Chapter 1 Introduction

This chapter describes the package contents, USB Adapter description, system requirements, features & benefits, applications and network configurations of our wireless LAN products.

1-1 Package Contents

The USB Adapter package contains the following items as shown in

1. One USB Adapter
2. One Installation CD
3. One Quick Installation Guide

1- 2 USB Adapter Descriptions

The USB Adapter is a standard USB Adapter that fits into any USB Interface. The USB Adapter has a LED indicator and an integrated external diversity antenna.

1. Integrated, with external diversity Antennas. The adapter would switch automatically to the antenna which receives single strongly.

2. Link LED
   - AdHoc mode – Solid GREEN, no matter the wireless is connected or not
   - Infrastructure – Solid GREEN when the wireless is connected and free
              flickering when linking.
   - Off – No wireless activity

1- 3 System Requirements

Installation of the USB Adapter requires:

1. PC compatible computer with USB Interface.

2. Windows 98//ME/2000 operating system environment.

3. Minimum 1.3M bytes free disk space for installing the USB Adapter driver and utility program.

1- 4 Features and Benefits

11Mbps data rate	High-speed data transmission
IEEE802.11b compliant	Fully interoperable with IEEE802.11b compliant products
Automatic data rate scaling at 11, 5.5, 2 and 1 Mbps	Optimized throughput, range and connectivity
64/128-bit WEP data encryption / decryption	Powerful data security
Wide coverage range up to 400 meters in open space	Wireless connectivity for all your computers
Plug and Play USB interface	Easy installation

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:

1. **Difficult-to-wire environments**
   There are many situations where wires can not or not easily be laid. Historic buildings, older buildings, open areas and across busy streets make the installation of LANs either impossible or very expensive.

2. **Temporary workgroups**
   Consider situations in parks, athletic arenas, exhibitions, disaster-recovery, temporary office and construction sites where one wants a temporary WLAN established and removed.

3. **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.

4. **Frequently changed environments**
   Show rooms, meeting rooms, retail stores, and manufacturing sites where frequently rearrange the workplace.

5. **Small Office and Home Office (SOHO) networks**
   SOHO users need a cost-effective, easy and quick installation of a small network.

6. **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.

7. **Wired LAN backup**

   Network managers implement wireless LANs to provide backup for mission-critical applications running on wired networks.

8. **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 Configurations

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 USB Adapter network configurations. The wireless LAN products can be configured as:

1. Ad-hoc (or peer-to-peer) for departmental or SOHO LANs.

2. Infrastructure for enterprise LANs.

3. IP Sharing for 56K/ISDN TA/Cable/DSL Modem – Connect Internet and your SOHO network.

Ad-hoc (peer-to-peer) Mode

This is the simplest network configuration that several computers equipped with the USB Adapters 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 requires no the access point. This is the easiest and least expensive way for the SOHO to set up a wireless network.

Infrastructure Mode

The infrastructure mode requires the use of an access point (AP). In this mode, all wireless communications between two computers have to be via the AP no matter the AP is wired to Ethernet network or stand-alone. If used in stand-alone, the AP can extend the range of independent wireless LANs by acting a repeater, which effectively doubling the distance between wireless stations*.*

If wired to an Ethernet network, the AP serves as a bridge and provides the link between the server and the wireless clients. The wireless clients can move freely throughout the coverage area of the AP while remaining connected to the server. Since the AP is connected to the wired network, each client would have access to server resources as well as to other clients.

Access points have a finite range, on the order of 50 meters indoor and 100 meters outdoors. In a very large facility such as an enterprise, a warehouse, or on a college campus, it will probably be necessary to install more than one access point to cover an entire building or campus. In this scenario, access points hand the client off from one to another in a way that is invisible to the client, ensuring unbroken connectivity. Wireless clients can roam seamlessly between different coverage areas and remain connected to the network.

Wireless Router and IP Sharing

In infrastructure mode, in addition to acting as a bridge between an Ethernet and wireless network, the AP can be configured as a wireless router and IP sharing device for Internet access . You don't have to buy an expensive router. Nor you have to buy several modems and setup phone lines. Just share one AP, one Modem, single dial-up account, and one
Phone line, dozens of network users can go surfing the Internet
concurrently.

