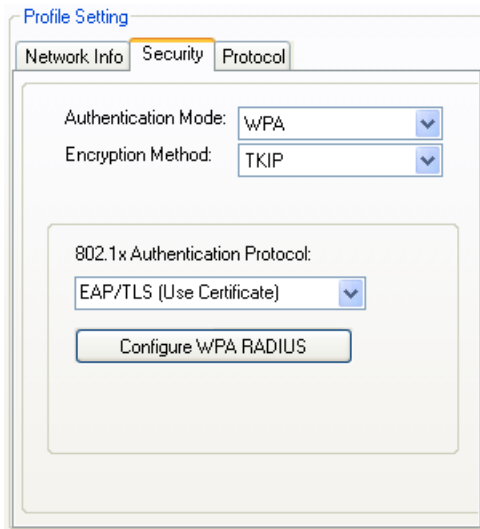
WPA-PSK/WPA2-PSK is not supported in Ad-Hoc network mode.

3.2.2.2.2 802.1X/WPA/WPA2 EAP/TLS SUPPORT

If the 802.1x EAP/TLS option is selected, the encryption method AES or TKIP can be selected, and a certificate is required for the authentication.

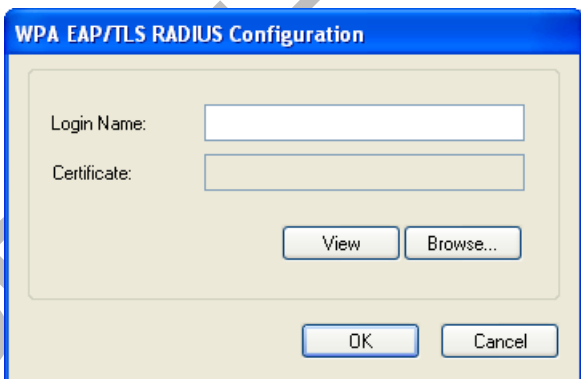
1. To connect to an AP through the RADIUS server, select 802.1x WPA/WPA2 as the Authentication Mode.
2. Select TKIP or AES as the Encryption Method.
3. Select EAP/TLS (Use Certificate) as the 802.1x Authentication Protocol.

Figure 20: Security Tab—802.1x/WPA/WPA2 EAP/TLS Authentication



4. Click the **Configure WPA RADIUS** button to configure security settings.

Figure 21: 802.1x/WPA/WPA2 EAP/TLS RADIUS Configuration Window



5. Click **Browse** to activate the dialog for selecting a certificate.
6. Before clicking **OK** to exit the dialog, make sure that the Login Name is entered.

Figure 22: Select Certificate Window

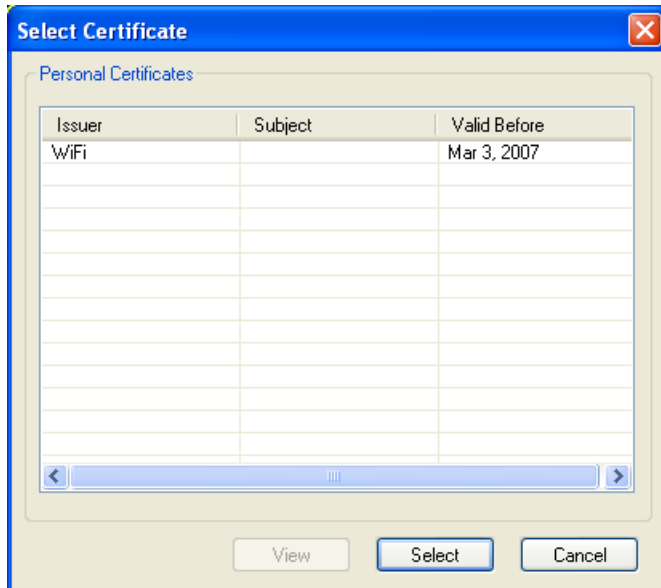


Figure 23: WPA RADIUS Configuration Window with Certificate

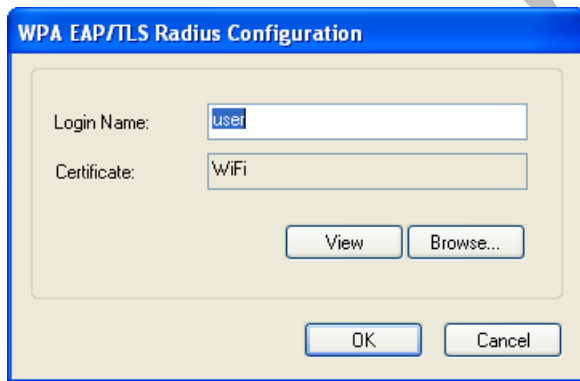


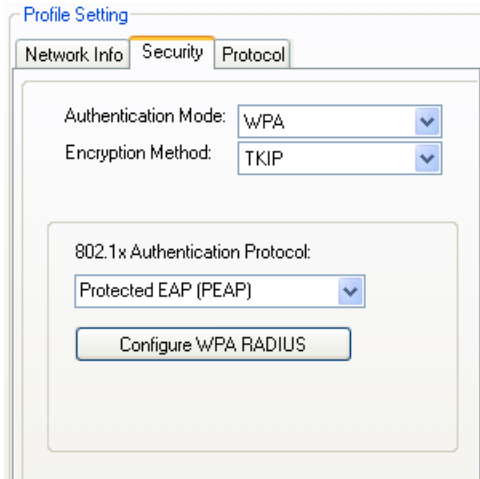
Table 5: 802.1x/WPA/WPA2 EAP/TLS RADIUS Configuration Window Description

Field/Button	Description
Login Name	Login name to the RADIUS server
Certificate	Certificate selected for authentication
View	Shows the selected certificate
Browse	Selects the certificate

3.2.2.2.3 802.1X/WPA/WPA2 PEAP SUPPORT IN INFRASTRUCTURE MODE

To connect to an AP through the RADIUS server, select 802.1x/WPA/WPA2 as the Authentication Mode, PEAP as the Authentication Protocol, and AES or TKIP as the Encryption Method.

