IEEE 802.11a/b/g Dual Band Wireless USB 2.0 Adapter

User's Manual

Version: 2.0

Table of Contents

1 INTRODUCTION 3

1.1 FEATURES & BENEFITS 3
1.2 PACKAGE CONTENTS 4
1.3 USB ADAPTER DESCRIPTION 4
1.4 SYSTEM REQUIREMENTS 5
1.5 APPLICATIONS 6
1.6 NETWORK CONFIGURATION 7

2 INSTALL DRIVERS & CLIENT UTILITY 9

2.1 BEFORE YOU BEGIN 9
2.2 INSTALLING THE DRIVERS 9

3 UNDERSTANDING CLIENT UTILITY 14

3.1 CURRENT NETWORK INFORMATION 14

4 STATION MODE CONFIGURATION 16

4.1 CURRENT NETWORK INFORMATION 16
4.2 GENERAL CONNECTION SETTING 17
4.3 WEP ENCRYPTION 19
4.4 WPA/WPA2 AUTHENTICATION WITH TKIP/AES ENCRYPTION 21
4.5 WPA-PSK AUTHENTICATION 24
4.6 PROFILES 25
4.7 ADVANCED SETTINGS 26

5 UNINSTALL THE DRIVERS & CLIENT UTILITY 28

5.1 ADD OR REMOVE PROGRAMS 28
5.2 THROUGH PROGRAMS 30

APPENDIX A – SPECIFICATIONS 33

APPENDIX B – FCC INTERFERENCE STATEMENT 34

1 Introduction

This is a USB 2.0 pen-size wireless adapter supporting dual-band 802.11a/b/g (2.4GHz & 5GHz) radio operation. It provides high-speed wireless connection with data rate up to 54Mbps.

It is based on the 802.11g standard backwards compatible with 802.11b products. This means that you do not need to change your entire network to maintain connectivity. You may sacrifice some of 802.11g speed when you mix 802.11b and 802.11g devices, but you will not lose the ability to communicate when you incorporate the 802.11g standard into your 802.11b network. You may choose to slowly change your network by gradually replacing the 802.11b devices with 802.11g devices. For a more secure application, it supports 802.1x, WPA and WPA2.

This chapter describes the features & benefits, package contents, applications, and network configuration.

1.1 Features & Benefits

Features	Benefits
WEP64/128/256, WPA(HW TKIP support) and AES128-CCMP	High level security
IEEE802.1x Client Support	Enhances authentication and security
Advanced Power Management	Low power consumption in power saving mode.
USB 2.0	USB 2.0 interface and compatible with USB 1.1
High Speed Data Rate Up to 54Mbps	Capable of handling heavy data payloads such as MPEG video streaming

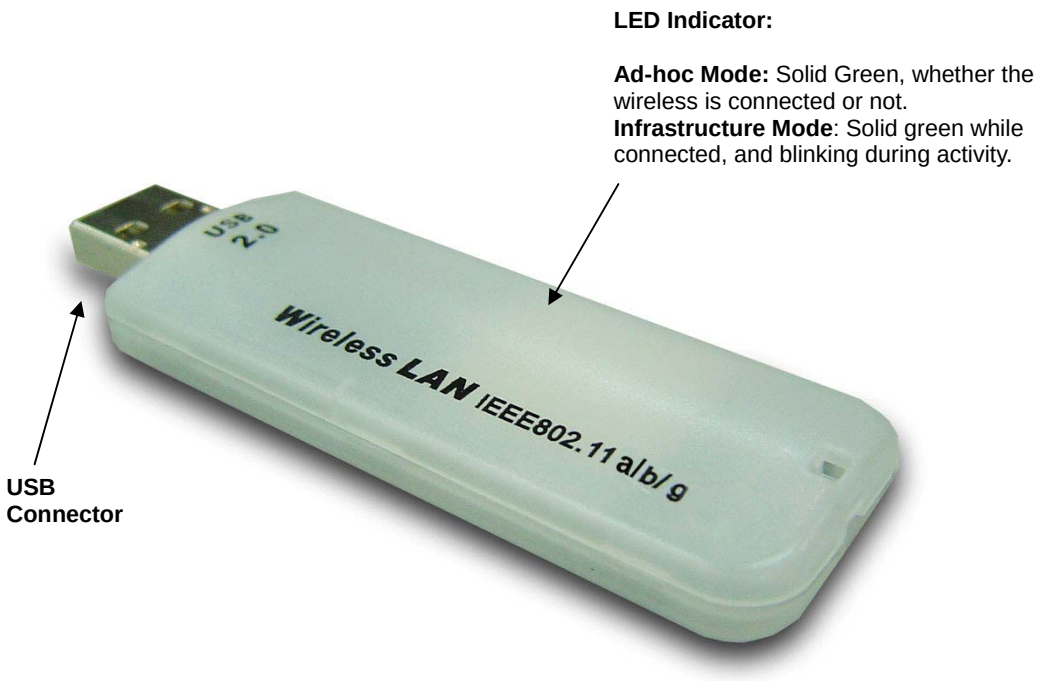
1.2 Package Contents

Open the package carefully, and make sure that none of the items listed below are missing. Do not discard the packing materials, in case of return; the unit must be shipped in its original package.

- One Wireless LAN USB Adapter
- One CD-ROM with User's Manual Included

1.3 USB Adapter Description

The USB adapter is a standard USB adapter that fits into any USB interface. The USB adapter has a LED indicator and a built-in antenna for wireless connectivity.



1.4 System Requirements

The following are the minimum system requirements in order to use the USB adapter.

- PC/AT compatible computer with a USB interface.
- Windows 98SE/ME/2000/XP operating system.
  (Windows 98SE/ME don't support USB 2.0, the performance could be influenced)
- 20 MB of free disk space for installing the USB adapter driver and utility program.

1.5 Applications

The wireless LAN products are easy to install and highly efficient. The following list describes some of the many applications made possible through the power and flexibility of wireless LANs:

a) **Difficult-to-wire environments**
   There are many situations where wires cannot be laid easily. Historic buildings, older buildings, open areas and across busy streets make the installation of LANs either impossible or very expensive.
b) **Temporary workgroups**
   Consider situations in parks, athletic arenas, exhibition centers, disaster-recovery, temporary offices and construction sites where one wants a temporary WLAN established and removed.
c) **The ability to access real-time information**
   Doctors/nurses, point-of-sale employees, and warehouse workers can access real-time information while dealing with patients, serving customers and processing information.
d) **Frequently changed environments**
   Show rooms, meeting rooms, retail stores, and manufacturing sites where frequently rearrange the workplace.
e) **Small Office and Home Office (SOHO) networks**
   SOHO users need a cost-effective, easy and quick installation of a small network.
f) **Wireless extensions to Ethernet networks**
   Network managers in dynamic environments can minimize the overhead caused by moves, extensions to networks, and other changes with wireless LANs.
g) **Wired LAN backup**
   Network managers implement wireless LANs to provide backup for mission-critical applications running on wired networks.
h) **Training/Educational facilities**
   Training sites at corporations and students at universities use wireless connectivity to ease access to information, information exchanges, and learning.

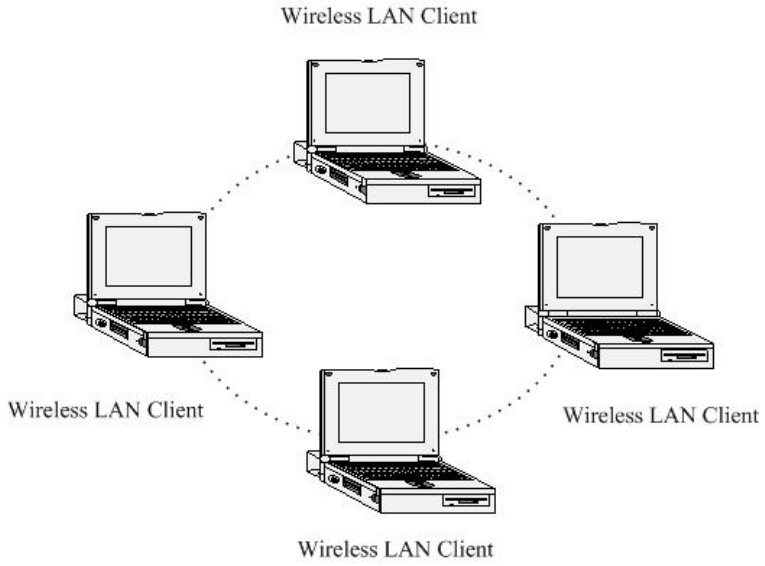
1.6 Network Configuration

To better understand how the wireless LAN products work together to create a wireless network, it might be helpful to depict a few of the possible wireless LAN PC card network configurations. The wireless LAN products can be configured as:

a) Infrastructure for enterprise LANs.

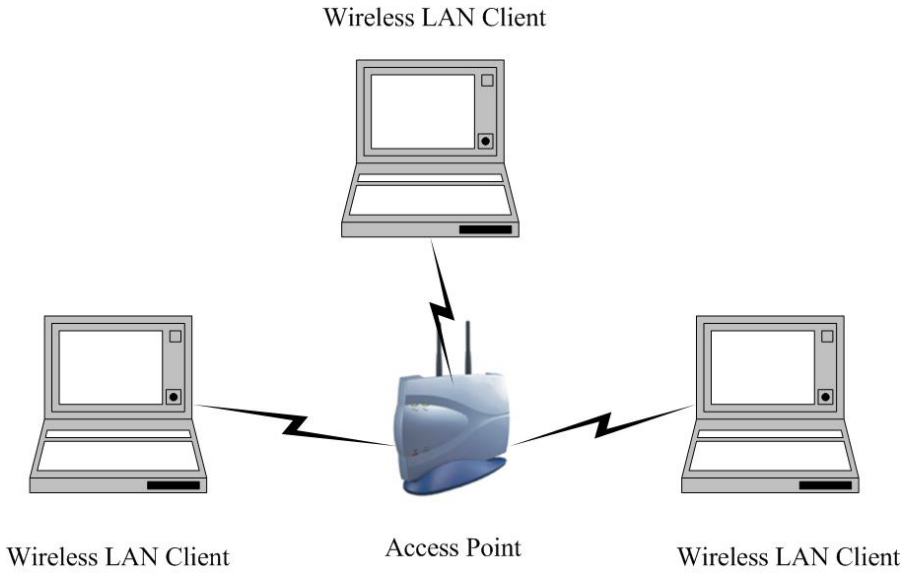
a) Ad-hoc (peer-to-peer) Mode

This is the simplest network configuration with several computers equipped with the PC Cards that form a wireless network whenever they are within range of one another. In ad-hoc mode, each client is peer-to-peer, would only have access to the resources of the other client and does not require an access point. This is the easiest and least expensive way for the SOHO to set up a wireless network. The image below depicts a network in ad-hoc mode.



b) Infrastructure Mode

The infrastructure mode requires the use of an access point (AP). In this mode, all wireless communication between two computers has to be via the AP. It doesn't matter if the AP is stand-alone or wired to an Ethernet network. If used in stand-alone, the AP can extend the range of independent wireless LANs by acting as a repeater, which effectively doubles the distance between wireless stations. The image below depicts a network in infrastructure mode.


