## WMP-G02V

## High-Speed 2.4GHz WLAN Mini PCI Card User's Manual

First Edition (November, 2003)

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## Preface

This user's guide provides the necessary information for first-time users to successfully install the Alphanetworks Driver Interface Specification (NDIS) driver, for the purpose of evaluating and/or operating the AlphanetworksWMP-G02V Station Reference Design in a Microsoft Windows environment. This guide also provides information for users who wish to upgrade the AlphanetworksNDIS driver from previous releases.

This guide describes the steps required to install NDIS drivers for the AlphanetworksWMP-G02V Wireless Network mini PCI Card in Windows 2000, Windows Millennium Edition, Windows 98 Second Edition, Windows XP, and Windows NT 4.0. This guide also includes detailed instructions for configuring the PC Card device, or IEEE 802.11b/g station (STA), to interact with an access point (AP) in infrastructure mode and with other STAs in ad hoc mode. Instructions for installing or upgrading the diagnostic utility LinkMon are also included. You should also read this before proceeding to install the AlphanetworksWMP-G02VV Wireless Network mini PCI Card and NDIS driver in the targeted operating system (OS) environment.

#### **About this Document**

The document consists of the following chapters and appendixes:

Chapter 1	Introduction—Hardware, Software, and System Requirements needed to setup AlphanetworksWMP-G02V Station Reference Design.
Chapter 2	<b>Windows 2000</b> —Installation/Uninstallation Procedures and Device/Network Configurations for Windows 2000.
Chapter 3	<b>Windows Millennium Edition</b> —Installation/Uninstallation Procedures and Device/Network Configurations for Windows Millennium Edition.
Chapter 4	<b>Windows 98 Second Edition</b> —Installation/Uninstallation Procedures and Device/Network Configurations for Windows 98 Second Edition.
Chapter 5	<b>Windows XP</b> —Installation/Uninstallation Procedures and Device/Network Configurations for Windows XP.

Chapter 6	<b>Windows NT 4.0</b> —Installation/Uninstallation Procedures and Device/Network Configurations for Windows NT 4.0.
Chapter 7	<b>LinkMon</b> —Graphical User Interface for Operational Status and Statistics of AlphanetworksWMP-G02VStation Reference Design.
Chapter 8	<b>RFSilent</b> —RFSilent application that allows you to enable or disable the RF Signal (radio) on all AlphanetworksSTA Reference Designs.
Chapter 9	<b>Troubleshooting</b> —Hints on fixing common Installation/Uninstallation and Device/Network Configurations issues.
Appendix 錯誤! 找不到參照來 源。	錯誤! 找不到參照來源。—Describes how to select Fixed Data Rate and/or Channel Frequency for specific testing.

#### **Audience**

This document is intended for Alphanetworkscustomers who wish to install and evaluate the AlphanetworksWMP-G02V Station Reference Design in the supported Microsoft Windows environments.

#### **Additional Resources**

AlphanetworksSTA Reference Design hardware, software, and documentation contain proprietary information of AlphanetworksCommunications, Inc., and are provided under a license agreement containing restrictions on use and disclosure, and are also protected by copyright law. Reverse engineering of this hardware, software, or documentation is prohibited.

The following resources should be referenced regarding topics that are not addressed in this document:

- AR2112 Radio-on-a-Chip for 5-GHz Wireless LANs data sheet
- AR5212 MAC/Baseband Processor for IEEE 802.11b/g 5-GHz Wireless LAN data sheet
- AP User's Guide
- STA Reference Design Functional Specification

# 1 Introduction

### **Package Contents**

Make sure the following materials are available before you begin:

- One 802.11b/g PCI Card
- One Installation CD-ROM containing software and utilities and this user's guide
- One 802.11b/g PCI Card Quick Start Guide
- One warranty registration card

## **System Requirements**

- A computer that meets the following specifications:
   -Windows 2000, Windows ME, or Windows 98SE
- PCI expansion slot
- At least 64 MB of memory
- A 300 MHz processor or higher
- At least one other IEEE 802.11b/g-compliant device

#### **Hardware Installation**

Follow these steps to install the 802.11b/g PCI Card in a computer's PCI slot:

- 1. Turn off your computer and unplug its power cord from the wall outlet for safety purposes.
- 2. Remove the computer cover.
- 3. Locate an unused PCI slot and refer to your PC 's manual for instructions on how to remove the plate that covers the slot (if applicable).
- 4. Align the Harmony 802.11b/g PCI Card over the empty slot.
- 5. Firmly insert the card into the slot, as illustrated below.
- 6. Secure the card's metal bracket to the computer following the directions provided in your PC's manual.
- 7. Replace the computer cover.
- 8. Plug the computer's power cord back into the wall outlet.
- 9. Place the antenna with the longer cable on top of your desk, computer, or monitor.

# **2** Windows 2000

## **Driver Installation (First-time Install)**

Insert the AlphanetworksWMP-G02V Wireless Network mini PCI Card into a 32-bit CardBus slot and follow these steps to install the NDIS driver:

Welcome to the Found New Hardware Wizard This wizard helps you install a device driver for a hardware device.	
To continue, click Next.	

1. Wait for the following dialog box to display, and click Next to continue.

2. Choose "Search for a suitable driver for my device (recommended)," and click Next.

Found New Hardware Wizard
Install Hardware Device Drivers A device driver is a software program that enables a hardware device to work with an operating system.
This wizard will complete the installation for this device:
A device driver is a software program that makes a hardware device work. Windows needs driver files for your new device. To locate driver files and complete the installation click Next.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< <u>B</u> ack <u>N</u> ext> Cancel

3. Insert the installation CD in your CD-ROM drive. Choose "Specify a location" under "Optional search locations," and click Next to continue.

Found New Hardware Wizard
Locate Driver Files Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify.
To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations:
Floppy <u>d</u> isk drives
CD-ROM drives
Specify a location
Microsoft Windows Update
< <u>B</u> ack <u>N</u> ext > Cancel

4. Browse to the location where the NDIS driver is located (assuming D is the CD-ROM drive), the default folder is D:\ndis\bin\production\ndis5. Click OK to continue.

Found New	w Hardware Wizard	×
<b></b>	Insert the manufacturer's installation disk into the drive selected, and then click OK.	OK Cancel
	Copy manufacturer's files from: D:\ndis\bin\production\ndis5	Browse

5. When you find the Alphanetworksdriver installation file (net5210b.inf), click Next to continue.

Found New Hardware Wizard
Driver Files Search Results The wizard has finished searching for driver files for your hardware device.
The wizard found a driver for the following device:
Windows found a driver for this device. To install the driver Windows found, click Next.
d:\ndis\bin\production\ndis5\net5210b.inf
< <u>B</u> ack [ <u>N</u> ext>] Cancel

6. The AlphanetworksNDIS evaluation driver currently does not have a digital signature from Microsoft. Therefore, Windows 2000 shows a warning message. Click Yes to proceed with driver installation.



7. Click Finish to complete the driver installation. See Section "Device Configuration" for the device configuration.



### **Driver Installation (Previous Driver Installed)**

If the system already has a previous release of the AlphanetworksNDIS installed, Windows does not prompt for the device driver when the WLAN Card is inserted. Follow the steps below to update the NDIS driver:

1. Start System Properties from Control Panel. Under Hardware tab, click Device Manager.

System Properties ? X
General Network Identification Hardware User Profiles Advanced
Hardware Wizard The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Driver Signing Device Manager
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles
OK Cancel Apply

2. Within Device Manager, right-click "AlphanetworksWMP-G02V Wireless Network mini PCI Card" under "Network adapters" device node, and click Properties.



3. Click "Update Driver..." from the Driver tab. Note the Driver Version that you are updating from. You may need to verify this field again after driver update completes to make sure Release 1.3 driver has been updated correctly.

Ather	os AF	15000 Wireless N	etwork Ad	lapter P	roperties		<u>? ×</u>
Gen	eral	Advanced Setting	s Driver	Resourc	es		
Ħ		Atheros AR5000 W	′ireless Netv	vork Adap	oter		
		Driver Provider:	Atheros				
		Driver Date:	Not availab	ole			
		Driver Version:	1.2.0.3				
		Digital Signer:	Not digitally	y signed			
To view details about the driver files loaded for this device, click Driver Details. To uninstall the driver files for this device, click Uninstall. To update the driver files for this device, click Update Driver.							
	<u>i</u>			novan		o onrol.	
					Close	Can	pel

4. Click Next to continue.



5. Choose "Display a list of the known drivers for this device so that I can choose a specific driver," and click Next to continue.

Upgrade Device Driver Wizard
Install Hardware Device Drivers A device driver is a software program that enables a hardware device to work with an operating system.
This wizard upgrades drivers for the following hardware device:
Atheros AR5000 Wireless Network Adapter
Upgrading to a newer version of a device driver may add functionality to or improve the performance of this device.
What do you want the wizard to do?
O Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< <u>B</u> ack <u>N</u> ext > Cancel

6. Insert the Release 1.3 CD into your CD-ROM drive. Click "Have Disk..." to continue.

Upgrade Device Driver Wizard					
Select Network Adapter Which network adapter do you want to inst	al?				
Click the Network Adapter that matches installation disk for this component, click	your hardware, then click OK. If you have an Have Disk.				
Network <u>A</u> dapter: Atheros AR5000 Wireless Network Adapter					
<ul> <li>Show <u>compatible</u> hardware</li> <li>Show <u>all hardware</u> of this device class</li> </ul>	<u>H</u> ave Disk				
	< <u>B</u> ack <u>N</u> ext > Cancel				

7. Browse to the location where the NDIS driver is located (assuming D is the CD-ROM drive), the default folder is "D:\ndis\bin\production\ndis5". Click OK to continue.

Install Fro	om Disk	×
_	Insert the manufacturer's installation disk into the drive selected, and then click OK.	OK Cancel
	Copy manufacturer's files from: D:\ndis\bin\production\ndis5	Browse

8. Select "AlphanetworksWMP-G02V Wireless Network mini PCI Card" from the list and click Next to continue.

Upgrade Device Driver Wizard					
Select Network Adapter Which network adapter do you want to install?					
Click the Network Adapter that matches your hardware, then click OK. If you have an installation disk for this component, click Have Disk.					
Network <u>A</u> dapter: Atheros AR5000 Wireless Network Adapter					
< <u>B</u> ack <u>N</u> ext> Cancel					

9. Click Yes to continue when Windows displays the warning message.



10. Click Next to proceed with installation.



11. The AlphanetworksNDIS evaluation driver currently does not have a digital signature from Microsoft. Therefore, Windows 2000 shows a warning message. Click Yes to proceed with driver installation.