Figure 24: Security Tab—802.1x/WPA/WPA2 PEAP Authentication



Clicking the **Configure WPA RADIUS** button displays the **WPA PEAP RADIUS Configuration** window. Enter all of the required information.

Figure 25: 802.1x/WPA/WPA2 PEAP RADIUS Configuration Window

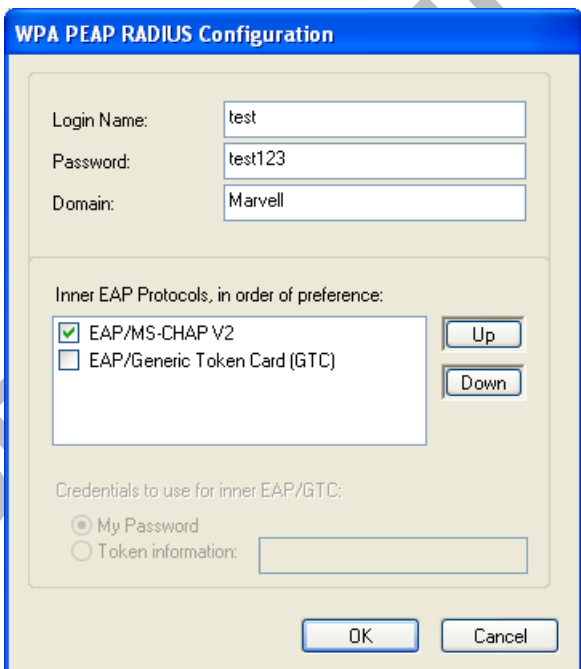


Table 6: WPA PEAP RADIUS Configuration Window Description

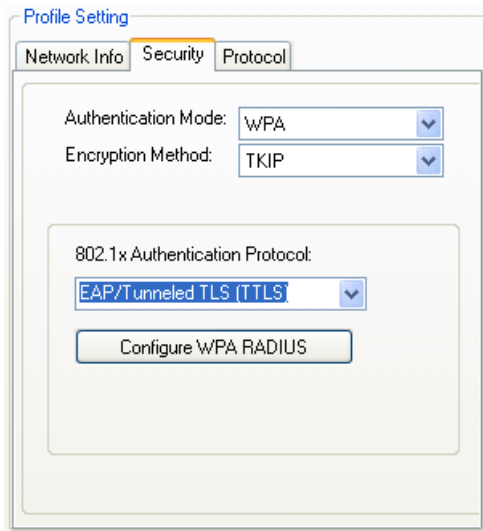
Field	Description
Login Name	Login name to the RADIUS server
Password	Password to login to the RADIUS server
Domain	Domain name for login to the RADIUS server (optional)
Inner EAP Protocol	Use EAP/MS-CHAP V2 or EAP/GTC to login to the RADIUS server

Click **OK** to set the configuration.

3.2.2.2.4 WPA/WPA2 EAP/TTLS

To connect to an AP through the RADIUS server, select WPA/WPA2 as the Authentication Mode, TTLS as the 802.1x Authentication Protocol, and TKIP as the Encryption Method for WPA TTLS or AES as the Encryption Method for WPA2 TTLS.

Figure 26: WPA/WPA2 EAP/TTLS Authentication



Clicking the **Configure WPA RADIUS** button displays the **WPA EAP/TTLS RADIUS Configuration** window. Enter all the required information.

Figure 27: WPA EAP RADIUS Configuration Window

The image shows a 'WPA EAP/TLS RADIUS Configuration' dialog box. It has a blue title bar and a light beige background. The fields are as follows: 'Inner Authentication Protocol' is a dropdown menu set to 'EAP/MS-CHAP V2'; 'Anonymous Name' is a text box containing 'Anonymous'; 'Login Name' is a text box containing 'TEST'; 'Password' is a text box containing 'TEST123'; and 'Domain' is an empty text box. At the bottom are 'OK' and 'Cancel' buttons. A large diagonal watermark 'DRAFT - Subject to Change' is overlaid on the image.

Table 7: WPA TTLS RADIUS Configuration Window Description

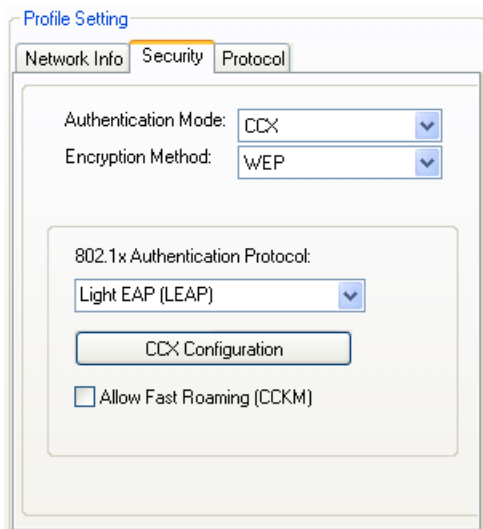
Field	Description
Inner Authentication Protocol	Currently supports EAP/MS-CHAP V2 only
Anonymous Name	Indicates the identity of the authentication server with which to make contact
Login Name	Login name to the RADIUS server
Password	Password to login to the RADIUS server
Domain	Domain name for login to the RADIUS server (optional)

Click **OK** to set the configuration.