Wireless LAN Client
Wireless LAN Client
Access Point
Wireless LAN Client

2 Install Drivers & Client Utility

2.1 Before You Begin

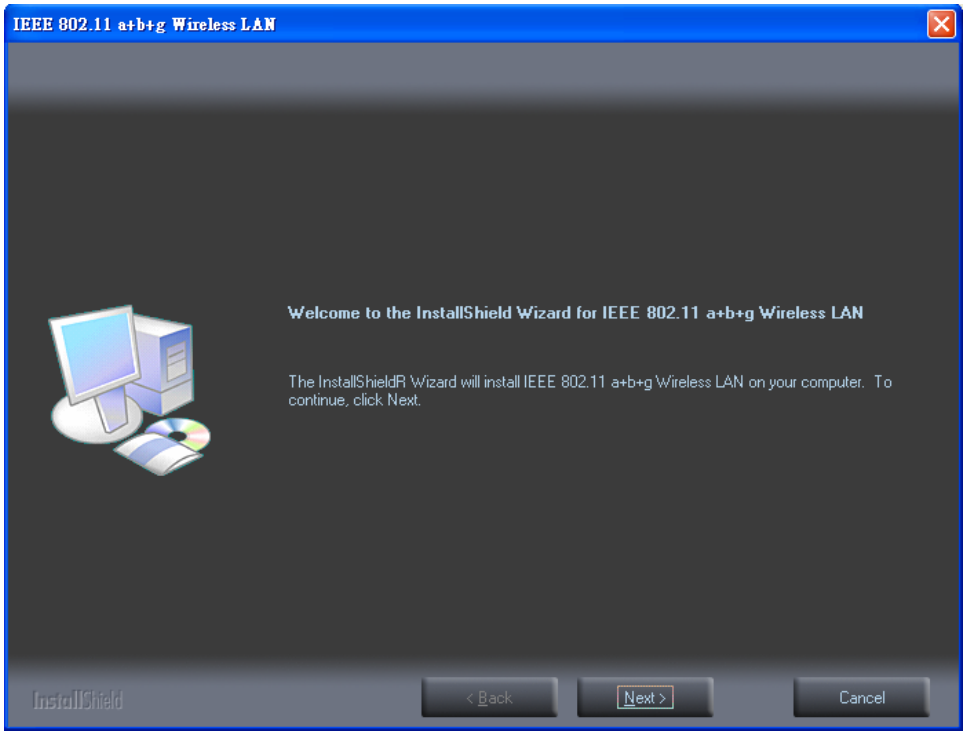
Before installing the new drivers of your USB adapter, you need to disable all of the Wireless LAN drivers that you have installed.

During the installation, Windows 98SE/ME/2000/XP may need to copy systems files from its installation CD. Therefore, you may need a copy of the Windows installation CD at hand before installing the drivers. On many systems, instead of a CD, the necessary installation files are archived on the hard disk in C:\WINDOWS \OPTIONS\CABS directory.

2.2 Installing the Drivers

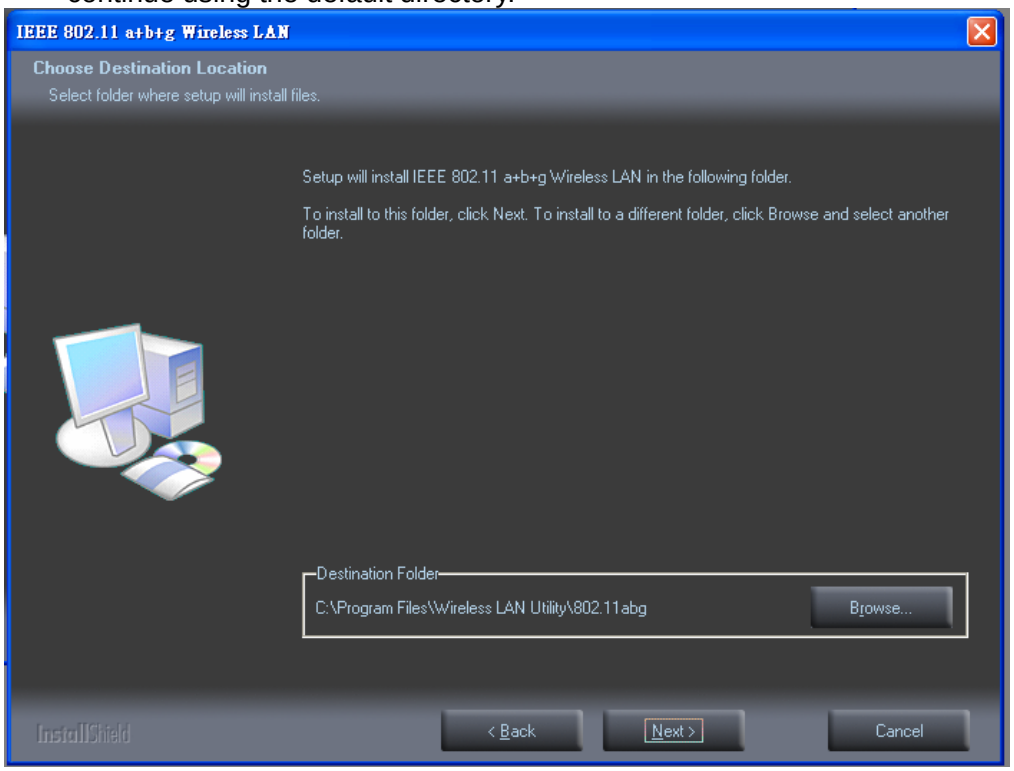
Follow the steps below in order to install the USB adapter drivers:

1. Insert the CD-ROM that was provided to you in this package. The setup should run automatically. If the setup does not run automatically, then you must manually select the **setup.exe** file from the CD-ROM drive.
2. Once the setup begins you will see the **Install Shield Wizard**, as the image depicts below.

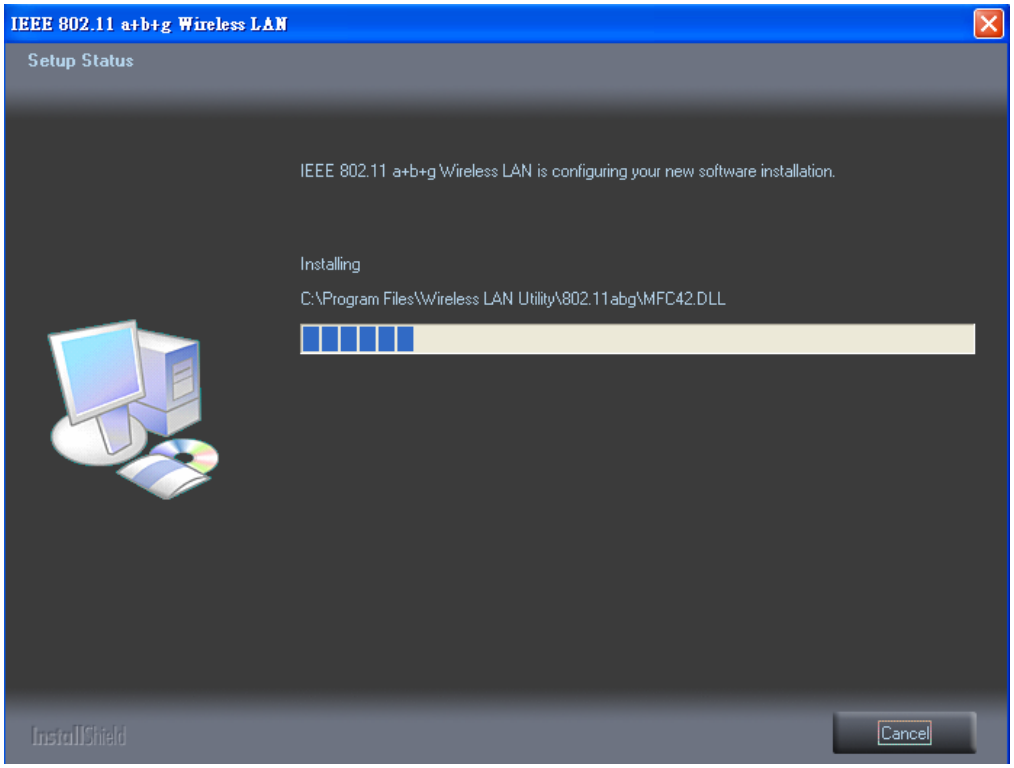


3. Click on the **Next** button to continue.
4. Select the location where you would like the driver installed. Click on the

