

WM5502

802.11b/g/n USB Module

User's Manual

REGULATORY STATEMENTS

FCC Certification

The United States Federal Communication Commission (FCC) and the Canadian Department of Communications have established certain rules governing the use of electronic equipment.

Part15, Class B

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

- 1) This device may not cause harmful interference, and
- 2) This device must accept any interference received, including interference that may cause undesired operation. This equipment has been tested and found to comply with the limits 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 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 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.

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.



CAUTION

1. 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.
2. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
3. For product available in the USA market, only channel 1~11 can be operated. Selection of other channels is not possible.

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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE:

This module is intended for OEM integrator. The OEM integrator is still responsible for the FCC compliance requirement of the end product, which integrates this module.

20cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such configuration, the FCC radiation exposure limits set forth for an population/uncontrolled environment can be satisfied.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

USERS MANUAL OF THE END PRODUCT:

In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. If the size of the end product is smaller than 8x10cm, then additional FCC part 15.19 statement is required to be available in the users manual: This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

LABEL OF THE END PRODUCT:

The final end product must be labeled in a visible area with the following " Contains TX FCC ID: MQ4WM5502 ". If the size of the end product is larger than 8x10cm, then the following FCC part 15.19 statement has to also be available on the label: This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

IC Certification

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

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 the device.

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

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.

This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter.

IMPORTANT NOTE:

IC Radiation Exposure Statement:

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

IMPORTANT NOTE:

This module is intended for OEM integrator. The OEM integrator is still responsible for the IC compliance requirement of the end product, which integrates this module.

20cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such configuration, the IC RSS-102 radiation exposure limits set forth for an population/uncontrolled environment can be satisfied.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

USERS MANUAL OF THE END PRODUCT:

In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the IC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. IC statement is required to be available in the users manual: This Class B digital apparatus complies with Canadian ICES-003. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

LABEL OF THE END PRODUCT:

The final end product must be labeled in a visible area with the following " Contains TX IC : 2826B-WM5502 ".

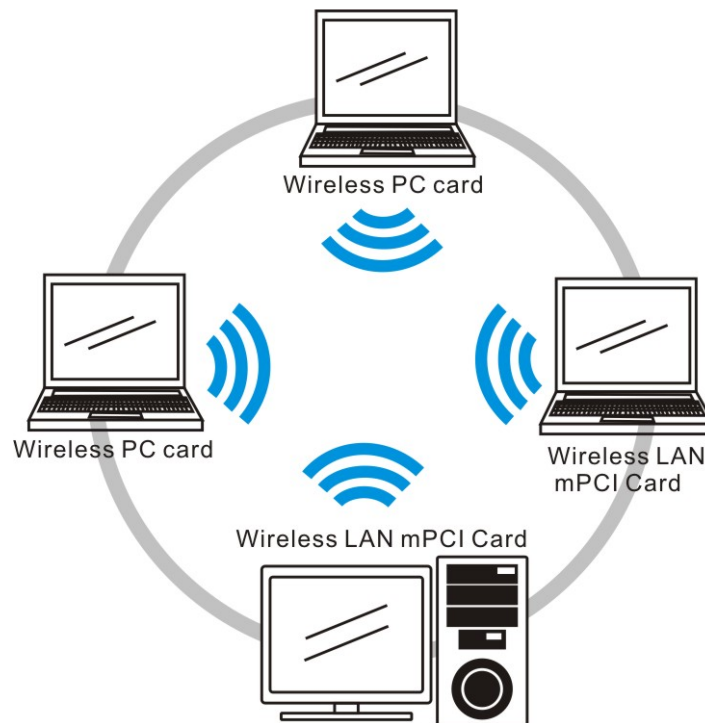
INTRODUCTION

WM5502 is a USB module that supports maximum range and speed. This USB module supports higher data rate of up to 150Mbps when connecting with wireless 802.11n device which is 3 times faster than your normally 11g connection. It is for sure the trendiest piece of upgrade you can make to your wireless network.