3.2.2.2.5 CCX EAP/LEAP

To connect to a Cisco AP through the RADIUS server, select CCX EAP/LEAP. WEP is the Encryption Method, and the key is generated automatically.

Figure 28: Security Tab—CCX EAP/LEAP Authentication



If **Allow Fast Roaming (CCKM)** is selected, Fast Roaming (Cisco Centralized Key Management (CCKM)) is enabled.

Clicking the **CCX Configuration** button displays the **CCX LEAP RADIUS Configuration** window. Enter all the required information.

Figure 29: CCX EAP/LEAP RADIUS Configuration Window

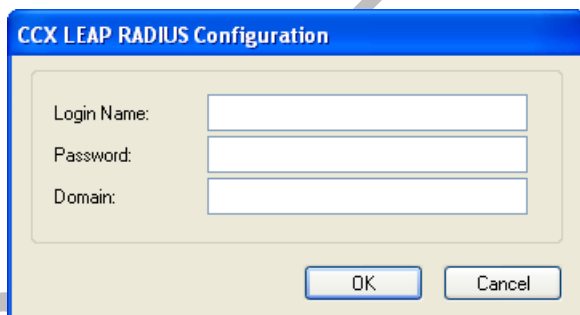


Table 8: CCX EAP/LEAP RADIUS Configuration Window Description

Field	Description
Login Name	Login name to the RADIUS server
Password	Password to login to the RADIUS server
Domain	Domain name for login to the RADIUS server (optional)

Click **OK** to set the configuration.

3.2.2.3 Encryption Methods

The following encryption methods are available, depending on the authentication mode:

- Security Off
- WEP
- TKIP
- AES

3.2.2.4 WEP Key Settings

If the WEP Encryption Method is selected, the **Security** tab displays the WEP Key Setting. To configure the WEP keys, select the WEP Key Setting, and click the **Configure WEP Keys** button.



Note

The WEP key used for the transmission must be identical on the sending and the receiving station.

Figure 30: Security Tab—WEP Key Settings

Profile Setting

Network Info Security Protocol

Authentication Mode: Open System

Encryption Method: WEP

WEP Key Setting

☒ Select Key 1 as Transmit Key

☐ Key 2 is not set

☐ Select Key 3 as Transmit key

☐ Key 4 is not set

Configure WEP Keys

Clicking the **Configure WEP Keys** button displays the **Configure WEP Key** window. Enter all the required information.

Figure 31: WEP Key Configuration Window

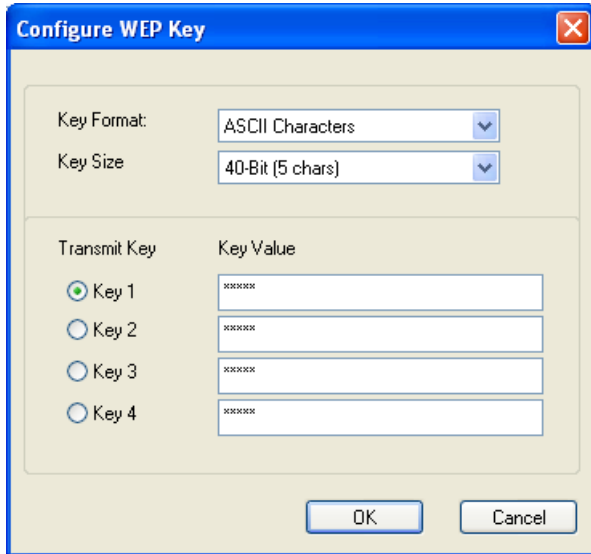


Table 9: WEP Key Configuration Window Description

Field	Description
Key Format	Either ASCII characters or hexadecimal digits
Key Size	40-bit, 5 character ASCII key size (40-bit, 10 character hexadecimal) 104-bit, 13 character ASCII key size (104-bit, 26 character hexadecimal)
Transmit Keys	There are four transmit keys. The key value is in ASCII or hexadecimal, depending on the format selected. The WEP key size shown depends on the key size selected.

Click **OK** to set the configuration.

3.2.2.5 TKIP/AES Settings

If TKIP/AES is selected and the Authentication Mode is WPA-PSK or WPA2-PSK, the security tab displays the TKIP/AES passphrase settings. Enter the passphrase into the **Passphrase** and **Confirm** boxes, and click **OK**.

Figure 32: TKIP/AES Settings

Profile Setting

Network Info Security Protocol

Authentication Mode: WPA2-PSK

Encryption Method: TKIP

Passphrase:

Confirm:

Currently, only the functions WPA-PSK + TKIP and WPA2-PSK + AES are available. There is no such combination as WPA-PSK + AES or WPA2-PSK + TKIP.

3.2.3 Profile Setting—Protocol Tab

The **Protocol** tab allows you to set or change the protocol information.

Figure 33: Protocol Tab

Profile Setting

Network Info Security Protocol

☐ Do not change settings

Use below settings

Power Save Mode: Continuous Access

Preamble (802.11b): Auto

Transmit Rate: Auto

Fragment Threshold: 2346

RTS/CTS Threshold: 2347

Region Code: Default

Reset

DO NOT CHANGE SETTINGS

If this check box is selected, the protocol setting is not changed when the profile is applied.

USE BELOW SETTINGS

If the **Do not change setting** check box is not selected, the protocol settings include the following parameters.

