Chung Nam Electronics (CNE)
IEEE 802.11 b/g MiniPCI WLAN Card
(Model #: WLC-101GA)
Installation Manual

Version 0.1

December 2008

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Chapter 1 Introduction

The CNE 802.11g WLAN NIC is a complete wireless high speed Network Interface Card (NIC). It conforms to the IEEE 802.11g protocol and operates in the 2.45GHz ISM frequency bands.

It provides a complete reference design evaluation platform of hardware and software to system providers or integrators requiring wireless data communications capability and is ideal for integration into computer platforms.

- Fully compliant with the IEEE 802.11g WLAN standards
- FCC Certified Under Part 15 to Operate in the 2.45 GHz Bands
- Support for 54, 48, 36, 24, 18, 12, 9, and 6 Mbps OFDM, 11 and 5.5 Mbps CCK and legacy 2 and 1 Mbps data rates
- Driver Supports Microsoft Windows ® XP and 2000 (SR1)

Model: WLC-101GA

Chapter 2 Installation Procedure

2.1 Installing the software drivers on MS Windows platform

The driver installation procedure on MS Windows platform is described as follows. Windows XP is used as the example. It is similar in other Windows platform (e.g. Windows 2000).

1. Make sure that the miniPCI card has been inserted in your machine properly.

2. Copy the driver into the notebook, execute the Setup.exe.

3. Select the language to want to install, Click Next to continue..
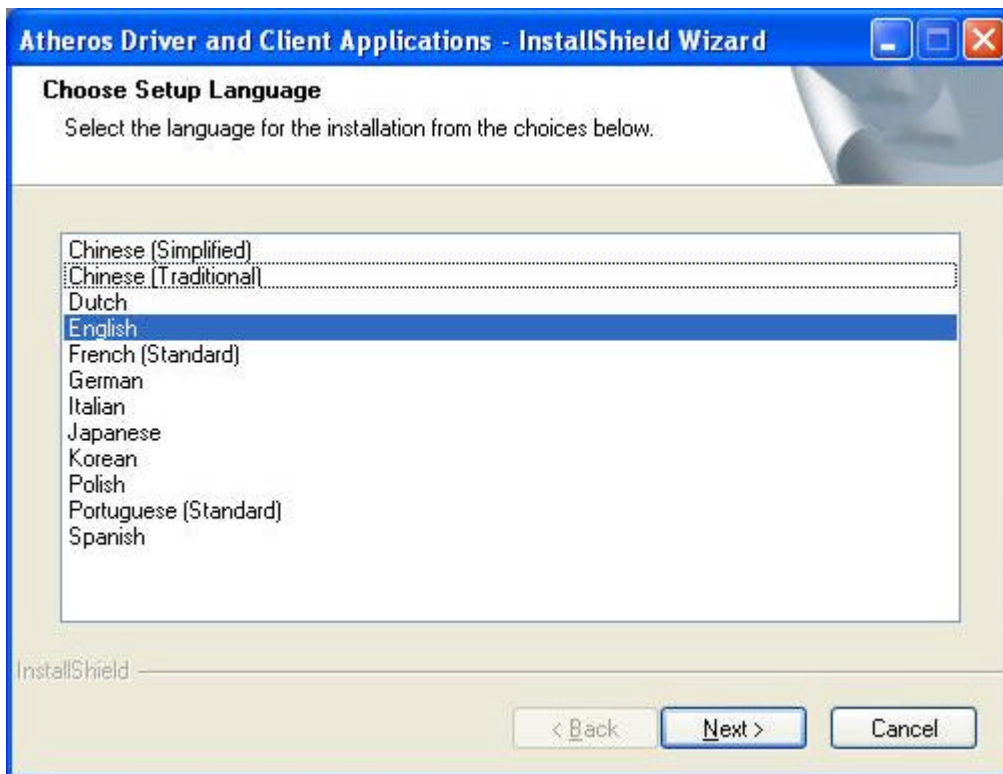

Figure 2-1 Choose Setup Language

4. To continue,click Next on the screen,figure 2-2.Click Cancel to end the lnstallation
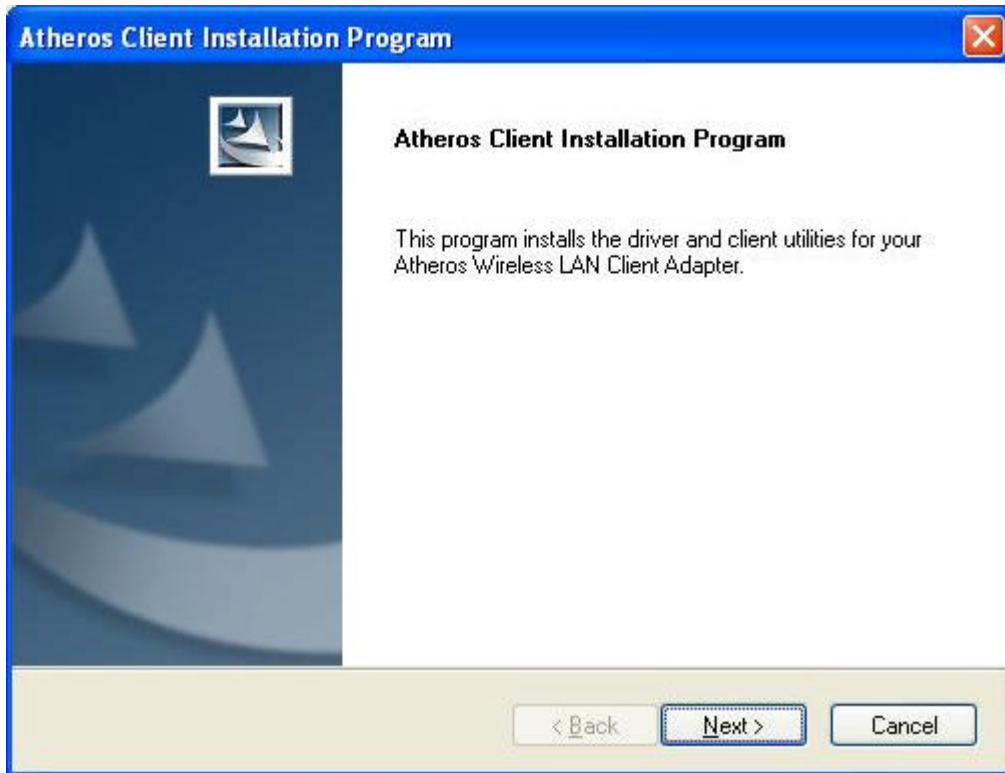

