



**802.11b USB Pen Type WLAN Adapter**

**WL-161**

**(802.11b Wireless Networks)**

**User's Manual**

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# INFORMATION TO USER

## FCC INFORMATION

### FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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 causes 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.

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.

"ASUSTeK COMPUTER INC. declare that WL-161 (802.11b USB Pen Type WLAN Adapter) is limited in CH1~CH11 by specified firmware controlled in USA."

## REGULATORY INFORMATION

ASUS WL-161 WLAN Adapter must be installed and used in strict accordance with the 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.
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 300-826 General EMC requirements for Radio equipment.
- ETS 300-328 Technical requirements for Radio equipment.
- EN60950 Safety Requirements for Radio equipment

The channel identifiers, channel center frequencies, and regulatory domains of each 22-MHz-wide channel are shown in following Table.

Channel Identifier	Center Frequency (MHZ)	Regulatory Domains					
		Japan	ETSI	North America	Israel	France	Mexico
1	2412	✓	✓	✓			
2	2417	✓	✓	✓			
3	2422	✓	✓	✓	✓		
4	2427	✓	✓	✓	✓		
5	2432	✓	✓	✓	✓		
6	2437	✓	✓	✓	✓		
7	2442	✓	✓	✓	✓		
8	2447	✓	✓	✓	✓		
9	2452	✓	✓	✓	✓		
10	2457	✓	✓	✓		✓	✓
11	2462	✓	✓	✓		✓	✓
12	2467	✓	✓			✓	
13	2472	✓	✓			✓	
14	2484	✓					

# 1. Introduction

Thank you for purchasing ASUS WL-161 WLAN Adapter. 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, mizing 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 ASUS WL-161 WLAN Adapter.

## 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 wireless LAN PC card called a BSS (Basic Service Set). These notebooks use their wireless LAN PC cards to communicate with each other, and notebooks cannot connect to the **Internet**.

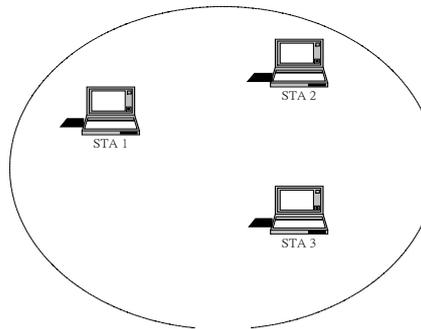


Figure 2-1 Ad Hoc wireless network

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**.

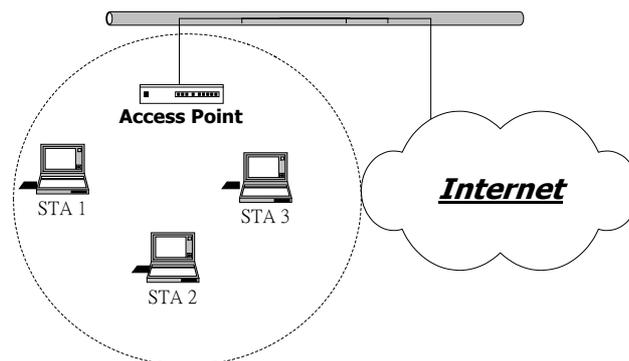


Figure 2-2 Infrastructure wireless network

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

### Before You Start

To use the ASUS WL-161 WLAN Adapter with a computing device, the ASUS WL-161 WLAN Adapter must be equipped with an USB 1.1 or 2.0 Interface. All drivers and supporting software for the ASUS WL-161 WLAN Adapter must be loaded and configured.

Ask your system abstractor for the following information, which you may need to provide during driver installation:

- Your Wireless Client Name
- Your Wireless SSID
- Your computer's unique client name and workgroup name
- For your network account, your user name and password.
- Your IP address, gateway address, and subnet mask if you're not using a DHCP server.