Chapter 2 Installing Drivers & Client Utility

This chapter describes how to install the USB adapter drivers and client utility under Windows 98/ME/2000.

2-1 Installation for Windows 98/ME/2000

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

Installation Procedure:

1. Insert the Setup Utility CD into your CD-ROM drive. Click the **Start** button and select **Run**. Enter E:\setup.exe where E is your CD-ROM drive. Then click **OK**. The InstallShield Wizard should run and the Welcome screen should appear.

2. After clicking **Next** in the Welcome screen, read the License Agreement and click **Yes** to agree and continue, or **No** to end the installation.

3. In the Adapter type dialog screen, the InstallShield Wizard will ask you to choose which the Adapter type you want to install. Select Application & USB drivers. Click **Next**.

4. In the About searching Dialog screen, click **Next** in order to search for already installed components.

5. In the Choose Destination Location screen, accept the default directory or if you wish, click **Browse** button to choose an alternate location, then click **Next** to proceed.

6. In the Select Program Folder screen, accept the default folder or if you wish, enter an alternate folder name, then click **Next** to proceed.

7. The Installshield Wizard will ask you to choose a wireless operating Mode. Choose the mode that applies to your network. For more information on the differences between **Ad-Hoc** and **Infrastructure** Mode, please refer to the User Guide. Click **Next**.

8. If you chose Infrastructure Mode, skip to Step 9. If you chose Ad-Hoc Mode, enter in the name of your SSID for your Ad-Hoc setting and choose the correct operating channel that applies to your network. The channel you choose should be the same as the other points in your wireless network. Click **Next**.

9. Enter in the name of your SSID for your Infrastructure setting. The SSID must be identical for all points in the network. To join any available, type in the word **ANY**. Click **Next**.

10. The Wizard will ask you to review your settings before copying files. Once the Configuration Utility has been installed, select **Finish** to complete the installation and restart your computer.

11. Plug the connector of the USB cable, which has been connected to the USB adapter, into any free USB port on your PC. The power LED should light up green when the Adapter is attached and the PC is on. Windows should now detect the new hardware and will automatically copy all of the files needed for networking.

2- 2 Checking after Installation

After installing the driver and utility, follow the steps below to check that the USB Adapter is operating correctly.

1. Click the *Start* button, select *Settings*, and then click *Control Panel*.

2. In the *Control Panel* window, double-click the *System* icon, then select the *Device Manager* tab.

3. Double-click *Network adapters*, then select *Wireless LAN USB Adapter*.

4. Click the *Properties* button, and then check the message. *This device is working properly* is displayed for Device status.

2- 3 Wireless LAN Monitor Utility

Wireless LAN Monitor Utility is used to display or change the USB Adapter information about link, configuration, encryption, and utility/driver/firmware version information. The monitor utility will also help you with site selection. The monitor utility will be installed automatically after installing the utility. A new icon should appear in your Icon tray. If the icon changes to red icon, it means the wireless is disconnection.

After finishing installing the utility, the monitor utility will automatically be executed and show a small blue *radio* icon at the right corner of *Taskbar* whenever the USB Adapter is inserted into the USB Interface of your computer. Double-click the *radio* icon to open the *Wireless LAN Monitor Utility* window . You can click the taps on the top of the windows to select various screen messages. Below we explain the use and meanings of the various screen messages.

Monitor

The configuration parameters are shown at the top of the screen (Operation Mode, Channel, SSID, TxRate, Power Management Mode and MAC Address of the PCMCIA card). In the middle of the screen there is information about the status of the communication (the BSSID of the Access Point to which the card is associated, Signal Strength, and Link Quality). In order to change the configuration parameters press the "Change" button, make your changes and then press "Submit" in order to save your changes.

Operating Mode:

• Adhoc – this is non-standard peer-to-peer mode of operation and requires no the Access Point. When wireless clients are operated in this mode, all wireless clients require the same channel number and don't care the SSID.

• Infrastructure: this mode of operation requires the use of an Access Point. In this mode, all wireless communications between computers have to be via the Access Point. (Default setting is Infrastructure)

• Channel: select the operating radio frequency channel in AdHoc or Infrastructure mode.