Digital Signature Not Fo	und X		
3	The Microsoft digital signature affirms that software has been tested with Windows and that the software has not been altered since it was tested.		
	The software you are about to install does not contain a Microsoft digital signature. Therefore, there is no guarantee that this software works correctly with Windows.		
	Atheros AR5000 Wireless Network Adapter		
	If you want to search for Microsoft digitally signed software, visit the Windows Update Web site at http://windowsupdate.microsoft.com to see if one is available.		
	Do you want to continue the installation?		
	Yes No More Info		

#### 12. Click Finish.



13. Note that Driver Version should display 1.3 as the major revision number. Click OK to continue.

Atheros AR5000 Wireless Network Adapter Properties						
General Advanced Settings Driver Resources						
<u>H</u>	Atheros AR5000 W	Vireless Network Adapter				
	Driver Provider:	Atheros				
	Driver Date:	Not available				
	Driver Version:	1.3.0.0				
	Digital Signer:	Not digitally signed				
Digital Signer:       Not digitally signed         To view details about the driver files loaded for this device, click Driver         Details.       To uninstall the driver files for this device, click Uninstall. To update the driver files for this device, click Update Driver.         Image: Driver Details.       Uninstall         Update Driver.       Update Driver.						
		OK Cancel				

14. Click Yes to restart system.

System Settings Change						
?	Your hardware settings have changed. You must restart your computer for these changes to take effect.					
~~~	Do you want to restart your computer now?					
	<u>[ ⊻es</u> ] <u>N</u> o					

15. After system restarts, the "AlphanetworksWMP-G02V Wireless Network mini PCI Card" now displays under "Network adapters" in the Device Manager. Proceed to Section "Device Configuration" for device configuration information.



#### **Driver Uninstallation**

This section provides information about uninstallation procedures required for upgrading the NDIS driver from previous Alphanetworkssoftware releases. If the system does not have previously installed versions of the NDIS driver and you wish to remove the newly installed driver from the system, proceed to Step 4.

The NDIS driver since Release 1.0 no longer leverages the Transport Driver Interface (TDI) protocol to provide the LinkMon programming interface. The TDI protocol should be uninstalled. Follow these steps to uninstall the TDI protocol:

1. To remove the NDIS driver from the OS, go to Device Manager, rightclick "AlphanetworksWMP-G02V Wireless Network mini PCI Card," and choose Uninstall.



2. Click OK to uninstall the device.



3. When the device is uninstalled from Device Manager, search for and delete the driver files that reside in the system. To do so, go to the Start menu and choose Search For Files or Folders..., enter "oem\*.inf" in the "Search for files or folders named:" field, and enter "Alpha" in the "Containing text:" field. Click Search Now. A few files matching these criteria are possible, if previous drivers have not been removed properly. Choose the files that have been found and delete them from the system.

Search Results							_ 🗆 🗙
File Edit View Favorites Tools H	lelp						1
← Back → → → 🔂 🔯 Search 🖓	Folders 🎯 History	哈哈×□	Ω <b>Ξ</b> •				
Address 🔕 Search Results							→ 260
Search                Ø	× Search I	Results	oem8.inf In Folder: <u>C:\WINNT\inf</u> Size: 12,977 bytes Type: Setup Information Modified: 11/2/2001 6:48 AM				
oem*.inf	Nama	In Foldo	•		Deleus	Size	Turca
Containing text:	- Soem8.inf	C:\WIN	v VT\inf		Keleva	13 KB	Setup Informal
Atheros							
Look in:	Confirm File	Delete			×		
Search Now Stop Search	it	ne file 'oem8.inf' is to the Recycle Bir	; a read-only file. Are you sure you? ?	u want to move			
Search for other items:			Yes	No	1		
Files or Folders							
Lomputers People							
Internet	-						
In Roll Tex							
	•						F

4. To complete the uninstallation, "AR5212b.sys" should also be removed from the "\WINNT\system32\drivers" folder.

ddress				• @@
	Name 🔺	Size	Туре	1
	🚞 disdn		File Folder	8
the second se	🚞 etc		File Folder	8
drivers	🔊 acpi.sys	160 KB	System file	7
25	🔊 acpiec.sys	12 KB	System file	5
ar5210b.sys	🔊 afd.sys	120 KB	System file	3
System file	S AGP440.SYS	21 KB	System file	9
1odified: 11/2/2001 6:48 AM	🔊 ar5210b.sys	193 KB	System file	1
	🔊 asyncmac.sys	17 KB	System file	2
bize: 192 KB	🔊 atapi.sys	84 KB	System file	1
Attributes: Read-only	🔊 atmarpc.sys	57 KB	System file	7
	N atmlane.svs	48 KB	System file	
Confirm File Delete			×	5
The file 'ar move it to	5210b.sys' is a read-only file. A the Recycle Bin?	re you sure you w	vant to	5
		Yes	No	4

#### **Device Configuration**

Configuration of the AlphanetworksWMP-G02V Wireless Network mini PCI Card can be done through the Network Control Panel (NCP) in adapter properties. You can set the Wireless Network mini PCI Card to work in one of two modes, either infrastructure mode (which leverages an AP) or ad hoc mode (which consists of a group of stations participating in the WLAN).

In infrastructure mode, the Wireless Network mini PCI Card participates in a basic service set (BSS) as a station, and communicates with the other stations through an AP, as illustrated in Figure 2-1.



Figure 2-1. Infrastructure Mode

In ad hoc mode, a Wireless Network mini PCI Card works within an independent basic service set (IBSS), as illustrated in Figure 2-2. All stations communicate directly with other stations without an AP.



#### Figure 2-2. Ad Hoc Mode

To configure the WMP-G02V Wireless Network mini PCI Card:

1. In the Device Manager, right-click "AlphanetworksWMP-G02V Wireless Network mini PCI Card," and click Properties to access the properties of the adapter.



2. Configuration additions, modifications, and deletions are made under the "Settings" tab of the "AlphanetworksWMP-G02V Wireless Network mini PCI Card" properties.

Atheros AR5000 Wireless Network Adapter Properties							
General Advanced Settings Driver Resources							
Selected Configuration: Default							
Configuration List							
Default     New       [Modify]]      Delete							
Selected Configuration Details         Network Name (SSID): <empty>         Network Connection:       AP (Infrastructure)         Turbo Mode :       Disabled         Power Saving:       Normal         Locally Admin. Address:       Not Used         Data Security:       Disabled</empty>							
OK Cancel							

- 3. Select one of the configurations under the configuration list, and click Modify to show the "Network Configuration Settings" screen. This property sheet has two pages: General and Security. The General page has the following fields:
  - Configuration Name: This field identifies the configuration. This name must be unique. Configuration names are case insensitive.
  - Network Name (SSID): This is the name of the IEEE 802.11b/g wireless network, for example, "Alphanetworks802.11b/g Wireless Network." This field has a maximum limit of 32 characters.
  - Network Connection: This field defines whether the STA is configured for an ad hoc or infrastructure network.

- Power Saving: This field allows the configuration of power management options. The options are Off, Normal, and Maximum.
   Power management is disabled when ad hoc mode is selected in the Network Connection field. When the Power Saving setting is Off, the adapter receives full power from the PC. When the Power Saving setting is Normal, the driver turns off power to the adapter for brief periods over briefly-spaced time intervals. When the Power Saving setting is Maximum, the driver turns off power to the adapter for longer periods over more widely-spaced time intervals.
- Turbo Mode: This field enables or disables Alphanetworksturbo mode.
- Locally Administered Address: This field defines the locally administered MAC address (LAA). To enter a value in the address field, the check box needs to be selected. Typically, an LAA is not required, because the driver automatically loads a unique, globally administered address from the EEPROM.

Network Configuration Settings		? ×
General Security		
Configuration Name:	Home	
Network Name (SSID):	My Home Network	
Network Connection:	AP (Infrastructure)	
Power Saving:	Normal	
Turbo Mode:	Disable 💌	
Locally Administered Address: (Hex 0-9 A-F)		
	OK	Cancel

- 4. The next tab on this property sheet allows for the selection of security features. The fields on this page are as follows:
  - Enable Security: This field completely enables or disables the IEEE 802.11 wired equivalent privacy (WEP) security feature.
  - Default Encryption Key: This field defines the type of encryption key to use (either Unique Key or Shared Keys). This field allows you to select only a key (Unique, First, Second, Third, or Fourth) whose corresponding field has been completed.

- Unique Key: This field defines the unique encryption key for security for the current network configuration. In ad hoc mode, this encryption key type is not used. To enable security using a Unique Key, this field must be populated.
- Shared Keys: These fields define a set of shared encryption keys. To enable security using Shared Keys, at least one Shared Key field must be populated.
- Key Length: This field defines the length for each encryption key. As the Key Length is changed, the number of available characters in the field is changed automatically. If after a key is entered the length is adjusted to a smaller number, the key is automatically truncated to fit. If the length is increased again, the field is not automatically updated to its previous value.

Network Configuration Settings				
General Security				
		_		
🔽 Enable Secu	rity Default Encryption Key: First	<u> </u>		
Encryption Keys (Hex 0-9 A-F)				
	Key Length (bits):			
Unique Key:	64 (40+24) 10 hex digits	-		
Shared Keys:				
First:	64 (40+24) 10 hex digits	<u>-</u>		
Second:	**************************************	J		
Third:	**************************************	J		
Fourth:	64 (40+24) 10 hex digits	J		
	ОК Са	incel		

All encryption key fields are displayed only when initially entered. On subsequent entry into the security property page, the fields are masked. The keys must be entered as hexadecimal digits.

#### Infrastructure Mode

To configure an AlphanetworksWMP-G02V Wireless Network mini PCI Card in infrastructure mode:

1. Ensure that the "Locally Administered Address" checkbox is unchecked.

Network Configuration Settings				
General Security				
Configuration Name:	OFFICE			
Network Name (SSID):	NET1			
Network Connection:	AP (Infrastructure)			
Power Saving:	Off			
Turbo Mode:	Disable			
Locally Administered Address: (Hex 0-9 A-F)				
	ОК	Cancel		

- 2. Choose the following settings:
  - Configuration Name: This field identifies the configuration. This name must be unique. Configuration names are case insensitive.
  - Network Name (SSID): This is the name of the IEEE 802.11b/g wireless network, for example, "Alphanetworks802.11b/g Wireless Network." This field has a maximum limit of 32 characters. If this field is left blank, the STA connects to the AP with the best signal strength.