Every computer on a network is identified by a unique network address. There are two methods of assigning network addresses to computer on a TCP/IP network:

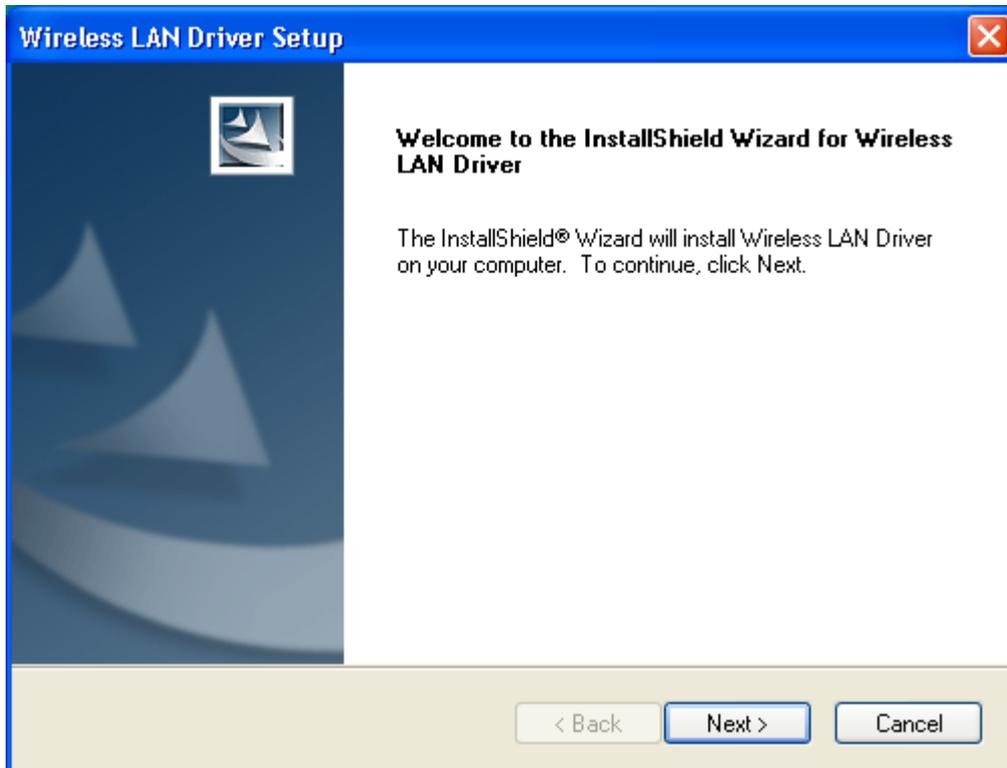
- Static IP addressing
- Dynamic IP addressing (DHCP)

In networks with static IP addressing, the network abstractor 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. You may manually change the IP address in the **Network Properties dialog box**. Networks using static IP addresses are easy to set up and do not require additional network management software.

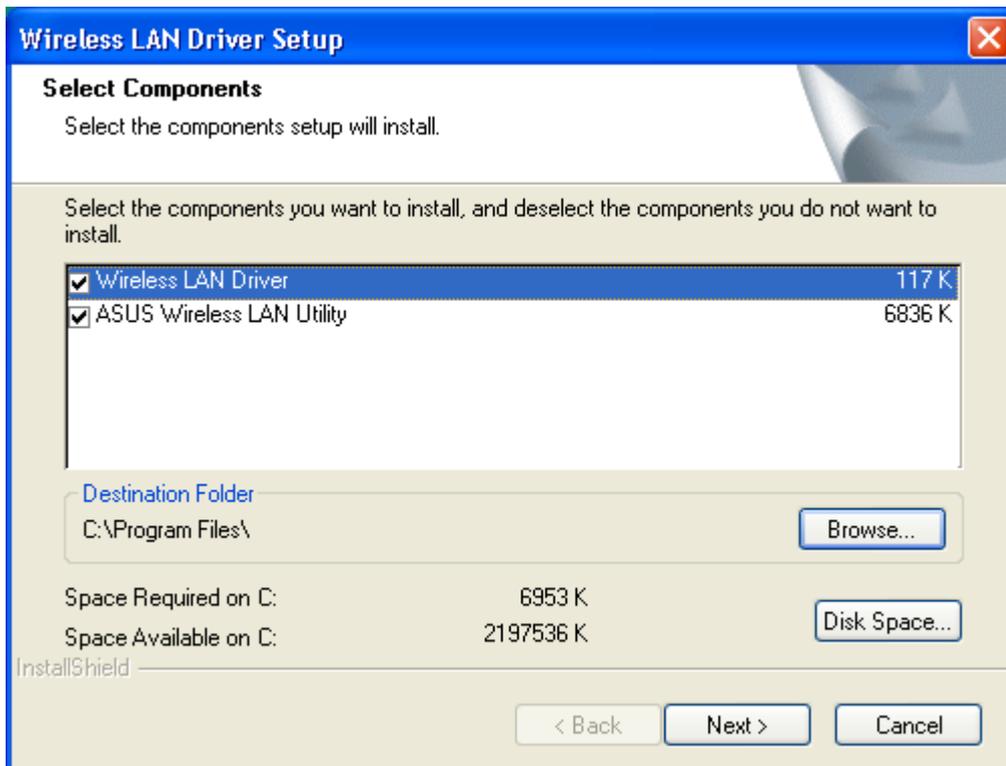
In networks with dynamic IP addressing, a DHCP server in the network dynamically assigns IP addresses to all clients every time they log on to the network. Network using dynamic IP addresses require setting up and running a DHCP Server or installing the Wingate software package.