Figure 2-2 Atheros Client Installation Program

5. The Setup Wizard will ask you to choose a Setup type in figure 2-3.lt is recommended that you select "**Install Client Utilities and Driver**".
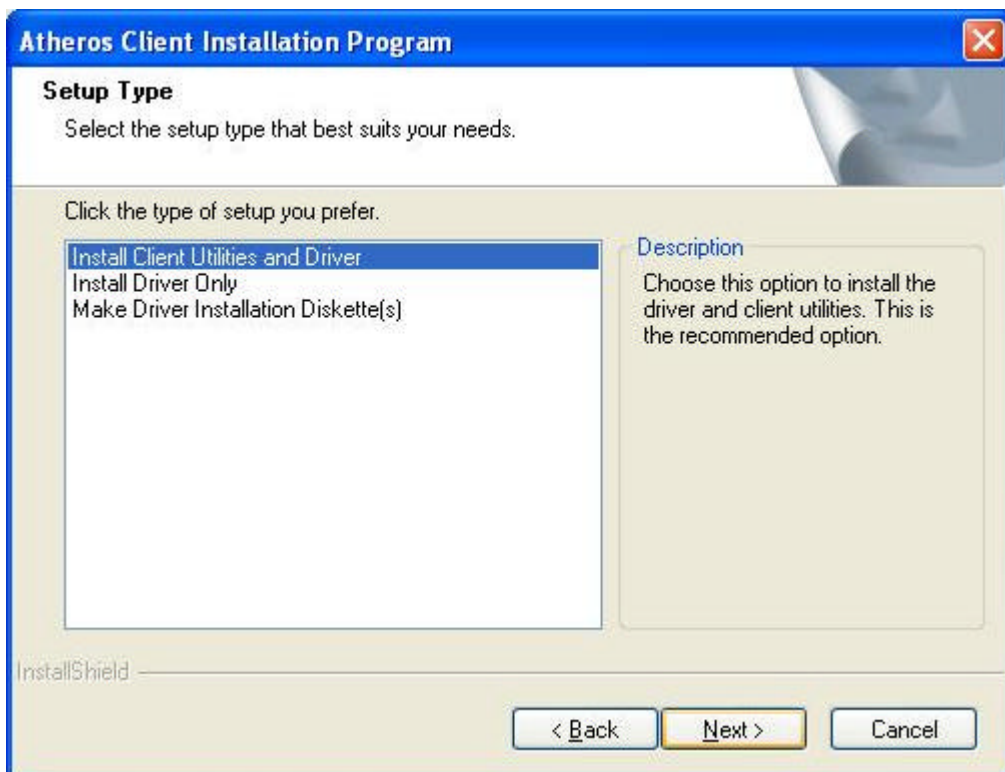

Figure 2-3 Select the setup type

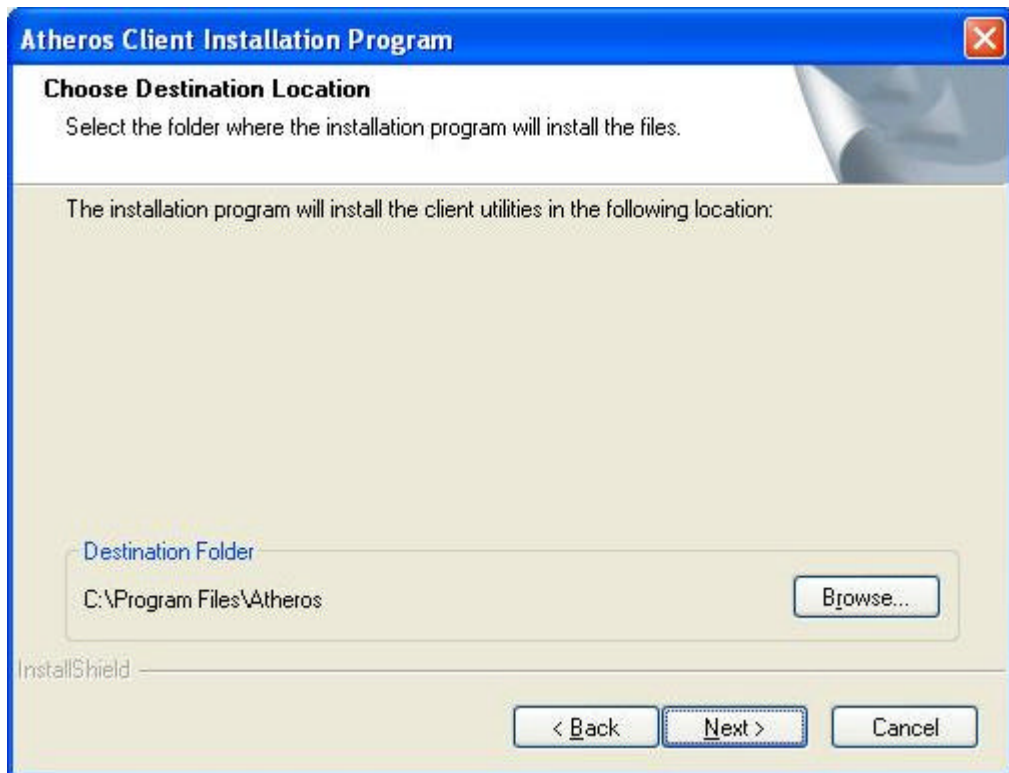6. Select the folder where the installation program will install the files.

Figure 2-4 Choose Destination Location

7. Setup your client adapter. lt is recommended that you select "**Atheros Client Utility(ACU)and Supplicant".**
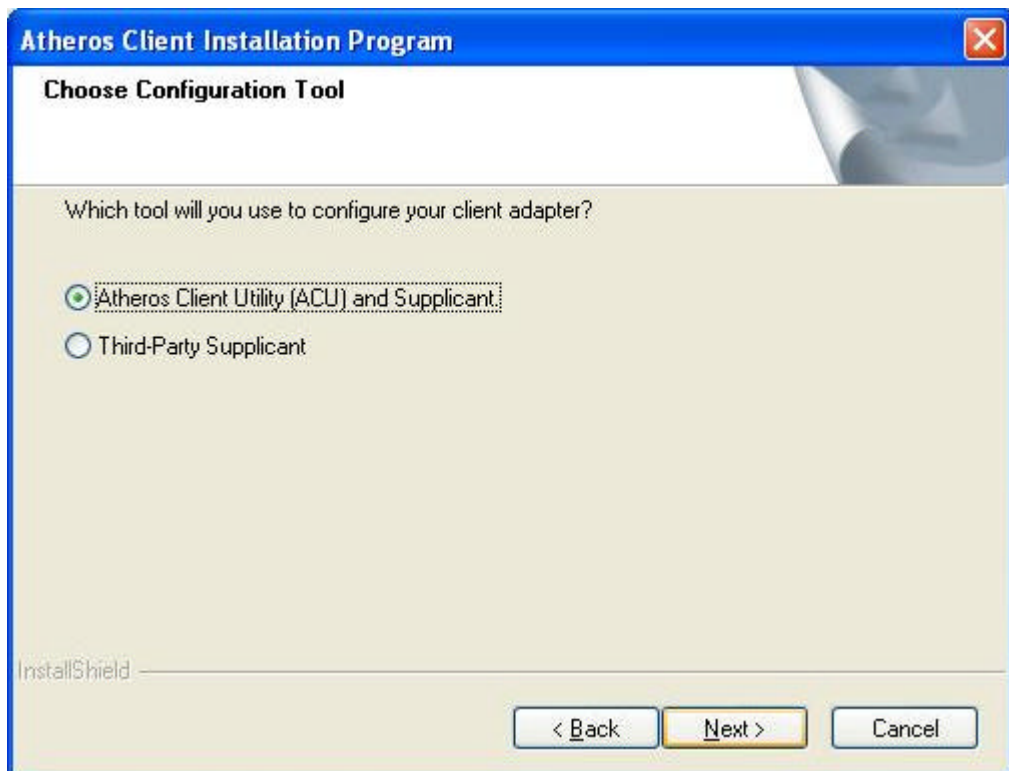
Figure 2-5 hoose Configuration Tool

