# User's Guide

# Wireless LAN USB Dongle

# 11 Mbps

Version 2.0

# Table of Contents

# INFORMATION TO USER

## FCC INFORMATION

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20centimeters between the radiator and your body.

The 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 instruction, may cause harmful interference to radio communication. However, there is no grantee that interference will not occur in a particular installation. If this equipment dose 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 or television technician for help.

Notice: The Part 15 radio device operates on a non-interference basis with other devices operating at this frequency. Any changes or modification not expressly approved by the party responsible could void the user's authority to operate the device.

# REGULATORY INFORMATION

The Wireless LAN USB Dongle must be installed and used in strict accordance with the manufacturer's instructions. This device complies with the following radio frequency and safety standards.

**USA - Federal Communications Commission (FCC)**

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 that may cause undesired operation.

**Europe - R&TTE Directive**

This device complies ./with the specifications listed below

• ETS 300 328 Technical requirements for Radio equipment.

• ETS 301 489 -1 & -17 General EMC requirements for Radio equipment.

• EN 60950 Safety Requirements for Radio equipment

# 1. Introduction

Thank you for purchasing your Wireless Local Area Net (WLAN) USB Dnogle. You are about to install a networking system that is not only fast and powerful, but also easy to set up and simple to maintain. In a short time you and those in your network will be able to share a local printer and files, access the Internet, and roam about the office wire-free.

Using radio frequency (RF) technology, WLANs transmit and receive data over the air, minimizing the need for wired connections. Thus, WLANs combine data connectivity with user mobility, and, through simplified configuration, enable movable LANs.

This wireless networking solution has been designed for both large and small businesses, and it is scalable so that you can easily add more users and new network features as your business grows.

This manual will assist you in the installing WLAN USB Dongle.

# 2.  Wireless LAN basics

Wireless LAN network defined by IEEE 802.11b standard committee could be configured as:

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

**Ad Hoc** network is a group of notebooks with WLAN PC cards or USB dongles called a BSS (Basic Service Set). These notebooks use their WLAN PC cards or USB dongles to communicate with each other, and notebooks can not connect to the **Internet**.
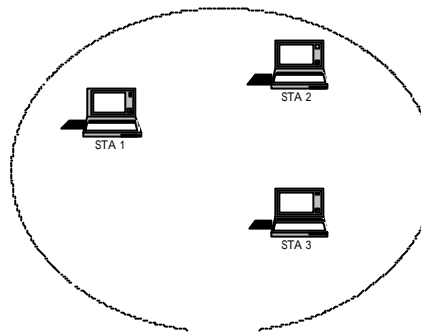


Figure 2-1 Ad Hoc wireless network

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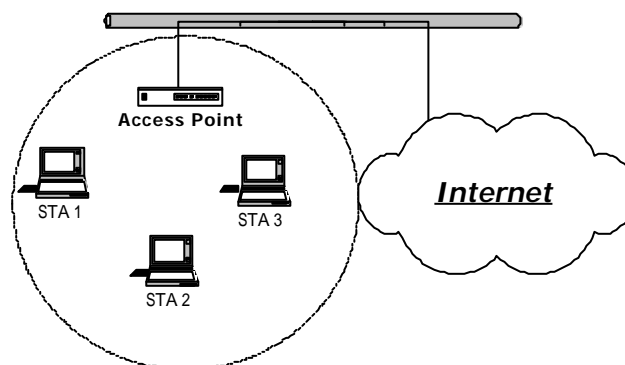


Figure 2-2 Infrastructure wireless network

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

# 3. Windows Installation

The following section will assist you to install Wireless LAN USB successfully. You will first install software (driver) and then connect the Wireless LAN USB, and finally set the network properties to accommodate resource sharing and select the type of wireless network that you wish to install. The Wireless LAN can easily be installed and used, without bothering to connect cables for keeping your computer to use network resources, as in case of wired LAN.

## Before You Start

Here are some steps you will perform in establishing your wireless network connection:

- Install the Access Point at first. AP is needed in case of infrastructure network mode.
- Install the software using the Installation CD ROM
- Install the Wireless LAN USB Dongle
- Install the network protocol(s) required to communicate on your network. Most likely you will need the TCP/IP protocol.