• SSID: is an identification code required for communication in a wireless LAN. You will only be able to connect with a wireless client (AdHoc) or an Access Point (Infrastructure) which has the same SSID. If the SSID of a USB Adapter is set as *any*, then the USB Adapter is possible to be connected to all available Access Point.

• Tx Rate: the data speed that wireless client is transmitting.

• Power Mgmt Mode: Power save function disabled or enabled. (Default

setting is *Active*)

• MAC Address: every network adapter has a unique number different from

other adapters in the network.

• Status: shows status information about the radio link.

Associated BSSID: means the wireless client is connected to an access point. BSSID is shown in the form of six hex digits which is the MAC address of the access point.

Scanning: means the wireless client is searching for an available access point in infrastructure mode.

Disconnected: means there are no access points or other wireless clients (if communicating in Ad-hoc mode), or the USB Adapter is unplugged in your computer.

• Signal Strength: The bar shows signal strength level. The higher blue   bar is, the more powerful radio signal is received by the USB Adapter .

• Link Quality: The bar shows the measured signal level and connection status. The higher blue bar is, the better is radio signal received by the USB Adapter.

Statistics

This option enables you to view the available statistic information (Data packets, Management Packets and Rejected packets). In order to renew or update this list of statistics, press the "Clear" button. In order to exit press the "Exit" button at the bottom of the screen.

Site Survey

By choosing the *Site Survey* option in any of the two modes, you can scan all the channels in order to find all the access points within the range of your card. The card can see four access points. The list includes information about the BSSID and SSID of the access point(s), the signal strength, the channel where the access point(s) operates, and whether or not WEP encryption is used. In order to update this list, press the "Rescan" button. If you want to associate with any of the access point(s) listed, double click on your choice, and the system will take you back to the *Monitor* screen showing you the parameters of the connection newly established.

Encryption

By choosing this option in any of the two modes, you can set four different WEP keys and specify which one of them to use (Figure 6-5). You can also select not to use any WEP keys if you do not need WEP encryption. You also have the option to select the WEP mode (Mandatory/Optional). If you select "Mandatory", then not only WEP will be used, but also any other station needs to use WEP encryption in order to establish a communication with your station. This requirement is in line with the IEEE 802.11b standard. If, on the other hand, you choose "Optional", then your station can communicate with every other station regardless if they use WEP or not. Please keep in mind that the WEP keys must be in HEX format. One final option you have is to select whether Open System or Shared Key authentication will be used. In order to save the changes you wish to make, press the "Submit" button at the bottom of the screen.

Advanced

By Choosing the *Advanced* option in any of the two modes, you can change advanced configuration settings, such as the Preamble Type, Fragmentation Threshold, and RTS/CTS Threshold .

Note: The PCMCIA card has an auto-detection feature therefore it automaticatilly
selects the Preable Type depending on the Access Point Preamble type. In
order to enable the Fragmentation and the RTS/CTS Threshold parameters
move the slide bar with your mouse and then use the right and left arrow keys in
order to select an exact number.

Version

By choosing this option, you can view basic information about the Utility like the Driver, Firmware and Application Version. Use the "Exit" button in order to exit the application.

2- 4 Uninstalling Utility

If the USB Adapter installation is unsuccessful for any reason, the best way to solve the problem may be to completely uninstall the USB Adapter and its software and repeat the installation procedure again.

Click the *Start* button, select *Program/Wireless LAN USB Adapter*, and then click *Uninstaller* to uninstall the driver and utility. Uninstaller will automatically uninstall and clear all utility, related settings installed previously.

Chapter 3 Connecting to a Network

This chapter describes how to prepare for connection to network after install the USB Adapter drivers and utility. The following is required for all computers if you want to connect to a network.

1. Check **Client for Microsoft Networks** is installed.
2. Check **NetBEUI -> Wireless LAN USB Adapter** installed.
3. Check **TCP/IP -> Wireless LAN USB Adapter** is installed.
4. Check file and printer sharing for Microsoft Networks.
5. Check computer name and workgroup name.

3-1 Checking and Adding Client for Microsoft Networks

The Client for Microsoft Networks enables you to connect to other Microsoft Windows computers and servers and use the files and printers shared on them. If you works on Microsoft network environment, you need to set up **Client for Microsoft Networks**.