8. The Setup Wizard will notify you of how to proceed with the installation, shown in figure 2-6. Clicd OK to continue the Installation.
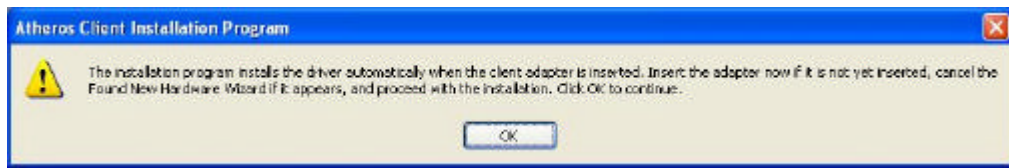
Figure 2-6 Information prompt

9. Atheros Client Installation Program is configuring your new software software installation.
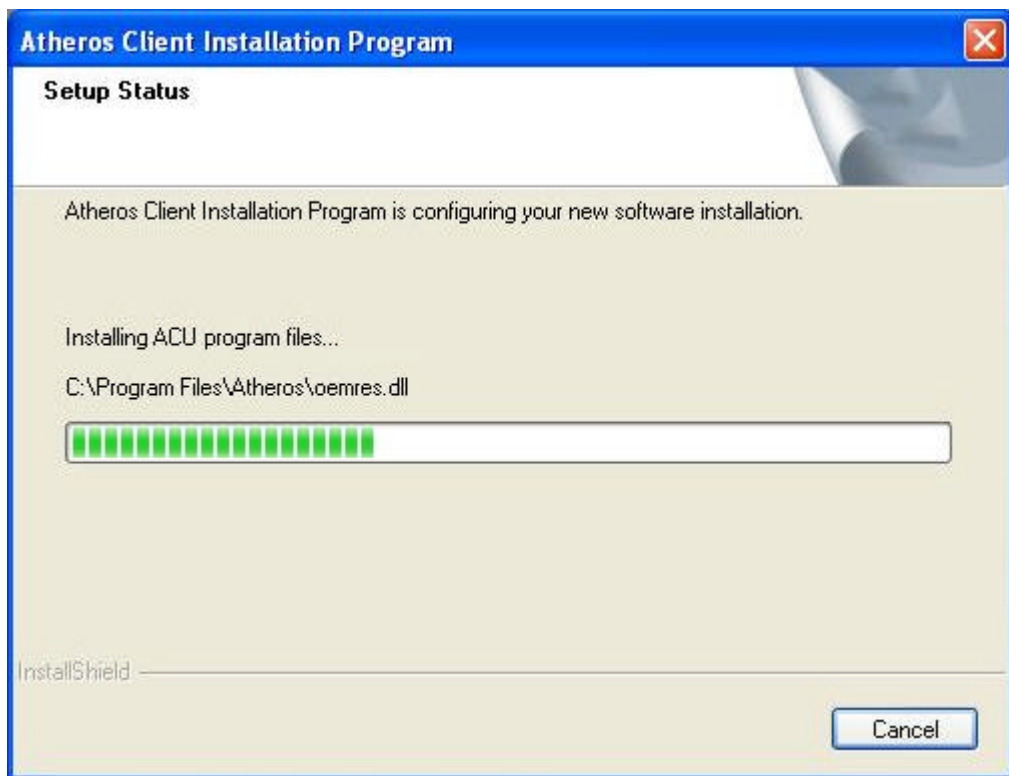
Figure 2-7 Setup Status

10. While files are copying .you will see a warning box, shown in figure 2-8a. Please select YES to continue installation. Our drivers have been tested thoroughly, and are able to work with the operating system.
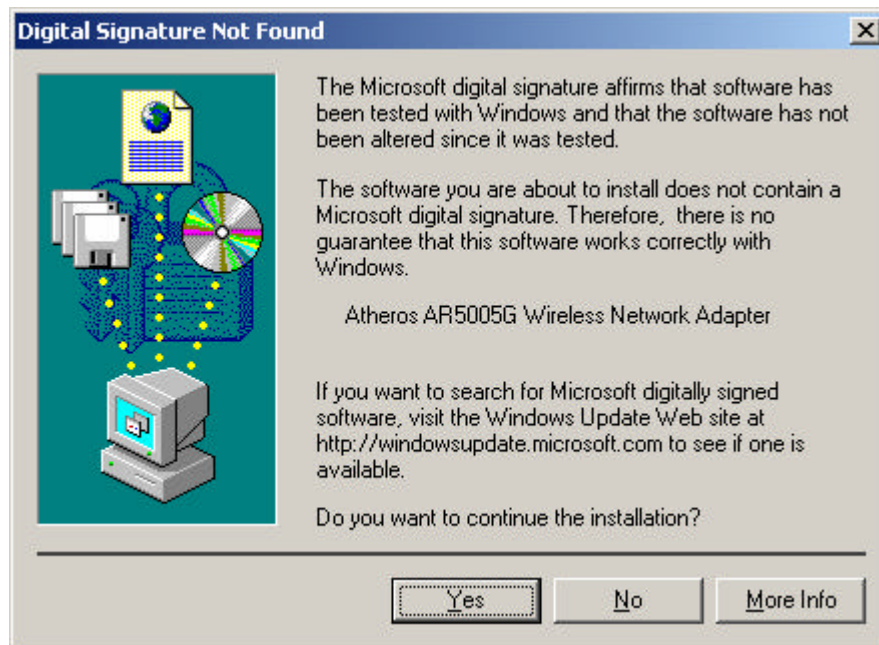
Figure 2-8a Widwods 2000 Warning Box

Note: In Windows XP, the warning box is similar to that shown figure 2-8b. Please select Continue Anyway to continue installation.

Figure 2-8b Windows XP Warning Box

11. After the files have been successfully copied, the screen in figure 2-9 will appear Click Finish to reboot the system.
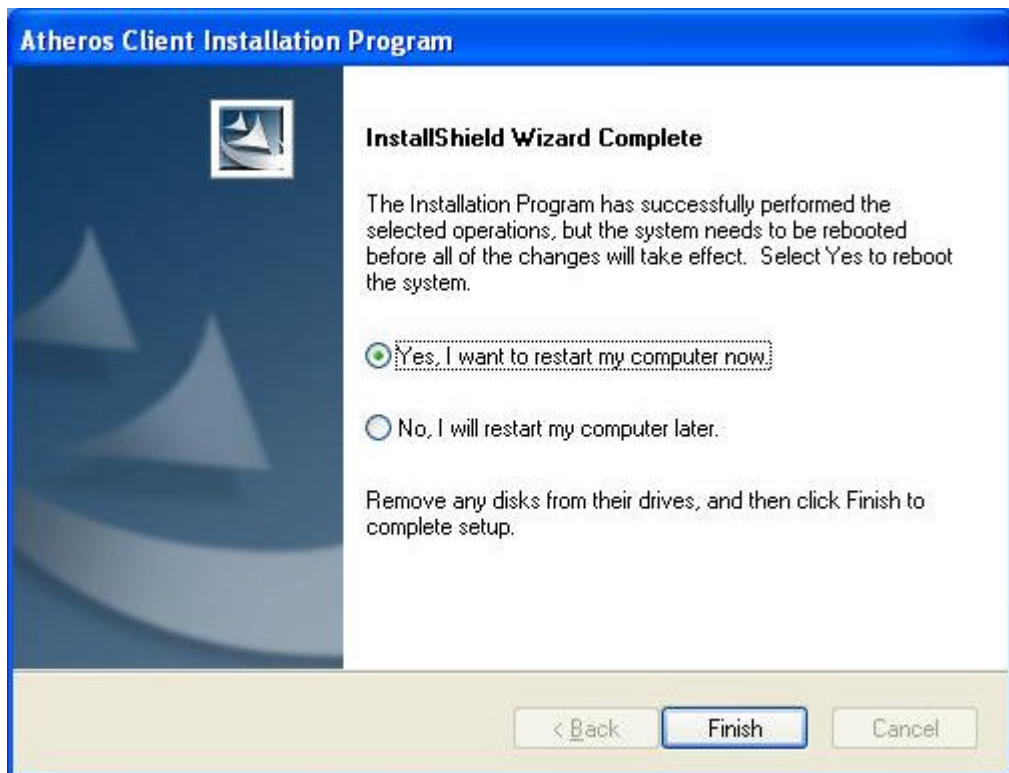
Figure 2-9 Finish