Wireless Network Options

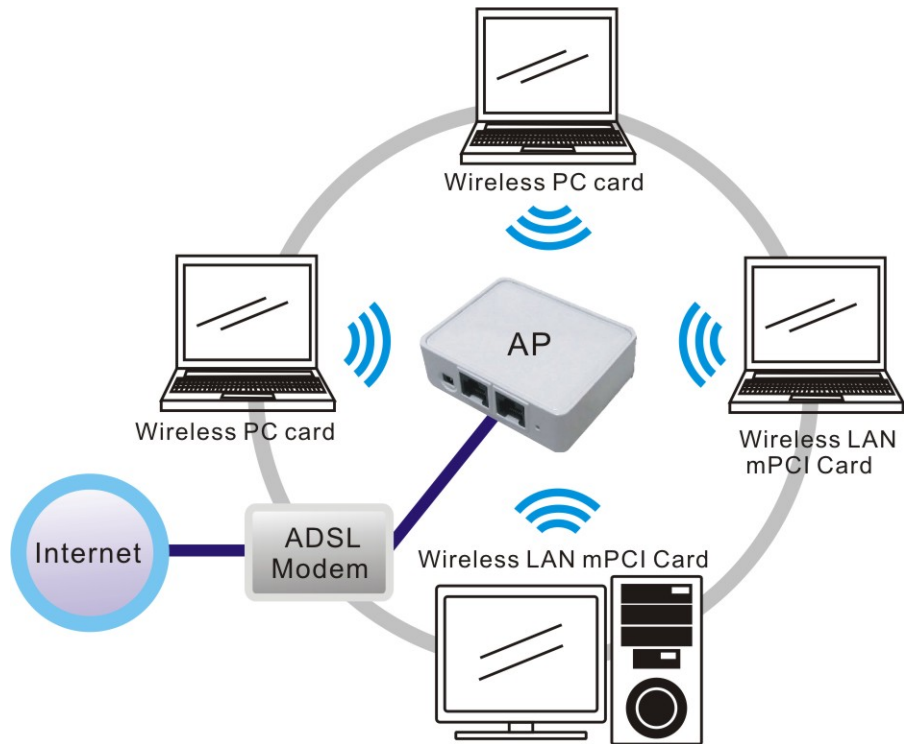
The Peer-to-Peer Network

This network installation lets you set a small wireless workgroup easily and quickly. Equipped with wireless PC Cards or wireless LAN mPCI Card, you can share files and printers between each PC and laptop.



The Access Point Network

The network installation allows you to share files, printers, and Internet access much more conveniently. With Wireless LAN Cards, you can connect wireless LAN to a wired global network via an **Access Point**.



Accessing the Configuration Utility

All settings are categorized into 5 Tabs:

Main Tab

Profile Manager Tab

Advanced Tab

Info Tab

About Tab

1. Select the wireless connection type- **Infrastructure**. Then click **Next** to continue.

Select Station Type

Choice work infrastructure Mode

Infrastructure :
Connect a wireless network through the AP.

Next Cancel

2. Select a wireless station on the list, and click **Next** to configure its settings.

Select Station Type

Click on item to select

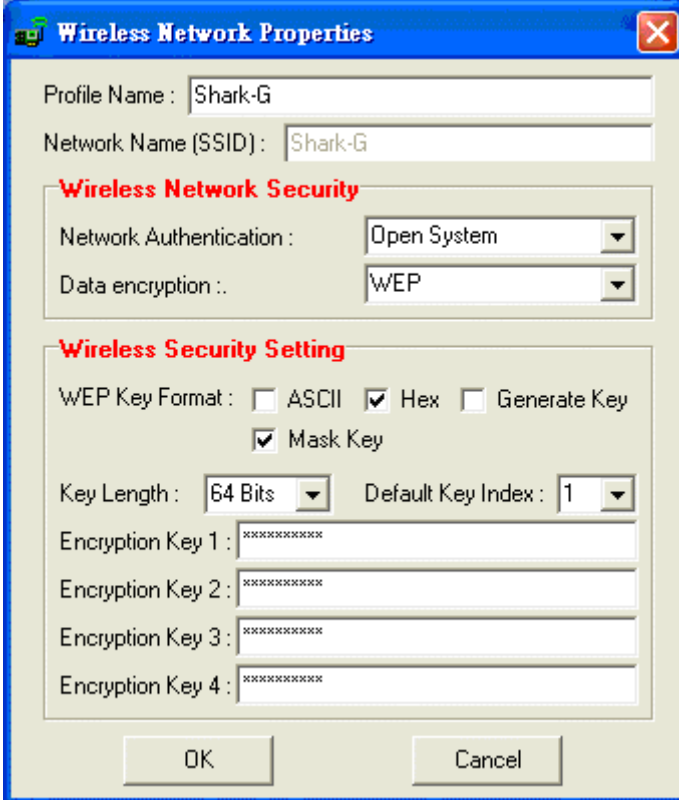
Select Network

SSID	Chan...	Encry...	Netw...	Signal	Type
Shrek_B	6	Disabl...	Unkn...	10%	Infrast
Xterasys	11	Disabl...	Unkn...	50%	Infrast
youren	11	Disabl...	Unkn...	10%	Infrast
ZUES	11	WEP	Unkn...	6%	Infrast