## 3.1 Installation and Configuration Procedures
Under Windows 98 SE

**Please follow the following steps one by one in order to install the WLAN USB Dongle successfully.**

Step 1. Power on your computer and allow **Windows 98 SE** to load fully. Be sure that there is no **USB dongle** is connected to computer yet. Insert the given **documentation CD** and then double click the **MY Computer** icon on your desktop. In my computer window, double click the **CD Drive** icon. Choose WLAN USB Dongle folder and double click **setup** to execute **Setup.exe**. It opens the **InstallShield Wizard** dialog box as shown next page.
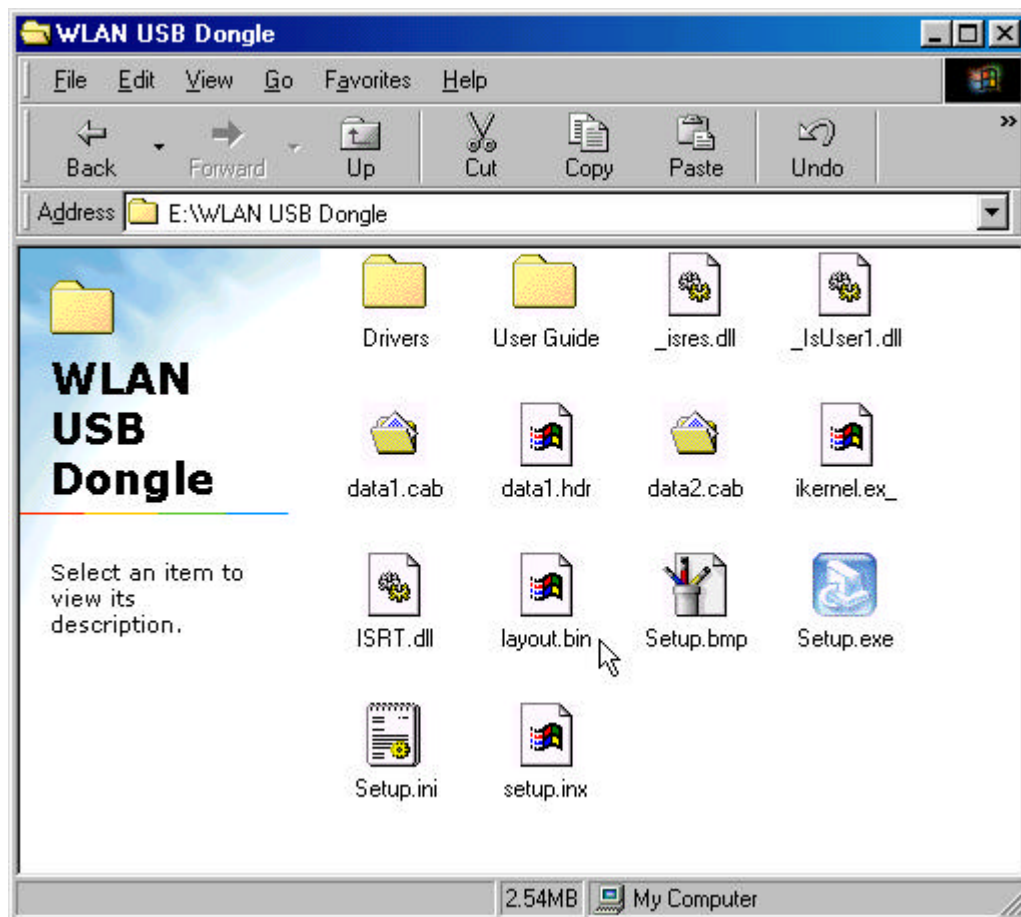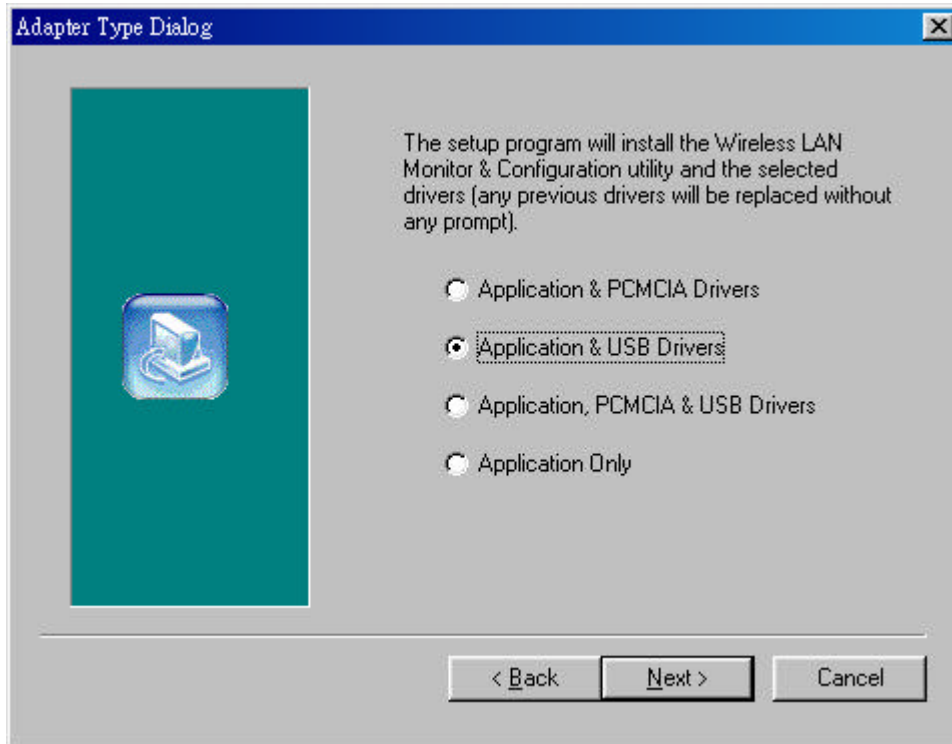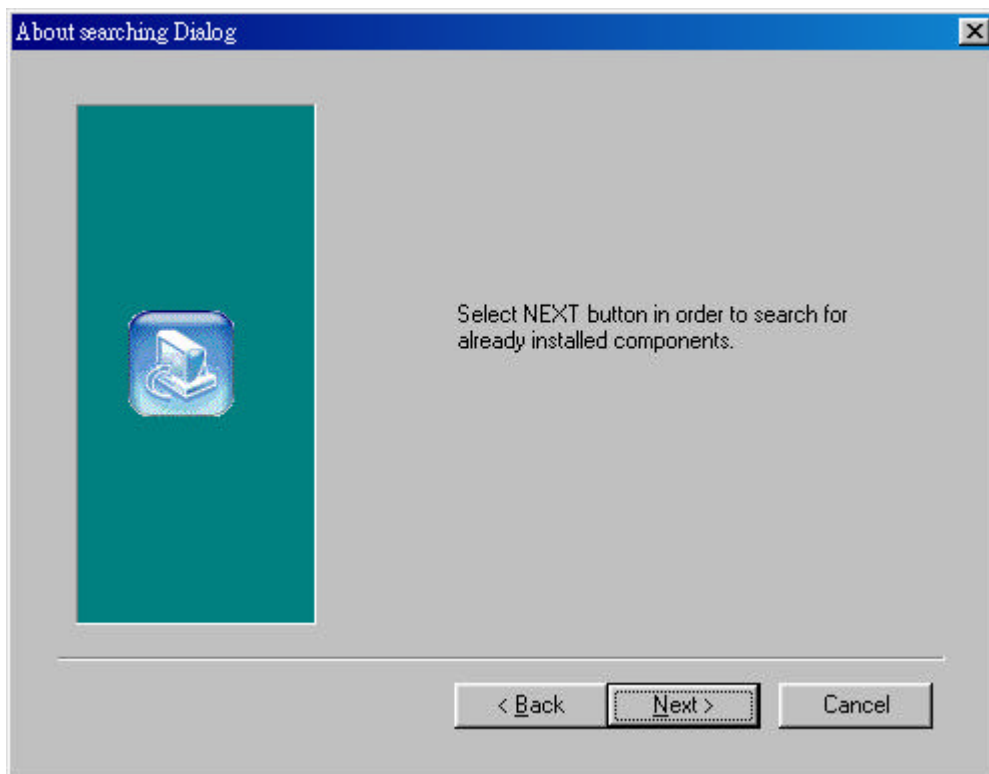
Click **Next** to continue.
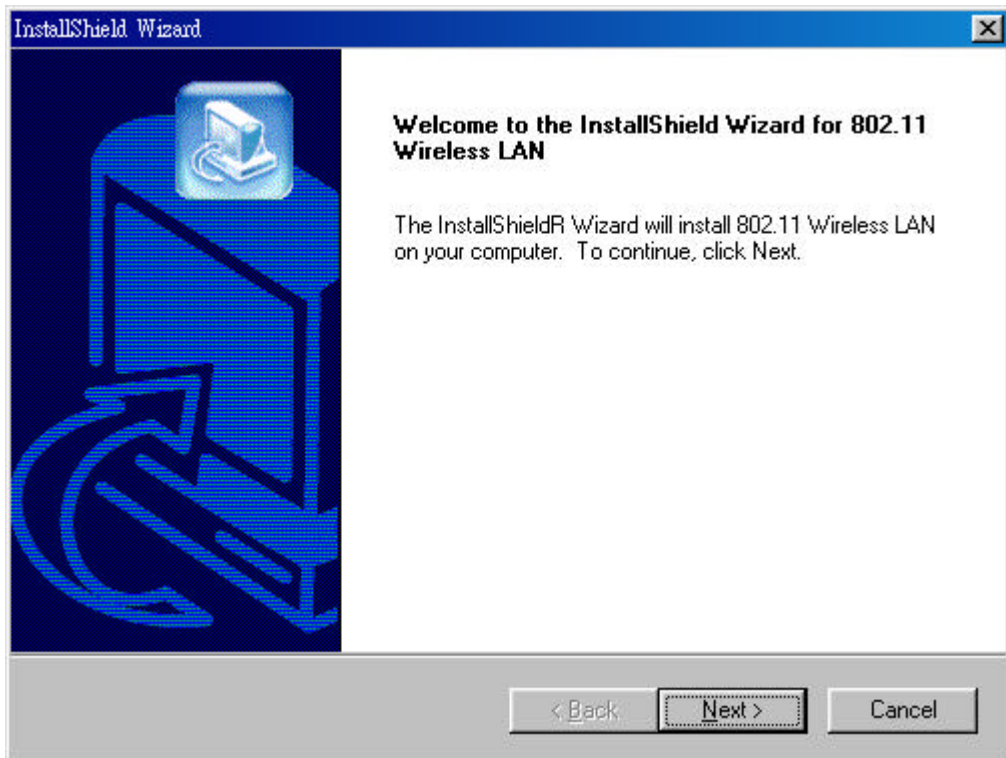