2.2 Configuration

The Wireless Adapter can be configured by Wireless Client Utility (WCU). This chapter describes how to configure your Wireless Adapter for wireless connectivity on your Wireless Local Area Network (WLAN) and use the data security encryption features.

After Installing the Adapter, the Adapter's tray icon will appear in your system tray. It appears at the bottom of the screen, and shows the signal strength using color and the received signal strength indication (RSSI).

If the icon is gray, there is no connection.

Double-click the icon and the **WCU utility** will run. You can also run the utility by clicking the **Start>Program>Wireless>Wireless Client Utility**. The WCU utility provides a complete and easy to use set of tools to:

∗ Display current status information

∗ Edit and add configuration profiles

∗ Display current diagnostics information

The section below introduces these above capabilities.

2.3 Current Status

The Current Status tab contains general information about the program and its operations. The Current Status tab does not require any configurations.
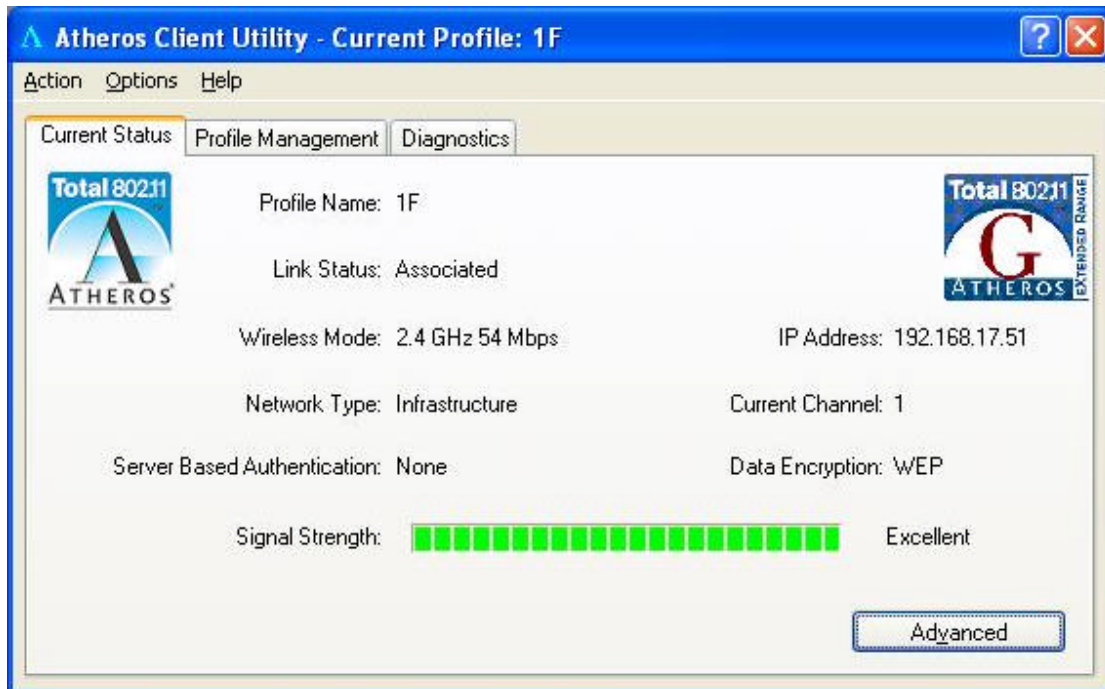
Figure 3-1 Current Status

The following table describes the items found on the Current Status screen.

* **Profile Name -** The name of current selected configuration profile. Set up the configuration name on the **General** tab of **Profile Management**.

* **Link Status -** Shows whether the station is associated to the wireless network.

* **Wireless Mode -** Displays the wireless mode. Configure the wireless mode on the **Advanced** tab of **Profile Management**.

* **Network Type -** The type of network and the station currently connected. The options include:

? Infrastructure (access point)

? Ad Hoc

Configure the network type on the **Advanced** tab of **Profile Management**.

* **IP Address -** Displays the computer's IP address.

* **Data Encryption -** Displays the encryption type the driver is using. Configure the encryption type on the **Security** tab of **Profile Management**.

* **Server Based Authentication -** Shows whether server based authentication is used.

* **Signal Strength -** Shows the strength of the signal.

2.4 Profile Management

Click the Profile Management tab of the WCU Utility and the Profile Management screen
will appear, figure 3-3. The Profile Management screen provides tools to:

* Add a profile
* Edit a profile
* Remove a profile
* Switch to another Profile
* Import a Profile
* Export a Profile
* Scan Available Networks
* Order profiles
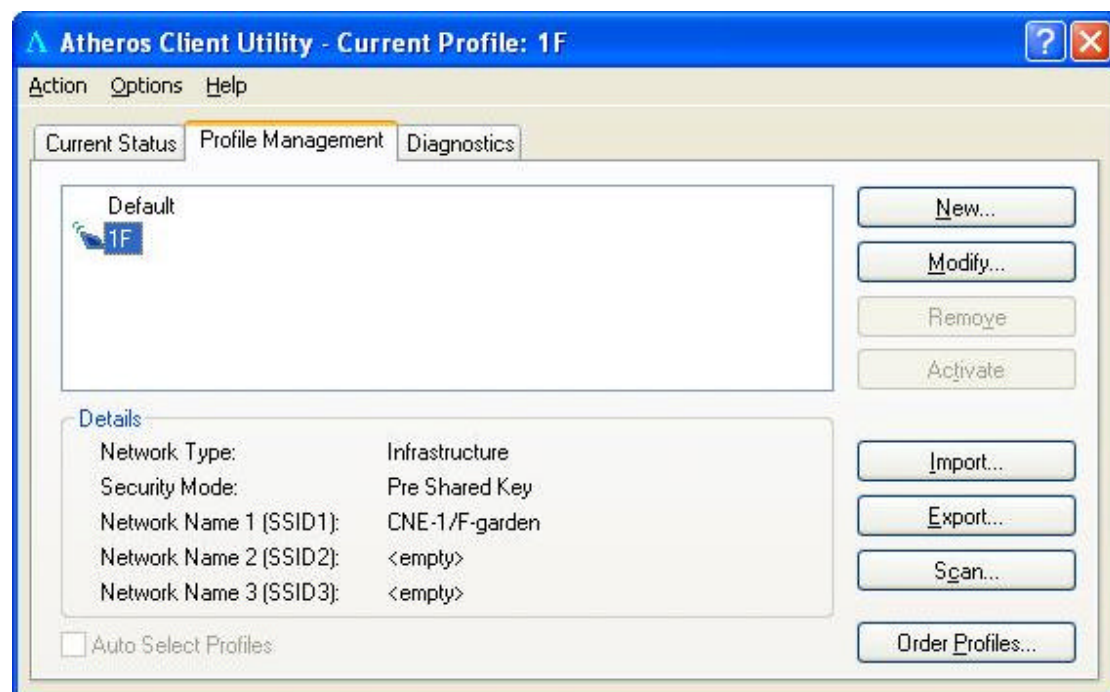
Figure 3-2 Profile Management tab

2.4.1 Add or Modify a Configuration Profile

To add a new configuration profile, click **New** on the Profile Management tab. To modify a
configuration profile, select the configuration from the Profile list and click **Modify**.
The Profile Management dialog box will display a screen similar to that shown in Figure
3-4.