Refresh

Back Next Cancel

The following screen will appear for you to configure, for detailed configuration, please refer to **Profile** tab in the later selection.

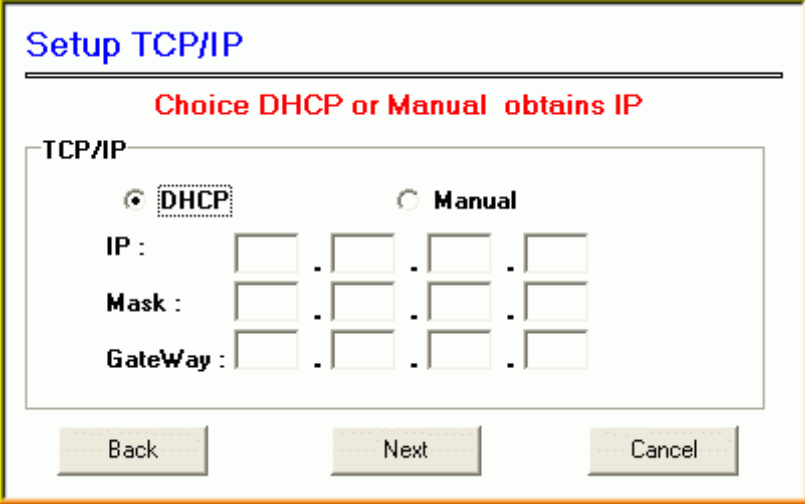


The image shows a Windows-style dialog box titled "Wireless Network Properties". It contains the following fields and options:

- Profile Name: Shark-G
- Network Name (SSID): Shark-G
- Wireless Network Security**
 - Network Authentication: Open System
 - Data encryption: WEP
- Wireless Security Setting**
 - WEP Key Format: ASCII Hex Generate Key
 - Mask Key
 - Key Length: 64 Bits
 - Default Key Index: 1
 - Encryption Key 1: [Redacted]
 - Encryption Key 2: [Redacted]
 - Encryption Key 3: [Redacted]
 - Encryption Key 4: [Redacted]

Buttons: OK, Cancel

3. Configure the network TCP/IP, you may select **DHCP** to obtain an IP address automatically or select **Manual** to set an IP address. Click **Next** to continue.



The image shows a "Setup TCP/IP" dialog box with the following content:

- Title: Setup TCP/IP
- Section: Choice DHCP or Manual obtains IP
- TCP/IP section:
 - DHCP
 - Manual
 - IP: [] . [] . [] . []
 - Mask: [] . [] . [] . []
 - GateWay: [] . [] . [] . []

Buttons: Back, Next, Cancel

4. Select **DNS Auto** to obtain DNS automatically or select **Manual** to set the primary and secondary DNS. Click **Finish** to complete the **Easy Config** procedure.

Setup DNS

Choice DNS Auto or DNS Manual

DNS

DNS Auto

Manual

Primary : . . .

Sec : . . .

Main Tab

The main tab enables you to scan for available networks, select a network to which to connect, modify the settings for the current connection.

