High-Speed Wireless

Cardbus Adapter

User' s Manual

Version: 1.1

Contents

Chapter 1 Introduction

The Dual-Band Wireless A/G Cardbus Adapter operates seamlessly and simultaneouslyin both the 2.4GHz and 5GHz frequency spectrum supporting the 802.11b (2.4GHz, 11Mbps) and the newer, faster 802.11a (5GHz, 54Mbps/108Mbps turbo mode) and 802.11g (2.4GHz, 54MHz) wireless

standards. It' s the best way to add wireless capability to your existing wired network, or to add

bandwidth to your wirless installation.

To protect your wireless connectivity, the Dual-Band Wireless A/G Cardbus Adapter can encrypt all

wireless transmissions through 64/128/152-bit WEP data encryption. Dynamic Frequency

Selection (DFS) puts your network on the cleanest channel in your location. With the Dual-Band

Wireless Cardbus Adapter, you will experience the bes wireless connectivity nowadays.

1-1 Package Contents

The PC Card package contains the following items.

1. One PC Card

2. One Quick Installation Guide

3. One Installation CD

1-2 PC Card Description

The PC Card is a standard PC Card that fits into any PCMCIA Card Type II slot. The PC Card has a
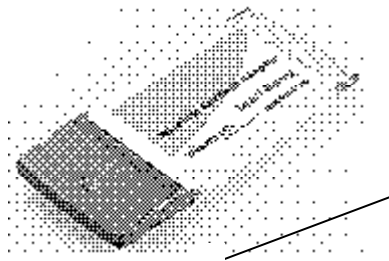 LED

as shown in Figure 1-1.

Figure 1-1

1. Link LED

802.11 AdHoc mode – Blinking, no matter the wireless is connected or not

Infrastructure – Solid GREEN when the wireless is connected

Off – No wireless activity

1-3 System Requirements

Installation of the PC Card requires:

    Laptop PC containing :

– 32-bit CardBus slot (or Desktop PC with PC Card-PCI adapter)

– 32 MB memory or greater

– 300 MHz processor or higher

    Microsoft Windows 2000/Windows Millennium Edition/Windows 98

Second Edition/Windows XP/Windows NT 4.0 (with Service Pack 6)

1-4 Features and Benefits

2.4GHz IEEE802.11b/g (draft) standard and 5GHz IEEE802.11a standard compliant	Fully interoperable with IEEE802.11a/b/g (draft) compliant products.
Up to 54Mbps and 108Mbps (turbo mode) high-speed data rates	Capable of handling heavy data payloads such as MPEG video streaming.
Up to 152-bit WEP Data Encryption with TKIP	Powerful data security.
IEEE802.11x Client support (Optional)	Enhances authentication and security.
Transmission Power Control (TPC) support	Offers flexibility to adjust RF output power.
Multi-country Roaming (802.11d) support	Automatically adjusts regulatory domain to operate in different countries.

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 informatios

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 PC card 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 PC Cards that

form a

wireless network whenever they are within range of one another (*Figure 1-2*). 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.

Peer to Peer

Wireless LAN PC Card

Wireless LAN PC Card

Wireless LAN PC Card
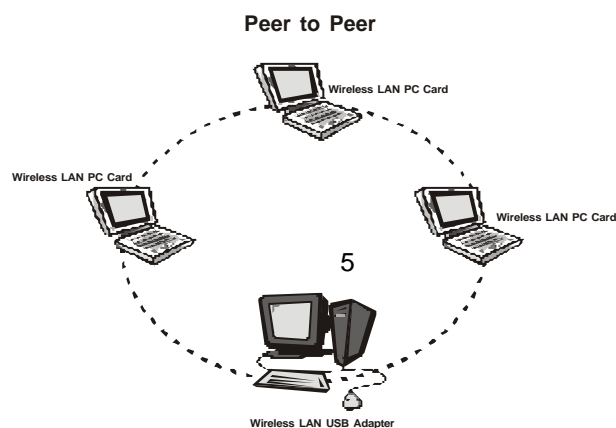
5

Wireless LAN USB Adapter

Figure 1-2　A wireless Ad-hoc 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 as shown in *Figure 1-3*.