  - Network Connection: AP (infrastructure).
  - Power Saving: This field allows the configuration of power management options. The options are Off, Normal, and Maximum.
  - Turbo Mode: This field enables or disables Alphanetworksturbo mode.
  - Locally Administered Address: This field defines the locally administered MAC address (LAA). To enter a value in the address field, the check box needs to be selected.
Usually infrastructure mode is used in an enterprise environment where APs are installed and maintained by corporate IT staff. Much of the data in the enterprise network is confidential. It is important to configure security to make sure only stations with appropriate keys can receive sensitive data. The AlphanetworksWMP-G02V Wireless Network mini PCI Card and NDIS driver support key lengths of 40 bits, 104 bits, and 128 bits. Typically, the appropriate encryption and decryption keys are supplied by the corporate IT staff.

#### Ad Hoc Mode

An ad hoc network usually is a short-lived network with a small number of stations. The network is usually created for a special purpose such as exchanging data between friends, or between customer and client. Because the duration of the ad hoc network tends to be limited, Power Saving and Security features are not typically a requirement. For ad hoc network activity, the Power Saving and Security features can be disabled. Currently, shared key security is supported in ad hoc mode. Future Alphanetworkssoftware implementations will provide unique key support.

In ad hoc mode, a station scans the air for an existing BSS. If no BSS is found, the station establishes a BSS for other stations to join. When other stations scan the air and find an established BSS in place, they join that BSS to form an ad hoc network. If a specific set of stations requires ad hoc network connectivity, it is recommended to have one station establish a BSS first before configuring the remaining stations. This prevents the scenario of several stations trying to form a BSS at the same time, which can result in multiple singular BSSs being established, rather than a single BSS with multiple stations.

- Configuration Name: This field identifies the configuration. This name must be unique. Configuration names are case insensitive.
- Network Name (SSID): A Network Name is <u>mandatory</u> for ad hoc mode. The SSID for all stations in a single ad hoc network <u>must</u> be the same.
- Network Connection: Ad Hoc.
- Power Saving: Power saving mode is not currently supported in an ad hoc network.
- Turbo Mode: All stations participating in the ad hoc network must have the same rate setting.
- Locally Administered Address: This field defines the locally administered MAC address (LAA). To enter a value in the address field, the check box needs to be selected.

Network Configuration Settings		<u>? ×</u>
General Security		
Configuration Name:	AD-HOC	
Network Name (SSID):	FRIEND	
Network Connection:	Ad Hoc	
Power Saving:	Dff 🗾	
Turbo Mode:	Disable 💌	
Locally Administered Address: (Hex 0-9 A-F)		
	ОК	Cancel

### **TCP/IP Setup**

After configuring the AlphanetworksWMP-G02V Wireless Network mini PCI Card through the Network Control Panel, the TCP/IP address for the network device must be configured.

- 1. Open the "Control Panel" and click "Network and Dial-up Connections."
- 2. Find the "Local Area Connection" that is associated with the AlphanetworksWMP-G02V Wireless Network mini PCI Card. Right-click that connection, and click Properties.

Network and Dial-up	Connections		
File Edit View Favorites Tools Advanced Help			
] ← Back → → → 🔂   ② Search 🖓 Folders ③History   😤 🧏 🗙 🖄   ☶ •			
Address 🔁 Network and Dial-up Connections			
Name	T Status	Device Name	Owner
🖻 Make New Connection			
🕹 Local Area Connection	LAN Enabled	Intel(R) PRO/100 SP Mo	System
Local Area Connection 2	I AN Network cable unplugged	Atheros AR5000 Wireles	System
	Disable		
	Status		
	Create Shortcut		
	Delate		
	Bename		
	Properties		
•			
🦳 Displays the properties o	of the selected connection.		//

3. Select "Internet Protocol (TCP/IP)" and click Properties.

Local Area Connection 2 Properties			
General Sharing			
Connect using:			
Atheros AR5000 Wireless Network Adapter			
Configure			
Components checked are used by this connection:			
<ul> <li>✓ Client for Microsoft Networks</li> <li>✓ Obterministic Network Enhancer</li> <li>✓ Pile and Printer Sharing for Microsoft Networks</li> <li>✓ Thernet Protocol (TCP/IP)</li> </ul>			
Install Uninstall Properties			
Description			
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.			
Sho <u>w</u> icon in taskbar when connected			
OK Cancel			

- 4. Click "Use the following IP address" and input an IP address and Subnet mask. Assigning an IP address and Subnet mask allows stations to operate in infrastructure mode and to have Internet access. "Default gateway" and "DNS server" information is also required. IP configuration information (DHCP or assigned IP address, Gateway and DNS server IP addresses) is usually obtained from the corporate IT staff.
- 5. After obtaining IP configuration information from the appropriate IT staff, click OK in both "Internet Protocol (TCP/IP) Properties" and "Local Area Connection Properties" to complete the IP configuration.

Internet Protocol (TCP/IP) Propert	ies <mark>?</mark> X			
General				
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.				
O Obtain an IP address automatic	ally			
─● Use the following IP address:				
<u>I</u> P address:	192.168.1.21			
S <u>u</u> bnet mask:	255 . 255 . 255 . 0			
Default gateway:	· · ·			
C Obtain DNS server address automatically				
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	ddresses:			
Preferred DNS server:				
<u>A</u> lternate DNS server:				
	Advanced			
	OK Cancel			

6. Choose Start > Programs > Accessories > Command Prompt to open the DOS command prompt window. Type "ipconfig" at the C:\> prompt to determine if the TCP/IP configuration has taken effect. To test IP connectivity in ad hoc or infrastructure mode, use the "ping <ipaddress>" command. When a TCP/IP connection is established, the LinkMon utility (See Chapter 7) can be used to monitor the AlphanetworksWMP-G02V Wireless Network mini PCI Card operating status.

C:\WINNT\System32\cmd.exe	_ 🗆 ×
C:\>ipconfig	<b>_</b>
Windows 2000 IP Configuration	
Ethernet adapter Local Area Connection 2:	
Connection-specific DNS Suffix .: IP Address: 192.168.1.21 Subnet Mask	
C:>>ping 192.168.1.20	
Pinging 192.168.1.20 with 32 bytes of data:	
Reply from 192.168.1.20: bytes=32 time<10ms TTL=128 Reply from 192.168.1.20: bytes=32 time<10ms TTL=128 Reply from 192.168.1.20: bytes=32 time<10ms TTL=128 Reply from 192.168.1.20: bytes=32 time<10ms TTL=128	
Ping statistics for 192.168.1.20: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = Oms, Maximum = Oms, Average = Oms	
C:\>_	
	-

7. To map the drive on another machine to your computer, right-click "My Computer" and click "Map Network Drive...."



8. After mapping the drive, you can perform file transfers, use video streaming applications, and all other network data transfers that are normally performed with wired 10/100 Ethernet connections.



# 3 Windows Millennium Edition

# **Driver Installation**

Alphanetworksrecommends that you remove any existing AlphanetworksNDIS driver on the PC system before installing Version release of the NDIS driver. See Section "Driver Uninstallation" on page 3-5 for the instructions on how to remove previous driver releases. When the system no longer has the AlphanetworksNDIS driver installed, insert the WMP-G02V Wireless Network mini PCI Card into a 32-bit CardBus slot, and follow these steps to install the NDIS driver:

1. Wait for the following dialog box to appear. Choose "Specify the location of the driver (Advanced)," and click Next to continue.

Add New Hardware Wiz	ard
	Windows has found the following new hardware: PCI Ethernet Controller Windows can automatically search for and install software that supports your hardware. If your hardware came with installation media, insert it now and click Next. What would you like to do? Automatic search for a better driver (Recommended) Specify the location of the driver (Advanced)
	< Back Next > Cancel

2. Choose "Search for the best driver for your device. (Recommended)" and select "Specify a location." Click Browse to locate the NDIS driver. The default folder is "E:\ndis\bin\production\ndis5" (assuming E: is the CD-ROM drive). Click Next to continue.

Add New Hardware Wizard			
	Windows will search for new drivers in its driver database on your hard drive, and in any of the following selected <ul> <li>Search for the best driver for your device.</li> <li>Removable Media (Floppy, CD-ROM)</li> <li>Specify a location:                 <ul> <li>e:\ndis\bin\production\ndis</li> <li>Browse</li> </ul> </li> <li>Display a list of all the drivers in a specific location, so you can select the driver you want.</li> </ul>		
	< <u>B</u> ack Next > Cancel		

3. When the Alphanetworksdriver installation file (NET5210B.INF) has been found, click Next to continue.



4. Click Finish to continue, and restart the system to complete driver installation. Refer to Section "Device Configuration" on page 3-7 for device configuration.



# **Driver Uninstallation**

This section provides uninstallation procedures for removing the AlphanetworksNDIS driver from the system. Uninstallation is recommended for upgrading the NDIS driver from previous Alphanetworksdriver releases.

 To remove the NDIS driver from the OS, go to Start > Search > For Files or Folders..., and search for the INF file containing the "Alpha" text string under the \WINDOWS\INF folder. Be sure to include subfolders in the search criteria. When "Alphanet5210b.inf" has been found, delete it by right-clicking the file and choose Delete.

💐 Search Results				
<u>File Edit View Favorites Tools H</u> elp				
🗧 🖶 Back 👻 🤿 👻 🔂 🧕 🚱 Search 🖓 Fold	ers 🎯 History 🛛 🖺 🖳 🗙	so <u>≡</u> •		
Address 🔕 Search Results				🝷 🤗 Go
Search ×				
Ot New Ø		Atherosnet5210b.i In Folder: C:\WINDO	nf WS\INF\OTHER	
Search for Files and Folders	Search Reculte	Size: 17,143 bytes Modified: 7/2/2001 5:	04 PM	
	Search Results	·		
Search for files or folders named:				
*.inf				
Containing text:	Name In Fo	lder	Size Type	Modified
Atheros	Atherosnet5210b.inf C:\\\\	INDOWS\INF\OTHER	17 KB Setup Information	7/2/2001 5:04 PM
Look in:	open containing rolder			
C:\windows\inf	Upen Print			
	Install			
Stop Search	Open With			
Search Options <<	Send To 🕨			
□ <u>D</u> ate	Cut			
🗆 Туре	Сору			
🗆 Size	Create Shortcut			
Advanced Options	Delete			
	Hename			
Search for other items:	Properties	]		
🖳 Deletes the selected items.				1.

2. From Control Panel, launch the System Properties window. Select "AlphanetworksWMP-G02V Wireless Network mini PCI Card" from Device Manager, and click Remove to uninstall the device.

System Properties
General Device Manager Hardware Profiles Performance
• View devices by type • View devices by connection
Computer CDROM CDROM CDBoM CDBoM CDBok drives CDBoM CDBok drives CDBo
OK Cancel

3. Click OK to confirm the removal of the device. Restart the system to complete un-installation.