802.11a/b/g High Power Wireless LAN mPCI Card ✖

Main **Profile** **Advanced** **Info** **About**

Status : **Associated**

Speed : **5.5 Mbps**

Type : **Infrastructure**

Authentication : **Open System**

Encryption : **None**

SSID : **Shark-G**

Signal Strength : **51%**

Link Quality : **79%**

Total Throughput : **0%**

Throughput TX : **0%**

Throughput RX : **0%**

Net Work Address

MAC Address : **00:E0:12:12:12:04** Subnet Mask : **255.255.255.0**

IP Address : **192.168.0.102** Gateway : **192.168.0.1**

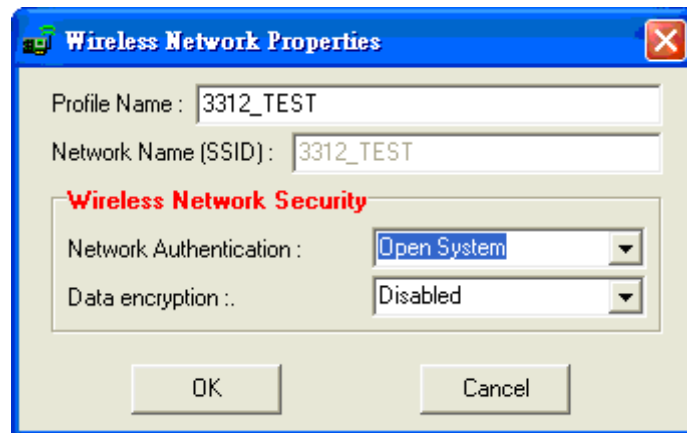
Show Tray Icon Windows Zero Config Radio Off

Easy Config

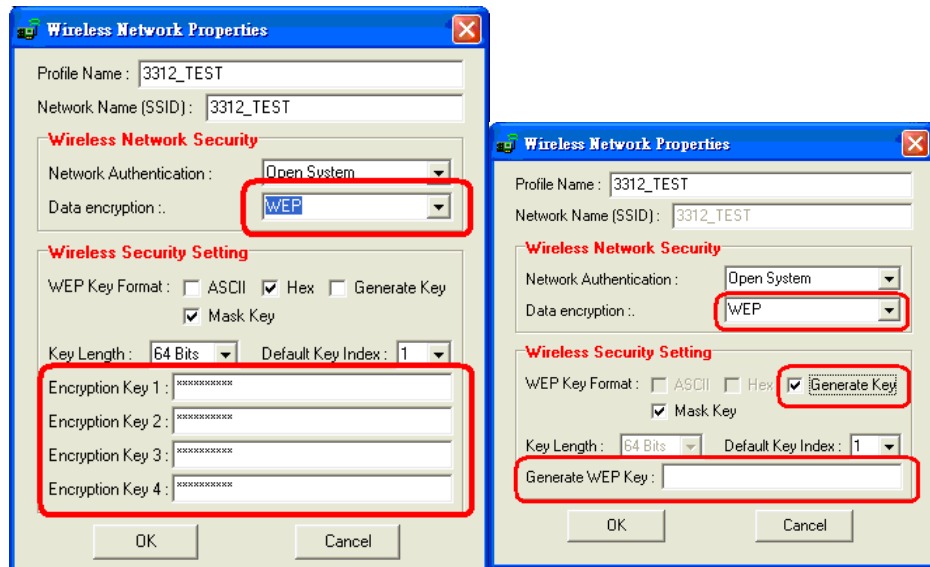
Status	Shows the current connection status.
Speed	Shows the connection speed.
Type	Shows the wireless connection type.
Authentication	Shows the authentication type.
Encryption	Shows the encryption type.
SSID	The SSID is the unique name shared among all points in your wireless network. The name must be identical for all devices and points attempting to connect to the same network.
Signal Strength	The signal strength from the network Access Point or station.
Link Quality	Shows the link quality percentage.
Total Throughput	Shows the total throughput percentage.
Throughput TX	The actual instantaneous transmitting rates.
Throughput RX	The actual instantaneous receiving rates.
Network Address	
MAC Address	The MAC address of this wireless adapter.
IP Address	The IP address of this wireless adapter.
Subnet Mask	The subnet mask of this wireless adapter.
Gateway	The default gateway address of the adapter.
<input type="checkbox"/> Show Tray icon	Place a check in the check box to show the utility icon in the tray.
<input type="checkbox"/> Radio Off	Place a check in the check box to disable the radio function.
<input type="checkbox"/> Windows Zero Config	<p>External Configuration Checkbox (Windows XP only): A checkbox that enables you to disable the WLAN Station Configuration Utility and indicates that the station driver is to be configured with Windows XP's built-in Zero Configuration Utility (ZCU).</p> <p>On Windows XP systems, the ZCU service is automatically stopped when the WLAN utility is installed. The ZCU is started when you check the Configure using Windows Zero Configuration checkbox.</p> <p>The checkbox is only displayed on Windows XP systems.</p>

Wireless Network Properties

The Wireless Network Properties screen will appear if you just click **Connect**, **Configure** or **Add** buttons.