### 3.1 Install Driver/Utility

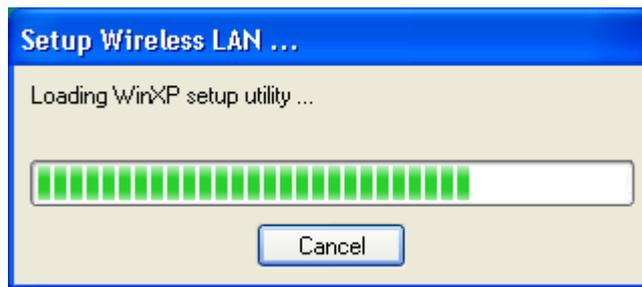
Step 1. Please insert the Device CD Windows XP/2000 was automatically running autorun. The Welcome dialog as below, please click **Next**



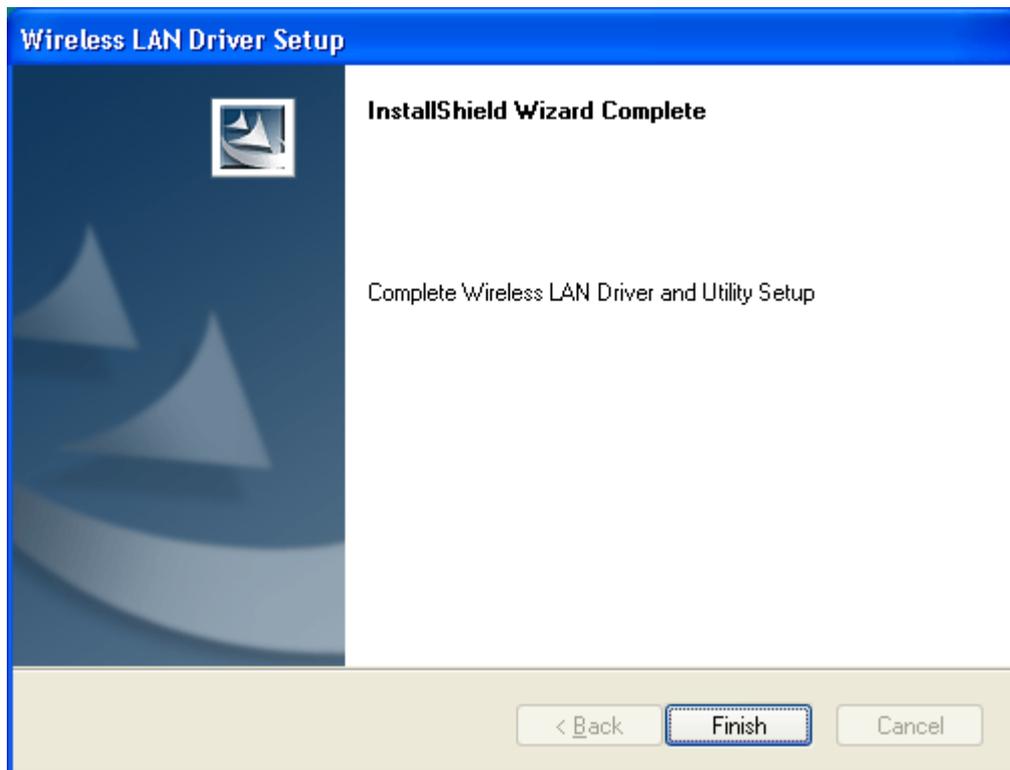
Step 2. Setup WLAN Driver and Utility, please click Next