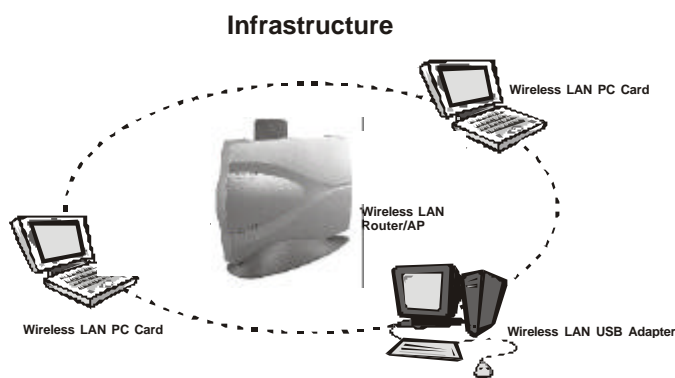**Infrastructure**

Figure 1-3

Extended-range independent WLAN using AP as repeater

If wired to an Ethernet network as shown in *Figure 1-4*, 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.
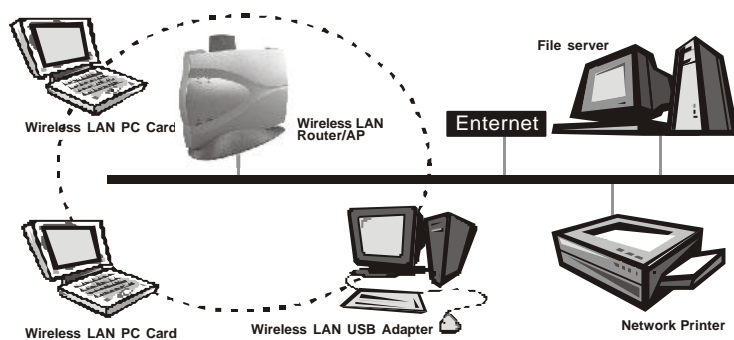
Figure 1-4 Single AP bridge

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, as shown in
Figure 1-5. In this scenario, access points hand the client off from one to another in a way that is
invisible to the client, ensuring roken connectivity. Wireless clients can roam seamlessly between
different coverage areas and remain connected to the network.
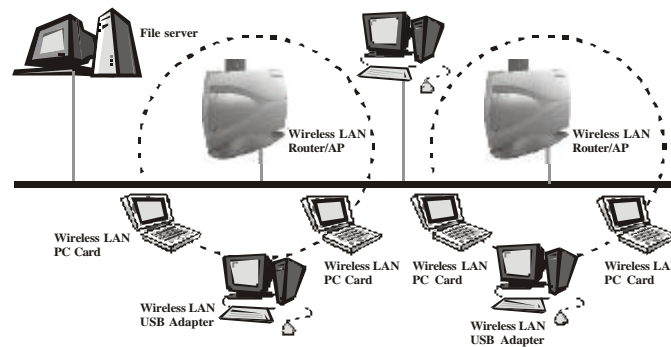