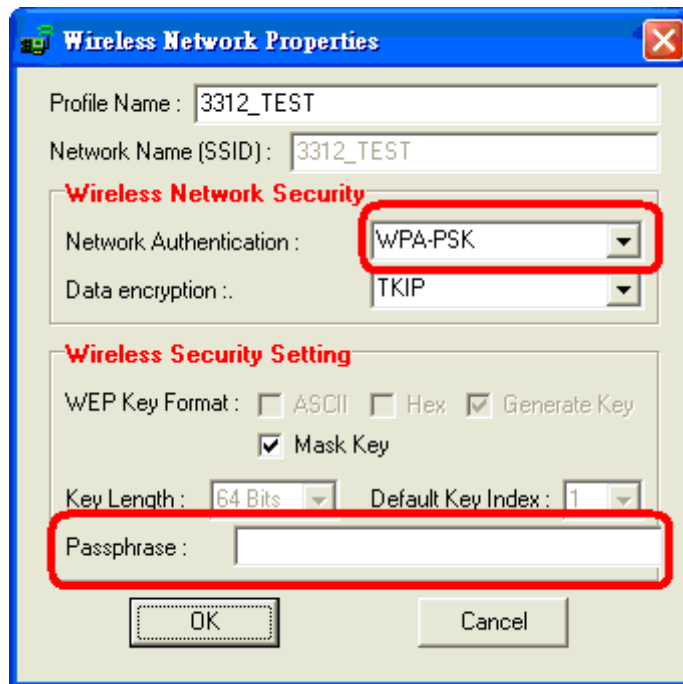


Profile Name	You may enter the preferred profile name in this column.
Network Name (SSID)	The SSID for the current profile.
Wireless Network Security	
Network Authentication	<p>The authentication type defines configuration options for the sharing of wireless networks to verify identity and access privileges of roaming wireless network cards.</p> <p>Select the Network Authentication from the pull-down list.</p> <p>Open System: If the Access Point is using "Open System" authentication, then the wireless adapter will need to be set to the same authentication type.</p> <p>Shared Key: Shared Key is when both the sender and the recipient share a secret key.</p> <ul style="list-style-type: none"> • If WEP is selected from Data encryption pull-down menu, you can either input Encryption Key 1~4 or check the Generate Key box and enter WEP keys in the Generate WEP Key blank, then the system will generate keys automatically.




- **WPA-PSK/WPA2-PSK:** In the **Passphrase** field, enter the key (8~63 characters, case sensitive.) that you are sharing with the network for the WLAN connection. By default, the key that you type is masked with asterisks (*). To view the key that you entered, uncheck the **Mask Key** box.

If **WPA-PSK/WPA2-PSK** is selected from Data encryption pull-down menu, enter the Passphrase in the column to setup the wireless network security.



Data encryption	Select the data encryption from the pull-down menu, either TKIP or AES.
WEP Key Format	<ul style="list-style-type: none"> ● ASCII (American Standard Code for Information Interchange), the standard for assigning numerical values to the set of letters in the Roman alphabet and