1. Edit the General tab

* **Profile Name -** Identifies the configuration profile. This name must be unique. Profile
names are not case-sensitive.

* **Client Name -** Identifies the client machine.

* **Network Names (SSIDs) -** The IEEE 802.11 wireless network name. This field has a
maximum limit of 32 characters.
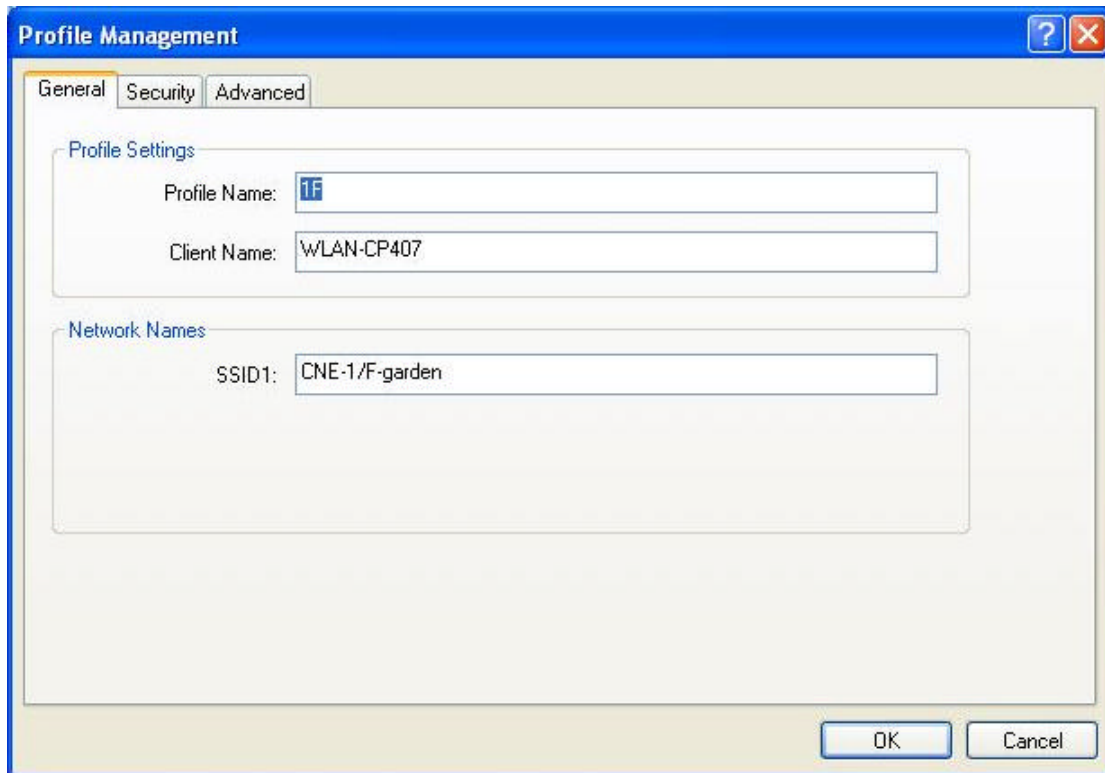
Figure 3-3 General Tab of Profile Management

2. Edit the Security tab

Edit the fields in the Security tab of Profile Management to configure the profile. To define the security mode, select the radio button of the desired security mode.

* **WPA -** Wi-Fi Protected Access
* **WPA Passphrase -** Wi-Fi Protected Access Passphrase
* **802.1x -** Enables 802.1x security.
* **Shared Key (Static WEP) -** Enables the use of shared keys that are defined on both the access point and the station. To define shared encryption keys, choose the Shared Key radio button and click **Configure** to fill in the Define Shared Keys window.

   None: No security (not recommended).

Note: If the access point that the wireless adapter is associating to has WEP set to Optional and the client has WEP enabled, make sure that Allow Association to Mixed Cells is checked on the Security Tab to allow association. To complete WEP encryption configuration, you must select the 802.11 Authentication Mode as appropriate on the **Advanced** tab of this **Profile Management** dialog.