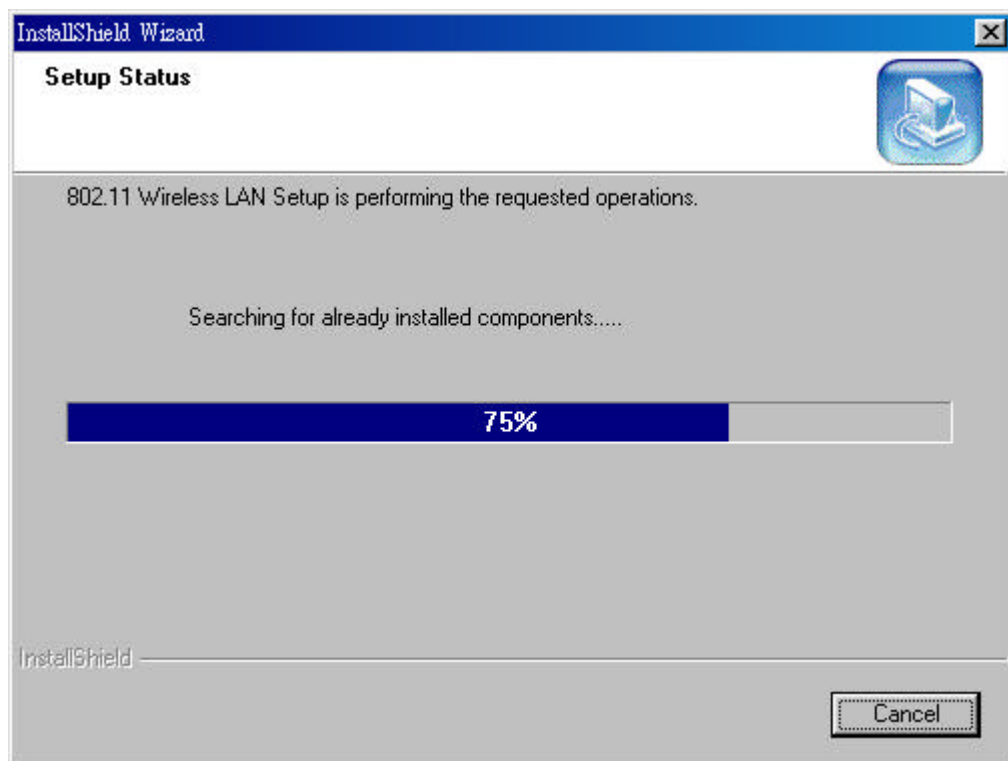Step 2. Software License Agreement, click **Yes** to accept.
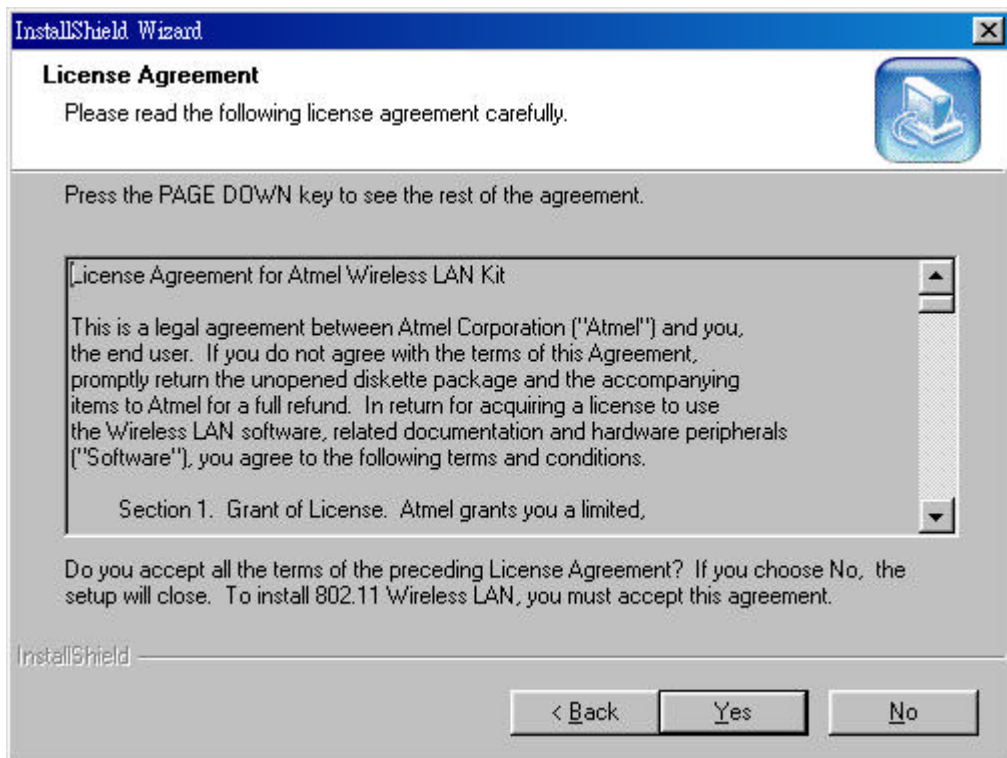
Step 3. Select Adapter Type. Please select **Application & USB Drivers** then click **Next**.
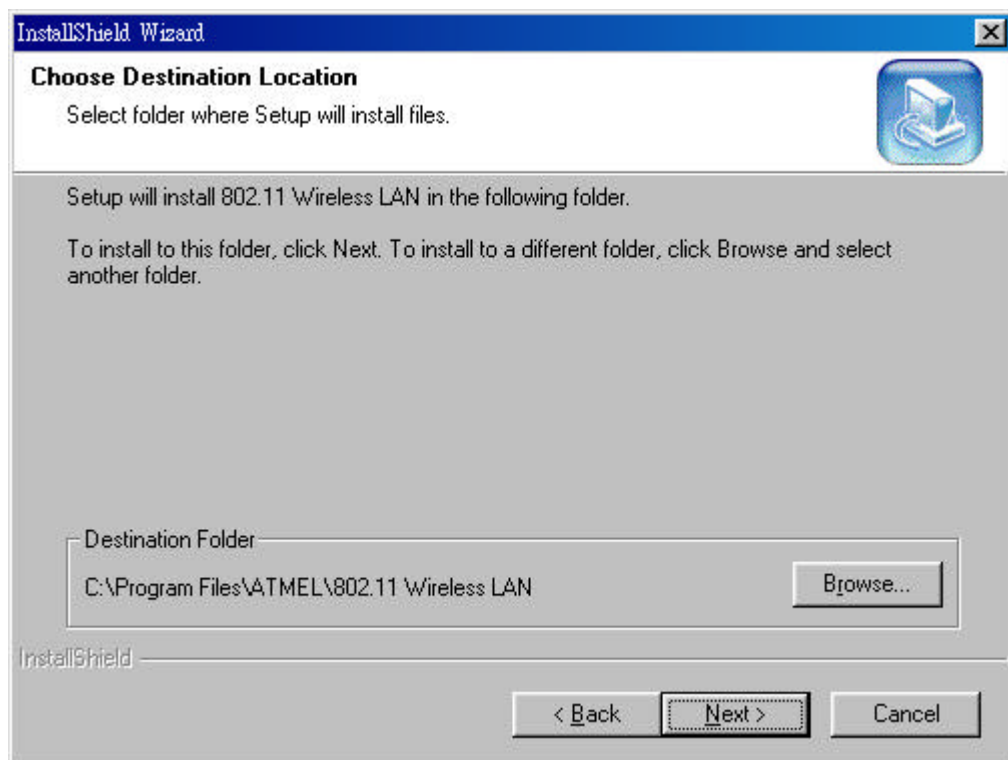