Step 3. Starting Copy.



Step 4. Click **Finish** to complete installation.



Step 5 After you install Utility, Hold the USB Adapter with the logo facing up, and insert the Adapter into the USB receptacle, applying just enough pressure to make sure it is fully seated. Windows XP/2000 automatically detects the USB Adapter.

After finished install driver and utility on your system. Let's starting to setup your wireless card. First of all we will see the connection notice in the right come.



## 3.2 Configuration Utility

There are two different utility to configure you wireless setting on XP, although we provide another choice, but in functional, both of them are similar. You can choose any one of them, which you more like or convenience to use.

### 3.2.1 Configured at “ Windows XP configuration ”

1. After finished install driver and utility on your system. Let’s starting to setup your wireless card. First of all we will see the connection notice in the right corner (Fig. 3.1-1)



Fig. 3.1-1

2. Click the **View Available Wireless Networks** and it will popup a setup dialog as below (Fig. 3.1-2). If there have some efficient access point, which efficient range contains your USB Adapter range, then the SSID will show in the “Available networks” list. Select one and click the Connect button.

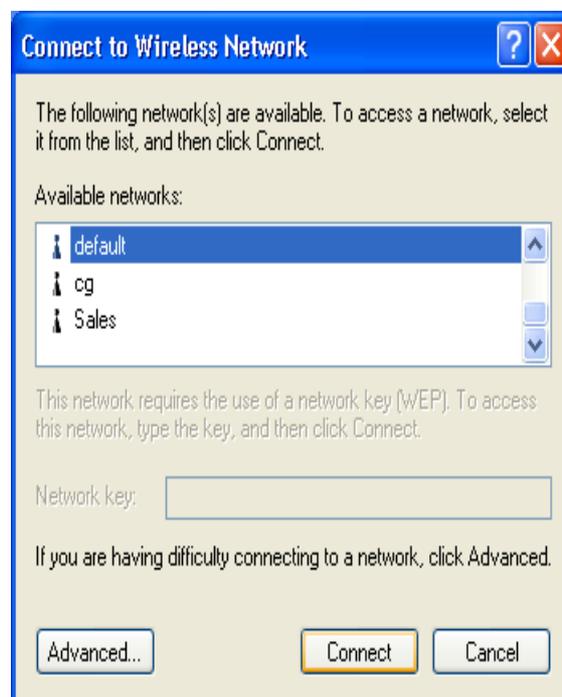


Fig. 3.1-2

### 3.2.2 Configured at “ASUS advanced configuration ”

We provide another wireless setting utility for Windows (2000/me/98SE) use. Of course, XP version already prepared. Every function is the same like Windows 2k version.

The Configuration Tab contains several fields where operating parameters of the driver can be viewed or changed. Changes to any of the parameters in this panel can be applied to the driver without a need to restart the PC.

1. Plug-in wireless card and you will see ASUS utility appear on your system tray.



2. Double-click the rotate circle icon, following dialog box will appear. (Fig3.2-1) The **NetStatus** tab shows the Link Status, Network mode, SSID, Channel, Tx Rate. You also can change your Ad hoc/Infrastructure network, Data Encryption, SSID, Channel, Tx Rate in this tab.