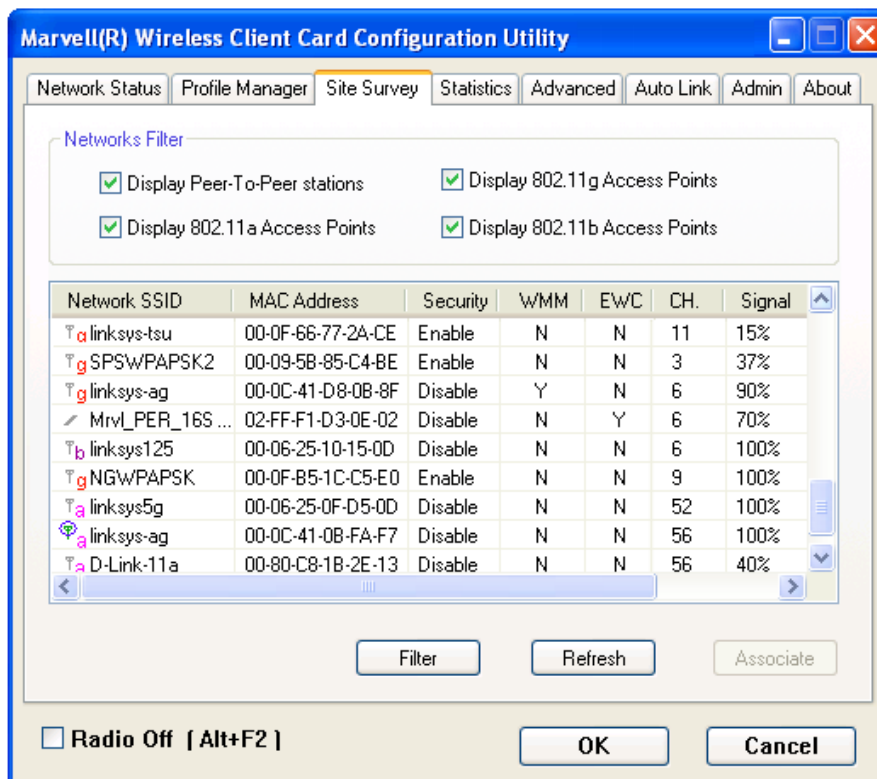
Table 10: Protocol Tab Description

Field	Description
Power Save Mode	Sets the power mode. Available options are Continuous Access or Max Power Save. The default setting is Continuous Access.
Preamble (802.11b)	Sets the Radio Preamble to Auto, Short or Long. This option takes effect only when attaching to an 802.11b network.
Transmit Rate	The range of the data rate depends on the type of AP that the client card is connected to. The default setting is Auto Select. MCS index will be allowed to select when the 802.11n Network check box in the Network Info tab is selected.
Fragment Threshold	Sets the fragmentation threshold (the size that packets are fragmented into for transmission). The default setting is 2346.
Region Code	Sets the region code. Available options are FCC (U.S.), IC (Canada), ETSI (Europe), Spain, France, and MKK (Japan).
RTS/CTS Threshold	Sets the packet size at which the AP issues a Request-To-Send (RTS) or Clear-to-Send (CTS) frame before sending the packet. The default setting is 2347.
Reset	Resets the protocol settings to their default values

3.3 Site Survey Tab

The **Site Survey** tab displays a list of all peer-to-peer (Ad-Hoc) and AP stations within range of the client card.

Figure 34: Site Survey Tab



3.3.1 Site Survey—Networks Filter

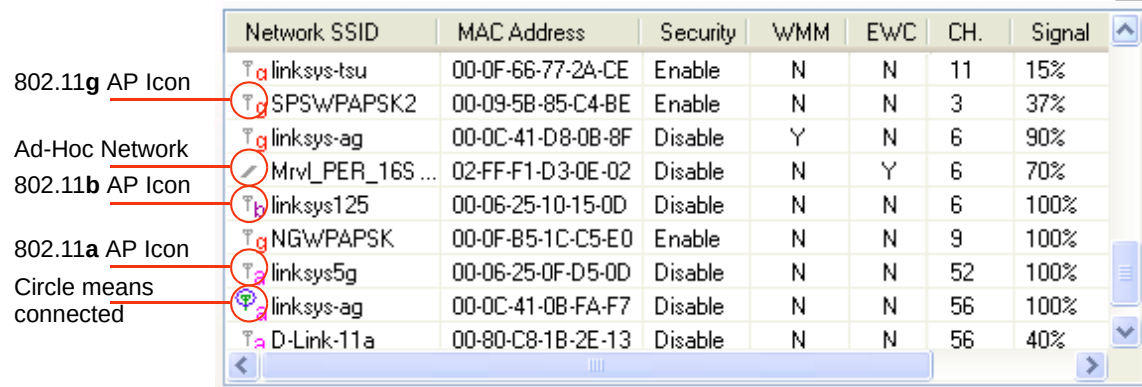
This section lets you customize which sites are displayed in the Site Survey list:

- **Display Peer-To-Peer stations**—selecting this check box displays all peer-to-peer (Ad-Hoc) stations within range.
- **Display 802.11a Access Points**—selecting this check box displays all 802.11a APs within range.
- **Display 802.11g Access Points**—selecting this check box displays all 802.11g APs within range.
- **Display 802.11b Access Points**—selecting this check box displays all 802.11b APs within range.

3.3.2 Site Survey—List of Detected Stations

This section reports information on the peer-to-peer (Ad-Hoc) stations or AP stations detected.