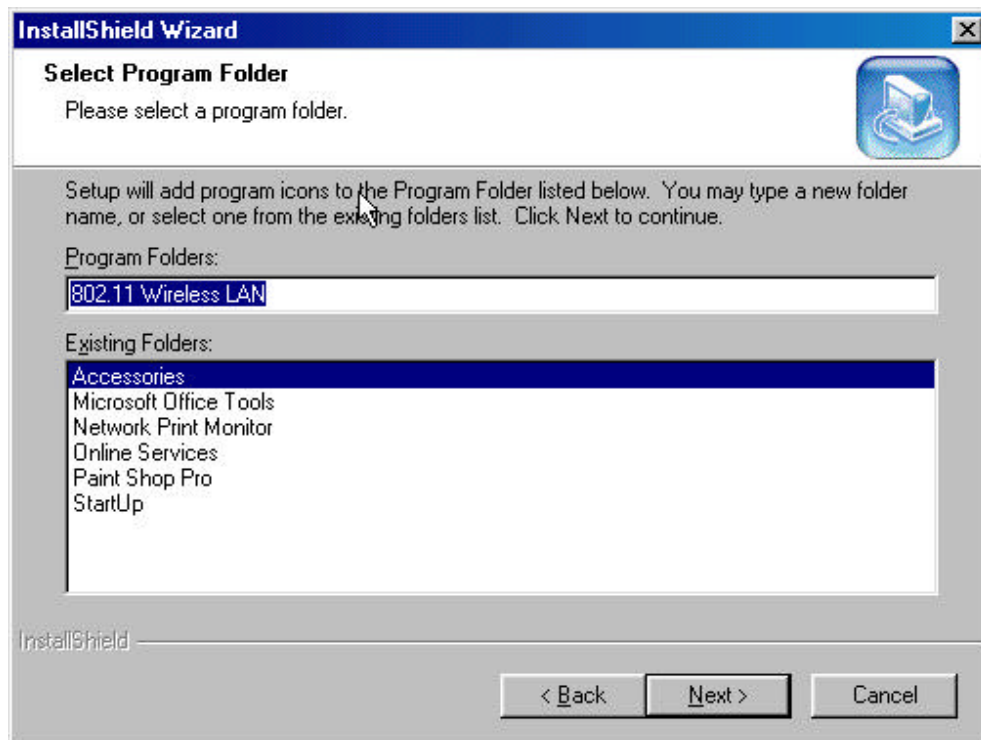Step 4. Click **Next** to search for already installed components.

Step 5. Search for already installed components



Step 6. Choose Destination Location. Click **Next**

Step 7. Setup will add program icons to the Program Folder listed below. You may type a new folder name, or select one from the existing folders list. Click **Next** to continue.



Step 8. Select operating mode. Ad hoc mode provides communication between wireless clients. Infrastructure mode provides communication between wired and wireless clients (Requires an access point). Select **Infrastructure** then click **Next**.
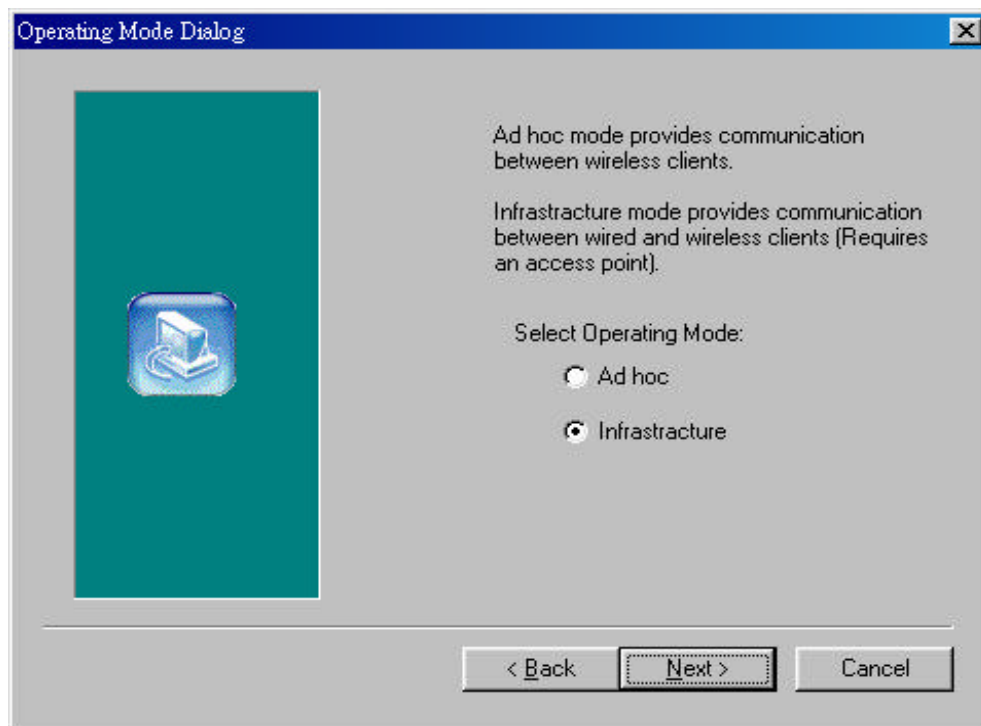
Step 9. ESSID is the name of a logical network group that your computer is about to join. (It can be changed again at run time by the configuration utility).
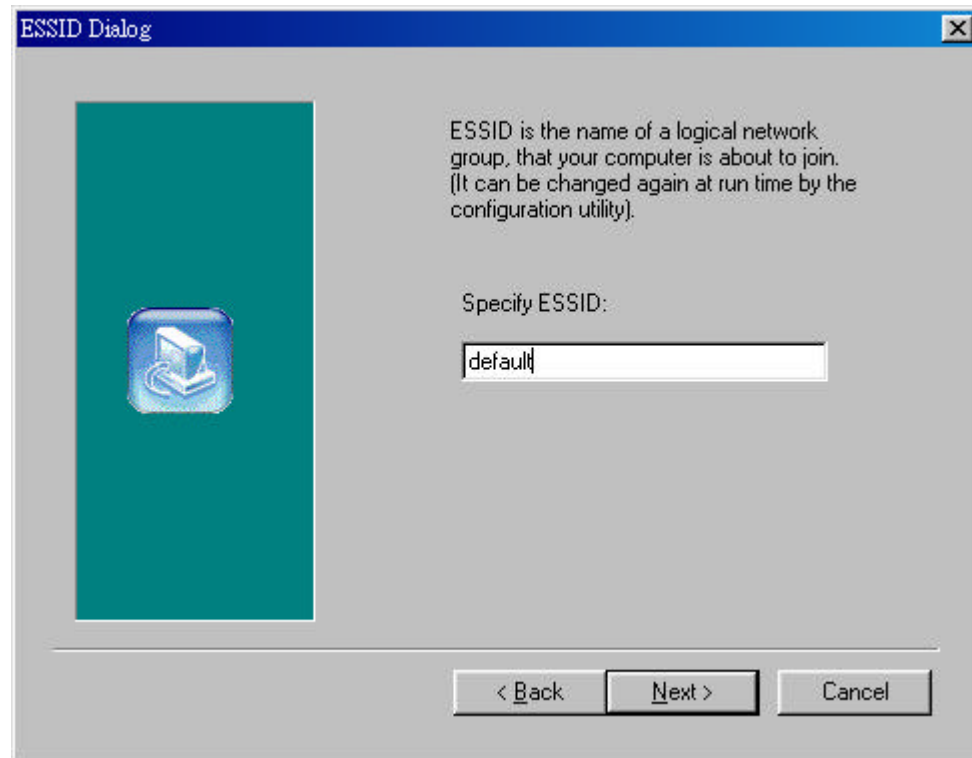