Figure 1-5 Multiple-AP and roaming

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 as shown
in *Figure 1-6*. 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,
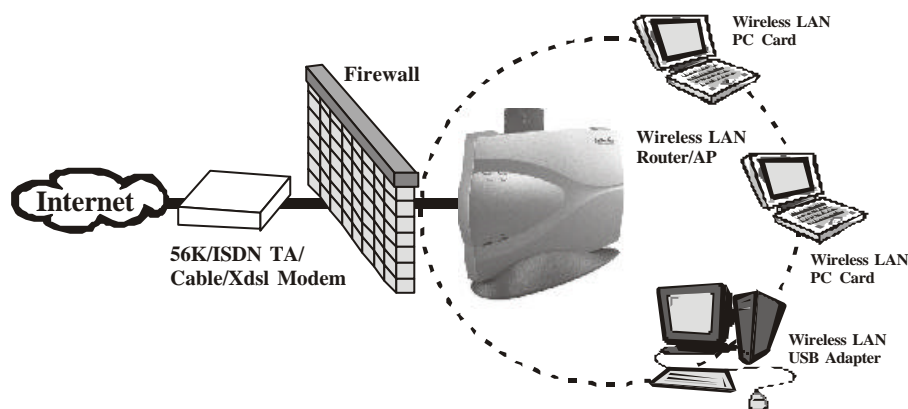dozens of network users can go surfing the Internet concurrently.

Figure 1-6 Wireless router and IP Sharing

Chapter 2 Installing Drivers & Client Utility

This chapter describes how to install the PC Card drivers and client utility under Windows 98/ME/2000/XP.

2-1 Installation for Windows 98SE/ME/2000/XP

This section describes the first-time installation for the driver installation under Windows

98SE/ME/2000. For a previously installed driver, we provides the InstallShield Wizard, which

includes an application for

upgrading the present driver and the Utility.

Installation Procedure:

1. Turn on your computer.

2. Be sure that there is no PCMCIA adapter inserted yet.

3. Insert the *Wireless LAN Installation* CD into your CD-ROM drive. Then executing Setup.exe by

selecting file from the CD-ROM drive.

4. When the Setup.exe program starting, it will pop up an window as shown in *Figure 2-1.*, click
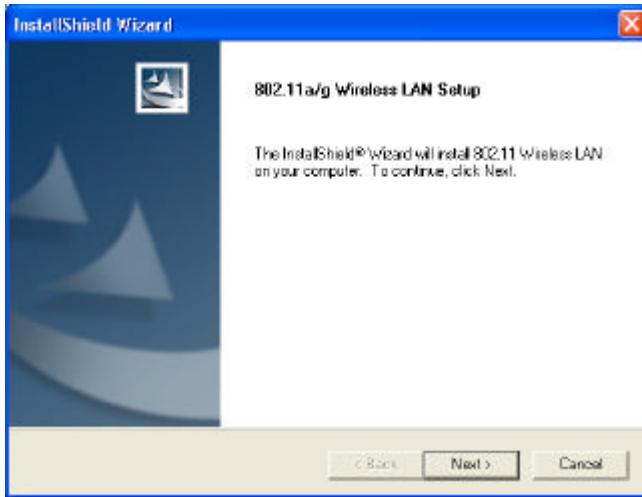
on the

Next button to continue the installation.

Figure 2-1

5. After finishing all installation steps, click **Finish** to complete the installation as *Figure 2-2.*
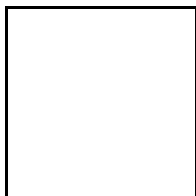

Figure 2-2

6. Insert the PC Card into the PCMCIA slot of your computer and wait for the Found New Hardware
   Wizard dialog box to display.

7. During the installation, the driver and utility will both been installed into the system, so please
   select

   Install the software automatically (Recommended) as shown in *Figure 2-3* and click Next to

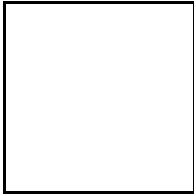search the driver installation file.

9

Figure 2-3

8. Then the system will find the driver and start to install as shown in *Figure 2-4*.
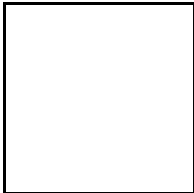
Figure 2-4

9. The driver currently does not have a digital signature from Microsoft. Therefore, Windows

  2000/XP will

show a warning message. Click **Continue Anyway** to proceed with driver installation as shown in

  Figure 2-5.
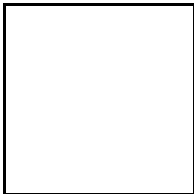
Figure 2-5

10. Click **Finish** to complete the driver installation as shown in *Figure 2-6*.
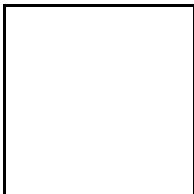
Figure 2-6

2- 2 Checking after Installation

After installing the driver and utility, follow the steps below to check that the PC Card 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 Network Adapter* as shown in *Figure 2-7*.