# **Device Configuration**

Configuration of the AlphanetworksWMP-G02V Wireless Network mini PCI Card can be done through the AlphanetworksNIC Configuration utility found in the Windows Control Panel. Similar to Windows 2000, the device can be set to work in one of two modes: infrastructure mode or ad hoc mode. Please refer to Section "Device Configuration" beginning on page 2-17 for more details on these network connection types.

To launch the configuration utility, go to Control Panel and double-click on the AlphanetworksNIC Configuration icon.



The configuration utility allows addition, modification, and deletion of the configuration profiles. Select one of the existing configuration profiles under the configuration list to modify, or click New to add a new configuration profile. Follow Section "Infrastructure Mode" on page 3-9 and Section "Ad Hoc Mode" on page 3-10 to set up the station to work in infrastructure mode and ad hoc mode.

Atheros NIC Configuration	? X
Network Card: [0003]Atheros AR5000 Wireless Network	Adapter 💌
Selected Configuration: Default	
Configuration List	
Default	<u>N</u> ew
	<u>M</u> odify
	<u>D</u> elete
Selected Configuration Details Network Name (SSID): <empty> Network Connection: AP (Infrastructure) Turbo Mode : Disabled Power Management: Normal Locally Admin. Address: Not Used Data Security: Disabled</empty>	
OK	Cancel

#### Infrastructure Mode

This section defines the process of configuring an AlphanetworksWMP-G02V Wireless Network mini PCI Card in infrastructure mode. See Section "Device Configuration" beginning on page 2-17 for detailed descriptions of each option in the Network Configuration Settings.

- 1. Under the "General" tab, make sure the "Locally Administered Address" checkbox is unchecked. Use the following information as a guideline to choose the values of each field in the configuration window:
  - Configuration Name: This field identifies the configuration. This name must be unique. Configuration names are case insensitive.
  - Network Name (SSID): This is the name of the IEEE 802.11b/g wireless network. This field has a maximum limit of 32 characters. If this field is left blank, the STA connects to the AP with the best signal strength.
  - Network Connection: AP (Infrastructure)
  - Power Saving: This field allows the configuration of power management options. The options are Off, Normal, and Maximum.
  - Turbo Mode: This field enables or disables Alphanetworksturbo mode.

Network Configuration Settings		? ×
General Security		
Configuration Name:	ALPHA_1	
Network Name (SSID):	ALPHA1	
Network Connection:	AP (Infrastructure)	
Power Saving:	Normal	
Turbo Mode:	Disable	
Locally Administered Address: (Hex 0-9 A-F)		
	ОК	Cancel

2. Usually, infrastructure mode is used in an enterprise environment where APs are installed and maintained by corporate IT staff. Much of the data in the enterprise network is confidential. It is important to configure security to make sure only stations with appropriate keys can receive sensitive data. The AlphanetworksWMP-G02V Wireless Network mini PCI Card and NDIS driver support key lengths of 40 bits, 104 bits and 128 bits. Typically, the appropriate encryption and decryption keys are supplied by the corporate IT staff.

Network Configu	ration Settings	<u>? ×</u>
General Securit	y ]	
Enable Secu	rity Default Encryption Key: s (Hex 0-9 A-F)	Unique
Unique Key:	******	64 (40+24) 10 hex digits 💌
Shared Keys: First:	жининин	64 (40+24) 10 hex digits 💌
Second:	*****	152 (128+24) 32 hex digits 💌
Third:	**********************	128 (104+24) 26 hex digits 💌
Fourth:	*******	64 (40+24) 10 hex digits 💌
		OK Cancel

#### Ad Hoc Mode

This section defines the process of configuring an AlphanetworksWMP-G02V Wireless Network mini PCI Card in ad hoc or IBSS mode. See Section "Ad Hoc Mode" on page 2-23 for descriptions of ad hoc operation.

- Similar to the set-up of AP Infrastructure mode described in the previous section, ad hoc mode is also configured by changing the options in the Network Configuration Settings of the AlphanetworksNIC Configuration utility. Use the following information as a guideline to choose the values of each field in the configuration window:
  - Configuration Name: This field identifies the configuration. This name must be unique. Configuration names are case insensitive.
  - Network Name (SSID): A Network Name is mandatory for ad hoc mode. The SSID for all stations in a single ad hoc network must be the same.
  - Network Connection: Ad Hoc.

- Power Saving: Power saving mode is not currently supported in an ad hoc network.
- Turbo Mode: All stations participating in the ad hoc network must have the same rate setting.
- Locally Administered Address: This field defines the locally administered MAC address (LAA). To enter a value in the address field, the check box needs to be selected.

I	Network Configuration Settings		? ×
	General Security		
	Configuration Name: AL	LPHA_2	
	Network Name (SSID): AL	LPHA2	
	Network Connection: Ac	d Hoc	
	Power Saving:	ff	
	Turbo Mode: Di	isable	
	Locally Administered Address: (Hex 0-9 A-F)		
		ОК	Cancel

- 2. You can optionally set up other properties, but because the duration of the ad hoc network tends to be limited, Power Saving and Security features are not typically a requirement. For ad hoc network activity, the Power Saving and Security features can be disabled. Currently, shared key security is supported in ad hoc mode. Future Alphanetworkssoftware implementations will provide unique key support.
- 3. Click OK when the properties are set correctly. The system needs to reboot in order for the changes to take effect.

Note that in ad hoc mode, a station scans the air for an existing BSS. If no BSS is found, the station establishes a BSS for other stations to join. When other stations scan the air and find an established BSS in place, they join that BSS to form an ad hoc network. If a specific set of stations requires ad hoc network connectivity, it is recommended to have one station establish a BSS first before configuring the remaining stations. This prevents the scenario of several stations trying to form a BSS at the same time, which can result in multiple singular BSSs being established, rather than a single BSS with multiple stations.

## **TCP/IP Configuration**

After configuring the AlphanetworksWMP-G02V Wireless Network mini PCI Card network adapter properties, the TCP/IP address for the network device needs to be configured.

 From Control Panel, launch the Network properties window. Select "TCP/IP → AlphanetworksWMP-G02V Wireless Network mini PCI Card" and click Properties. Depending on the type of network the station connects to, Gateway and DNS Configuration information can also be required. IP configuration information (DHCP or assigned IP address, Gateway and DNS server IP addresses) is usually obtained from the corporate IT staff. For a simple demonstration, the station is assigned a static IP address. From "TCP/IP Properties," choose "IP Address" and select "Specify an IP address." Input an IP address and subnet mask. Assigning an IP address and subnet mask allows the station to interact with the AP or other stations in the same IP subnet. Click OK to complete the TCP/IP configuration, and restart the system for the changes to take effect.

Network ?X	TCP/IP Properties
Configuration   Identification   Access Control	Bindings Advanced NetBIOS
The following network components are installed: TCP/IP -> Atheros AR5000 Wireless Network Adapter TCP/IP -> Dial-Up Adapter TCP/IP -> Intel 8255x-based PCI Ethernet Adapter (10/10 TCP/IP -> Intel(R) PR0/100 VE Network Connection TCP/IP -> NDIS 1394 Net Adapter	DNS Configuration Gateway WINS Configuration IP Address An IP address can be automatically assigned to this computer. If your network does not automatically assign IP addresses, ask your network administrator for an address, and then type it in the space below.
Add Remove Properties Primary Network Logon:	<u>O</u> btain an in address: <u>IP Address:</u> <u>192.168.1.22</u>
Client for Microsoft Networks	S <u>u</u> bnet Mask: <b>255.255.255.0</b>
Description TCP/IP is the protocol you use to connect to the Internet and wide-area networks.	Detect connection to network media
OK Cancel	OK Cancel

 Choose Start > Programs > Accessories > Command Prompt to open the DOS command prompt window. Type "ipconfig" to determine if the TCP/IP configuration has taken effect. To test IP connectivity in ad hoc or infrastructure mode, use the "ping <ipaddress>" command. When a TCP/IP connection is established, the LinkMon utility (see Chapter 7) can be used to monitor the AlphanetworksWMP-G02V Wireless Network mini PCI Card operating status.

MS-DOS Prompt	_ 🗆 🗙
8 x 12 🗸 🛄 🛍 🔂 💕 📇 🔺	
C:\WINDOWS\Desktop>ipconfig	
Windows IP Configuration	
0 Ethernet adapter :	
IP Address	
C:\WINDOWS\Desktop>ping 192.168.1.21	
Pinging 192.168.1.21 with 32 bytes of data:	
Reply from 192.168.1.21: bytes=32 time<10ms TTL=128 Reply from 192.168.1.21: bytes=32 time<10ms TTL=128 Reply from 192.168.1.21: bytes=32 time<10ms TTL=128 Reply from 192.168.1.21: bytes=32 time<10ms TTL=128	
Ping statistics for 192.168.1.21: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = Oms, Maximum = Oms, Average = Oms	
C:\WINDOWS\Desktop>	

3. To map the drive on another machine to your computer, right-click "My Computer" and click "Map Network Drive...." Specify the path of a network-shared folder.

My Computer	<b>Ореп</b> Explore S <u>e</u> arch		
	Map <u>N</u> etwork Drive Djsconnect Network Drive		
	Create <u>S</u> hortcut Rena <u>m</u> e		
Map Netw	Properties		? ×
<u>D</u> rive:	₽ F:	•	ОК
<u>P</u> ath:	\\192.168.1.21\C\$	•	Cancel
	Reconnect at logon		

4. After mapping the drive, you can perform file transfers, video streaming, and all other network data transfers that are normally performed with wired 10/100 Ethernet connections.

# 4 Windows 98 Second Edition

# **Driver Installation**

Alphanetworksrecommends that you remove any existing AlphanetworksNDIS driver on the PC system before installing Version 1.3 release of the NDIS driver. See Section "Driver Uninstallation" on page 4-5 for the instructions on how to remove previous driver releases. When the system no longer has the AlphanetworksNDIS driver installed, insert the WMP-G02V Wireless Network mini PCI Card into a 32-bit CardBus slot, and follow these steps to install the NDIS driver:

1. Wait for the following dialog box to appear, and click Next to continue.



2. Choose "Search for the best driver for your device. (Recommended)," and click Next.



 Insert the AlphanetworksSoftware Release CD in your CD-ROM drive. Choose "Specify a location" and browse to the location where the NDIS driver is located. The default folder is D:\ndis\bin\production\ndis5 (assuming D: is the CD-ROM drive). Click Next to continue.

Add New Hardware Wiz	ard
	Windows will search for new drivers in its driver database on your hard drive, and in any of the following selected locations. Click Next to start the search.         □ Eloppy disk drives         □ CD-ROM drive         □ Microsoft Windows Update         ☑ Specify a location:         □ D:\ndis\bin\production\ndis5         ☑ Browse