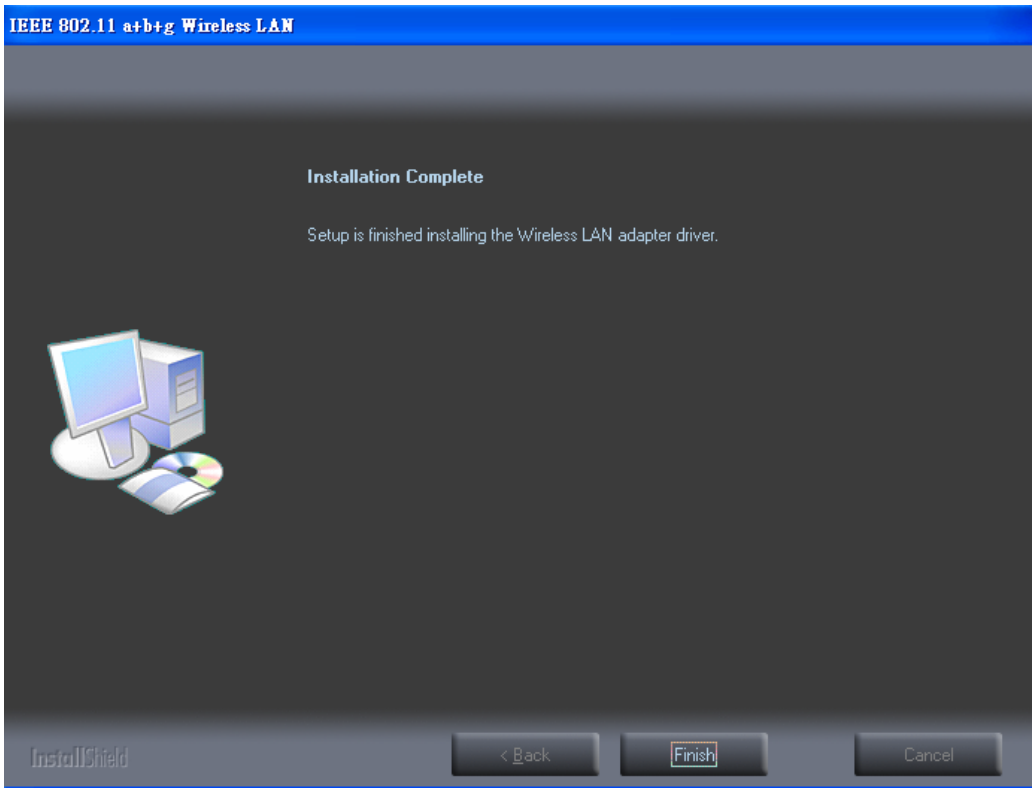
Browse button to change the directory, or click on the **Next** button to continue using the default directory.



5. Wait a few moments until the files are copied to the computer.



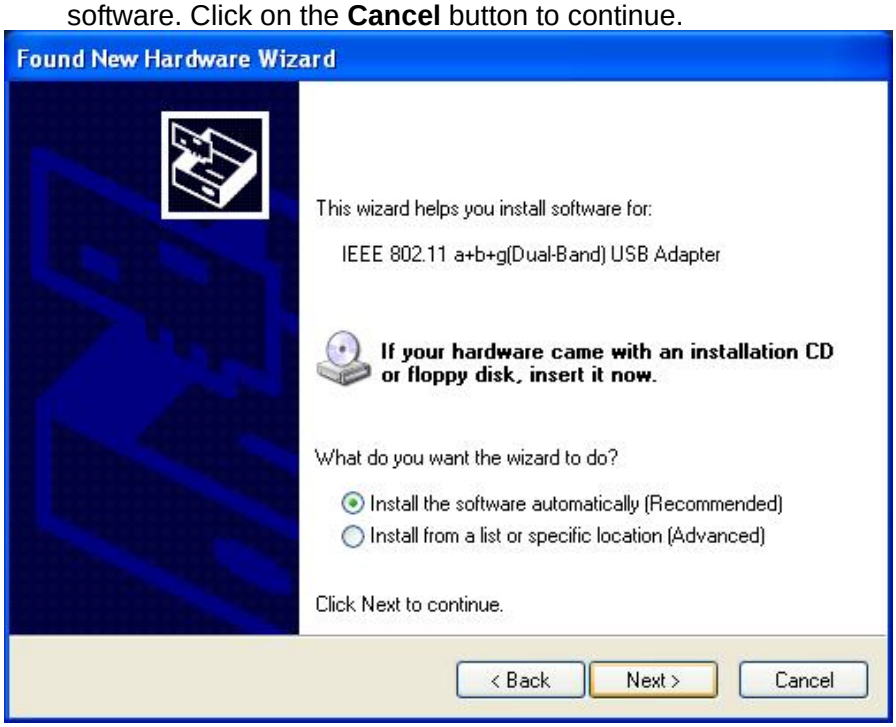
6. The first part of the installation is complete. Click on the **Finish** button.



7. At this point, carefully insert the device into the USB port of your computer.

8. Windows will automatically detect the device and display the **Found New Hardware Wizard**, as the image depicts below. It will ask you to connect to the Windows Update website, to search for software. Select **No, not this time**, and click on the **Next** button.

9. Once again the **Found New Hardware** Wizard will ask you to install software. Click on the **Cancel** button to continue.



10. Select **Install the software automatically (Recommended)** radio button and then click on the **Next** button. Please wait while the files are copied to the computer.

11. If you are using Windows XP, you will see a message regarding Windows

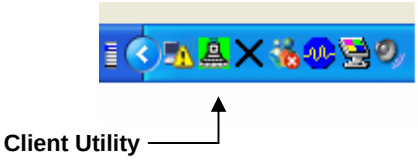
Logo Testing, click on the **Continue Anyway** button to continue.

12. A message will then appear indicating that the installation process is complete Click on the **Finish** button.

3 Understanding Client Utility

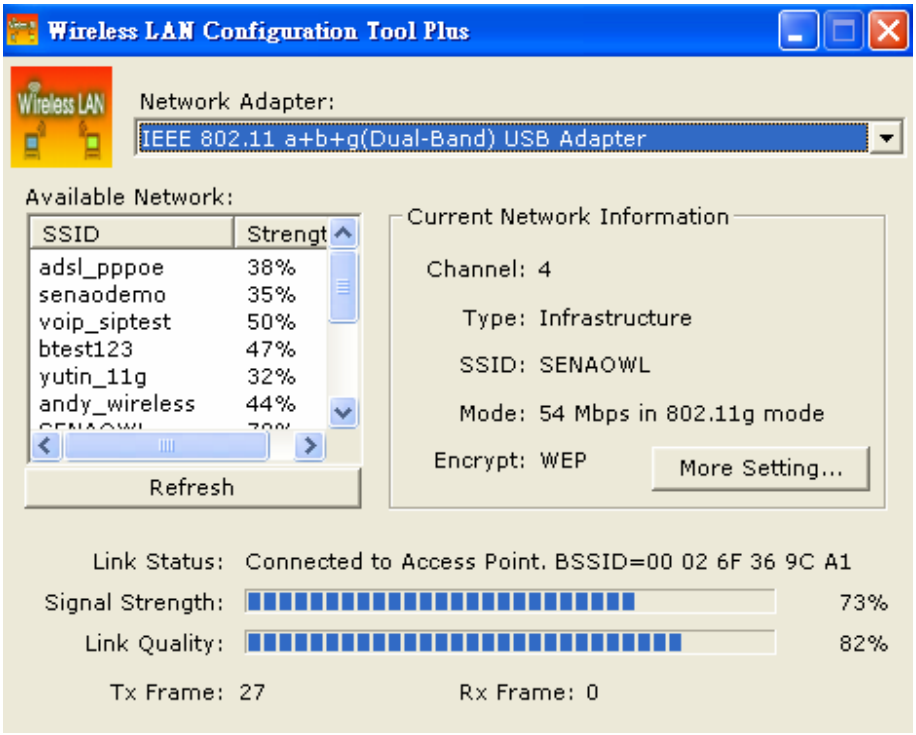
After a successful installation you will see the USB adapter **Client Utility** in the Windows Program group called **802.11 a+b+g Wireless LAN.**

To run the Client Utility click **Start > Programs > 802.a+b+g Wireless LAN > Wireless LAN Utility**. You will then see the Client Utility icon in the system tray of your computer.



3.1 Current Network Information

The **Current Network Information** screen displays the current status of the wireless radio as a station. To configure each mode separately refer to **Chapter 4** (Station mode) .



- **Available Network**: If you would like to associate with a specific network, double click on the network name (SSID), you will then get connected to the network if you have the correct permission keys.

- **Channel**: Displays the channel at which this device is connected.
- **Type**: Displays the type of network, such as: Infrastructure or Ad-hoc.
- **SSID:** Displays the SSID of the network. The SSID is a unique name shared among all points in your wireless network. The SSID must be identical for all points in the network, and is case-sensitive.
- **Tx Rate**: Display the data transmit rate, 54Mbps or 11Mbps.
- **Encryption**: Displays the type of encryption used, None, WEP, or WPA.

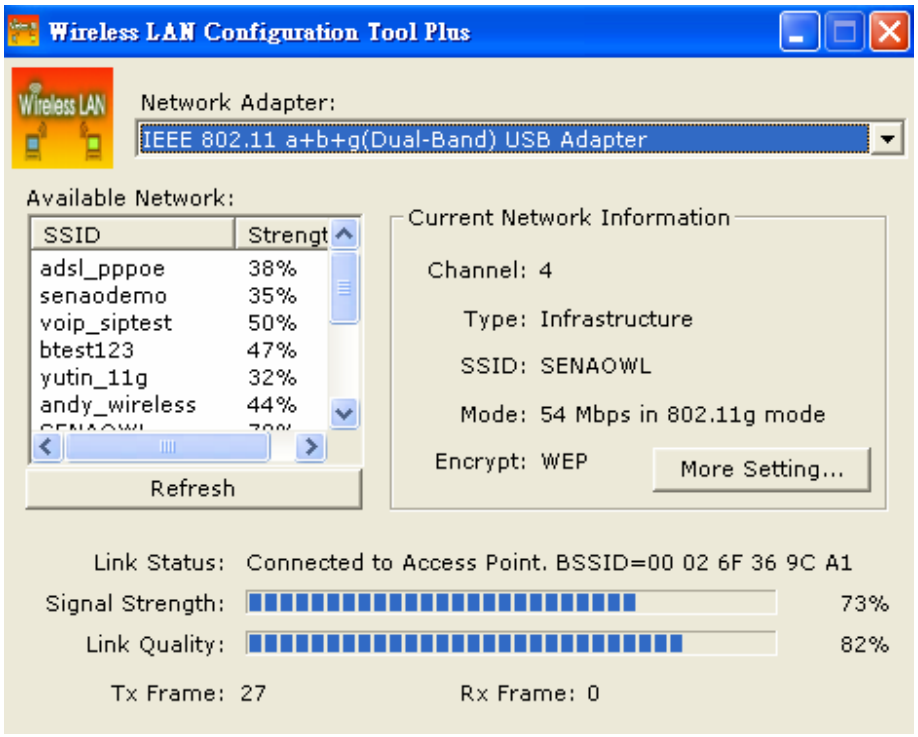
Refer to chapter 4 to configure the settings for station mode.