Figure 35: Site Survey—List of Detected Stations



Network SSID	MAC Address	Security	WMM	EWC	CH.	Signal
linksys-tsu	00-0F-66-77-2A-CE	Enable	N	N	11	15%
SPSWPAPSK2	00-09-5B-85-C4-BE	Enable	N	N	3	37%
linksys-ag	00-0C-41-D8-0B-8F	Disable	Y	N	6	90%
Mrvl_PER_16S ...	02-FF-F1-D3-0E-02	Disable	N	Y	6	70%
linksys125	00-06-25-10-15-0D	Disable	N	N	6	100%
NGWPAPSK	00-0F-85-1C-C5-E0	Enable	N	N	9	100%
linksys5g	00-06-25-0F-D5-0D	Disable	N	N	52	100%
linksys-ag	00-0C-41-0B-FA-F7	Disable	N	N	56	100%
D-Link-11a	00-80-C8-1B-2E-13	Disable	N	N	56	40%

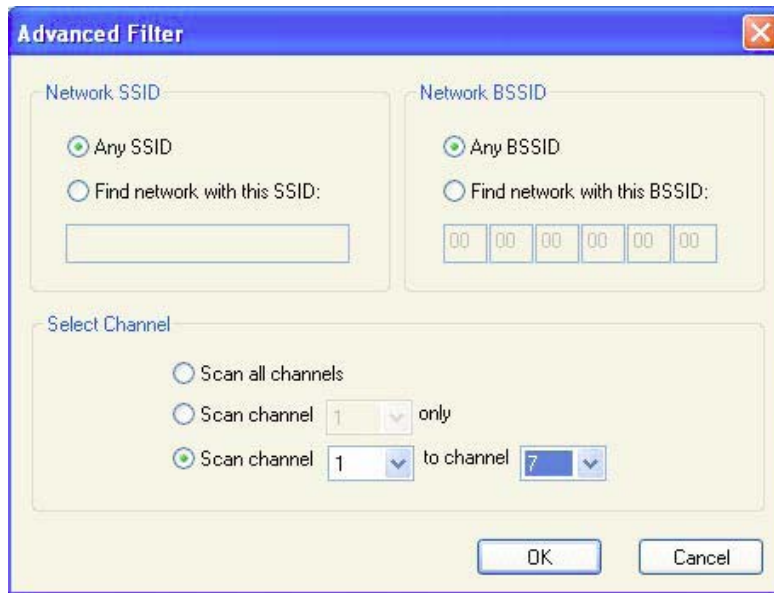
Table 11: List of Detected Stations Description

Field	Description
Network SSID	Network SSID label (i.e., the Network Name). The Network Name is a text string.
MAC Address	MAC address, a hardware address that uniquely identifies each node of a network
Security	Security enabled or disabled
CH	Channel used by the detected device
Signal	Signal strength of the detected device as a percentage
Icons	The following icons may be displayed left of the Network SSID: - An antenna icon with a subscript a indicates an 802.11a AP. - An antenna icon with a subscript b indicates an 802.11b AP. - An antenna icon with a subscript g indicates an 802.11g AP. - A circle around the antenna icon means the client card is connected to this network. - A slash icon indicates an Ad-Hoc network.
WMM	Wireless Multimedia Enhancements (WMM) supported by the detected device
EWC	Draft-802.11n/EWC functionality supported by the detected device
Network Type	Type of environment connected to: Ad-Hoc or Infrastructure

3.3.3 Site Survey—Filter Button

Clicking the **Filter** button displays the **Advanced Filter** window.

Figure 36: Site Survey—Advanced Filter Window



3.3.3.1 Network SSID

- **Any SSID**—no specific SSID is used when scanning for available networks in the area.
- **Find network with this SSID**—the utility searches for the specified SSID.

3.3.3.2 Network BSSID

- **Any BSSID**—no specific BSSID is used when scanning for available networks in the area.
- **Find network with this BSSID**—the utility searches for the specified BSSID.

3.3.3.3 Select Channel

- **Scan all channels**—all channels are scanned when searching for available networks in the area.
- **Scan channel Only**—only the specified channel is scanned when searching for available networks in the area.
- **Scan Channel to Channel**—a range of channels are scanned when searching for available networks in the area.

3.3.4 Site Survey—Refresh Button

Clicking the **Refresh** button requests a survey of the wireless networks in the area.

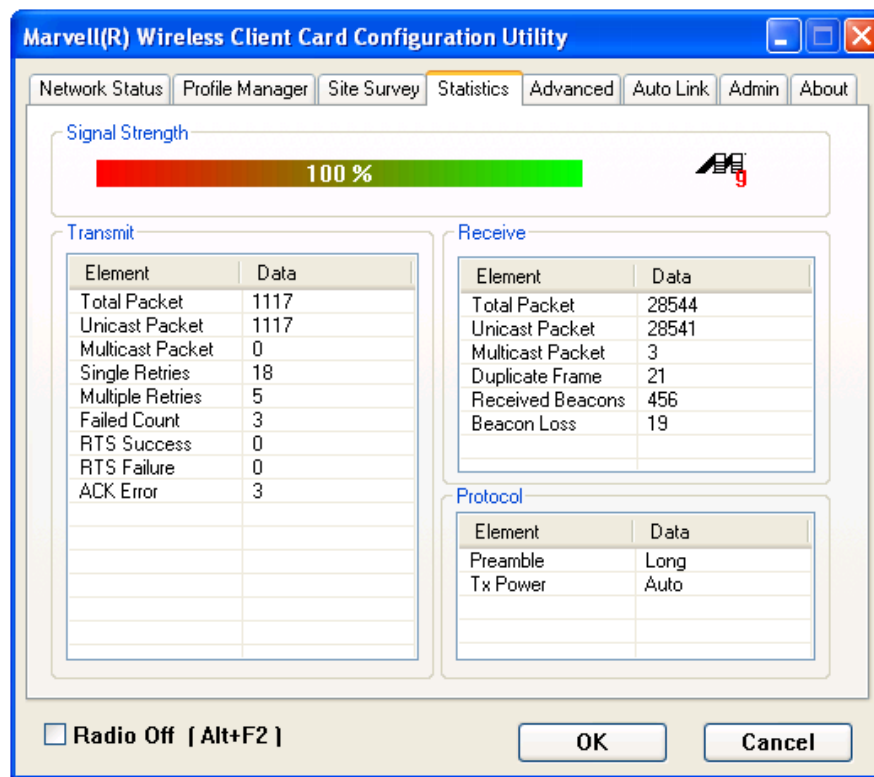
3.3.5 Site Survey—Associate Button

Select an available network, and then click the **Associate** button to establish a connection. Alternatively, the connection can be established by double-clicking the selected network.