	< <u>B</u> ack Next > Cancel

4. When the Alphanetworksdriver installation file (NET5210B.INF) has been found, click Next to continue.



5. Click Finish to continue.



6. Click Yes to restart the system and complete driver installation. See Section "Device Configuration" on page 4-8 for device configuration.

System S	Settings Change 🛛 🕅
?	To finish setting up your new hardware, you must restart your computer.
	Do you want to restart your computer now?
	<u>Yes</u> <u>N</u> o

# **Driver Uninstallation**

This section provides uninstallation procedures for removing the AlphanetworksNDIS driver from the system. Uninstallation is recommended for upgrading the NDIS driver from previous Alphanetworksdriver releases.

 To remove the NDIS driver from the OS, go to Start > Search > For Files or Folders..., and search for the INF file containing the "Alpha" text string under the \WINDOWS\INF folder. Be sure to include subfolders in the search criteria.

🖏 Find: All Files	
<u>File Edit View Options H</u> elp	
Name & Location Date Advanced	Find Now
Named: .inf	Stop
Containing text: Atheros	Ne <u>w</u> Search
Look in: 🗀 c:\windows\inf	
✓ Include <u>subfolders</u> <u>B</u> rowse	<b>`</b>

2. When "Alphanet5210b.inf" has been found, delete it by right-clicking the file and choose "Delete."

File       Edit       View       Options       Help         Name & Location       Date       Advanced       Find Now         Named:       *.inf       Stop         Containing text:       Atheros       New Search         Look in:       c:\windows\inf       Image: Containing text:       Containing text:         Image: Image: Image: Containing text:       C:\windows\inf       Image: Containing text:       C:\windows\inf         Image: Image: Containing text:       C:\windows\inf       Image: Containing text:       C:\windows\inf         Image: Image: Containing text:       C:\windows\inf       Image: Containing text:       C:\windows\inf         Image: Image: Containing text:       C:\windows\inf       Image: Containing text:       C:\windows\inf         Image: Image: Containing text:       C:\windows\inf       Image: Containing text:       C:\windows\inf         Image: Image: Containing text:       C:\windows\inf       Image: Containing text:       C:\windows\inf         Image: Image: Containing text:       C:\windows\inf       Image: Containing text:       C:\windows\inf         Image: Image: Containing text:       C:\windows\inf       Image: Containing text:       C:\windows\inf         Image: Containing text:       C:\windows\inf       Image: Containing text:       C:\windows\inf	<u>File E</u> dit <u>V</u> iew	Options Help			
Name & Location       Date       Advanced         Named:       *.inf       Stop         Containing text:       Atheros       New Search         Look in:       c:\windows\inf       Image: Containing text:         Image: Containing text:       Atheros       New Search         Image: Containing text:       C:\windows\inf       Image: Containing text:	<u>File Edit View Options H</u> elp				
Named:     *.inf     Stop       Containing text:     Atheros     New Search       Look in:     c:\windows\inf     ✓       ✓     Include gubfolders     Browse	Name & Locatio	Name & Location Date Advanced			
Containing text:     Atheros       Look in:     c:\windows\inf       ✓     Include subfolders	<u>N</u> amed:	Named: .inf			
Look in: c:\windows\inf ✓ Include subfolders ✓	<u>C</u> ontaining text	Containing text: Atheros		Ne <u>w</u> Search	
Include <u>s</u> ubfolders <u>B</u> rowse	Look in:	c:\windows\inf	•	Q	
		nclude <u>subfolders</u>	e	-10	
Name In Folder Size Type	Name	In Folder	Size	Туре	
Atherosnet5210b.inf C:\WINDOWS\INF\OTHER 13KB Setup Information	Atherosnet521	b.inf 🚞 C:\WINDOWS\INF\OTHER	13KB	Setup Information	
Open       Print       Install       Quick View	<u>O</u> реп <u>P</u> rint <u>I</u> nstall Quick Vie	w			
Trend PC-cillin 98 ∰ Add to Zip ∰ Add to Atherosnet5210b.zip ∰ Zip and E-Majl Atherosnet5210b.zip	Trend PC 句』 Add to Zij 句』 Add to Ati 句』 Zip and E	-cillin 98 o herosnet5210b.zip -Majl Atherosnet5210b.zip			
Send Io	Send <u>T</u> o	•			
Cut <u>C</u> opy	Си <u>t</u> <u>С</u> ору				
Create Shortcut	Create <u>S</u> P	iortcut			
Delete Rena <u>m</u> e	<u>D</u> elete Rena <u>m</u> e				
Properties				Þ	

3. From Control Panel, launch the Network properties window. Select "AlphanetworksWMP-G02V Wireless Network mini PCI Card" from the list, and click Remove to uninstall the device.

Network
Configuration Identification Access Control
· · · ·
The following network components are installed:
Elient for Microsoft Networks
Atheros AR5000 Wireless Network Adapter
Biological Up Adapter
Intel 8255x-based PCI Ethernet Adapter (10/100)
Add Remove Properties
Primary Network Logon:
Client for Microsoft Networks
<u>F</u> ile and Print Sharing
Description
A network adapter is a hardware device that physically connects your computer to a network.
OK Cancel

4. Click OK to confirm the removal of the device. Restart the system to complete uninstallation.

Network	×
•	Do you want to remove this network adapter, or just disable it for this hardware profile? To remove this adapter from all profiles, click OK. Otherwise, click Cancel, and then do the following:
	1. In Control Panel, double-click System, and then click the Device Manager tab.
	2. Double-click Network Adapter, click the network adapter you want to disable, and then click Properties.
	3. Uncheck the hardware profile(s) for which you want to disable this adapter.
	Cancel

# **Device Configuration**

Configuration of the AlphanetworksWMP-G02V Wireless Network mini PCI Card can be done through the AlphanetworksNIC Configuration utility found in the Windows Control Panel. Similar to Windows 2000 the device can be set to work in one of two modes: infrastructure mode or ad hoc mode. Please refer to Section "Device Configuration" beginning on page 2-17 for more details on these network connection types.

To launch the configuration utility, go to Control Panel and double-click on the AlphanetworksNIC Configuration icon.



The configuration utility allows addition, modification, and deletion of the configuration profiles. Select one of the existing configuration profiles under the configuration list to modify, or click New to add a new configuration profile. Follow Section "Infrastructure Mode" on page 4-9 and Section "Ad Hoc Mode" on page 4-11 to set up the station to work in infrastructure mode and ad hoc mode.

Atheros NIC Configur	ation		?×
Network Card:	[0003]Atheros AR5000 \	Wireless Network /	Adapter 💌
Selected Configuration:	Default		
Configuration List			
Default			<u>N</u> ew
			<u>M</u> odify
			<u>D</u> elete
Selected Configuration Network Name (SSI Network Connection Turbo Mode : Power Saving: Locally Admin. Addre Data Security:	n Details D): <empty> AP (Infrastructure) Disabled ess: Normal ess: Not Used Disabled</empty>		
		OK	Cancel

#### **Infrastructure Mode**

This section defines the process of configuring an AlphanetworksWMP-G02V Wireless Network mini PCI Card in infrastructure mode. See Section "Device Configuration" beginning on page 2-17 for detailed descriptions of each option in the Network Configuration Settings.

- 1. Under the "General" tab, make sure the "Locally Administered Address" checkbox is unchecked. Use the following information as a guideline to choose the values of each field in the configuration window:
  - Configuration Name: This field identifies the configuration. This name must be unique. Configuration names are case insensitive.
  - Network Name (SSID): This is the name of the IEEE 802.11b/g wireless network. This field has a maximum limit of 32 characters. If this field is left blank, the STA connects to the AP with the best signal strength.
  - Network Connection: AP (Infrastructure)
  - Power Saving: This field allows the configuration of power management options. The options are Off, Normal, and Maximum.
  - Turbo Mode: This field enables or disables Alphanetworksturbo mode.

Network Configuration Settings		? ×
General Security		
Configuration Name:	ALPHA	
Network Name (SSID):	ALPHA_1	
Network Connection:	AP (Infrastructure)	
Power Saving:	Off	
Turbo Mode:	Disable 💌	
Locally Administered Address: (Hex 0-9 A-F)		
	OK	Cancel

2. Usually, infrastructure mode is used in an enterprise environment where APs are installed and maintained by corporate IT staff. Much of the data in the enterprise network is confidential. It is important to configure security to make sure only stations with appropriate keys can receive sensitive data. The AlphanetworksWMP-G02V Wireless Network mini PCI Card and NDIS driver support key lengths of 40 bits, 104 bits, and 128 bits. Typically, the appropriate encryption and decryption keys are supplied by the corporate IT staff.

Network Configu	ration Settings	<u>?×</u>		
General Securit	<u>ا</u> بر			
💌 Enable Secu	ity Default Encryption Key:	Unique 💌		
Encryption Keys (Hex 0-9 A-F)				
		Key Length (bits):		
Unique Key:	********	64 (40+24) 10 hex digits		
Shared Keys:				
First:	********	64 (40+24) 10 hex digits 💌		
Second:	*****	128 (104+24) 26 hex digits 💌		
Third:	***********************	128 (104+24) 26 hex digits 💌		
Fourth:	******	152 (128+24) 32 hex digits 💌		
		OK Cancel		

## Ad Hoc Mode

This section defines the process of configuring an AlphanetworksWMP-G02V Wireless Network mini PCI Card in ad hoc or IBSS mode. See Section "Ad Hoc Mode" on page 2-23 for descriptions of ad hoc operation.

- Similar to the setup of the AP infrastructure mode described in the previous section, ad hoc mode is also configured by changing the Network Configuration Settings of the AlphanetworksNIC Configuration utility. Use the following information as a guideline to choose the values of each field in the configuration window:
  - Configuration Name: This field identifies the configuration. This name must be unique. Configuration names are case insensitive.
  - Network Name (SSID): A Network Name is mandatory for ad hoc mode. The SSID for all stations in a single ad hoc network must be the same.
  - Network Connection: Ad Hoc.
  - Power Saving: Power saving mode is not currently supported in an ad hoc network.
  - Turbo Mode: All stations participating in the ad hoc network must have the same rate setting.
  - Locally Administered Address: This field defines the locally administered MAC address (LAA). To enter a value in the address field, the check box needs to be selected.

Network Configuration Settings		? ×
General Security		
Configuration Name:	ALPHA2	
Network Name (SSID):	ALPHA_2	
Network Connection:	Ad Hoc	
Power Saving:	Off	
Turbo Mode:	Disable 💌	
Locally Administered Address: (Hex 0-9 A-F)		
	OK	Cancel

- 2. You can optionally set up other properties, but because the duration of the ad hoc network tends to be limited, Power Saving and Security features are not typically a requirement. For ad hoc network activity, the Power Saving and Security features can be disabled. Currently, shared key security is supported in ad hoc mode. Future Alphanetworkssoftware implementations will provide unique key support.