	<p>typographic characters.</p> <ul style="list-style-type: none"> ● HEX (Hexadecimal): numbers from 0 to 9 and letters from A to F. ● Generate Key: Check the Generate Key box and enter WEP keys in the Generate WEP Key blank, then the system will generate keys automatically. ● Mask Key: Place a check in the check box to enable the Unmask Key function, this function is for concealing the WEP key.
Key Length	<p>Select the key length from the pull-down menu, either 64 Bit or 128 Bit.</p> <p>If you are using 64-bit WEP encryption, then the key must consist of exactly 10 hexadecimal characters or 5 ASCII characters. If you are using 128-bit WEP encryption, then the key 26 hexadecimal characters or 13 ASCII characters. Valid hexadecimal characters are “0” to “9” and “A” to “F”.</p>
Default Key Index	Select the default key index 1~4 from the pull-down menu.
Passphrase	<p>Instead of manually entering WEP keys, you can enter a Passphrase, so that a WEP key is automatically generated. It is case-sensitive and should not be longer than 16 alphanumeric characters. This Passphrase must match the Passphrase of your wireless network.</p>
Encryption Key 1~4	<p>To configure your WEP settings. WEP (Wired Equivalent Privacy) encryption can be used to ensure the security of your wireless network. Select one Key and Key Size then fill in the appropriate value/phrase in Encryption field.</p> <p><i>Note: You must use the same Key and Encryption settings for the both sides of the wireless network to connect.</i></p> <p>KEY 1 ~ KEY 4 : You can specify up to 4 different keys to <i>decrypt</i> wireless data. Select the Default key setting from the radio button.</p> <p>Encryption : This setting is the configuration key used in accessing the wireless network via WEP encryption.</p> <p>A key of 10 hexadecimal characters (0-9, A-F) is required if a 64-bit Key Length was selected.</p> <p>A key of 26 hexadecimal characters (0-9, A-F) is required if a 128-bit Key Length was selected.</p> <p>A key of 58 hexadecimal characters (0-9, A-F) is required if a 256-bit Key Length was selected.</p>
802.1x configure	
EAP TYPE	<p>WPA 802.1x/ WPA2 802.1x: Require setting up a RADIUS sever for authentication, RADIUS server manager will assign the username and password.</p> <p>Select the EAP TYPE from the pull-down list. Including TLS, TTLS and PEAP.</p>

	
Username	Type in the user name assigned to the certificate.
Certificate	Please query your network manager about the certificate, select the same certificate as the certification server.
OK	Click OK to save the configuration.
Cancel	Click Cancel to exit the configuration screen.

Advanced Tab

The **Advanced** tab displays the current status of the module.

Threshold	
Fragment Threshold	The mechanism of Fragmentation Threshold is used to improve the efficiency when high traffic flows along in the wireless network. If your 802.11b/g Wireless LAN Adapter often transmits large files in wireless network, you can enter new Fragment Threshold value to split the packet. The value can be set from 256 to 2432. The default value is 2432 .
RTS Threshold	RTS/CTS Threshold is a mechanism implemented to prevent the “ Hidden Node ” problem. If the “Hidden Node” problem is an issue, users have to specify the packet size. <u>The RTS/CTS mechanism will be activated if the data size exceeds the value you set.</u> The default value is 2432 . This value should remain at its default setting of 2432 . Should you encounter inconsistent data flow, only minor modifications of this value are recommended.
Connection	Wireless Mode: Select 802.11a , 802.11b , 802.11a/b , 802.11 a/g or 802.11g/b from the pull-down menu. Preamble Mode: A preamble is a signal used in wireless environment to synchronize the transmitting timing including Synchronization and Start frame delimiter. Select from the pull-down menu to change the Preamble type into Auto , Long or Short .
Apply	Click to save current changes.

Set Default

Click to restore default settings.

Info Tab

The **Info** tab displays information maintained by the driver, such as the number of packet errors and the total number of bytes received or transmitted. The tab also displays information about the current connection, as well as network information about the station. The statistics are for the period starting when you last connected to a network. The statistics are refreshed at least twice a second.

The screenshot shows a configuration window for an 802.11a/b/g High Power Wireless LAN mPCI Card. The window has a title bar with a close button (X) and five tabs: Main, Profile, Advanced, Info (selected), and About. The Info tab is active, displaying statistics for Transmit and Receive, and Card Status. A Reset button is located at the bottom left of the window.

Transmit		Card Status	
TX OK :	887	Short Radio Header :	YES
TX Error :	50	Encryption :	Disabled
TX Retry :	435	Authenticate :	Open System
TX Beacon OK :	0	Channel Set :	FCC
TX Beacon Error :	0	MAC Address :	00:E0:12:12:04
Receive		Data Rate :	5.5 Mbps
RX OK :	203	Channel (Frequency) :	3 (2422 MHz)
RX Packet Count :	203	Status :	Associated
RX Retry :	0	SSID :	Shark-G
RX CRC Error(0-500) :	0	Network Type :	Infrastructure
RX CRC Error(500-1000) :	0	Power Save Mode :	None
RX CRC Error(>1000) :	0	Associated AP MAC :	00:0F:3D:41:42:32
RX ICV Error :	0	Associated AP IP :	
		Up Time (hh:mm:ss) :	0:09:25

Reset

About Tab

Click on the **About** tab to view basic version information about the **OS Version**, **Utility Version**, **Driver Version**, **Firmware Version** and **EEPROM Version**.