Figure 2-7

4. Right mouse and click the **Properties** button, then check the message. **This device is working properly** is displayed for Device status as shown in **Figure 2-8**.

Figure 2-8

5. If you find the Yellow (?) sign on the adapter or the above message is not displayed, it shows the installation is not successful or the wireless LAN PC Card is not operating properly. Uninstall and re-install the driver, referring to Chapter 2-4 Uninstalling Driver and Utility.

2- 3 IEEE 802.11 WLAN NIC Client Utility

Use the WLAN NIC Client Utility to configure the device driver. Access the Utility by clicking the Start button and choosing Programs > IEEE 802.11 > ACU. The ACU tray icon is displayed in the right side of the Toolbar. Launch the ACU by double-clicking the tray icon, or by right-clicking the tray icon and selecting **Launch Client Utility …**

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WLAN Client Utility is used to display or change the PC Card information about **Current Status, Profile Management and Diagnostics**. The client utility will be installed automatically after installing the driver and utility. After finishing installing the driver and utility, the client utility will automatically be executed and show a small icon at the right corner of *Taskbar* whenever the PC Card is inserted into the PC Card slot of your computer. You can click the taps on the top of the windows to select various screen messages as shown in *Figure 2-9*.
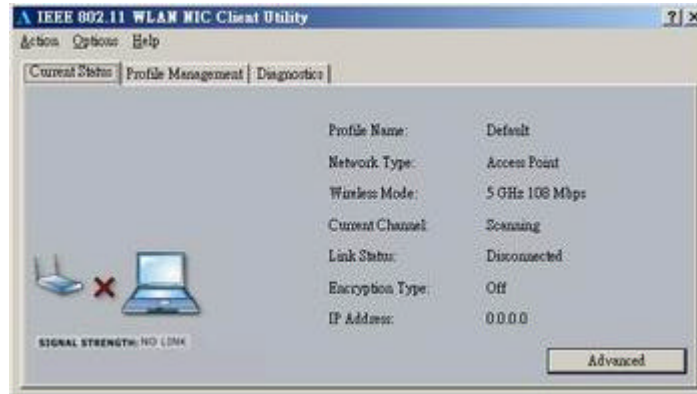

Figure 2-9

The tool bar provides three functions of Action, Option and Help.

Action : the *Disable Radio* function is used to break down the wireless connection, you don't want to see icon shown in Taskbar, you can use *Disable Tray Icon* function to hide the icon.

Option : you can use *Display settings* to change Signal Strength Display Units, Refreash Interval and Data Disply settings.

Help : click About IEEE 802.11 Client Utility… function to get related information of the Client Utility.

Except for tool bar's function, the Utility also provides Current Status, Profile Management and Diagnostics three main function page for configuration.
Below we explain the use and meanings of the various screen messages.

1. Current Stasus

In Current Status, it will provides user information of Profile Name, Network Type, Wireless Mode, Current Channel, Link Status, Encryption and IP Address. If you click **Advanced** button, it will pop advanced status as shown in *Figure 2-10*, and in Advanced Status, it provide user information of Country, Transmit Power Level, Network Name (SSID), Power Save Mode, Frequency, Transmit Rate and Receive Rate.