- 3. Click OK when the properties are set correctly. The system needs to reboot in order for the changes to take effect.

Note that in ad hoc mode, a station scans the air for an existing BSS. If no BSS is found, the station establishes a BSS for other stations to join. When other stations scan the air and find an established BSS in place, they join that BSS to form an ad hoc network. If a specific set of stations requires ad hoc network connectivity, it is recommended to have one station establish a BSS first before configuring the remaining stations. This prevents the scenario of several stations trying to form a BSS at the same time, which can result in multiple singular BSSs being established, rather than a single BSS with multiple stations.

### **TCP/IP Setup**

After configuring the AlphanetworksWMP-G02V Wireless Network mini PCI Card network adapter properties, the TCP/IP address for the network device needs to be configured.

 From Control Panel, launch the Network properties window. Select "TCP/IP → AlphanetworksWMP-G02V Wireless Network mini PCI Card" and click Properties. Depending on the type of network the station connects to, Gateway and DNS Configuration information can also be required. IP configuration information (DHCP or assigned IP address, Gateway and DNS server IP addresses) is usually obtained from the corporate IT staff. For a simple demonstration, the station is assigned a static IP address. From "TCP/IP Properties," choose "IP Address" and select "Specify an IP address." Input an IP address and subnet mask. Assigning an IP address and subnet mask allows the station to interact with the AP or other stations in the same IP subnet. Click OK to complete the TCP/IP configuration, and restart the system for the changes to take effect.

Configuration         Identification         Access Control         Bindings           DNS Configuration         G	Advanced Gateway	NetBIOS
DNS Configuration G	Gateway WINS Conf	iguration IP Address
The following network components are installed:     NetBEUI -> Dial-Up Adapter   NetBEUI -> Intel 8255x-based PCI Ethernet Adapter (10/1)   TCP/IP -> Atheros AR5000 Wireless Network Adapter   TCP/IP -> Dial-Up Adapter   TCP/IP -> Intel 8255x-based PCI Ethernet Adapter (10/10)   TCP/IP -> Intel 8255x-based PCI Ethernet Adapter (10/10)   Add   Remove   Primary Network Logon:   Client for Microsoft Networks   Eile and Print Sharing   Description   TCP/IP is the protocol you use to connect to the Internet and wide-area networks.	e automatically assigne not automatically assig strator for an address, a ddress automatically address: 192.168.1 255.255.255 0	<pre>id to this computer. in IP addresses, ask ind then type it in 20 5. 0 5. 0 Cancel</pre>

2. Choose Start > Programs > Accessories > Command Prompt to open the DOS command prompt window. Type "ipconfig" to determine if the TCP/IP configuration has taken effect. To test IP connectivity in ad hoc or infrastructure mode, use the "ping <ipaddress>" command. When a TCP/IP connection is established, the LinkMon utility (see Chapter 7) can be used to monitor the AlphanetworksWMP-G02V Wireless Network mini PCI Card operating status.

KS-DOS Prompt	
Auto 💽 🛄 🖻 🔁 🐼 🗗 🗛	
C:\WINDOWS>ipconfig	
Windows 98 IP Configuration	
O Ethernet adapter :	
IP Address : 192.168.1.22 Subnet Mask : 255.255.255.0 Default Gateway :	
C:\WINDOW5>ping 192.168.1.21	
Pinging 192.168.1.21 with 32 bytes of data:	
Reply from 192.168.1.21: bytes=32 time=1ms TTL=128 Reply from 192.168.1.21: bytes=32 time<10ms TTL=128 Reply from 192.168.1.21: bytes=32 time=1ms TTL=128 Reply from 192.168.1.21: bytes=32 time=1ms TTL=128	
Ping statistics for 192.168.1.21: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = Oms, Maximum = 1ms, Average = Oms	
C:\WINDOWS>	

3. To map the drive on another machine to your computer, right-click "My Computer" and click "Map Network Drive...." Specify the path of a network-shared folder.

My Computer	<u>O</u> pen		
	<u>E</u> xplore		
	<u>F</u> ind		
	Map <u>N</u> etwork Drive		
	Disconnect Network Drive		
	Create <u>S</u> hortcut		
	Rena <u>m</u> e		
	P <u>r</u> operties		
Map Netwo	rk Drive		<u>? </u> ×
Drive:	₽ F:	•	ОК
<u>P</u> ath:	\\192.168.1.21\C\$	•	Cancel
I	Reconnect at logon		

4. After mapping the drive, you can perform file transfers, video streaming, and all other network data transfers that are normally performed with wired 10/100 Ethernet connections.
# 5 Windows XP

## **Driver Installation (First-time Install)**

Alphanetworksrecommends that you remove any existing Alphanetworksdrivers on the PC system before installing Version release of the NDIS driver. See Section "Driver Uninstallation" on page 5-6 for the instructions on how to remove previous driver releases. With no existing AlphanetworksNDIS driver installed, insert the AlphanetworksWMP-G02V Wireless Network mini PCI Card into a 32-bit CardBus slot, and follow these steps to install the NDIS driver:

1. Wait for the following dialog box to appear. Choose "Install from a list or specific location (Advanced)," and click Next to continue.



2. Under "Search for the best driver in these locations," choose "Include this location in the search" and click Browse to find the location of the NDIS driver. When the driver location has been identified, click Next to continue.

Found New Hardware Wizard
Please choose your search and installation options.
⊙ Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM)
Include this location in the search:
D:\ndis\bin\production\ndis5
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< <u>B</u> ack <u>N</u> ext > Cancel

3. The AlphanetworksNDIS evaluation driver currently does not have a digital signature from Microsoft. Therefore, Windows XP shows a warning message. Click Continue Anyway to proceed with driver installation.

Hardwa	re Installation
<u>.</u>	The software you are installing for this hardware: Atheros AR5000 Wireless Network Adapter has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.) Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
	Continue Anyway STOP Installation

4. Click Finish to complete driver installation, and refer to Section "Device Configuration" on page 5-10 for device configuration.



## **Driver Uninstallation**

This section provides uninstallation procedures for removing the AlphanetworksNDIS driver from the system. Uninstallation is recommended for upgrading the NDIS driver from previous Alphanetworksdriver releases.

1. To remove the NDIS driver from the OS, go to Device Manager, right click "AlphanetworksWMP-G02V Wireless Network mini PCI Card," and choose Uninstall.

🚇 Device Manager		
File Action View Help		
Atheros     Batteries     Computer     Statteries     Computer     Disk drives     Display adapters     Disk drives     Display adapters     Disk drives     Modems     Modems     Disk drives     Modems     Disk drives     Notors     Portors AR5000 Wireless Network Adapter     Portors (COM & LPT)     Ports (COM & LPT)     Ports     Sound, video and game controllers     System devices	Update Driver Disable Uninstall Scan for hardware changes Properties	
Uninstalls the driver for the selected device.		

2. Click OK to uninstall the device.

Confirm	Device Removal 🔹 💽 🔀
▦	Atheros AR5000 Wireless Network Adapter
Warning	: You are about to uninstall this device from your system.
	OK Cancel

3. When the device is uninstalled from Device Manager, search for and delete the driver installation file that resides in the system. To do so, go to Start and choose Search > All files and folder, enter "oem\*.inf" in the "All or part of the file name" field, and enter "Alpha" in the "A word or phrase in the file" field. Enter "C:\WINNT\INF" in the "Look in" field, where C: is the drive letter of where Windows XP is installed. Click Search to find the driver installation file.



4. A file matching the search criteria is displayed. Choose this file and delete it from the system.



## **Device Configuration**

Windows XP zero-configuration functionality allows the user to select and join a wireless network without having to configure the device separately. You can decide to choose the default parameters and directly proceed to zero-configuration in Section "Windows XP Wireless Network Configuration" on page 5-20.

Similar to Windows 2000, configuration of the AlphanetworksWMP-G02V Wireless Network mini PCI Card can be done through the Network Control Panel (NCP) in adapter properties. You can set the Wireless Network mini PCI Card to work in one of two modes: infrastructure mode or ad hoc mode. See Section "Device Configuration" beginning on page 2-17 for more details on these network connection types.

To launch NCP go to Device Manager, right-click "AlphanetworksWMP-G02V Wireless Network mini PCI Card," and select Properties to access to the properties of the adapter.



Configuration additions, modifications, and deletions are made under the "Settings" tab of "AlphanetworksWMP-G02V Wireless Network mini PCI Card Properties." Select one of the configurations under the configuration, click Modify or New and complete the steps in Section "Infrastructure Mode" on page 5-12 or Section "Ad Hoc Mode" on page 5-13 to set up the station to work in infrastructure mode or ad hoc mode, respectively.

Atheros AR5000 Wireless Network Adapter Properties	?×
General Advanced Settings Driver Resources	
Selected Configuration: Default	
Configuration List	
Default     New       Modify       Delete	
Selected Configuration Details Network Name (SSID): <empty> Network Connection: AP (Infrastructure) Turbo Mode : Disabled Power Saving: Off Locally Admin. Address: Not Used Data Security: Disabled</empty>	
ОК Са	ncel

#### Infrastructure Mode

This section defines the process of configuring an AlphanetworksWMP-G02V Wireless Network mini PCI Card in infrastructure mode. See Section "Device Configuration" beginning on page 2-17 for detailed descriptions of each option in the Network Configuration Settings.

- 1. Under the "General" tab, make sure the "Locally Administered Address" checkbox is unchecked. Use the following information as a guideline to choose the values of each field in the configuration window:
  - Configuration Name: This field identifies the configuration. This name must be unique. Configuration names are case insensitive, for example, "Infrastructure."
  - Network Name (SSID): This is the name of the IEEE 802.11b/g wireless network, for example, "AP\_Network." This field has a maximum limit of 32 characters. If this field is left blank, the STA connects to the AP with the best signal strength.
  - Network Connection: AP (Infrastructure).
  - Power Saving: This field allows the configuration of power management options. The options are Off, Normal, and Maximum.
  - Turbo Mode: This field enables or disables Alphanetworksturbo mode.

Network Configuration Settings		? 🔀
General Security		
Configuration Name:	Infrastructure	
Network Name (SSID):	AP_Network	
Network Connection:	AP (Infrastructure)	
Power Saving:	Normal	
Turbo Mode:	Disable 💌	
Locally Administered Address: (Hex 0-9 A-F)		
	ОК	Cancel