3.4 Statistics Tab

Clicking the **Statistics** tab displays the statistics of the current connect session.

Figure 37: Statistics Tab



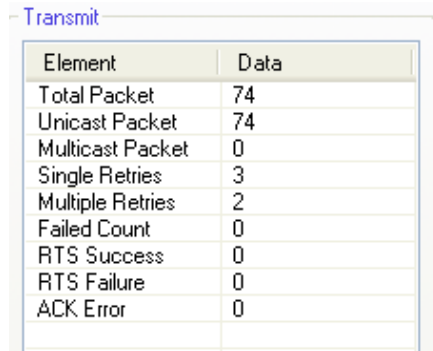
3.4.1 Signal Strength

The color-coded Signal Strength bar displays the signal strength of the last packet received by the client card. Signal strength is reported as a percentage. A signal in the red indicates a bad connection. A signal in the green indicates a good connection.

3.4.2 Transmit Section

The **Transmit** section displays the information on the packets sent.

Figure 38: Transmit Section



Element	Data
Total Packet	74
Unicast Packet	74
Multicast Packet	0
Single Retries	3
Multiple Retries	2
Failed Count	0
RTS Success	0
RTS Failure	0
ACK Error	0

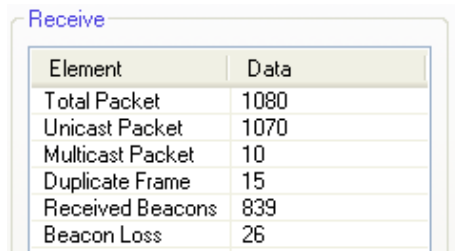
Table 12: Transmit Section Description

Field	Description
Total Packet	Reports the total number of packets transmitted
Unicast Packet	Reports the number of packets transmitted by the client card that were destined for a single network node
Multicast Packet	Reports the number of packets transmitted by the client card that were destined for more than one network node
Single Retries	Reports the number of packets that require one retry before the client card received an acknowledgement. NOTE: After the client card sends a packet, it waits for an acknowledge from the receiving radio to confirm that the packet was successfully received. If the acknowledge is not received within a specified period of time, the client card retransmits the packet.
Multiple Retries	Reports the number of packets that require more than one retry before the client card received an acknowledgement
Failed Count	Reports the number of packets that were not successfully transmitted because the client card did not receive an acknowledge within the specified period of time
RTS Success	Reports the number of RTS attempts that were successful
RTS Failure	Reports the number of RTS attempts that were not successful
ACK Error	Reports the number of unicast transmit attempts for which no acknowledgement was received

3.4.3 Receive Section

The **Receive** section displays the information on the packets received.

Figure 39: Receive Section



Element	Data
Total Packet	1080
Unicast Packet	1070
Multicast Packet	10
Duplicate Frame	15
Received Beacons	839
Beacon Loss	26

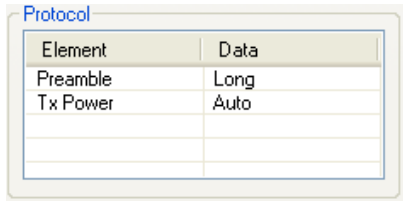
Table 13: Receive Section Description

Field	Description
Total Packet	Reports the total number of packets received
Unicast Packet	Reports the number of packets received by the client card that were destined for a single network node
Multicast Packet	Reports the number of packets received by the client card that were destined for more than one network node
Duplicate Frame	Reports the number of duplicate frames received
Received Beacons	Reports the number of beacons received after association is established
Beacon Loss	Reports the number of missing beacons after association is established

3.4.4 Protocol Section

The **Protocol** section displays the information on the protocol status.