Step 10. Click **Next** to start copying files.
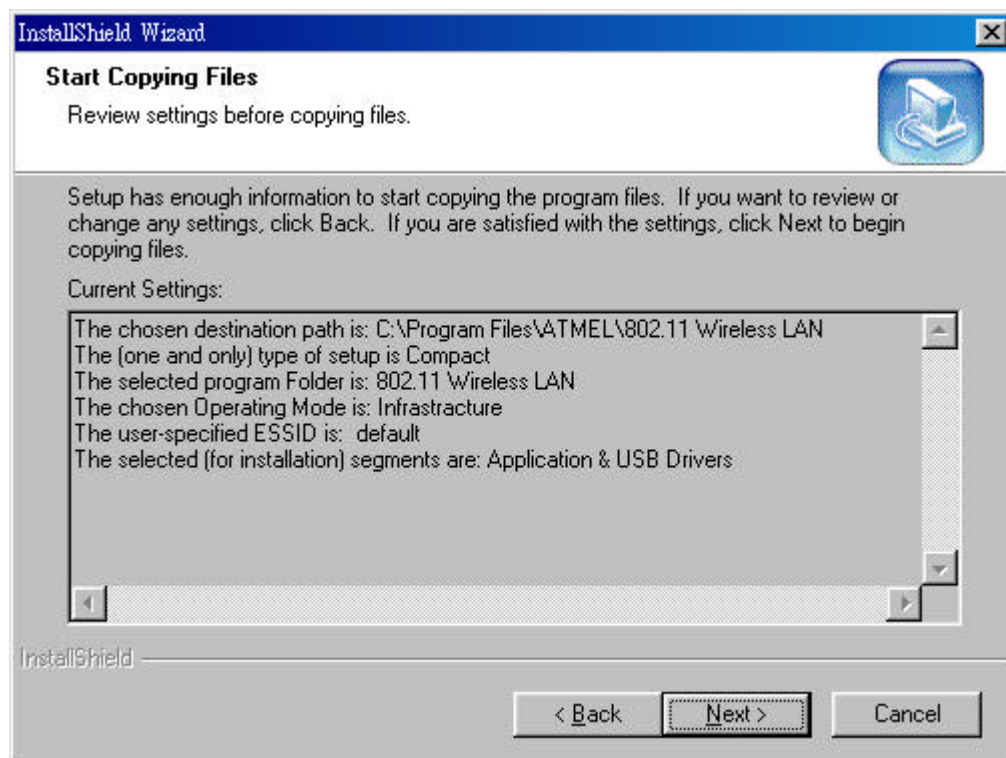
Step 11. Step Status



Step 12. Click **Finish** to exit the wizard.

## 3.2 Configuration Utility

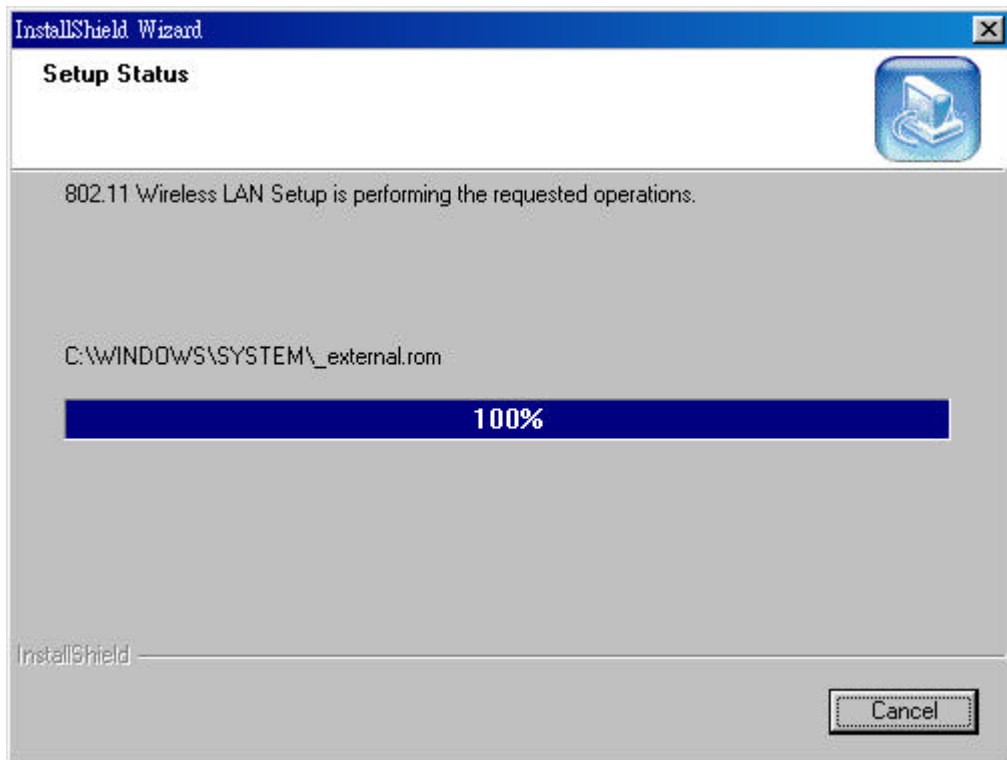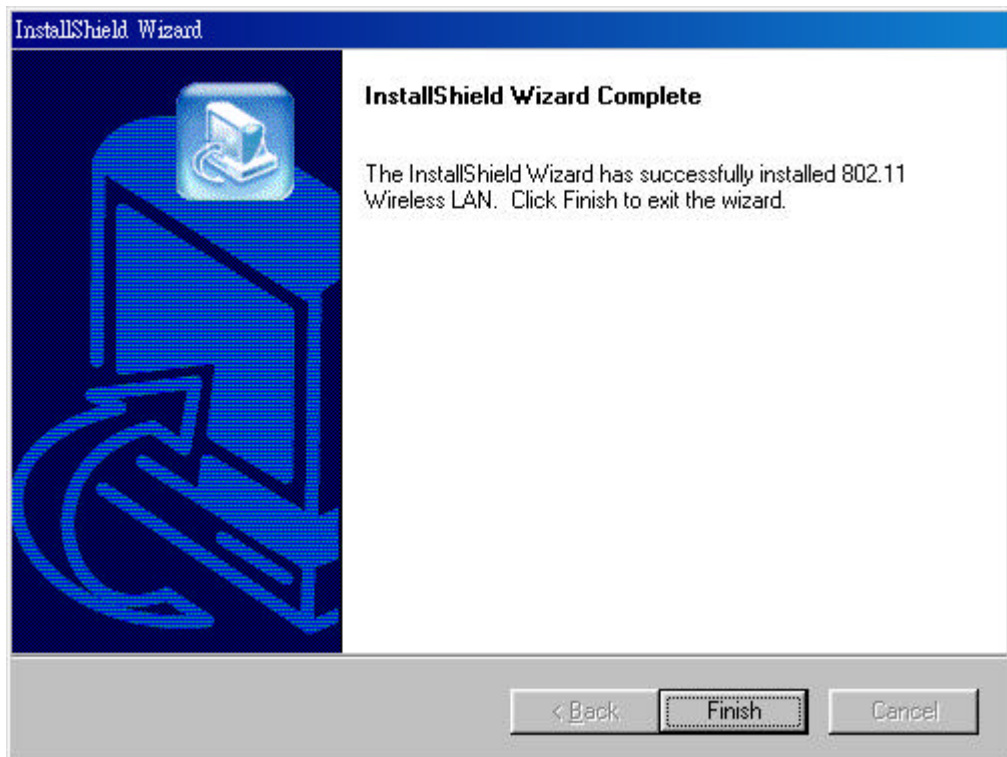WLAN USB dongle uses its own management software. All functions controlled by user are provided by this application. When you plug WLAN USB dongle into the USB port, a new icon  should appear in your icon tray automatically wait a while. If the icon is in red, it means that WLAN USB Dongle configuration is invalid or incomplete.