Figure 3-4 Security tab of Profile Management

Figure 3-5 Define Shared Keys

3. Edit the Advanced tab

* **Power Save Mode -**

 ? **Maximum -** Selects maximum mode to let the access point buffer incoming
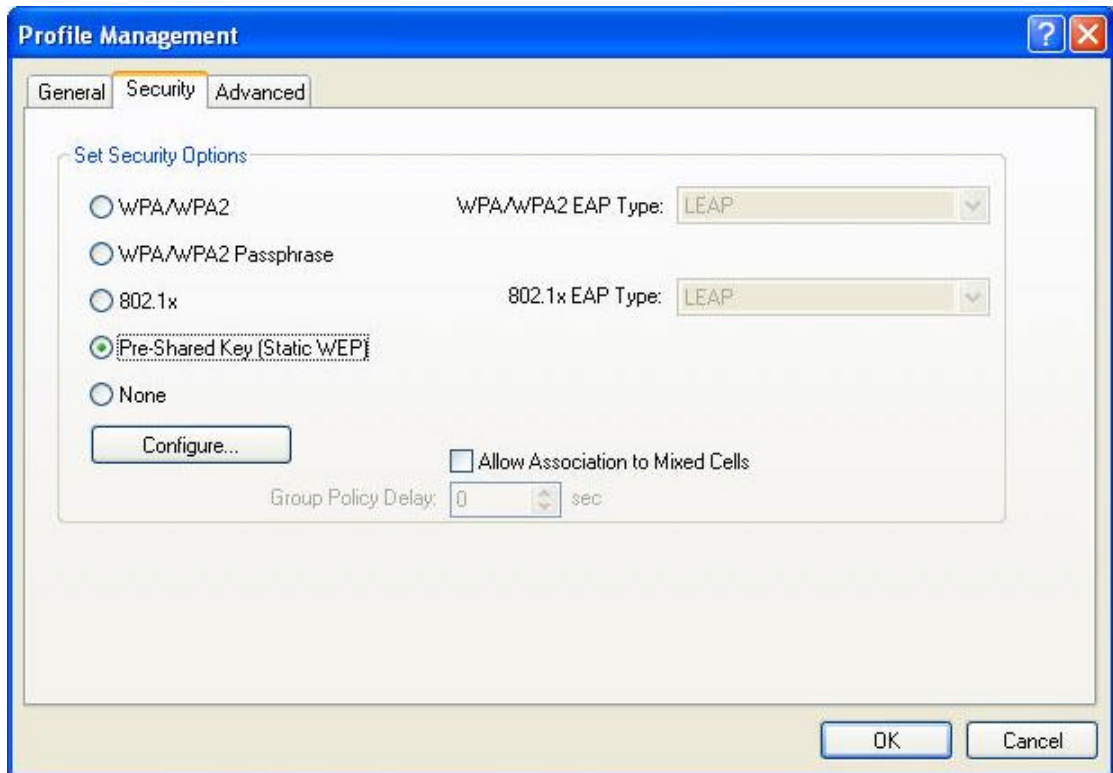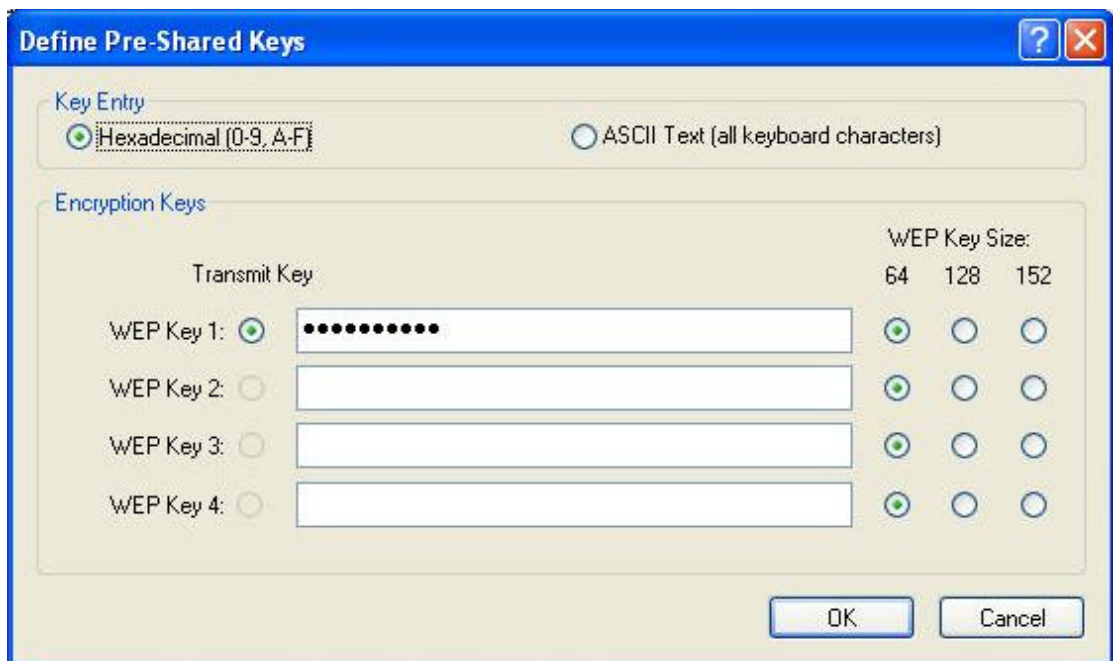   messages for the wireless adapter. The adapter will detect the access point if
   any messages are waiting periodically.

 ? **Normal -** In Normal mode, the adapter will be switched to maximum mode
   automatically when no large packets are retrieved.

 ? **Off -** turns power saving off, thus powering up the wireless adapter continuously
   for a short message response time.

* **802.11b Preamble -** Specifies the preamble setting in 802.11b. The default setting is
  Short & Long (access point mode), which allows both short and long headers in the
  802.11b frames. The adapter can only use short radio headers if the access point
  supports and uses them. Set to **Long Only** to override allowing short frames.

* **Wireless Mode -** Specifies 2.4 GHz 54 Mbps, 2.4 GHz 11 Mbps operation in an
  access point network. The wireless adapter must match the wireless mode of the
  access point with which it associates

* **Wireless Mode when Starting an Ad Hoc Network -** Specifies 2.4 GHz 54/11Mbps
  to start an Ad Hoc network if no matching network name is found after scanning all
  available modes.

* **802.11 Authentication Mode -** Select which mode the wireless adapter uses to
  authenticate to an access point:

 ? **Automatic** causes the adapter to attempt authentication using shared, but switches it to open
   authentication if shared fails.

 ? **Open System** enables an adapter to attempt authentication regardless of its WEP settings. It
   will only associate with the access point if the WEP keys on both the adapter and the access
   point match.

 ? **Shared-key** only allows the adapter to associate with access points that have the same WEP
   key.

For infrastructure (access point) networks, click **Preferred APs…**to specify up to four
access points to the client adapter that attempts to be associated to the access points.

2.4.2 Scan Available Networks

1. Click **Scan** on the Profile Management, the Available Infrastructure and Ad Hoc
Networks window will appear.

2. Click **Refresh** to refresh the list at any time.

3. Highlight a network name and click **Activate** to connect an available network. If no configuration profile exists for that network, the Profile Management window will open the General tab. Fill in the Profile name and click **OK** to create the configuration profile for that network.
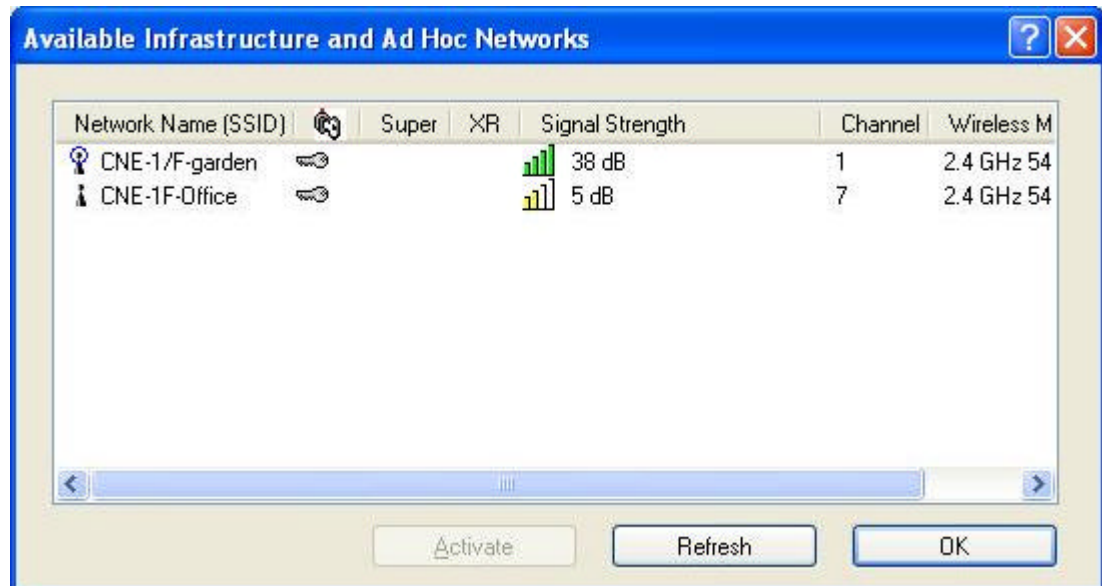

Figure 3- 6 Scan Available Networks Dialog

2.4.3 Auto Profile Selection Management

The auto selection feature allows the wireless adapter to automatically select a profile from the list of profiles and use it to connect to the network. To add a new profile into the Auto Selected Profiles list, please follow these steps.

1. On the Profile Management tab, click **Order Profiles….**

2. The Auto Profiles Selection management window will appear, with a list of all created profiles in the Available Profiles box.