2. Usually, infrastructure mode is used in an enterprise environment where APs are installed and maintained by corporate IT staff. Much of the data in the enterprise network is confidential. It is important to configure security to make sure only stations with appropriate keys can receive sensitive data. The AlphanetworksWMP-G02V Wireless Network mini PCI Card and NDIS driver support key lengths of 40 bits, 104 bits and 128 bits. Typically, the appropriate encryption and decryption keys are supplied by the corporate IT staff.

Network Config	guration Settings	? 🛛
General Securi	w	
Enable Secu	rity Default Encryption Key: Unique	•
- Encryption Key	is (Hex U-9 A+) Key L	ength (bits):
Unique Key:	××××××××××	40+24) 10 hex digits 💌
Shared Keys:		
First:	×××××××××××	40+24) 10 hex digits 💌
Second:	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	(128+24) 32 hex digits 💌
Third:	***************************************	(104+24) 26 hex digits 💌
Fourth:	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	40+24) 10 hex digits 💌
		OK Cancel

#### Ad Hoc Mode

This section defines the process of configuring an AlphanetworksWMP-G02V Wireless Network mini PCI Card in ad hoc or IBSS mode. See Section "Ad Hoc Mode" on page 2-23 for descriptions of ad hoc operation.

- Similar to the setup of AP Infrastructure mode described in the previous section, ad hoc mode is also configured by changing the options in the "Network Configuration Settings" window. Use the following information as a guideline to choose the values of each field in the configuration window:
  - Configuration Name: This field identifies the configuration. This name must be unique. Configuration names are case insensitive, for example, "Ad Hoc."

- Network Name (SSID): A Network Name is mandatory for ad hoc mode. The SSID for all stations in a single ad hoc network must be the same.
- Network Connection: Ad Hoc.
- Power Saving: Power saving mode is not currently supported in an ad hoc network.
- Turbo Mode: All stations participating in the ad hoc network must have the same rate setting.
- Locally Administered Address: This field defines the locally administered MAC address (LAA). To enter a value in the address field, the check box needs to be selected.

Network Configuration Settings	? 🗙
General Security	
Configuration Name: Ad Hoc	
Network Name (SSID): Adhoc_Network	
Network Connection: Ad Hoc	
Power Saving: Off	
Turbo Mode: Disable	
Locally Administered Address: (Hex 0-9 A-F)	
OK	Cancel

2. You can optionally set up security features, but it is not typically a requirement because the duration of the ad hoc network tends to be limited. Currently, shared key security is supported in ad hoc mode. Future Alphanetworkssoftware implementations will provide unique key support.

3. In ad hoc mode, a station scans the air for an existing BSS. If no BSS is found, the station establishes a BSS for other stations to join. When other stations scan the air and find an established BSS in place, they join that BSS to form an ad hoc network. If a specific set of stations requires ad hoc network connectivity, it is recommended to have one station establish a BSS first before configuring the remaining stations. This prevents the scenario of several stations trying to form a BSS at the same time, which can result in multiple singular BSSs being established, rather than a single BSS with multiple stations.

#### **TCP/IP Setup**

After configuring the AlphanetworksWMP-G02V Wireless Network mini PCI Card through the Network Control Panel, the TCP/IP address for the network device needs to be configured.

 From the Start menu, choose Programs > Accessories > Communications > Network Connections. Find the "Local Area Connection" that is associated with the AlphanetworksWMP-G02V Wireless Network mini PCI Card. Right-click that connection and click Properties.



2. Select "Internet Protocol (TCP/IP)" and click Properties. Click "Use the following IP address" and input an IP address and Subnet mask. Depending on the type of network the station connects to, Gateway and DNS Configuration information can also be required. IP configuration information (DHCP or assigned IP address, Gateway and DNS server IP addresses) is usually obtained from the corporate IT staff. For a simple demonstration, the station is assigned a static IP address. Click OK in both "Internet Protocol (TCP/IP) Properties" and "Local Area Connection Properties" to complete the IP configuration.

🕹 Wireless Network Connection 4 Properties 👘 🤶 🗙	Internet Protocol (TCP/IP) Properties	
General Wireless Networks Authentication Advanced	General	
Connect using:  Atheros AR5000 Wireless Network Adapter #4	You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.	
Configure This connection uses the following items:	<u>D</u> btain an IP address automatically <u>Use the following IP address</u>	
Client for Microsoft Networks      Ele and Printer Staring for Microsoft Networks	<u>I</u> P address: 192.168.1.20	
✓ The and Printer Shaling to Microsoft Networks ✓ Themet Protocol (TCP/IP)	Subnet mask: 255 , 255 , 255 , 0	
	Default gateway:	
Install Uninstall Properties	○ 0 <u>b</u> tain DNS server address automatically	
Description	O Use the following DNS server addresses:	
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication	Preferred DNS server:	
across diverse interconnected networks.	Alternate DNS server:	
Show icon in notification area when connected	Ad <u>v</u> anced	
OK Cancel	OK Cancel	

3. Choose Start > Programs > Accessories > Command Prompt to open a command prompt window. Type "ipconfig" to determine if the TCP/IP configuration has taken effect. To test IP connectivity in ad hoc or infrastructure mode, use the "ping <IP address>" command. When a TCP/IP connection is established, the LinkMon utility (see Chapter 7) can be used to monitor the operating status of AlphanetworksWMP-G02V Wireless Network mini PCI Card.

Select C:\WINNT\System32\cmd.exe	- 🗆 X
Ethernet adapter Wireless Network Connection 4:	
Connection-specific DNS Suffix .: IP Address	
C:\Documents and Settings\FAE>ping 192.168.1.21	
Pinging 192.168.1.21 with 32 bytes of data:	
Reply from 192.168.1.21: bytes=32 time<1ms TTL=128 Reply from 192.168.1.21: bytes=32 time<1ms TTL=128 Reply from 192.168.1.21: bytes=32 time<1ms TTL=128 Reply from 192.168.1.21: bytes=32 time<1ms TTL=128	
Ping statistics for 192.168.1.21: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = Oms, Maximum = Oms, Average = Oms C:\Documents and Settings\FAE>	<b>-</b>

4. To map the drive on another machine to your computer, from the Start menu, choose My Computer and right-click to select "Map Network Drive...."



5. Assign the drive letter that maps to the network-shared folder and specify the shared folder information. Click Finish to map the drive.

Map Network Drive			
	Windows and assig access th Specify ti that you	can help you connect to a sh on a drive letter to the connect ne folder using My Computer. he drive letter for the connect want to connect to:	hared network folder ction so that you can ction and the folder
	<u>D</u> rive: F <u>o</u> lder:	Y: \\192.168.1.21\C\$ Example: \\server\share ✓ Reconnect at logon Connect using a <u>different us</u> Sign up for online storage or network server.	Browse Browse
		< <u>B</u> ack Finish	Cancel

6. After mapping the drive, you can perform file transfers, video streaming, and all other network data transfers that are normally performed with wired 10/100 Ethernet connections.

## Windows XP Wireless Network Configuration

Aside from using the Network Control Panel (NCP) to configure the AlphanetworksWMP-G02V Wireless Network mini PCI Card, Windows XP provides zero-configuration functionality that automatically tries to connect the STA to available wireless networks in the following order:

- a. Infrastructure mode with valid WEP keys
- b. Infrastructure mode with unauthenticated access for stations without WEP keys
- c. Ad hoc mode

To configure wireless network settings through the Windows XP user interface, open Network Connections from Control Panel. Right-click the Local Area Network Connection icon (pertinent to AlphanetworksWMP-G02V Wireless Network mini PCI Card), click Enable to enable the device first, and then click Properties. On the Wireless Networks tab, select the "Use Windows to configure my wireless network settings" check box to enable automatic wireless network configuration. Follow Section "Infrastructure Mode" on page 5-12 or Section "Ad Hoc Mode" on page 5-13 to set up the station to connect to an infrastructure or ad hoc network.

If you want to use non-default settings for power saving and turbo mode, you should set those parameters through the NCP method described in Section "Device Configuration" on page 5-10. Then use Wireless Networks tabs to select network name, network type, and encryption keys.

Note that you can disable automatic wireless network configuration, and revert back to using AlphanetworksNCP configuration settings, by clearing the "Use Windows to configure my wireless network settings" check box.

🕹 Wireless Network Connection 4 Properties 👘 🕐 🔀
General Wireless Networks Authentication Advanced
✓ Use Windows to configure my wireless network settings
Available networks:
Test_Alpha     Adhoc_Network     Refresh
Preferred networks: Automatically connect to available networks in the order listed below:
Move <u>up</u>
Move <u>d</u> own
Add Remove Properties
Learn about <u>setting up wireless network</u> <u>configuration.</u> Ad <u>v</u> anced
OK Cancel

### Infrastructure Mode

To set up automatic wireless network configuration to connect to an existing Access Point (infrastructure network):

1. Click the network name under "Available networks" in the Wireless Networks tab, and click Configure. You can update the list of available networks that are within range of your computer by clicking Refresh under Available Networks.

🕹 Wireless Network Connection 4 Properties 💦 🛛 🔀
General Wireless Networks Authentication Advanced
✓ Use <u>W</u> indows to configure my wireless network settings
To connect to an available network, click Configure
L'Test_Alpha Configure Adhoc_Network Refresh
Preferred networks: Automatically connect to available networks in the order listed below:
Move <u>up</u>
Move down
Add <u>R</u> emove Properties
Learn about <u>setting up wireless network</u> <u>configuration.</u> Ad <u>v</u> anced
OK Cancel

2. If the network requires WEP, then the "Data encryption (WEP enabled)" check box is selected by default in Wireless Network Properties. Select the "The key is provided for me automatically" check box if the WEP key is automatically provided for you. The driver will then use the Default Encryption key from the current AlphanetworksNCP configuration profile irrespective of the network name. You may choose to enter the WEP key by clearing this check box and manually entering the network key and key length. Note that the key format must be hexadecimal digits and the key length is limited to 104-bit in Windows XP, as opposed to 128-bit key supported by AlphanetworksNDIS driver in the NCP configuration interface. If the network that you are connecting to requires 128-bit WEP key, then it is recommended that you disable Windows XP automatic wireless network configuration and use AlphanetworksNCP configuration instead.