Double click on that icon the screen is shown below.
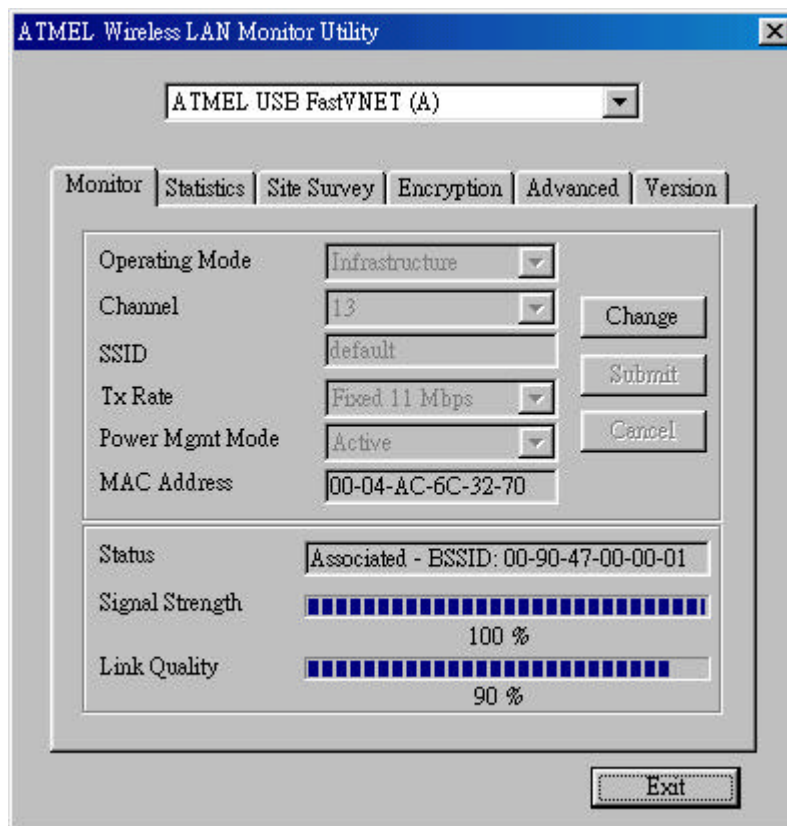


User can navigate through "cards", by clicking or tapping them with a stylus. In the following we explain the use and meanings of the various card.

### Monitor

The field shows the association to available Access Point with Operating Mode, Channel, Tx Rate Power Management mode and MAC Address of WLAN USB Dongle. When the state is "Associated" means normal flow of operation in infrastructure mode. The PC is connected to Access Point. BSSID is chose in the form of hex digits.

"*Change*" / "*Submit*" button

This button becomes active only when one of the fields has been modified. Pressing "*Change*" button applies the changed values to the driver. Than pressing "Submit" button saves them to the registry.

*Network Mode*

This field allows you to select from a list of supported Network "Modes". The modes displayed will have two values: "Ad Hoc" and "Infrastructure".

Ad Hoc - This is the 802.11b peer-to-peer mode of operation. All communication is done from Client to Client without the use of an Access Point. 802.11 Ad Hoc networking uses the same SSID for establishing the wireless connection.

Infrastructure -This mode of operation requires the presence of an 802.11b Access Point. All communication is done via the Access Point, which relays packets to other wireless Clients in the BSS as well as to modes on a wired network such as Ethernet.

*Channel*

There are 14 channels available. The channels differ from country to country. Select the channel to be used.

*SSID*

SSID is the group name that will be shared by every member of your wireless network. You will be able to connect with an Access Point, which has the same SSID.

*Tx Rate*

The transmission rate at which the data packets are transmitted by client of AP. You can set this to 1Mbps, 2Mbps, 5.5Mbps, 11Mbps or Fully Automatic.

*Signal Strength / Link Quality*

The Link Quality and Signal Strength bar graph is only active when the node is in Infrastructure Mode. The bar graph displays the quality and strength of the link between the node and its Access Point. A label summarizes the quality of the Link over the bar graph.