4 Station Mode Configuration

This chapter focuses on how to configure the device in Station mode (wireless LAN client)

4.1 Current Network Information

The **Current Network Information** screen displays the current status of the wireless radio as a station.



- **Available Network**: If you would like to associate with a specific network, double click on the network name (SSID), you will then get connected to the network if you have the correct permission keys.
- **Channel**: Displays the channel at which this device is connected.
- **Type**: Displays the type of network, such as: Infrastructure or Ad-hoc.
- **SSID:** Displays the SSID of the network. The SSID is a unique name shared among all points in your wireless network. The SSID must be identical for all points in the network, and is case-sensitive.
- **Tx Rate**: Display the data transmit rate, 54Mbps or 11Mbps.
- **Encryption**: Displays the type of encryption used, None, WEP, or WPA.

Click on the **More Setting** button to configure a profile and change the default settings.

4.2 General Connection Setting

The **General Connection Setting** allows you to configure the SSID, network type, authentication, and encryption type.

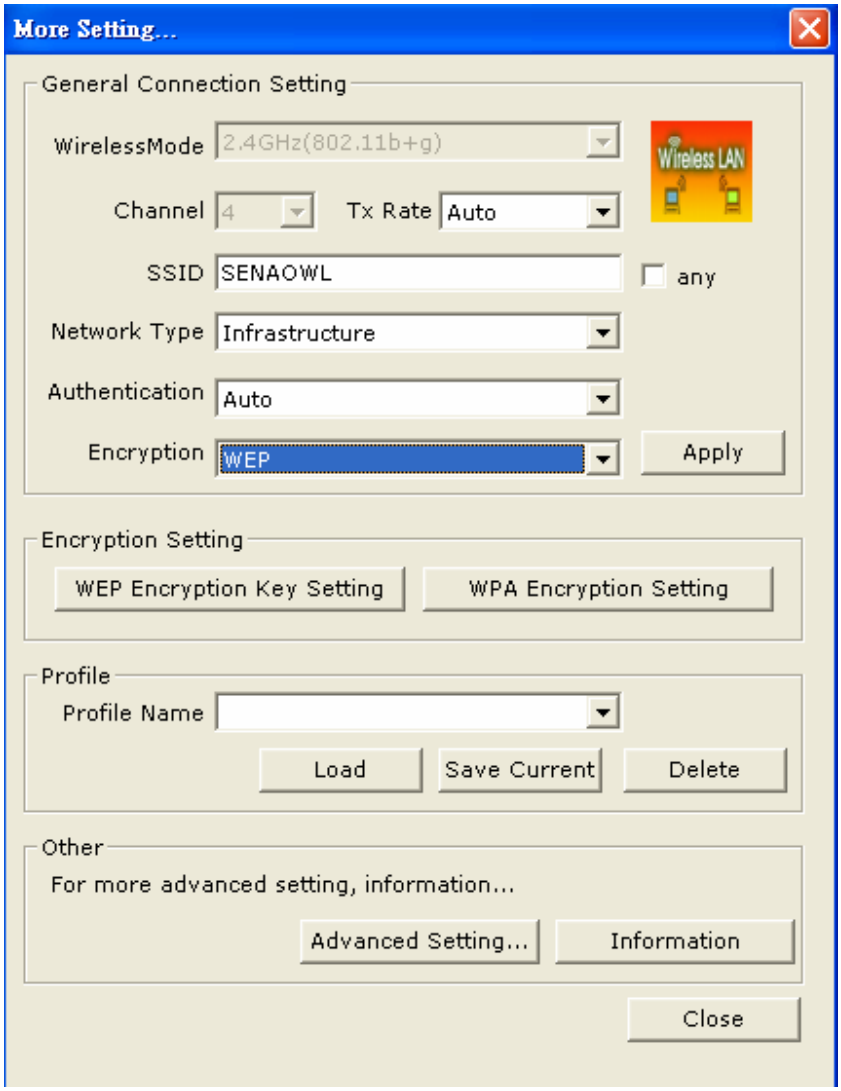
You may click “Change” button to set change those settings.

- **SSID:** Enter the SSID of the network. The SSID is a unique name shared among all points in your wireless network. The SSID must be identical for all points in the network, and is case-sensitive. Place a check in the **any** box if you would like the device to connect to the first available Access Point with the strongest signal.
- **Network Type:** Select a network type from the drop-down list, **Infrastructure** or **Ad-hoc**. If you select infrastructure, the device must be connected to an Access Point. If you select ad-hoc, you may connect the device to another WLAN client adapter (such as this one).
- **Authentication:** Select an authentication type from the drop down list. Options available are: **Auto, Open System Shared Key, WPA, WPA-PSK, WPA2, WPA2-PSK**.
- **Encryption:** Select an encryption type from the drop-down list: Options available are **Disable, WEP, TKIP, AES**.

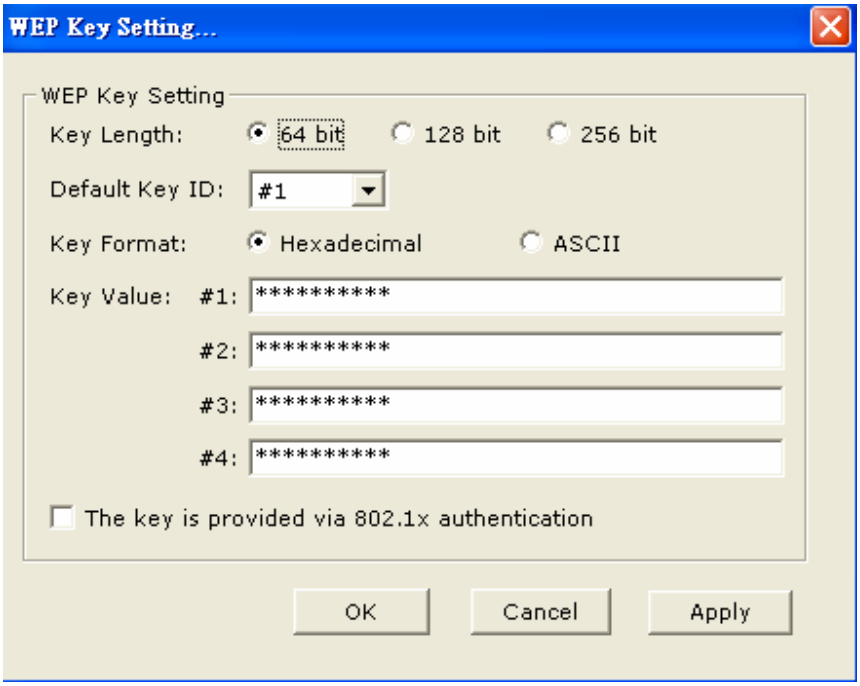
Note: Refer to the **WEP encryption** and **WPA encryption** sections in this chapter to configure the security settings.

4.3 WEP Encryption

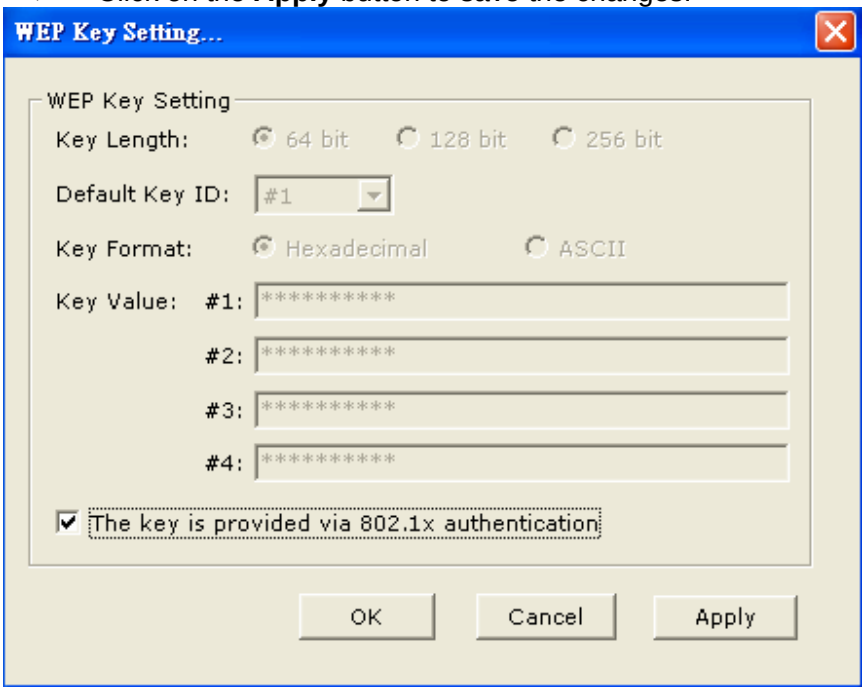
You may select 64, 128 or 256-bit WEP (Wired Equivalent Privacy) key to encrypt data (Default setting is Disable). WEP encrypts each frame transmitted from the radio using one of the Keys from a panel. When you use WEP to communicate with the other wireless clients, all the wireless devices in this network must have the same encryption key or pass phrase.



- **Authentication:** Select **Open System** or **Shared Key** from the drop-down list. If you are not sure what to choose, select **auto**.
- **Encryption:** Select WEP from the drop-down list.
- Click on the **WEP Encryption Key Setting** button.