3. Highlight the profiles to add to auto profile selection, and click **Add**. The profile will appear in the Auto Selected Profiles box.

4. Highlight a profile in the Auto Selected Profiles box.

5. Click **Move Up** or **Move Down** as appropriate. Note: The first profile in the Auto Selected Profiles box has highest priority, and the last profile has lowest priority.

6. Click **OK**.

7. Check the **Auto Select Profiles** checkbox on the **Profile Management** tab.

Note: When auto profile selection is enabled by checking **Auto Select Profiles** on the **Profile Management** tab, the client adapter will scan for an available network. The profile with the highest priority and the same SSID as one of the found networks will be used to connect to the network. If the connection fails, the client adapter will try the next highest priority profile that matches the SSID until an available network is found.
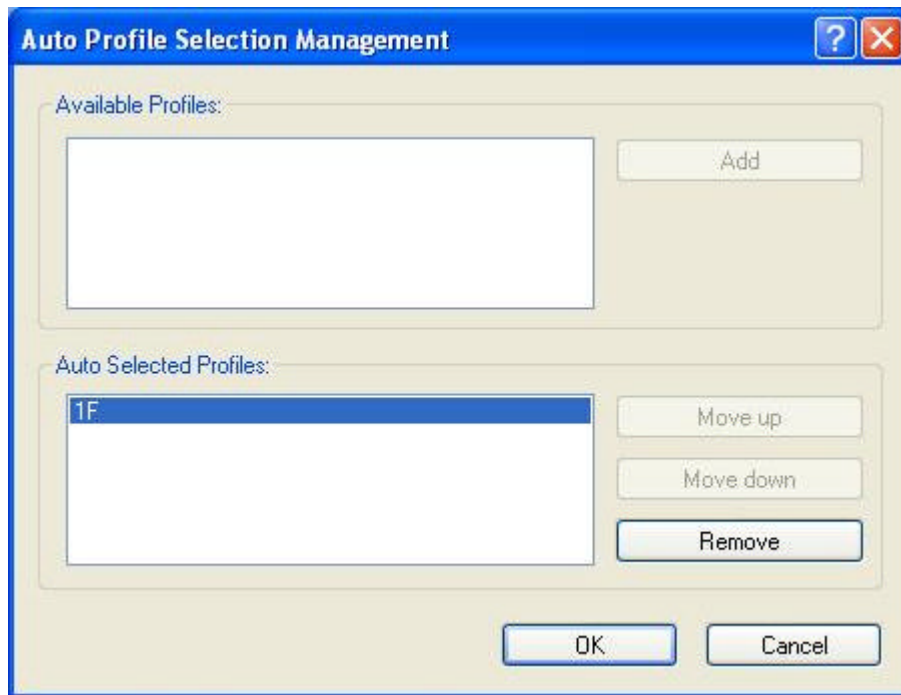
Figure 3-7 Auto Profile Selection Management Dialog

2.5 Diagnostics

The **Diagnostics** tab of the Wireless Client Utility (WCU) provides buttons used to retrieve receiving and transmitting statistics. The Diagnostics tab does not require any configuration.

The Diagnostics tab lists the following receive and transmit diagnostics for frames received or transmitted by the wireless network adapter:

* Multicast frames transmitted and received
* Broadcast frames transmitted and received
* Unicast frames transmitted and received
* Total bytes transmitted and received
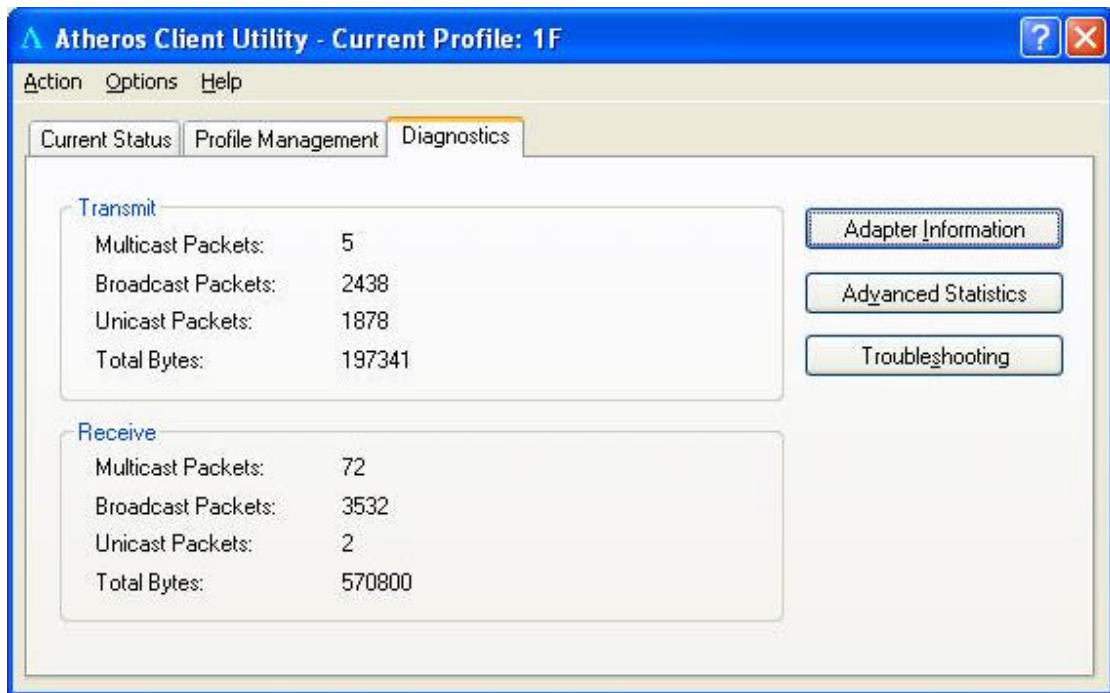
Figure 3-8 Diagnostics tab

2.5.1 Check Driver Information

The **Adapter Information** contains general information about the wireless network adapter and the Network Driver Interface Specification (NDIS) driver. Access the adapter information from the Diagnostics tab.

* **Card Name -** The name of the wireless network adapter.
* **MAC Address -** The MAC address of the wireless network adapter.
* **Driver -** The driver name and path of the wireless network adapter driver.
* **Driver Version -** The version of the wireless network adapter driver.
* **Driver Date -** The creation date of the wireless network adapter driver.
* **Client Name -** The name of the client computer.