**Statistics**

To check the packets status, uses can press the "Statistics" tab and get related statistical figures of data and management packets.
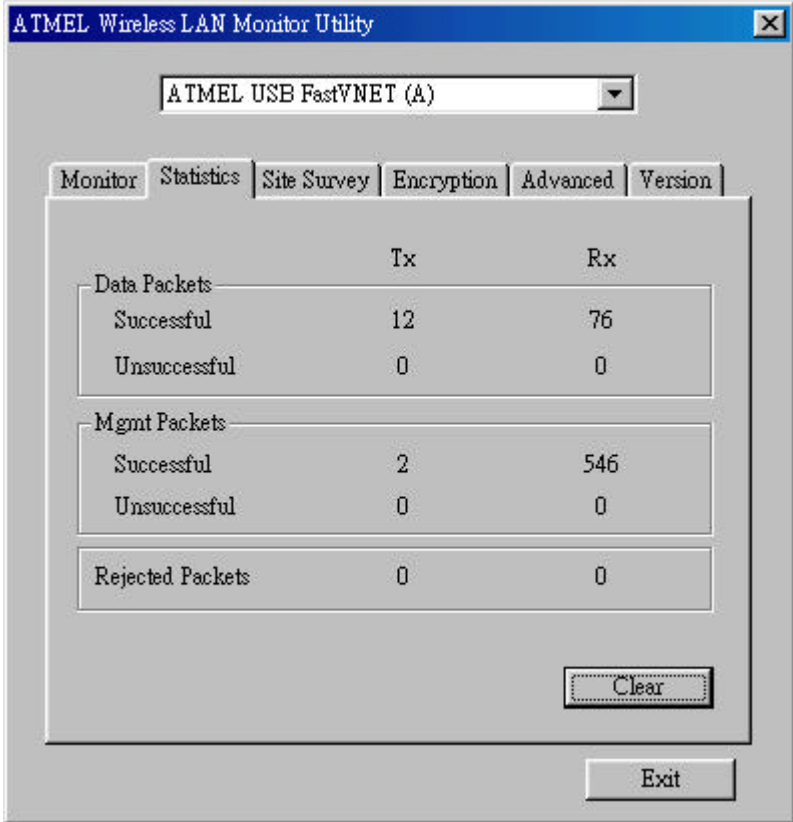
**Site Survey**

Click on the site survey tab, all access point within detectable range will be found and their related information will be displayed.

**Encryption**
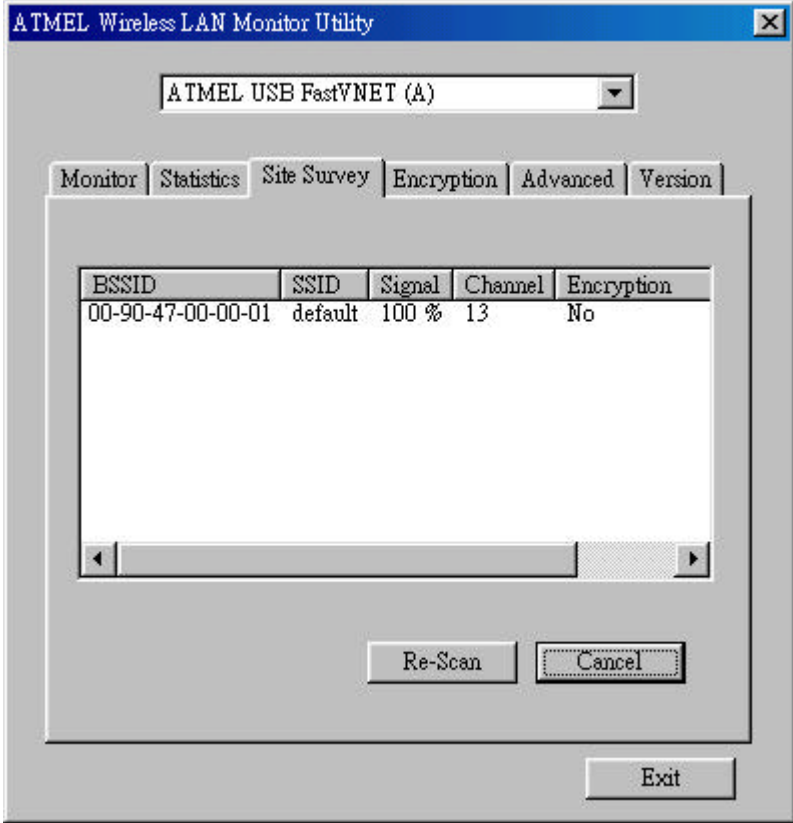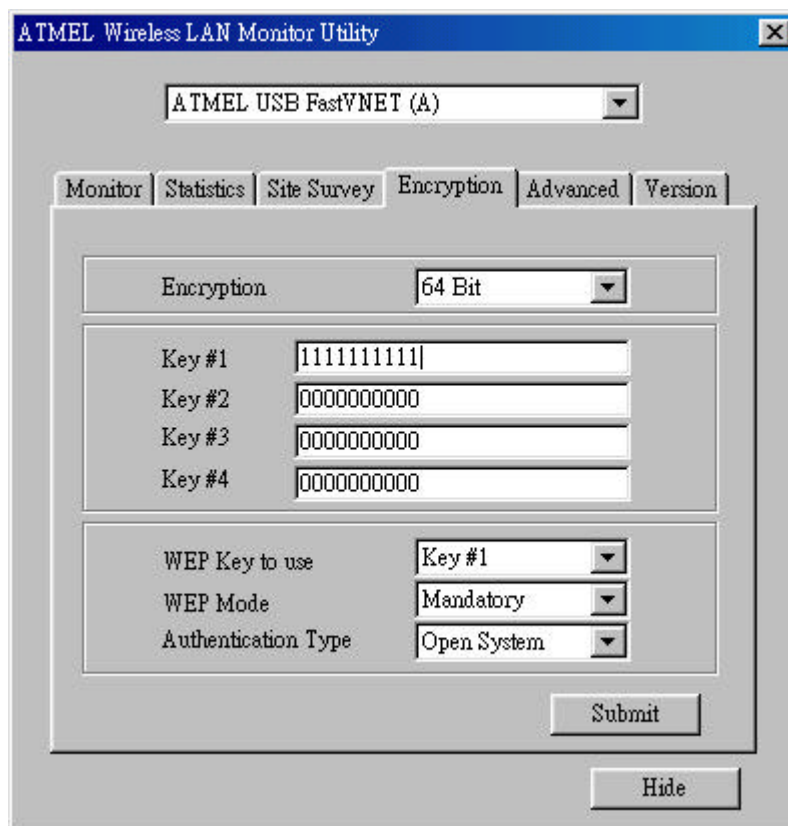
An encryption function can avoid unintended users who are not at the same wireless LAN user group to access or get information. The "**Encryption**" options allow you to enable 64-bit or 128-bit WEP (wired equivalent privacy) encryption. If an encryption function is not needed, you can just simply tick on the "Disable" box to disable it. By choosing this option you must define the encryption key values of your choice. There are four 5 Hex digit encryption keys available if you select 64 bit WEP or there are four 13 Hex digit encryption keys available if you select 128 bit WEP.

WEP Key to use is a mechanism to enable the encryption function. After enabling the WEP users need to select the authentication type, open system key or shared key.

**Open System** with this setting any station in the WLAN can associate with this device to receive and transmitted data.

**Shared Key** with this setting only stations using a share key encryption identified by this device are allowed to associate with it.

**Advanced**

In advanced tab, you can change configuration setting such as Preamble Type, Fragmentation Threshold, and RTS/CTS Threshold. Before selecting Short Preamble, make sure that the other stations and AP's are also supporting this feature.

*Preamble Type* (Short/Long)
Preamble is the first subfield of PPDU, which is the appropriate frame format for transmission to PHY (Physical layer). There are two options, Short Preamble and Long Preamble. The Short Preamble option improves throughput performance.