Figure 40: Protocol Section



Element	Data
Preamble	Long
Tx Power	Auto

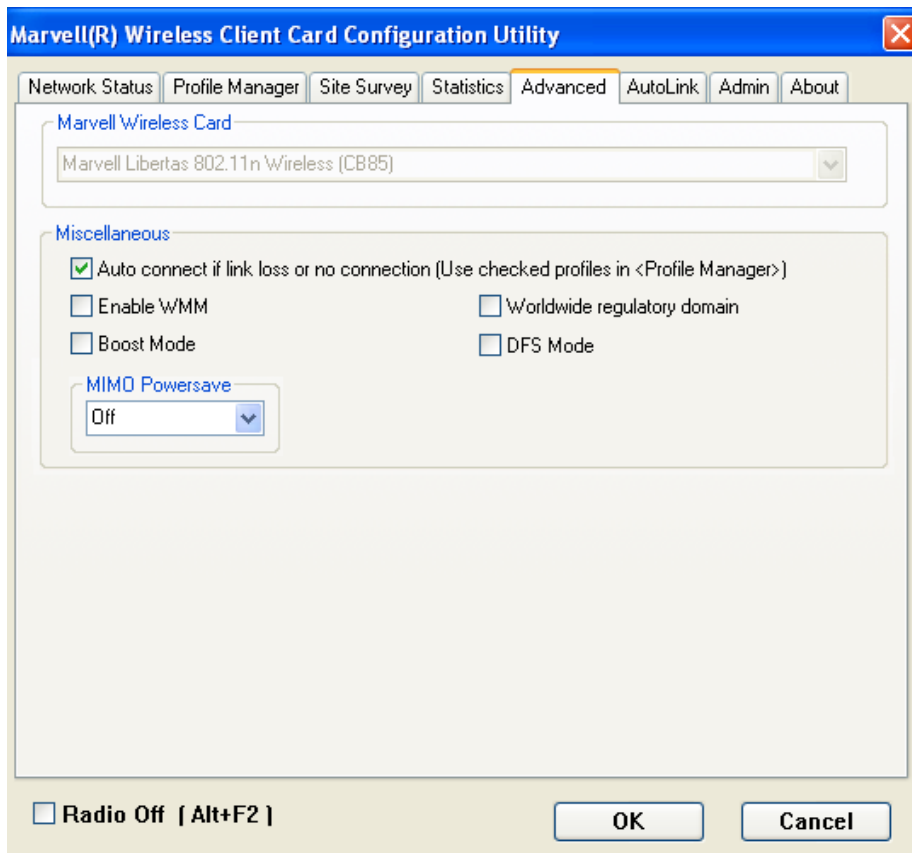
Table 14: Protocol Section Description

Field	Description
Preamble	Displays radio preamble type: • Auto • Short • Long
Tx Power	Displays transmit power mode: • Auto • High • Medium • Low

3.5 Advanced Tab

The **Advanced** tab displays the advanced parameters available for the installed Marvell client cards.

Figure 41: Advanced Tab



Note

The **Advanced** tab is not accessible when the Windows Zero Configuration Utility is enabled.

3.5.1 Advanced Tab—Marvell Wireless Card

This section of the **Advanced** tab reports the type of Marvell client card installed.

3.5.2 Advanced Tab—Miscellaneous

Figure 42: Miscellaneous Section

Miscellaneous

☒ Auto connect if link loss or no connection (Use checked profiles in <Profile Manager>)

☐ Enable WMM ☐ Worldwide regulatory domain

☐ Boost Mode ☐ DFS Mode

MIMO Powersave

Off

Table 15: Advanced Tab Miscellaneous Section Description

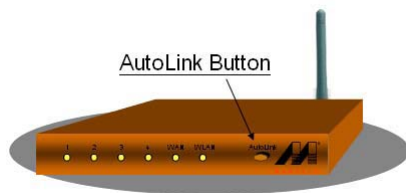
Field	Description
Auto connect if link loss or no connection (Use checked profiles in <Profile Manager>)	Clear this check box to disable the auto-configuration feature. Whenever there is a link loss, auto-configuration tries to establish a connection to the checked profiles in the Profile Manager window.
Boost Mode	Select this check box for performance enhancement.
Enable WMM	Select this check box to enable/disable the Wireless Multimedia Enhancements (WMM) feature.
Worldwide regulatory domain	Select this check box to set the regulatory domain
DFS Mode	Select this check box to enable Dynamic Frequency Selection (DFS)
MIMO Powersave	Enables/disables the Multiple Input Multiple Output (MIMO) Powersave Mode. Available options are Off and Static.

3.6 AutoLink Tab

To enable AutoLink mode, proceed as follows:

1. Toggle the AutoLink button on the Access Point to enable AutoLink mode.
2. Toggle the AutoLink button on the client to enter AutoLink mode.

Figure 43: Access Point AutoLink Button



Within 60 seconds, the AutoLink will be completed.

Figure 44: AutoLink Tab (Client)



AutoLink is complete.

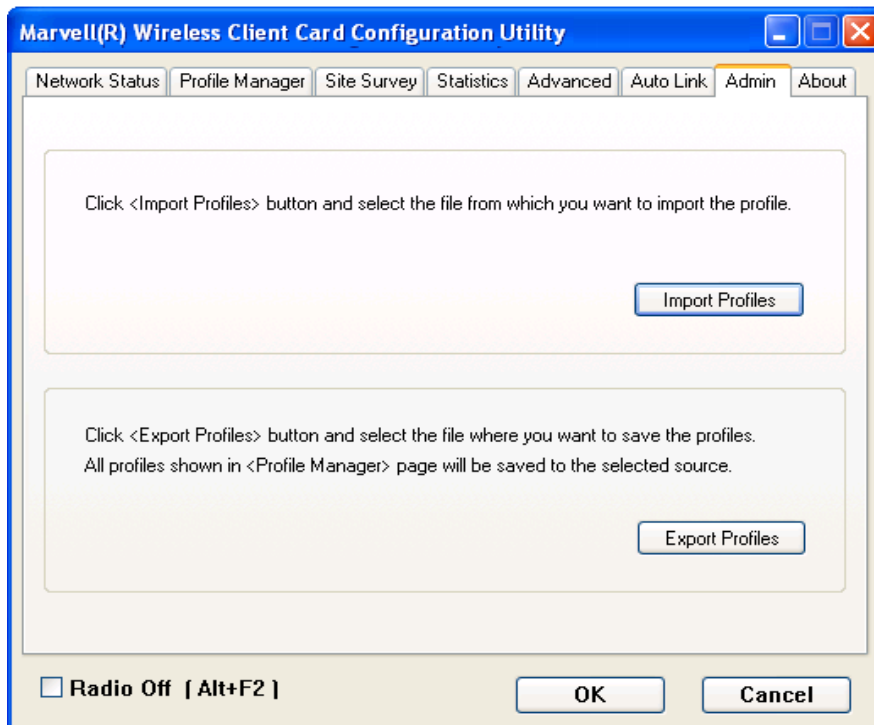
Figure 45: AutoLink Tab (AutoLink Complete)



3.7 Admin Tab

The **Admin** tab allows you to import and export profiles.