Figure 2-10

2. Profile Management

In Profile Management, it provides function to New, Modify, Remove or Activate an Profile settings as
shown in *Figure 2-11*. With default status, the profile will be empty and you have to click **New** button to
add an profile settings and if there exist Profile file, we can use **Modify** button to change settings or use
Remove button to erase file or **Activate** button to activate another profile settings.
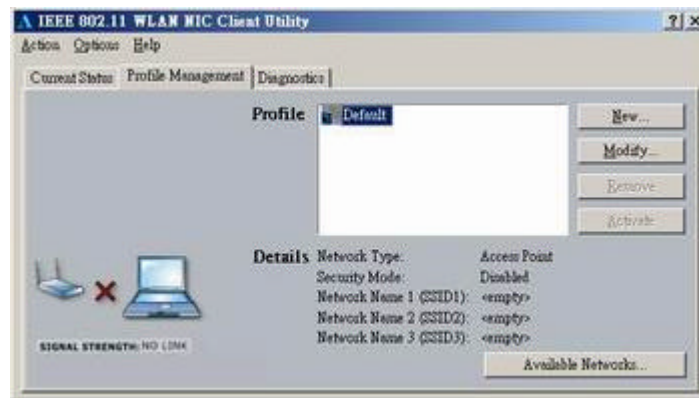
Figure 2-11

After click **New** button, it will pop Profile Management window including General, Security and Advanced
three configuration pages.
In General page : type the desirable profile name into the Profile Name field and the known SSID into
the Network field.
In Security page : the default value is Disable and we provide Pre-Shared Keys, LEAP and Externally
Managed 802.1x Keys for selection.
In Advanced page : you can set Power Save Mode, Network Type, 802.11 Preamble, Transmit Power
Level and Wireless Mode in this page.
In Profile Management, it also provides **Available Networks….** for the user to get information
of available AP and Ad Hoc Networks as shown in *Figure 2-12*.
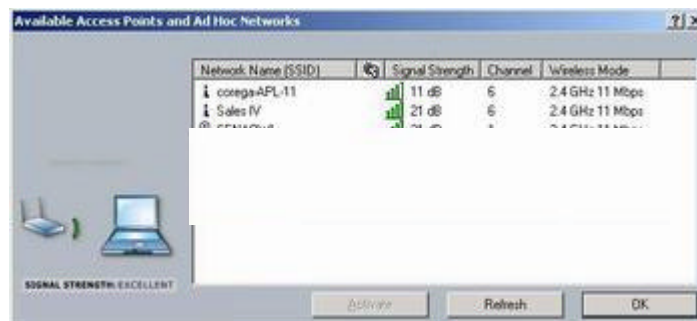
Figure 2-12

3. Diagnostics

In Diagnostics, it provides statistics of Multicast Frames, Broadcast Frames. Unicast Frames and Total Bytes for **Transmit** and **Receive** as shown in *Figure 2-13*.

Figure 2-13

In **Advanced Statistics**, it provides more advanced information for reference as shown in *Figure 2-14*.

Figure 2-14

In **Driver Information**, it provides information of Card Name, MAC Address, Driver, Driver Version and Driver Date as shown in *Figure 2-15*.

Figure 2-15

2- 4 Uninstalling Driver and Utility

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

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

2.In the *Control Panel* window, double-click the *Add or Remove Programs* icon, then select the 802.11 Wireless LAN item and remove the driver and utility as shown in *Figure 2-16*.
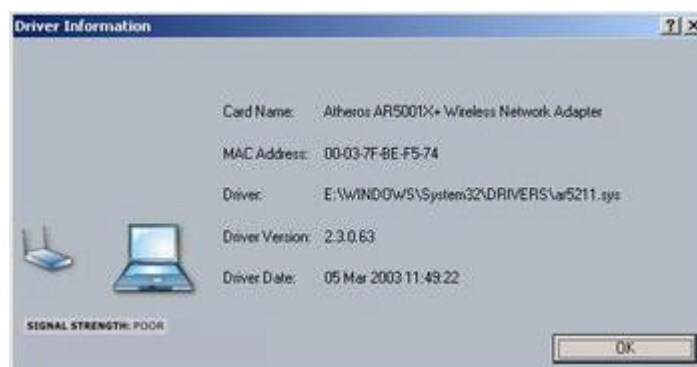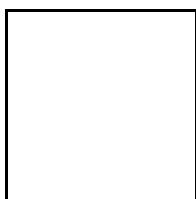
Figure 2-16