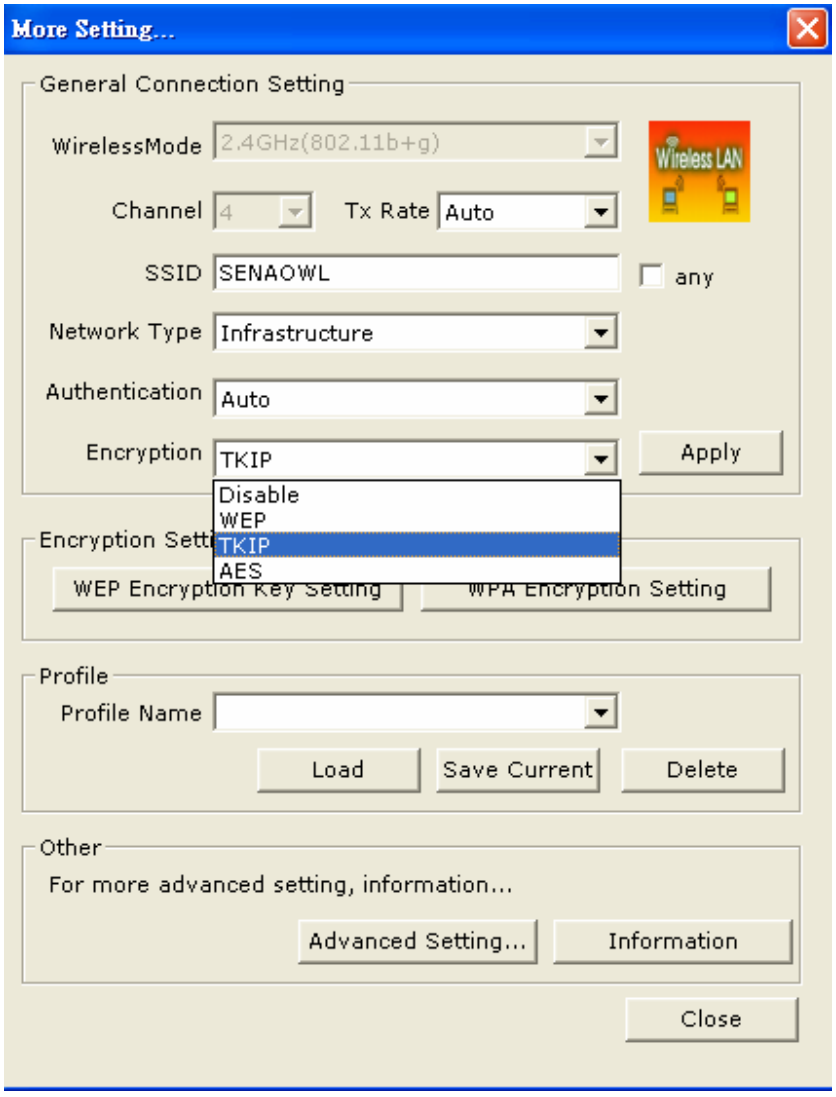
- **Key Lengh:** Select an encryption key length: **64**, **128** or **256-bit**. The setting must be the same as the Access Point.
- **Default Key ID:** Since you can specify up to 4 different WEP keys, select the WEP key value that will be used for this network.
- **Key Format:** Select **Hexadecimal** or **ASCII**.
- **Key Value #1 - #4:** You may enter up to 4 different WEP keys. However, only that WEP key will be used that is defined by the **Default Key ID**.
- Click on the **Apply** button to save the changes.



- **The key is provided via 802.1x authentication**: Place a check in this box is 802.1x authentication is used. By selecting this option, the WEP key settings will be disabled.
- Click on the **Apply** button to save the changes.
- Click **OK** or **Cancel** to exit this setting.

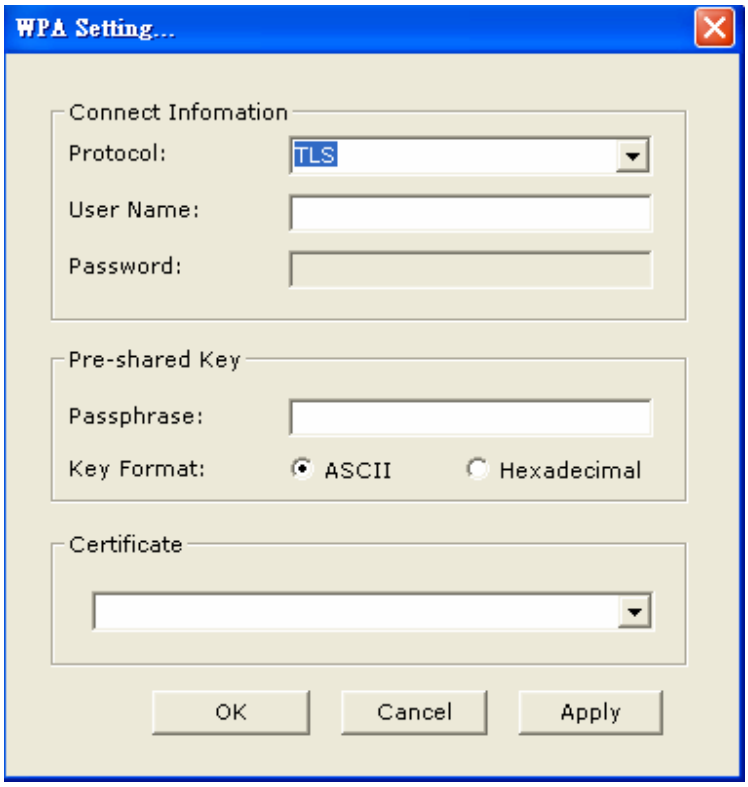
4.4 WPA/WPA2 Authentication with TKIP/AES Encryption

WPA (Wi-Fi Protected Access) was designed to improve upon the security features of WEP (Wired Equivalent Privacy). The technology is designed to work with existing Wi-Fi products that have been enabled with WEP. WPA provides improved data encryption through the Temporal Integrity Protocol (TKIP), which scrambles the keys using a hashing algorithm and by adding an integrity-checking feature which makes sure that keys haven't been tampered with.



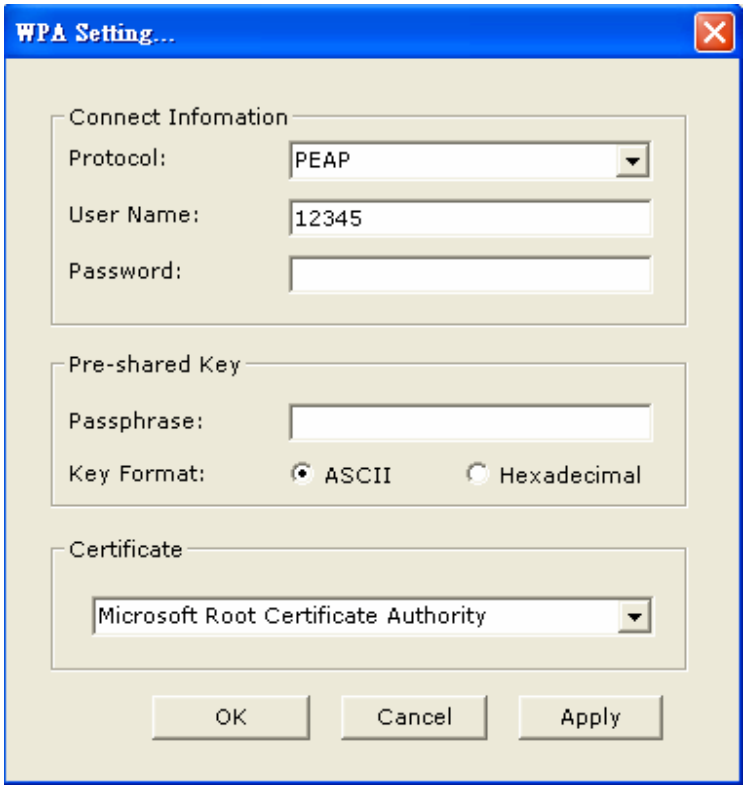
- **Authentication:** Select **WPA** from the drop-down list.
- **Encryption:** Select **TKIP** or **AES** from the drop-down list.
- Click on the **WPA Encryption Setting** button.

In this section you can configure the settings for TLS or PEAP. TLS (Transport Layer Security) is an IETF standardized authentication protocol that uses PKI (Public Key Infrastructure) certificate-based authentication of both the client and authentication server.



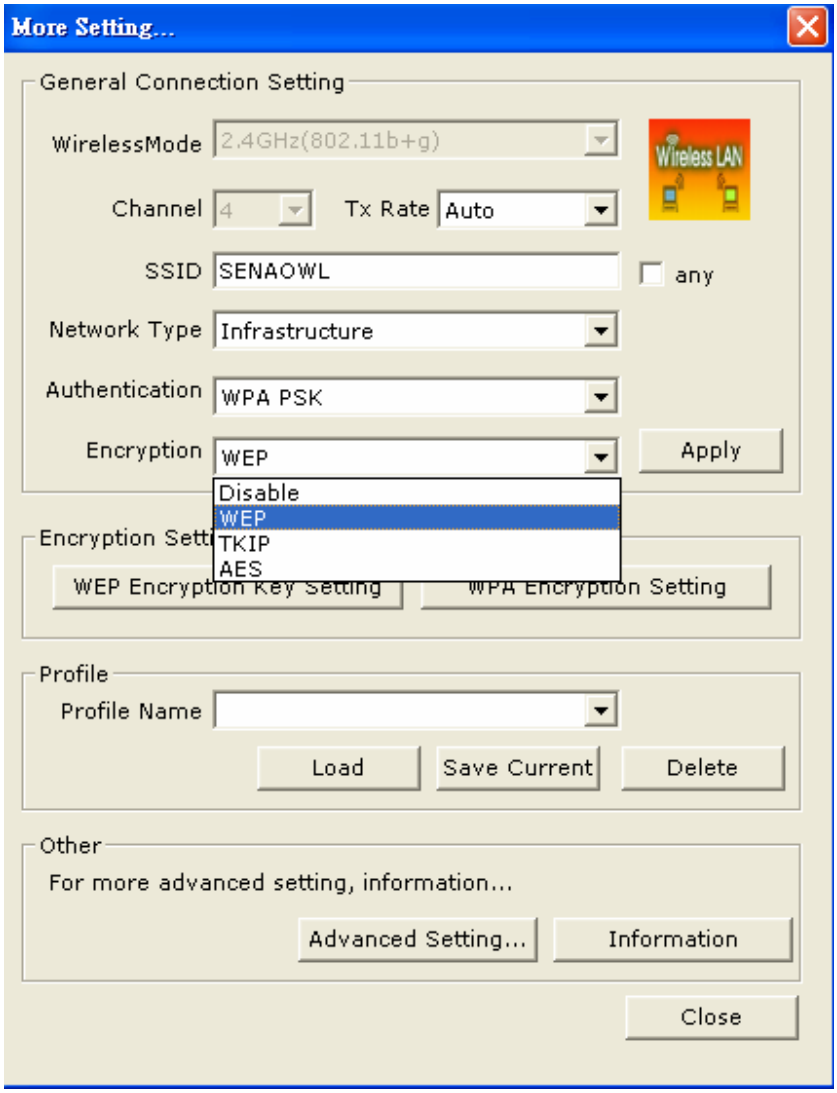
- **Protocol:** Select **TLS** from the drop-down list.
- **User Name:** Enter the user name that is used for authentication purposes.
- **Certificate:** Make sure that you have downloaded and installed the certificate on the computer. Then select the appropriate certificate from the drop-down list.
- Click on the **Apply** button to save the changes. **OK** to exit this page.