Figure 46: Admin Tab



3.7.1 Admin Tab—Import Profiles

To import a profile, proceed as follows:

1. Click **Import Profiles**.
2. Select the path and filename of the profile.
3. Click **Open**.

3.7.2 Admin Tab—Export Profiles

To export a profile, proceed as follows:

1. Click **Export Profiles**.
2. Select or enter the path and filename of the profile.
3. Click **Save**.

3.8 About Tab

The **About** tab displays information about the Marvell Client Card Configuration Utility.

Figure 47: About Tab





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Appendix A. Compliance Statements

A.1 Federal Communications Commission (FCC) Compliance

Transmitter Module Approval Conditions

1. Antennas must be installed to provide 20 cm separation distance from the transmitting antenna to the body of the user during normal operating condition. This device must not be co-located or operating in conjunction with any other antenna or transmitter.
2. Only those antennas filed under FCC ID:UAY-MMC85M can be used with this device.
3. When the module is installed in the final system where the antenna location is less than 20 cm separation distance to the body of user, additional equipment authorization must be applied.
4. FCC ID label on the final system must be labeled with "Contains FCC ID:UAY-MMC85M" or "Contains transmitter module FCC ID:UAY-MMC85M".
5. In the user manual, final system integrator must ensure that there is no instruction provided in the user manual to install or remove the transmitter module.
6. The transmitter module must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product. This device complies with the following radio frequency and safety standards.

USA-Federal Communications Commission (FCC)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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. If not installed and used in accordance with the instructions, it 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 tuning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

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

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



Caution

This device is restricted to indoor use due to its operation in the 5.15 to 5.25 GHz frequency range. FCC requires this product to be used indoors for frequency range 5.15 to 5.25 GHz to reduce the potential for harmful interference to co-channel mobile satellite systems. High power radars are allocated as primary users of the 5.25 to 5.35 GHz and 5.65 to 5.85 GHz bands. These radar stations can cause interference with and/or damage this device.



Caution

Exposure to Radio Frequency Radiation

To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons. This device must not be co-located or operating in conjunction with any other antenna or transmitter.

A.2 Industry Canada Notice

This device complies with Canadian RSS-210.

"This Class B digital apparatus complies with Canadian ICES-003"

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of this device."

L'utilisation de ce dispositif est autorisée seulement aux conditions suivantes : (1) il ne doit pas produire de brouillage et (2) l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

The term "IC" before the equipment certification number only signifies that the Industry Canada technical specifications were met.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.

To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing.

A.3 European Community

This equipment is marked with the **CE 0984**  symbol and can be used throughout the European community.

This indicates compliance with the R&TTE Directive 1999/5/EC and meets the relevant parts of following technical specifications:

- EN 301 893 – Broadband Radio Access Networks (BRAN); 5 GHz high performance RLAN; Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive.
- EN 300 328-2 – Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques
- EN 301 489-17 – Electromagnetic compatibility and Radio Spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for 2.4 GHz wideband transmission systems and 5 GHz high performance RLAN equipment.
- EN 60950 – Safety of information technology equipment, including electrical business equipment. Marking by the symbol:  indicates that usage restrictions apply.

Marking by the symbol  indicates that usage restrictions apply.



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Appendix B. Acronyms and Abbreviations

Table 16: Acronyms and Abbreviations

Term	Definition
AES	Advanced Encryption Standard
AP	Access Point
BRAN	Broadband Radio Access Networks
BSS	Basic Service Set
BSSID	Basic Service Set ID
CCKM	Cisco Centralized Key Management
CCX	Cisco Compatible eXtensions
CE	Conformité Européenne (European Conformity)
CTS	Clear to Send
DFS	Dynamic Frequency Selection
DHCP	Dynamic Host Configuration Protocol
EAP	Extensible Authentication Protocol
EC	European Community
EIRP	Equivalent Isotropically Radiated Power
EMC	Electromagnetic Compatibility
EN	European Standard
ERM	Electromagnetic compatibility and Radio spectrum Matters
EWG	Enhanced Wireless Consortium
FCC	Federal Communications Commission
ICES	Interference-Causing Equipment Standard
IEEE	Institute of Electrical and Electronics Engineers
IP	Internet Protocol
ISM	Industrial, Scientific, and Medical applications (of radio)
LAN	Local Area Network
LEAP	Light EAP
IC	Industry Canada
MAC	Medium Access Controller
Mbps	Megabits per second
MCS	Modulation and Coding Scheme
MIC	Message Integrity Check
MIMO	Multiple Input Multiple Output

Table 16: Acronyms and Abbreviations (Continued)

Term	Definition
NMB	Norme sur le Matériel Brouilleur (ICES)
PEAP	Protected EAP
PSK	Pre-Shared Keys
R&TTE	Radio and Telecommunications Terminal Equipment
RADIUS	Remote Authentication Dial In User Service
RLAN	Radio Local Area Network
RSS	Radio Standards Specification
RTS	Request to Send
SSID	Service Set Identifier
TCP/IP	Transmission Control Protocol/Internet Protocol
TKIP	Temporal Key Integrity Protocol
TLS	Transport Layer Security
TTLS	Tunneled TLS
WEP	Wired Equivalent Privacy
Wi-Fi	Wireless Fidelity (IEEE 802.11)
WLAN	Wireless Local Area Network
WMM	Wireless Multimedia Enhancements
WPA	Wi-Fi Protected Access
WPA2	Wi-Fi Protected Access 2
WPA2-PSK	Wi-Fi Protected Access 2-Pre-Shared Keys
WPA-PSK	Wi-Fi Protected Access-Pre-Shared Keys

Appendix C. Revision History

Table 17: Revision History

Document Type	Revision
Release	Rev. B
<i>Appendix A. "Compliance Statements" on page 53</i> added	



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