Select **Remove** in InstallShield Wizard and click **Next** to start to remove driver then click **Finish** to complete driver and utility uninstallation as shown in *Figure 2-17*.
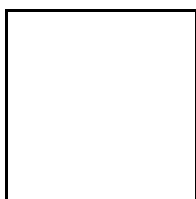
Figure 2-17

Chapter 3 Connecting to a Network

This chapter describes how to prepare for connection to network after install the PC Card 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 PC Card installed.

3. Check TCP/IP -> Wireless LAN PC Card 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.

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.

Click Start button, select Settings and then click Control Panel to open the Control Panel window.

In the Control Panel window, double-click the Network icon to open the Network dialog box.

Select Configuration tab to check Client for Microsoft Networks is installed as shown in *Figure 3-1*.
If no,

click the Add or Install button. Select Client and click the Add button.
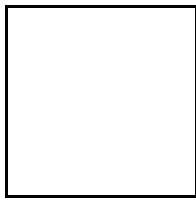
Figure 3-1

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.

Repeat the step 2 and 3 of Chapter 3-1 Checking and Adding Client for Microsoft Networks. Select
Configuration tab to check NetBEUI -> Wireless LAN PC Card is installed. If no, click the Add or
Install button. Select Protocol and click the Add button. 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.

Repeat the step 2 and 3 of Chapter 3-1 Checking and Adding Client for Microsoft Networks. Select
Configuration tab to check TCP/IP -> Wireless LAN PC Card is installed. If no, click the Add or
Install button. Select Protocol and click the Add button. Select Microsoft for Manufacturer and
TCP/IP for Network Protocol, and then click OK.

If yes, double-click TCP/IP -> Wireless LAN PC Card to open TCP/IP properties as shown in *Figure
3-2*. 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.
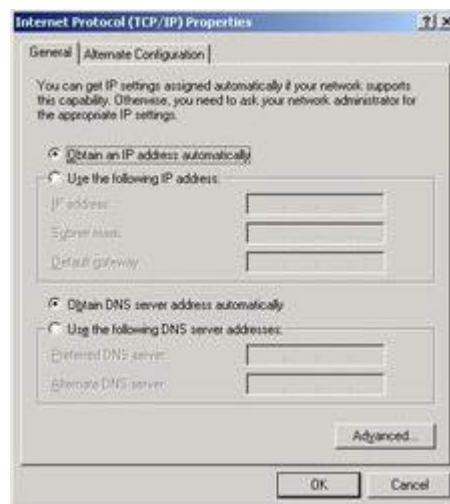
Figure 3-2

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.

Repeat the step 2 and 3 of Chapter 3-1 Checking and Adding Client for Microsoft Networks. Select
Configuration tab to check File and printer sharing for Microsoft Networks is installed. If no, click
the File and Printer Sharing button.
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.

In Windows 98SE/ME, Repeat the step 2 and 3 of Chapter 3-1 Checking and Adding Client for Microsoft Networks. Select Identification tab 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.

In Windows 2000/XP, from *Start > Settings > Control Panel* and click **System**, select **Computer Name** page as shown in *Figure 3-3*.

Figure 3-3

Then click **Change…** button to rename the computer or join a domain or a Workgroup as shown in *Figure 3-4*.
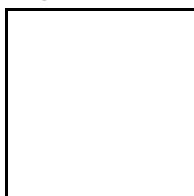
Figure 3-4

Chapter 4 Troubleshooting

This chapter describes the problems and corresponding solutions that may occur when installing a PC Card.