The PEAP authentication type is based on EAPTLS authentication, but uses a password instead of a client certificate for authentication. PEAP uses a dynamic session-based WEP key, which is derived from the device and RADIUS server, to encrypt data.

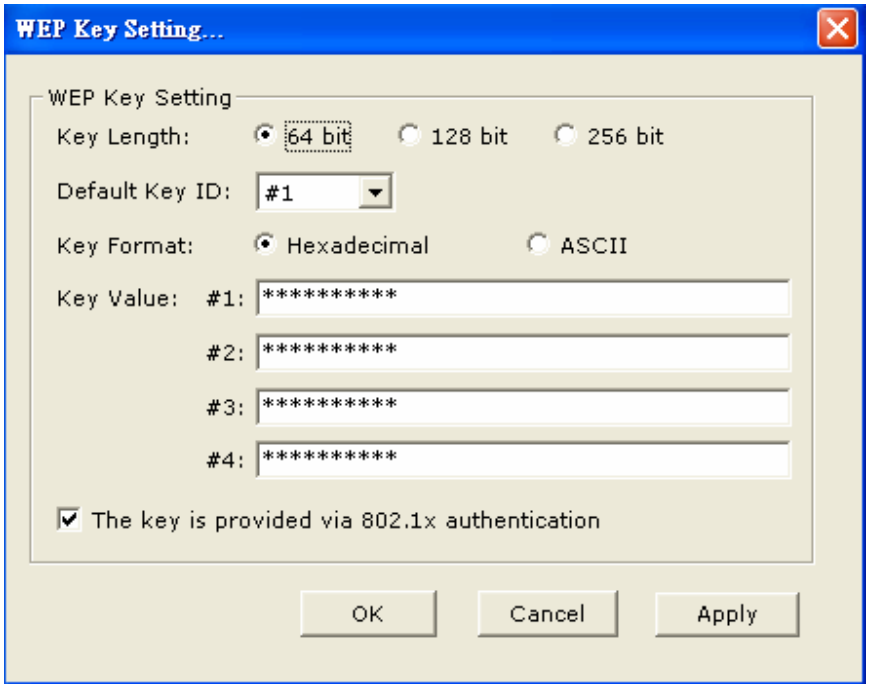


- **Protocol:** Select **PEAP** from the drop-down list.
- **User Name:** Enter the user name that is used for authentication purposes.
- **Password:** Enter the password for the specified user name.
- Click on the **Apply** button to save the changes. **OK** to exit this page.

4.5 WPA-PSK Authentication



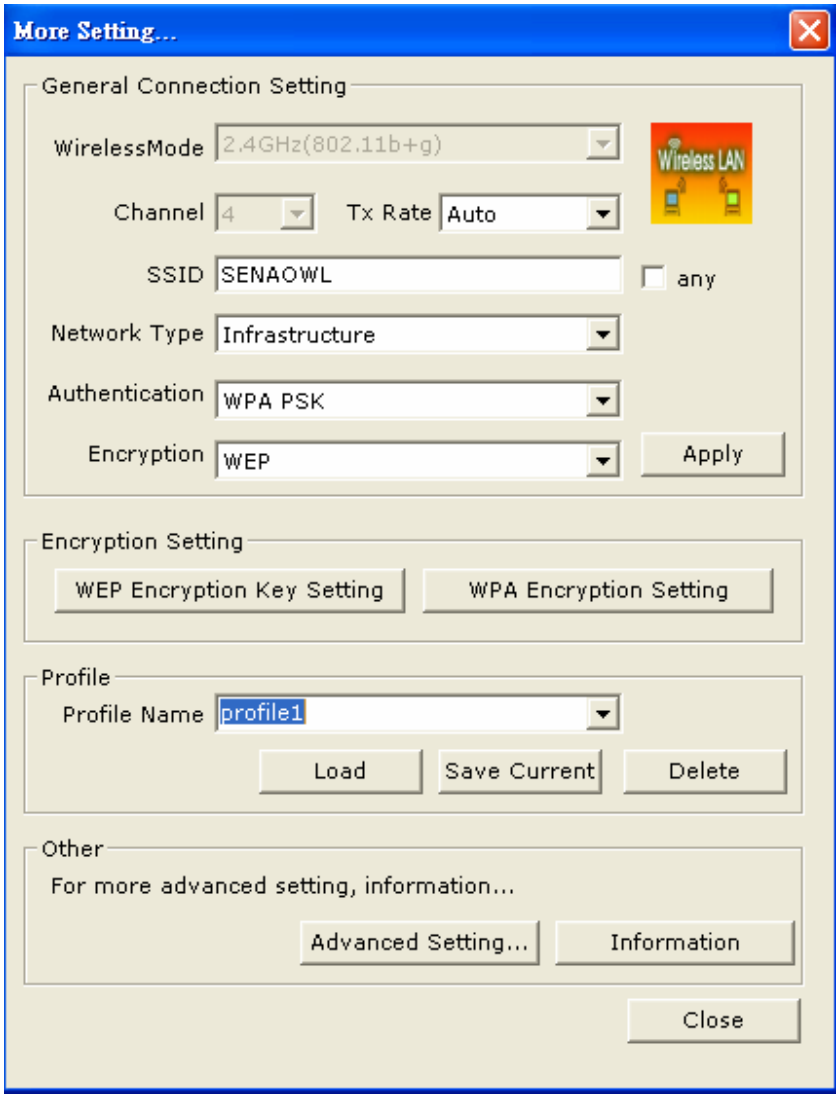
- **Authentication:** Select **WPA-PSK** from the drop-down list.
- **Encryption:** Select an encryption type from the drop-down list.
- Click on the **Apply** button to save the changes.
- Click on the **WPA Encryption Setting** button.



- **Passphrase**: Enter a WPA passphrase. For ASCII text, enter 8-63 characters, for hexadecimal enter 64 characters).
- Key Format: Select **ASCII** or **Hexadecimal**.
- Click on the **Apply** button to save the changes.

4.6 Profiles

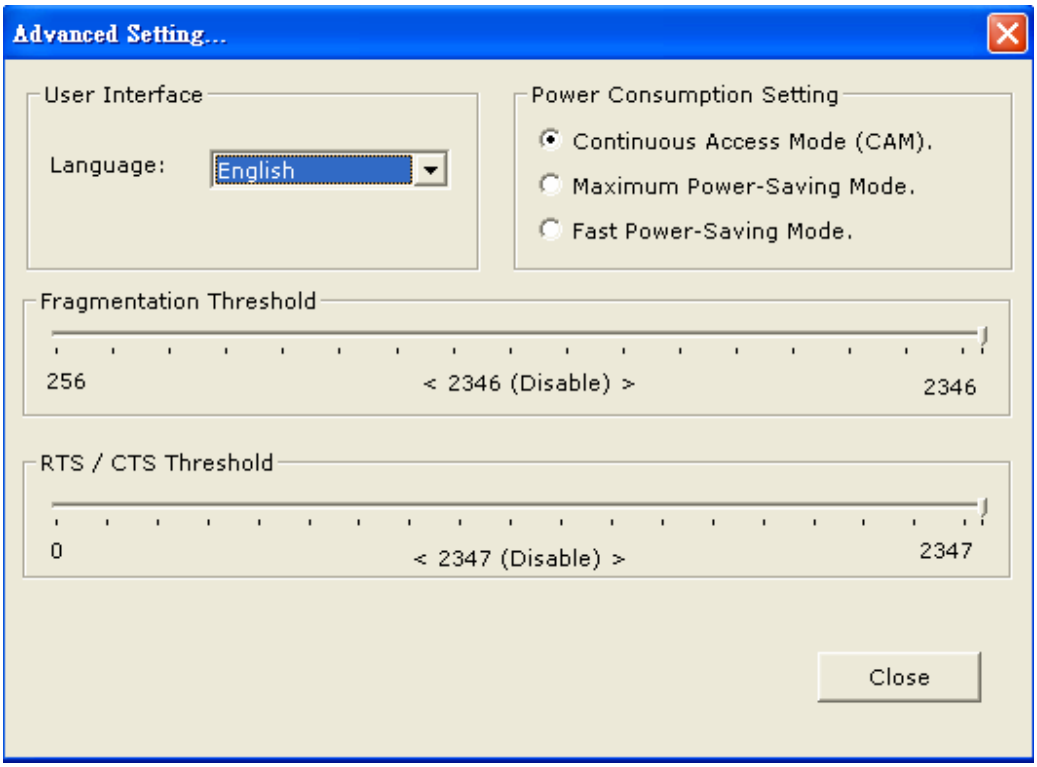
Multiple profiles can be created for different Network Names (SSIDs) and security settings. This allows a user to quickly associate with another network, instead of entering the credentials each time.