Fragmentation Threshold
The size at which packets will be fragmented. Choose a setting within a range of 256 to 2346 bytes.

RTS/CTS Threshold
Minimum packet size requires an RTS/CTS. For packets smaller than this threshold, and RTS/CTS is not sent and the packet is transmitted directly to the WLAN. This is the option for the RTS/ CTS Threshold activation.
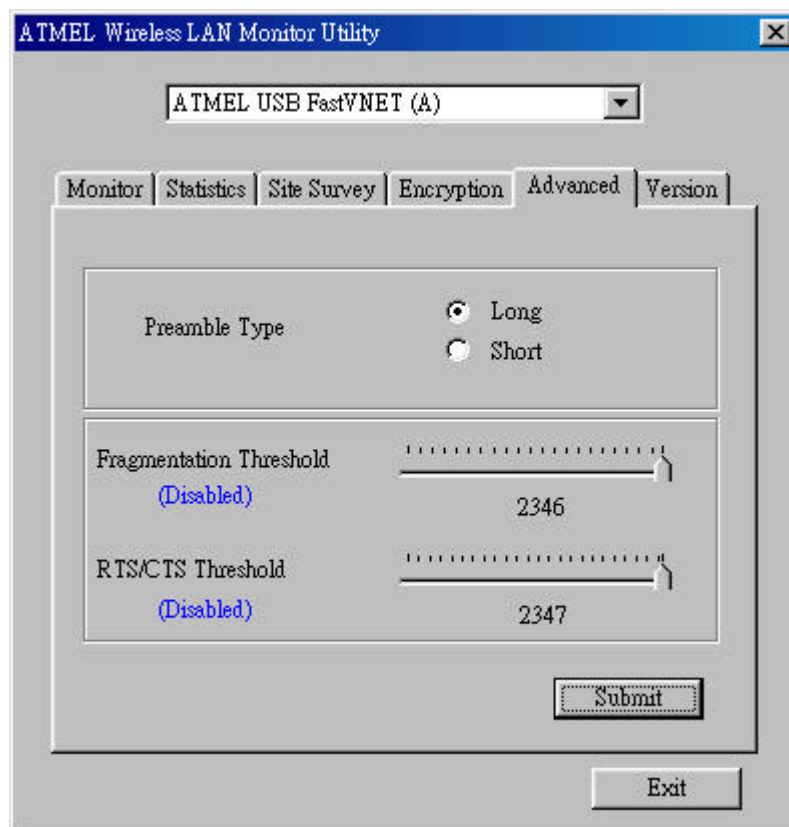
**Version**

Version tab shows the product version including the detail of driver, firmware and application version. Users must use this version number when reporting their problems for technical support.
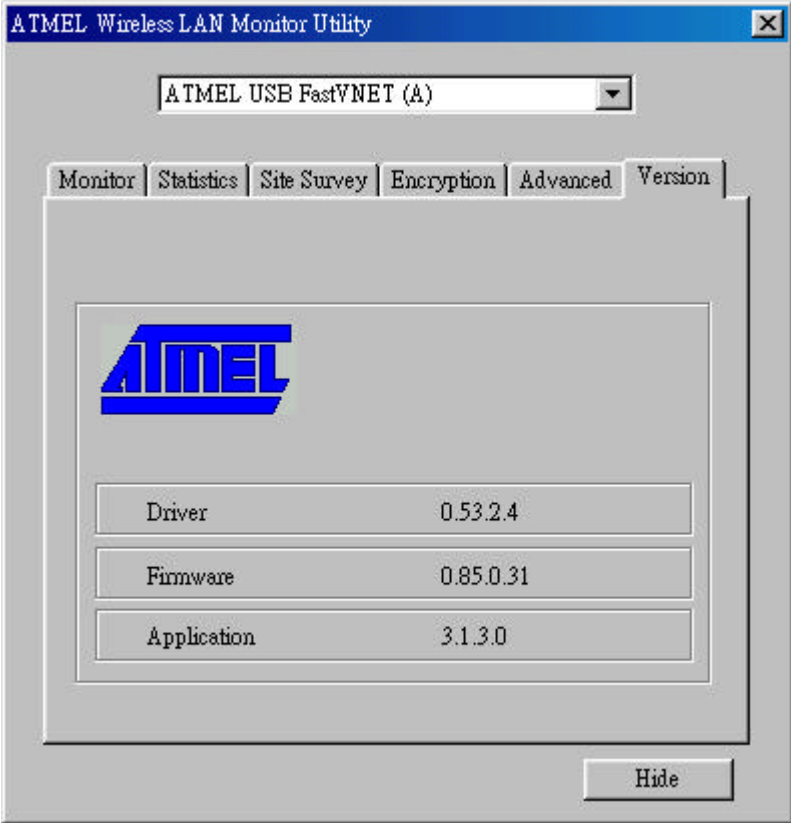
# 4. Technical Specifications of WLAN USB Dongle

## Driver Supported
Microsoft Windows 98 / Windows 98 SE / Windows ME / Windows 2000

## Standards Supported
IEEE 802.11b standard for Wireless LAN

## Radio Specifications
Frequency Range: 2.4-2.4835 GHz, Direct Sequence Spread Spectrum
Antenna system: Two integrated antenna
Mobility: Seamless roaming across cell boundaries with handover

## Power Specifications
Operating Voltage: 5 VDC
Continuous Transmitting: 330 mA
Continuous Receiving: 280 mA

## Specific Features
Supported bit rates: 11Mbps, 5.5Mbps, 2Mbps and 1Mbps

## Number of Channels
Europe: 1-13
US: 1-11
France: 10-13
Japan: 1-14

# Glossary

**IEEE 802.11** Standard

The IEEE 802.11 Wireless LAN standards subcommittee, which is formulating a standard for the industry. The objective is to enable wireless LAN hardware from different manufacturers to enteropera.

**Access Point**

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

**Ad Hoc**

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

**BSSID**

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

**DHCP**

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

**Direct Sequence Spread Spectrum**

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

**ESSID**

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

**Ethernet**

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

**Gateway**

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

**IEEE**

Institute of Electrical and Electronics Engineers

**Infrastructure**

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

**ISM Band**

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

**Local Area Network (LAN)**

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

**Network**

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

**PCMCIA**

Personal Computer Memory Card International Association. Also a PCMCIA card is also referred to PC Card.

**Protocol**

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

**Roaming**

In an infrastructure network, this is when a wireless PC moves out of range of the previously connected access point and connects to a newly connected access point. Throughout the network environment where access point are deployed, PCs can always be connected regardless of where they are located or roam.

**SSID**

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

**Simple Network Management Protocol (SNMP)**

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

**Static IP Addressing**

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

**Transmission Control Protocol / Internet Protocol (TCP/IP)**

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

**Transmit / Receive**

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

**Wide Area Network (WAN)**

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

**Wireless LAN (WLAN)**

A wireless LAN does not use cable to transmit signals, but rather uses radio or infrared to transmit packets through the air. Radio Frequency (RF) and infrared are the commonly used types of wireless transmission. Most wireless LANs use spread spectrum technology. It offers limited bandwidth, usually under 11Mbps, and users share the bandwidth with other devices in the spectrum; however, users can operate a spread spectrum device without licensing from the Federal Communications Commission (FCC)