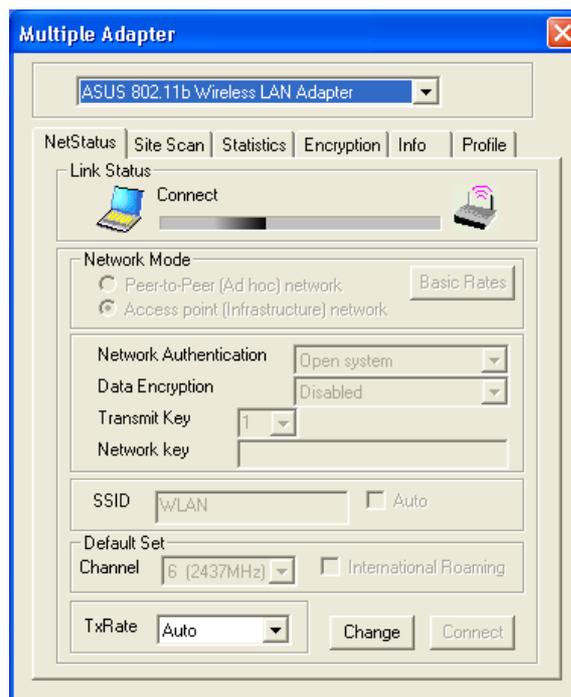


Fig 3.2-1

3. Then select the **Site Scan** tab, following dialog box will appear. (Fig3.2-2) Please wait system to scan or click **Re-refresh**, all Access Point and Ad-hoc devices within detectable range will be found and their related information will be displayed in the list. You can assign Access Point or Ad-hoc devices which you want connect to. We also can change presently connection just double

click SSID from the list. If you check the **Use Windows XP to configure my wireless network settings** that will change to Windows XP configuration to set the Wireless link function.

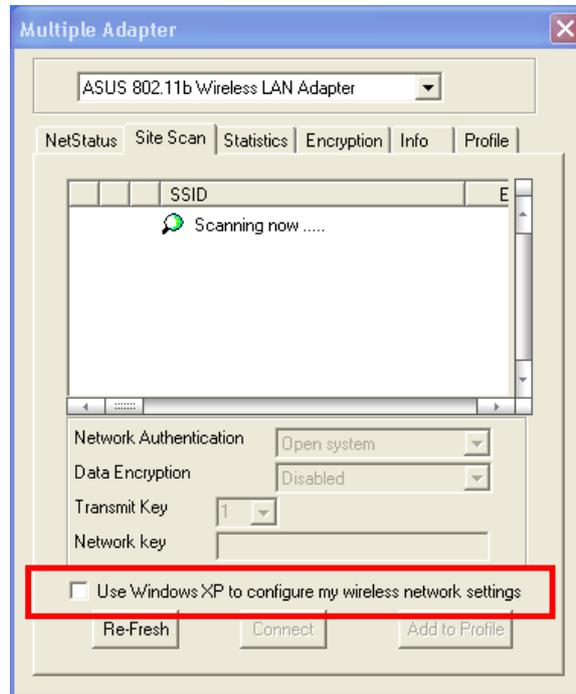


Fig 3.2-2

4. Select the **Statistics** tab (Fig3.2-3), you will see the Link Status, Signal strength, and transmit/receive statistics. If check the **Turn Radio OFF**, the radio interface will be turn off.