Symptom	Solution
Windows does not detect the PC Card when installed.	Verify that the PC Card is properly inserted into the PC Card slot. Check whether the computer has a Plug and Play BIOS. Windows 98/ME/2000/XP might not detect the PC Card if a previous installation of the PC Card 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 PC Card. 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 PC Card, you have the option of changing that device' s I/O address or IRQ instead of changing the PC Card.
No resource conflicts were detected, but the wireless station does not attach to the network	Verify that the **SSID** of the PC Card 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 PC Card is configured correctly.
Nonfunctioning card LED	The PC Card is not powered on. The cause may be: No Driver loaded or installed. Card – Driver mismatch which prevented the driver from loading. Device conflict 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 PC Card antenna is attached to the end of the PC Card. 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 Signal Strength display in the *Client Utility* to determine the best location and orientation for a network connection.

Appendix A   Product Specifications

1. General

Radio Data Rate (Auto-rate capable)	802.11a : 6, 9, 12, 18, 24, 36, 48, 54 & 108Mbps turbo mode 802.11g : 6, 9, 12, 18, 24, 36, 48 & 54Mbps 802.11b : 1, 2, 5.5, 11Mbps
Network Standards	WECA (Wi-Fi & Wi-Fi5 Compliant), IEEE802.11, IEEE802.11a, IEEE802.11g draft, IEEE802.11b, draft IEEE802.11e, f, h and I standards, IEEE802.11x (Optional)
Security	IEEE802.11x Support for LEAP (Optional) WPA – Wi-Fi Protected Access (64, 128, 152-WEP with TKIP)
Network Architecture	Support ad-hoc, peer-to-peer networks and infrastructure communications to wired Ethernet networks via Access Point
Drivers	Windows 98/ME/2000/XP
Access Protocol	CSMA/CA with ACK
Roaming	IEEE802.11b compliant
Operating Voltage	3.3V/5V
Regulation Certifications	FCC Part 15/UL, ETSI 300/328/CE
LED Indicator	RF Link activity

2. RF Information

Frequency Band	802.11a : 5.15 to 5.25GHz 5.25 to 5.35GHz 5.725 to 5.825GHz 802.11b/g : 2.412 to 2.462GHz 2.412 to 2.484GHz 2.412 to 2.472GHz 2.457 to 2.462GHz 2.457 to 2.472GHz
Modulation Technology	**802.11a/g :** OFDM (64-QAM, 16-QAM, QPSK, BPSK) **802.11b :** DSSS (DBSK, DQPSK, CCK)
Receive Sensitivity (Typical)	802.11a : -86dBm@6Mbps, -80dBm@18Mbps, -70dBM@ 48Mbps -84dBm@9Mbps, -77dBm@24Mbps, -68dBM@ 54Mbps -82dBm@12Mbps, -73dBm@36Mbps 802.11b/g : -91dBm@1Mbps, -85dBm@9Mbps, -77dBM@ 36Mbps -89dBm@2Mbps, -82dBm@12Mbps, -76dBM@ 48Mbps -87dBm@5.5Mbps, -80dBm@18Mbps, -73dBM@ 54Mbps -86dBm@6Mbps, -78dBm@24Mbps
Transmit Output Power	**802.11a :** Up to 18dBm **802.11b/g :** Up to 21dBm

3. Environmental

Temperature Range	-10 to 60 (14 to 140) – Operating -40 to 70 (-40 to 158) - Storage

Humidity (non-condensing)	5% to 95% Typical

4. Physical Specifications

Interface	32-bit CardBus PC Card Standard V7.1 Type II
Antenna	Integrated built-in diversity Antenna
Dimensions	118(L)mm * 54(W)mm * 6.3(H)mm (4.65in * 2.13in * 0.30in)

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

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 : To assure continued compliance, (example – use only shielded interface cables when connecting to computer or peripheral devices). 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.

If this device is going to be operated in 5.15 ~ 5.25GHz frequency range, then it is restricted in

indoor environment only.

We declare that **NL-5354CB Plus Aries2** (Atheros 11a/g Card Bus Adapter) is limited in

CH1~CH11 by specified firmware controlled in USA.

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.

The device has been SAR evaluated and authorized for use in laptop(notebook) only.