Figure 3-9 Adapter Information

2.5.2 Check Receive and Transmit Statistical Information

The **Advanced Statistics** show receiving and transmitting statistical information for the

following receive and transmit diagnostics for frames received by or transmitted to the wireless network adapter.
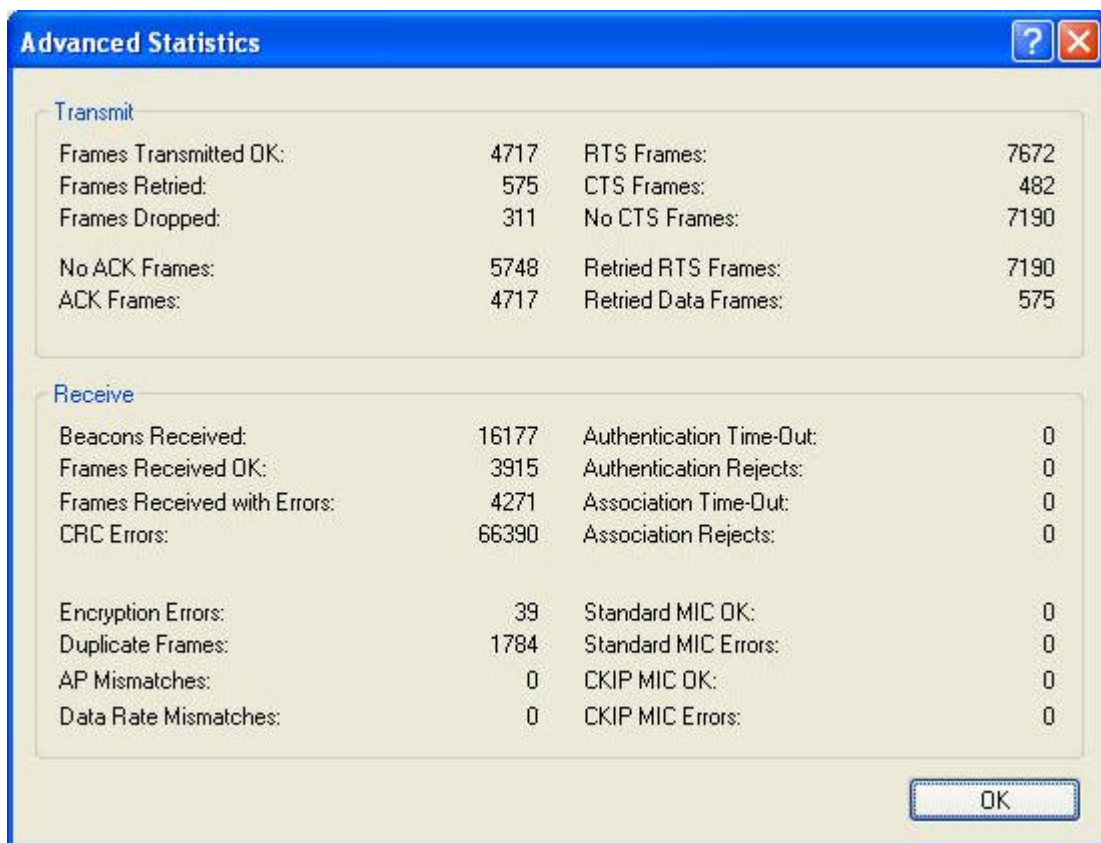
Figure 3-10 Advanced Statistics

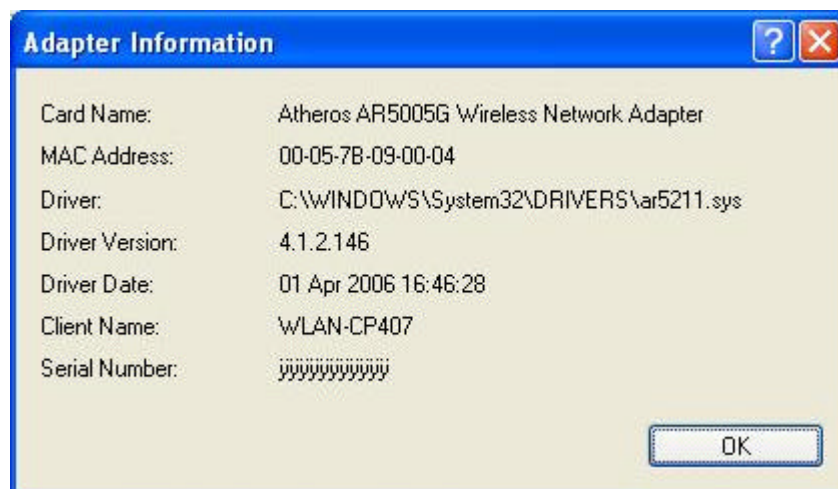## 2.6 Wireless LAN Installation Guidelines and Authorization for Use

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 made to this device that are not expressly approved by Chung Nam Electronics (CNE) may void the user's authority to operate the equipment. CNE is not responsible for any radio or television interference caused by unauthorized modification of this device, or the substitution or attachment of connecting cables and equipment other than specified. It is the responsibility of the user to correct any interference caused by such unauthorized modification, substitution or attachment. CNE 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.

The use of Wireless LAN devices may be restricted in some situations or environments for example:

- On board airplanes, or

- In an explosive environment, or
- In case the interference risk to other devices or services is perceived or identified as harmful.

In case the policy regarding the use of Wireless LAN devices in specific organizations or environments (e.g. airports, hospitals, chemical/oil/gas industrial plants, private buildings etc.) is not clear, please first verify authorization to use these devices prior to operating the equipment.

Chapter 3 Regulatory Information

3.1 FCC Information to User

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

3.2 FCC Guidelines for Human Exposure

Warning:

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

3.3 FCC Electronic Emission Notices

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.

3.4 FCC Radio Frequency 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 when the equipment is operated in a commercial environment. 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. Operation of this equipment in a residential area may cause harmful interferences, in which case the user will be required to correct the interference at his own expense.

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

3.5 OEM installation Guide

This device is intended only form OEM integrators under the following conditions:

1) The antenna must be installed such that 20cm is maintained between the antenna and users, and
2) The transmitter module may not be co-located with any other transmitter or antenna.

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

This transmitter module is authorized only for use in devices where the antenna may be installed such that 20 cm may be maintained between the antenna and users (for example access points, routers, wireless ADSL modems, and similar equipment). The final end product must be labeled in visible area with the following:

" **Contains TX FCC ID: Q72WLC101GA**

End Product Manual Information

The user manual for end users must include the following information in a prominent location "IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter."

IMPORTANT NOTE

FCC RF Radiation Exposure Statement: This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

RF Exposure Info (For mobile configuration)

To comply with FCC RF exposure compliance requirements, this grant is applicable to only Mobile Configurations. The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter

This device is certified as modular radio form with the antenna the gain must be less than 1.8 dBi. Change to other type requires re-evaluation/ certification

Chapter 4 Technical Specifications

Appendix A: Specifications

Normal	
Interface	Mini-PCI interface
Standards	IEEE802.11b; IEEE802.11g
Operating System	Windows 98; Windows Me; Windows 2000; Windows XP
Transmission Distance	Indoor up to 100m, outdoor up to 250m (Standard transmission distance, It is limited to the environment). Indoor up to 200m; Outdoor up to 830m (Adopt 2x to 3x eXtended Range™ WLAN transmission technology, it is limited to the environment)
Radio Data Rate	54/48/36/24/18/12/9/6/11/5.5/2/1Mbps (Auto Rate Sensing)
Sensitivity	54M -68dBm/8%PER (TYPICAL) 11M -84dBm/8%PER
Modulation	1M 2M BPSK; 5.5M 11M CCK; 6M 9M 12M 18M OPSK 24M 36M 16QAM 48M 54M 64QAM
Media Access Protocol	CSMA/CA with ACK
Data Security	WPA; 64/128/152-bit WEP; TKIP/AES
Frequency	2.412 ~ 2.462GHz
Spread Spectrum	Direct Sequence Spread Spectrum (DSSS)
Channel	
Power Consumption	Typically 685mA in full Transmit (TX), 515mA in full Receive (RX)

Environmental and Physical	
Operating Temp	0 ~40 (32 ~104)
Storage Temp	–40 ~ 70 (-40 ~158)
Humidity	10% ~ 95% RH, Non-condensing
Dimensions (W× D× H)	60×30× 3.5 mm