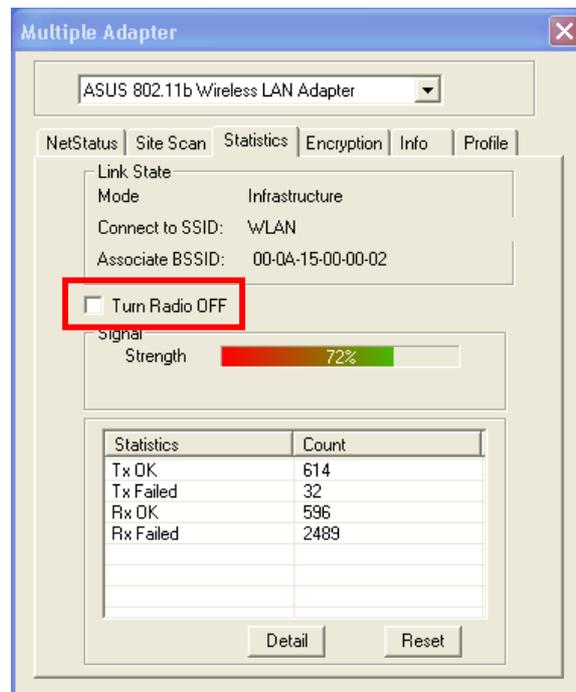


Fig 3.2-3

5. If there are several wireless network coexist, we must consider with data encryption. It depend on your Access Point security setting, one of them not match, them the connection will be failed.

Select the **Encryption tab** (Fig3.2-4). If you want to enable the function, please set the **Data Encryption** to **WEP**. WEP encrypts each frame transmitted from the radio using one of the Keys entered from this panel. To be written to the driver and registry, each key must consist of hex digits, which means that only digit 0-9 and letters A-F are valid entries. If entered incorrectly program will not write keys to a driver.

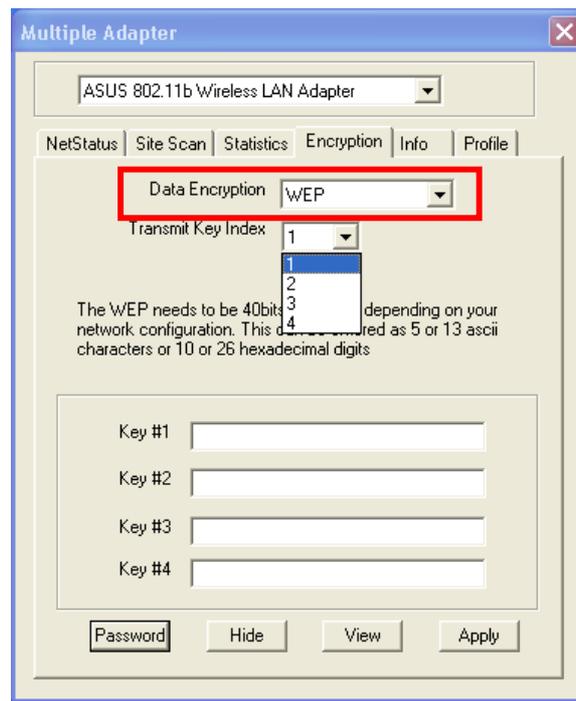


Fig 3.2-4

6. The **Info tab** (Fig3.2-5) shows the Driver version including the detail of Configuration Utility, and NIC firmware version. Users must use this version number when reporting their problems for technical support.

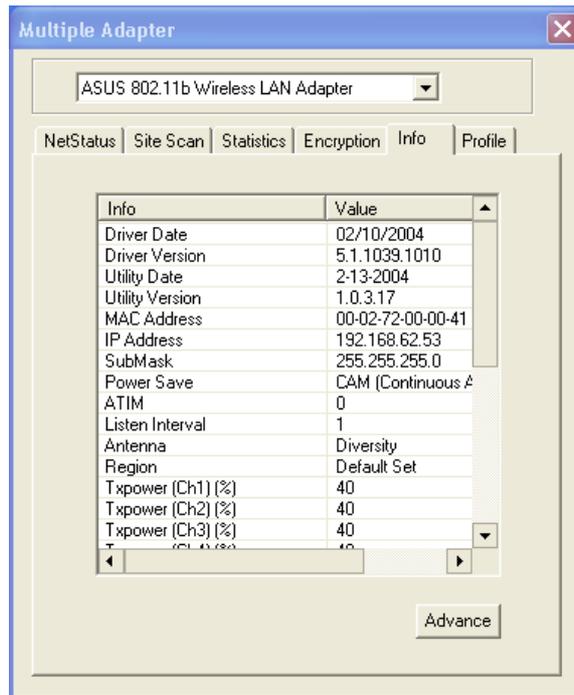


Fig 3.2-5

7. The **Profile tab** (Fig3.2-6) allows you to save the information associated with a specific, so you can quickly and easily connect to your network when you are in that location. The Profiles page allows you to new, delete and edit your profiles.