- **Profile Name:** Displays the name of current profile. One device can have many profiles, but only one profile can be loaded at a time.
- **Load:** Select a profile from the drop-down list and then click on the **Load** button.
- **Save Current:** Enter a new profile name and then click on the **Save Current** button to save the profile.
- **Delete:** To delete an existing profile, select it from the drop-down list and then click on the **Delete** button.

4.7 Advanced Settings

The Advanced Settings allows you to configure the user interface language, power consumption, and threshold values.



- **Language:** Select a user interface language from the drop-down list. Options available are: English or Traditional Chinese
- **Power Consumption Setting:** If your desktop or notebook is connected to external power, select **Continuous Access Mode (CAM)**, if your notebook is using a battery, select **Maximum Power-Saving Mode**, or **Fast Power-Saving Mode**.

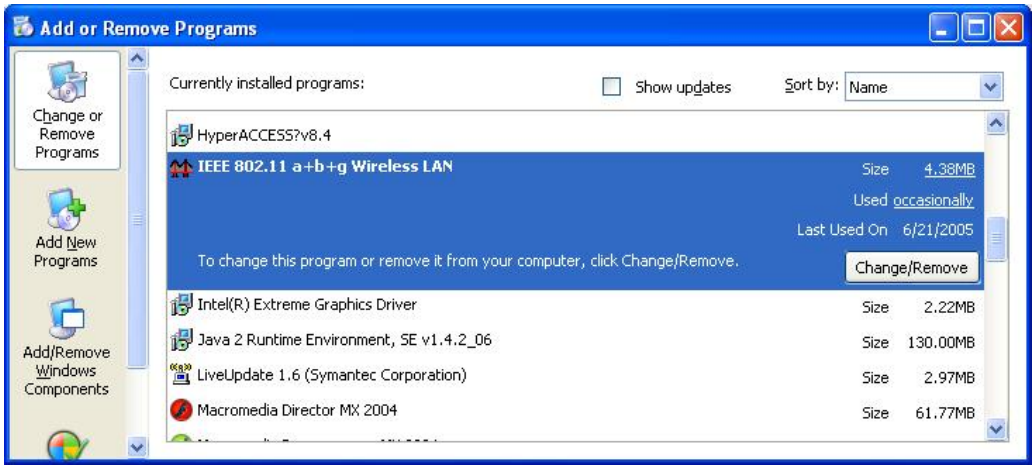
5 Uninstall the Drivers & Client Utility

If the device installation is unsuccessful for any reason, the best way to solve the problem may be to completely uninstall the device and its utility and repeat the installation procedure again. Hereby, customers can use one of the following two methods to uninstall the driver and utility.

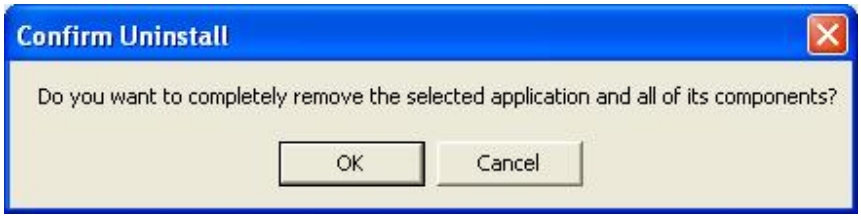
5.1 Add or Remove Programs

Follow the steps below in order to uninstall the Drivers and Client Utility:

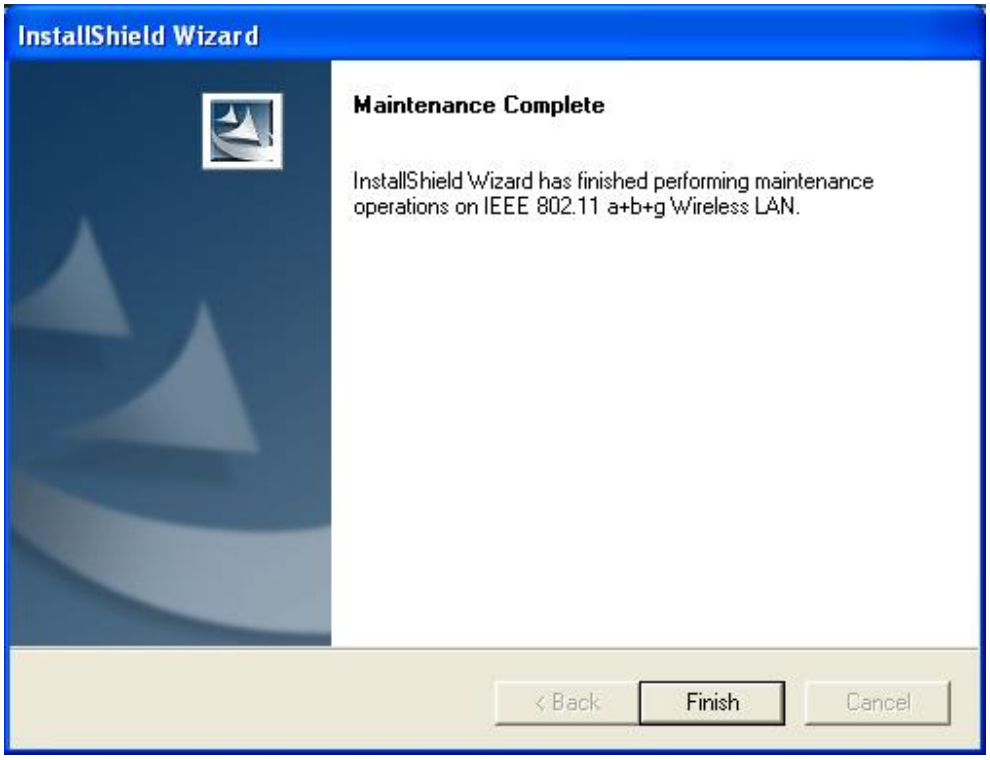
1. Click on **Start > Settings > Control Panel > Add or Remove Programs**
2. You will then see the following window. Select the **IEEE 802.11a+b+g Wireless LAN** and then click on **Change/Remove**.



3. Click on the **OK** button to confirm the Uninstallation process.



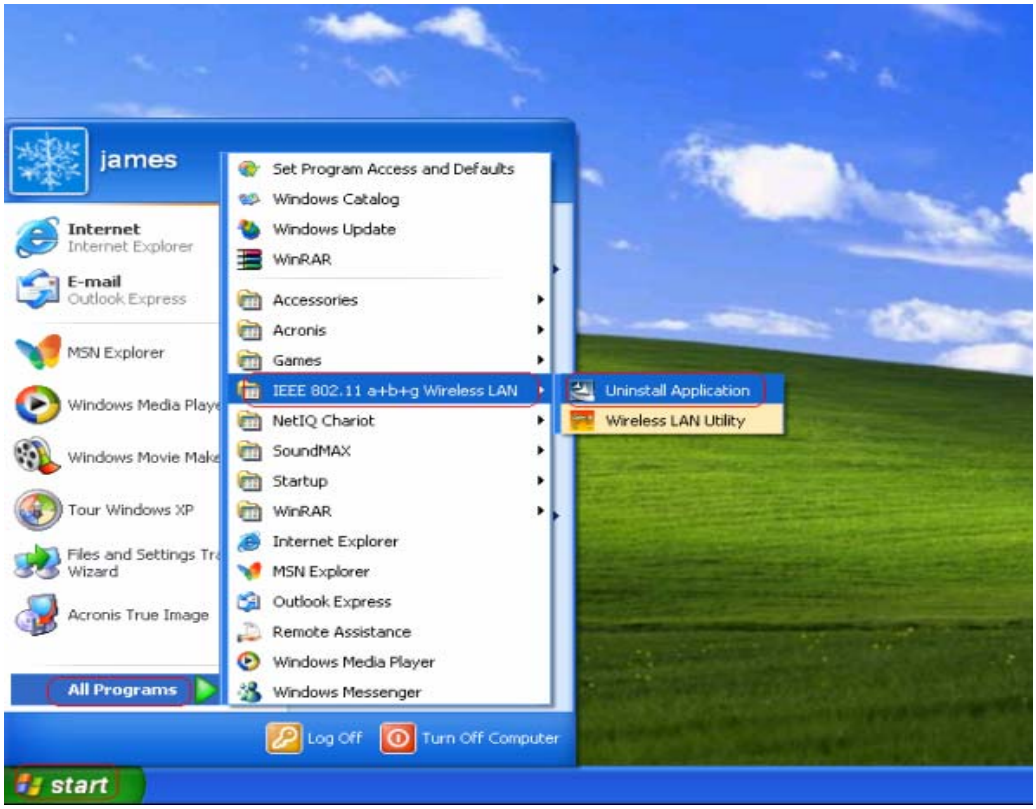
4. The process will then remove the drivers from your computer. Click on the **Finish** button and then remove the USB adapter.