1. After finishing installing the driver & utility and rebooting the computer as described in Chapter 2. The computer will show a dialog box titled **Enter Network Password** dialog box. Enter your password if it had been set or just click **Cancel**.
2. Click **Start** button, select **Settings** and then click **Control Panel** to open the **Control Panel** window.
3. In the **Control Panel** window, double-click the **Network** icon to open the **Network** dialog box.
4. Select **Configuration** tab to check **Client for Microsoft Networks** is installed. If no, click the **Add** button. Select **Client** and click the **Add** button.
5. Select *Microsoft* for Manufacturer and *Client for Microsoft Networks* for Network Client, and then click *OK*.

3-2 Checking and Adding NetBEUI

NetBEUI is a protocol you can use to connect to Windows NT, Windows for Workgroups, or LAN Manager servers. If you work on Microsoft network environment, you need to set up NetBEUI protocol.

1. Repeat the step 2 and 3 of Chapter 3-1 Checking and Adding Client for Microsoft Networks.
2. Select **Configuration** tab to check **NetBEUI -> Wireless LAN USB Adapter** is installed. If no, click the **Add** button. Select **Protocol** and click the **Add** button.
3. Select *Microsoft* for Manufacturer and **NetBEUI** for Network Protocol, and then click *OK*.

3-3 Checking and Adding TCP/IP

TCP/IP is the protocol you use to connect to the Internet and wide-area networks. If you want to connect to Internet, you need to set up TCP/IP protocol.

1. Repeat the step 2 and 3 of Chapter 3-1 Checking and Adding Client for Microsoft Networks.
2. Select **Configuration** tab to check **TCP/IP -> Wireless LAN USB Adapter** is installed. If no, click the **Add** button. Select **Protocol** and click the **Add** button.
3. Select *Microsoft* for Manufacturer and **TCP/IP** for Network Protocol, and then click *OK*.
4. If yes, double-click **TCP/IP -> Wireless LAN USB Adapter** to open **TCP/IP properties**. Due to different network applications there are many different settings here. You can select either **Obtain an IP address automatically** or **Specify an IP address**. If you use the **Specify and IP address**, then you need to enter an **IP address**, **Subnet Mask**, **Gateway** IP address, and **DNS Server** IP address for connecting to Internet.

3-4 Checking and Adding File and Printer Sharing for Microsoft Networks

File and printer sharing for Microsoft networks gives you the ability to share your files or printers with Windows NT and Windows for Workgroups computers. If you want to share your files or printers with Microsoft networks, you need to set up this service.

1. Repeat the step 2 and 3 of Chapter 3-1 Checking and Adding Client for Microsoft Networks.
2. Select **Configuration** tab to check **File and printer sharing for Microsoft Networks** is installed. If no, click the **File and Printer Sharing** button.
3. In the **File and Print Sharing** window, select what you need, and click **OK**. **File and printer sharing for Microsoft Networks**, and then click **OK**.

3-5 Checking and Adding Computer Name & Workgroup Name

Windows uses the computer name and workgroup name to identify your computer on the network. Please enter an unique name for your computer, the workgroup it will appear in, and a short description of the computer.

1. Repeat the step 2 and 3 of Chapter 3-1 Checking and Adding Client for Microsoft Networks.

2. Select *Identification* tab (Windows 98) or User Information tab to check the computer name, workgroup and computer description are entered. If no, enter a computer name, a workgroup name and then click *OK*. The description field may be left blank. If you want to share data with other persons, make sure you have the same workgroup name.

Chapter 4 Troubleshooting

This chapter describes the problems and corresponding solutions that may occur when installing a USB Adapter.