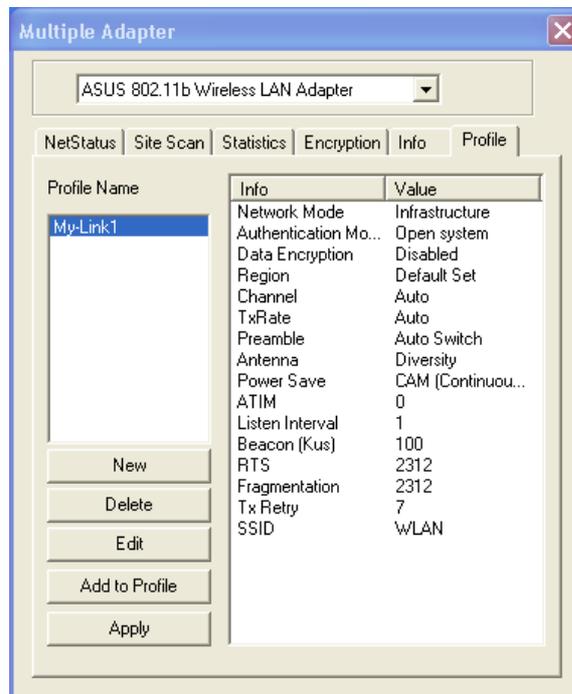


Fig 3.2-6

## 4. Technical Specifications of ASUS WL-161 WLAN Adapter

Standard	IEEE802.11b
Frequency Band	2.400GHz ~ 2.4835GHz unlicensed ISM band
Spread Spectrum	DSSS (Direct Sequence Spread Spectrum)
Modulation method	DQPSK/DBPSK/CCK
Data Rate	1Mbps, 2Mbps, 5.5Mbps, 11Mbps
Operation mode	Ad hoc Infrastructure (Access Points is needed)
Transmitter Output Power	<13.5 dBm
Receive Sensitivity	Operating at 11Mbps: >8% PER @ -86dBm
Operating Range	100 - 400m, depending on surrounding environment
Antenna	On board chip antenna
Power consumption	Transmit: < 350mA; Receive: < 260mA
Security	64-bit or 128-bit WEP (Wired Equivalent Privacy)
I/O Interface	USB 1.1
LED	Blue LED indicator; Power on indicator
Operating system supported	Windows 98Se, Me, 2000 and XP
Management	Windows-based utility for configuration and status monitoring
Regulation	FCC part 15B/C for North America; CE
Dimension	58(L) x 24(W) x 9.9(H) mm
Weight	9.6 g
Operating Temperature	0 ~ 55°C
Storage Temperature	-20 ~ 70°C
Humidity	5 ~ 90% (non-condensing)

## Troubleshooting

**Symptom:**

The LED is off.

**Possible Remedy:**

Make sure the PC Card is inserted properly. Otherwise contact your vendor.

**Symptom:**

The LED is blinking but the PC Card icon does not appear in your icon tray.

**Possible Remedy:**

Make sure that you have installed the Utility from attached CD.

**Symptom:**

The PC Card is linking, but can't share files with others.

**Possible Remedy:**

Make sure the **file and printer sharing** function is enabled. You could enable the function by checking the icon of **My Computer** → **Control Panel** → **Network** → **file and printer sharing** → **I want to be able to give others to access to my files**.

**Symptom:**

Slow or erratic performance

**Possible Remedy:**

Try change the channel of the communicating group or move your device closer to the communicating device.

**Symptom:**

Can't find the utility icon in the taskbar when plugged in the WLAN card

**Possible Remedy:**

You could enable the function by click the icon of **start** → **All Programs** → **ASUS Wireless LAN Utility** → **ASUSCFG**

# Glossary

## **IEEE 802.11 Standard**

The IEEE 802.11 Wireless LAN standards subcommittee, which is formulating a standard for the industry.

## **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.

## **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 is 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 abstractor 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)