InstallShield Wizard
Maintenance Complete
InstallShield Wizard has finished performing maintenance operations on IEEE 802.11 a+b+g Wireless LAN.
< Back
Finish
Cancel

5.2 Through Programs

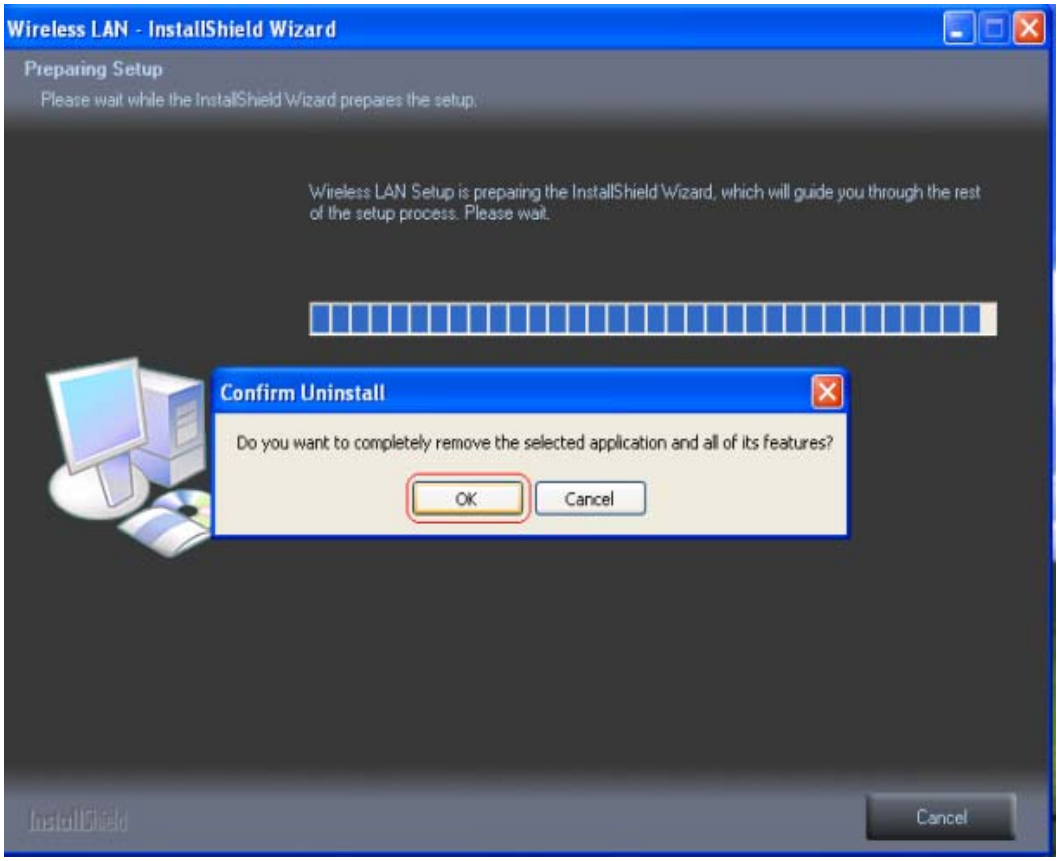
Follow the steps below in order to uninstall the Drivers and Client Utility:

1. Click on **Start > All programs > Select IEEE802.11a/b/g Wireless Lan > Uninstall All Application**

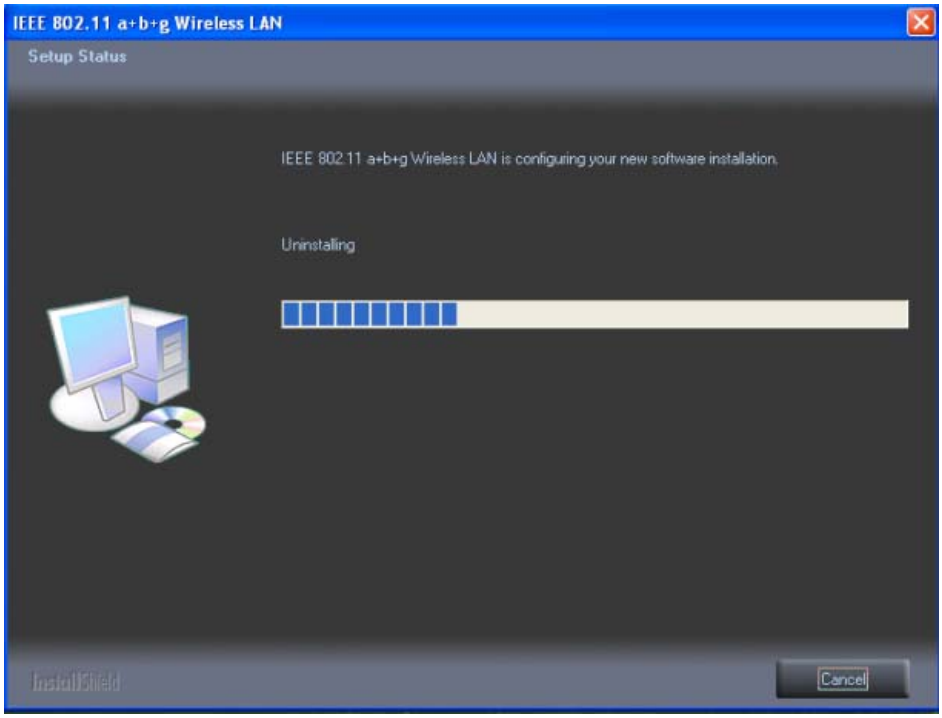


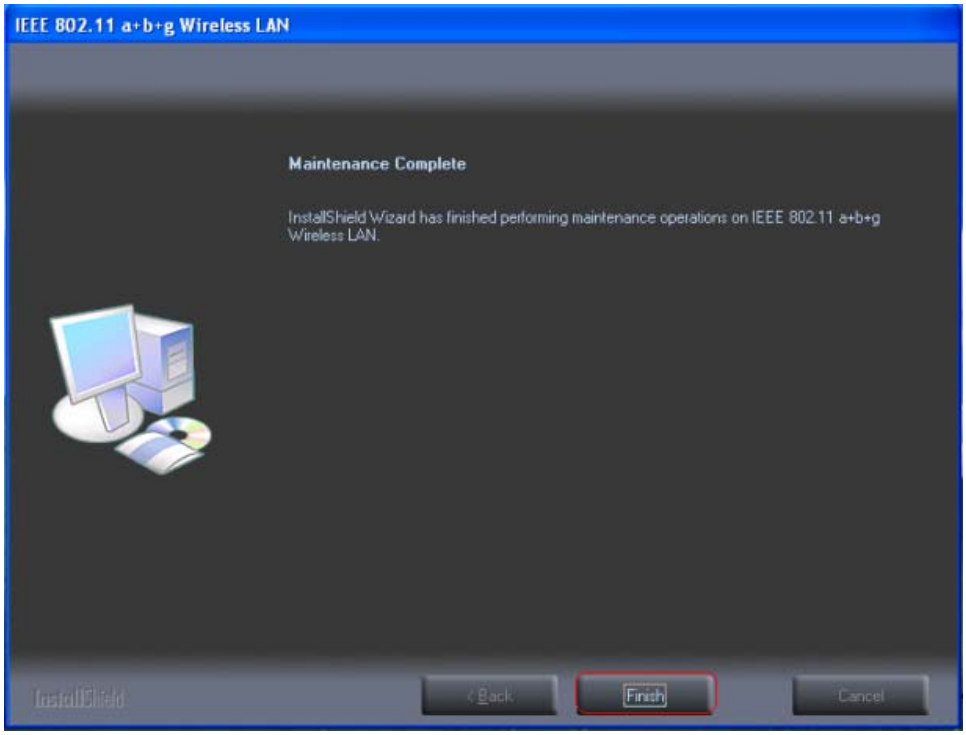
2. Then, process will go to Installshield Wizard. The screen will pop up the following conversation **" Do you want to completely remove the selected application and all of its features"**

3. Click on the **OK** button to confirm the Uninstallation process.



4. The process will then remove the drivers from your computer. Click on the **Finish** button and then remove the USB adapter.


IEEE 802.11 a+b+g Wireless LAN
Setup Status
IEEE 802.11 a+b+g Wireless LAN is configuring your new software installation.
Uninstalling
InstallShield
Cancel


IEEE 802.11 a+b+g Wireless LAN
Maintenance Complete
InstallShield Wizard has finished performing maintenance operations on IEEE 802.11 a+b+g Wireless LAN.
InstallShield
< Back
Finish
Cancel

Appendix A – Specifications

Data Rates

802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps

802.11g: 6, 9, 12, 18, 24, 36, 48, 54, Mbps

802.11b: 1, 2, 5.5, 11Mbps

Standards / Compliance

IEEE802.11, IEEE802.11a, IEEE802.11g, IEEE802.11b, IEEE802.1h, IEEE802.1x

Regulation Certifications

FCC Part 15/UL, ETSI 300/328/CE

Operating Voltage

3.3V

Status LEDs

RF link activity

Drivers

Windows 98SE/ME/2000/XP

RF Information

Frequency Band

802.11a: 5.15~5.25GHz, 5.25~5.35GHz, 5.725~5.825GHz
802.11b/g: U.S., Europe and Japan product covering 2.4 to 2.484 GHz, programmable for different country regulations

Media Access Protocol

Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA)

Modulation Technology

802.11a/g: OFDM (64-QAM, 16-QAM, QPSK, BPSK)
802.11b: DSSS (DBPSK, DQPSK, CCK)

Operating Channels

11 for North America, 14 for Japan, 13 for Europe, 2 for Spain, 4 for France

Receive Sensitivity (Typical)

- 5.15~5.35GHz
  6Mbps@ -90dBm;
  54Mbps@ -72dBm
- 5.47~5.725GHz
  6Mbps@ -90dBm;
  54Mbps@ -72dBm
- 5.725~5.825GHz
  6Mbps@ -89dBm;
  54Mbps@ -72dBm
- 2.412~2.472G(IEEE802.11g)
  6Mbps@ -90dBm;
  54Mbps@ -73dBm
- 2.412~2.472G(IEEE802.11b)
  11Mbps@ -87dBm;
  1Mbps@ -94dBm

Available Transmit Power

- 5.15~5.35 GHz
  15± 2dBm @6Mbps
  12 ± 2dBm @54Mbps
- 5.725 ~ 5.825GHz
  15 ± 2dBm @6Mbps
  12 ± 2dBm @54Mbps
- 2.412~2.483G (IEEE802.11g)
  17 ± 2dBm @6Mbps
  15 ± 2dBm @54Mbps
- 2.412~2.472G(IEEE802.11b)
  18 ± 2dBm @1~11Mbps

Antenna

Integrated with built-in diversity

Networking

Topology

Ad-Hoc, Infrastructure

Security

IEEE802.1x support for LEAP/PEAP

WPA – Wi-Fi Protected Access (AES, 64,128,152-WEP with shared-key authentication)

Physical

Form Factor

USB 2.0 / 1.1 dongle

Dimensions (HxWxD)

79.5(L) mm x 26(W) mm x 10.4(H) mm

Weight

40 g/ 1.6oz

Environmental

Temperature Range

Operating: -0°C to 55°C
Storage: -20°Cto 75°C

Humidity (non-condensing)

5%~95% Typical

Appendix B – FCC Interference Statement

Federal Communication Commission Interference Statement

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

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.

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:
FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
This device complies with FCC RF Exposure limits set forth for an uncontrolled environment, under 47 CFR 2.1093 paragraph (d)(2).
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.