Symptom	Solution
Windows does not detect the USB Adapter when installed.	Verify that the USB Adapter is properly inserted into the USB Interface. Check whether the computer has a Plug and Play BIOS. Windows 98/ME/2000 might not detect the USB Adapter if a previous installation of the USB Adapter was cancelled before it was finished. Remove the previous driver, and redo the installation again.
Driver fails to load	A resource conflict could exist. For Windows 98/ME/2000, use the *Device Manager* to resolve resource conflicts. Select *System* from the *Control Panel*, then click on the *Device Manager* tab.
Device conflict on a Windows system	A device conflict under Windows 98/ME/2000 may be related to the USB Adapter. For Windows 98/ME/2000, use the Computer properties to identify the used I/O port addresses and IRQ values. If there is a device conflict, select alternative settings for I/O Base Address or IRQ values. If you know which device is conflicting with the USB Adapter, you have the option of changing that device's I/O address or IRQ instead of changing the USB Adapter.

No resource conflicts were detected, but the wireless station does not attach to the network	Verify that the **SSID** of the USB Adapter matches that of the access point. Use the **Network Configuration Properties Application** in the **Control Panel** to modify the **SSID**. Verify that the **Network Mode** of the USB Adapter is configured correctly.
Nonfunctioning card LED	The USB Adapter is not powered on. The cause may be: • No Driver loaded or installed. • Adapter – Driver mismatch which prevented the driver from loading. • Device conflicts which prevented the driver from loading. Actions: • Verify that a driver has been installed. • Determine if there is a conflict with another device.
Weak signal or intermittent connection.	Try reorienting the antenna. The USB Adapter antenna is attached to the two sides of the USB Adapter. For best use of the antenna: Keep the area around the antenna clear from materials that could block radio transmission, such as metal objects, electronic devices, and cordless telephones. If your signal is weak, change the direction of the antenna slightly. If necessary, move your notebook computer a few inches to find a better signal. Use the Link Quality and Signal Strength display in the **Monitor Utility** to determine the best location and orientation for a network connection.

Appendix A
Product Specifications

General

Radio Data Rate	11, 5.5, 2 and 1 Mbps, Auto Fall-Back
Range (open environment)	11 Mbps – 150m 5.5 Mbps – 200m 2 Mbps – 250m 1 Mbps – 400m
Operating Voltage	5V
EMC Certifications	FCC Part 15, ETSI 300/328
Compatibility	Fully interoperable with IEEE802.11b compliant products
LED Indicator	RF Link activity

Network Information

Network Architecture	Support ad-hoc, peer-to-peer networks and infrastructure communications to wired Ethernet networks via Access Point
Drivers	Windows 98/ME/2000
Access Protocol	CSMA/CA
Roaming	IEEE802.11b compliant
Security	64/128-bit WEP data encryption

Radio

Frequency Band	2.4 – 2.484 GHz
Radio Type	Direct Sequence Spread Spectrum (DSSS)
Modulation	CCK (11, 5.5Mbps) DQPSK (2Mbps) DBPSK (1Mbps)
Operation Channels	11 for North America, 14 for Japan, 13 for Europe, 2 for Spain, 4 for France
RF Output Power	12dBm $\pm$ 2dBm
Antenna	Integrated, with built-in diversity
Sensitivity @FER=0.08	11 Mbps < -83dBm 5.5 Mbps < -86dBm 2 Mbps < -89dBm 1 Mbps < -91dBm

Environmental

Temperature Range	0 to 50℃ (operating) -20 to 80℃ (storage)
Humidity (non-condensing)	5% to 95% typical

Physical Specifications

Form Factor	USB 1.1
Dimensions	115(L) mm x 100(W) mm x 25.5(H) mm
Weight	160 g

Appendix B
Regulatory Compliance Information

Radio Frequency Interference Requirements

This device complies with Part 15 of FCC Rules and Canada RSS-210.

Operation is subject to the following 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. To comply with RF safety requirements, you must maintain a distance of 20 cm from the antenna when operating the device.

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 and Regulation. 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 manual, may cause harmful interference to nearby TV's, VCR's, radio, computers, or other electronic devices. To minimize or prevent such interference, this equipment should not be placed or operated near these devices. If interference is experienced, moving the equipment away from them will often reduce or eliminate the interference.

However, there is no guarantee that interference will not occur in a particular installation. If the 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:

- Re-orient 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 which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Our company is not responsible for any radio or television interference caused by unauthorized modification of the devices included with this IEEE802.11 wireless LAN products, or substitution or attachment of connecting cables and equipment other than specified by our company. The correction of interference caused by such unauthorized modification, substitution or attachment will be the responsibility of the user.