Wireless Network Prop	erties 🛛 🛛 🔀	
Network <u>n</u> ame (SSID):	Test_Alpha	
Wireless network key (WE	P)	
This network requires a ke	y for the following:	
☑ Data encryption (WEP enabled)		
Network <u>A</u> uthenticat	ion (Shared mode)	
Network <u>k</u> ey:		
Key <u>f</u> ormat:	ASCII characters	
Key length:	104 bits (13 characters) 💌	
Key inde <u>x</u> (advanced):	0	
✓ The key is provided for me automatically		
This is a <u>c</u> omputer-to-con access points are not use	nputer (ad hoc) network; wireless	

### Ad hoc mode

To connect to an existing computer-to-computer (ad hoc) network:

1. Click the ad hoc network name under "Available networks" in the Wireless Networks tab, and click Configure.

🖵 Wireless Network Connection 4 Properties 💦 💽		
General Wireless Networks Authentication Advanced		
Use Windows to configure my wireless network settings		
Available networks:		
To connect to an available network, click Configure.		
I Test_Alpha		
Refresh		
- Preferred petwork or		
Preferred networks: Automatically connect to available networks in the order listed below:		
Move <u>up</u>		
Move <u>d</u> own		
Add <u>R</u> emove Properties		
Learn about <u>setting up wireless network</u> <u>configuration.</u> Ad <u>v</u> anced		
OK Cancel		

2. In Wireless Network Properties, the "This is a computer-to-computer (ad hoc) network; wireless access points are not used" check box is selected by default. You may choose to enable WEP by selecting the "Data encryption (WEP enabled)" check box and the "Network Authentication (Shared mode)" check box. Select the "The key is provided for me automatically" check box if the shared key is automatically provided for you. The driver will then use the Default Encryption key from the current AlphanetworksNCP configuration profile irrespective of the network name. You may choose to enter the shared key by clearing this check box and enter the key and key length manually. Note that the key format must be hexadecimal digits and the key length is limited to 104-bit in Windows XP as opposed to 128-bit key supported by AlphanetworksNDIS driver in the NCP configuration interface. If the network that you are connecting to requires 128-bit WEP key then it is recommended that you disable Windows XP automatic wireless network configuration and use AlphanetworksNCP configuration instead.

Wireless Network Properties		
Network <u>n</u> ame (SSID):	Adhoc_Network	
-Wireless network key (WE	P)	
This network requires a ke	ey for the following:	
Data encryption (WEP enabled)		
Network <u>A</u> uthentical	ion (Shared mode)	
Network <u>k</u> ey:		
Key <u>f</u> ormat:	ASCII characters	
Key length:	104 bits (13 characters) 💌	
Key inde <u>x</u> (advanced):	0	
✓ The key is provided for me automatically		
✓ This is a <u>c</u> omputer-to-cor access points are not us	nputer (ad hoc) network; wireless ed OK Cancel	

3. If you want to connect to an ad hoc network, but both ad hoc and infrastructure networks are within range of your computer, then click Advanced in the Wireless Networks tab and then select "Computer-tocomputer (ad hoc) networks only". Note that if you want the station to start its own ad hoc network, the "Computer-to-computer (ad hoc) networks only" option should be selected. There should be no network active from the preferred list and the "Automatically connect to nonpreferred networks" check box should be cleared.

Advanced ? 🔀
Networks to access
O Any available network (access point preferred)
O Access point (infrastructure) networks only
Omputer-to-computer (ad hoc) networks only
Automatically connect to non-preferred networks

#### Connect to an Available Wireless Network

When there is more than one available network detected by Windows XP, the OS will prompt the user to select and connect to a preferred network.



To connect to an available wireless network, right-click the network connection icon in the notification area, and then click "View Available Wireless Networks".

	5 🛒 👯 12:07 PM
Open Network Connections	
View Available Wireless Networks	

In Connect to Wireless Network, under "Available networks", select the wireless network that you want to connect to. If a network key is required and is automatically provided for you, then leave "Network key" blank. If the network key is not automatically provided for you, then type the key in "Network key". Click Connect to establish the network connection.

Connect to Wireless Network		
The following network(s) are available. To access a network, select it from the list, and then click Connect.		
Available <u>n</u> etworks:		
La Test_Alpha		
This network requires the use of a network key (WEP). To access this network, type the key, and then click Connect.		
Network key:		
If you are having difficulty connecting to a network, click Advanced.		
Advanced Connect Cancel		

If you are either unable to make a connection to the wireless network that you selected or need to configure additional wireless network connection settings, click Advanced in Connect to Wireless Network, and the Wireless Networks tab will appear.

🕹 Wireless Network Connection 7	Properties 💦 🛛 🔀	
General Wireless Networks Authenticat	ion Advanced	
Use Windows to configure my wireless	network settings	
Available networks:		
To connect to an available network, clip	ck Configure.	
👗 Test_Alpha	Configure	
Adhoc_Network	R <u>e</u> fresh	
Preferred networks: Automatically connect to available networks in the order listed		
	Move <u>up</u>	
	Move <u>d</u> own	
Add Remove Pr	operties	
Learn about <u>setting up wireless network</u> configuration.	Adyanced	
	OK Cancel	

You can configure a new wireless network connection by clicking Add, and specifying the network name (SSID) in Wireless Network Properties, and the wireless network key settings, if needed. If the network connection that you are configuring is an ad hoc network, then select "This is a computer-to-computer (ad hoc) network; wireless access points are not used" check box. The network will be added under "Preferred networks" in the Wireless Networks tab.

Wireless Network Properties		
Network <u>n</u> ame (SSID):	Test_Network	
Wireless network key (WE	P)	
This network requires a key for the following:		
Data encryption (WEP enabled)		
Network <u>A</u> uthenticat	ion (Shared mode)	
Network <u>k</u> ey:		
Key <u>f</u> ormat:	ASCII characters	
Key Jength:	104 bits (13 characters) 💌	
Key inde <u>x</u> (advanced):	0	
✓ The key is provided for	me automatically	
This is a <u>c</u> omputer-to-con access points are not use	nputer (ad hoc) network; wireless ed OK Cancel	

You can change the order of the preferred networks by selecting the wireless network that you want to reposition on the list, and then clicking Move up or Move down. You can change the wireless network connection settings of a preferred network by selecting the wireless network, clicking Properties, and then changing the settings as needed. To remove a wireless network from the list of preferred networks, select the wireless network that you want to remove, and then click Remove.

- Wireless Network Connection 7 Pro	perties 🛛 김 🔀
General Wireless Networks Authentication	Advanced
✓ Use <u>W</u> indows to configure my wireless netw	vork settings
Available networks:	
To connect to an available network, click Co	nfigure.
👗 Test_Alpha	Configure
Adhoc_Network	Befresh
_ <u>P</u> referred networks:	
Automatically connect to available networks below:	in the order listed
🛪 Test_Network	Move up
👗 Test_Alpha	
Adhoc_Network	Move <u>d</u> own
Add <u>R</u> emove Pr <u>o</u> pert	ies
Learn about <u>setting up wireless network</u> configuration.	Advanced
	Cancel

If a network is not defined in the preferred networks list, but you know it is available and you want to automatically connect to it, then click Advanced in the Wireless Networks tab, and select the "Automatically connect to nonpreferred networks" check box.

Advanced ? 🔀
<ul> <li>Networks to access</li> <li>Any available network (access point preferred)</li> <li>Access point (infrastructure) networks only</li> <li>Computer-to-computer (ad hoc) networks only</li> </ul>
Automatically connect to non-preferred networks

# **6** Windows NT 4.0

## **Driver Installation and TCP/IP Setup**

Windows NT 4.0 does not support Plug-and-plug. Therefore, the AlphanetworksNDIS driver installation uses an approach that is different from the installation used in other Operating Systems. In order to install AlphanetworksWMP-G02V Wireless Network mini PCI Card in Windows NT 4.0 with Service Pack 6, a PC Card utility called CardWizard is used. If your computer system does not have CardWizard utility pre-loaded, then you can purchase it from SystemSoft Corporation (www.systemsoft.com) or you can download a 14-day evaluation copy from ftp://www.systemsoft.com/pub/Wn51tren.exe. Note that CardWizard requires Windows NT 4.0 Build 1381 (Service Pack 6) installed in order to function correctly. Please install Service Pack 6 if your Windows NT 4.0 is not updated.

After CardWizard utility is loaded, insert the AlphanetworksWMP-G02V Wireless Network mini PCI Card into a 32-bit CardBus slot, and follow these steps to install the NDIS driver:

1. CardWizard will detect the insertion of the AlphanetworksCardBus card and show the following screen. Click Correct to continue.

Wizard	×
Wizard Information	
AR5BCB-01-01, Atheros Communications, Inc.	
The inserted card has not yet been configured. This may mean that the driver has not been installed or configured. Select CORRECT in order to fix this problem.	Test
When you press the CORRECT button, you may be prompted to supply the system drivers needed. Please have the Windows NT setup disk and/or the card manufacturer's install disk and/or the card manufacturer's install disk and the base setup.	Help
install disk ready in this case.	Exit
 Ei	nable AutoCorrection 🗖

2. Click OK to continue.

CardWizard for Windows NT
CardWizard cannot locate the driver for this card. Click "DK" to start the Network Control Panel, and choose "Add" on the "Adapters" page to install the card.
Cancel

3. Windows NT 4.0 Network Properties windows displays. Click Add to continue.

letwork			? ×	
Identification Ser	vices Protocols	Adapters Bind	lings	
Network Adapters:				
<u>A</u> dd	<u>R</u> emove	Properties	<u>U</u> pdate	
Item Notes:				
		OK	Cancel	

4. Click Have Disk.



5. Manually enter the location of where the AlphanetworksNDIS 4.0 driver is located. For example, D:\NDIS\BIN\PRODUCTION\NDIS4. Click OK to continue.


6. Make sure AlphanetworksWMP-G02V Wireless Network mini PCI Card is selected. Click OK to continue.

Select OEM Option	$\times$
Choose a software supported by this hardware manufacturer's disk.	
Alleges AD 5000 V Gelese Metwork Advetes	
Ameros Anauuu wireless Network Adapter	
OK Cancel <u>H</u> elp	

7. Set Map Registers, QoS, and Transmit Power Control to default values and click OK.

AR5000 Wireless Network Adapter Setup V1.01			
Map Registers:	256		
QoS (802.11e):	Disabled 💌		
Transmit Power Control:	Highest Power		
	OK Cancel		

8. Windows NT 4.0 binds TCP/IP protocol to AlphanetworksWMP-G02V Wireless Network mini PCI Cards and TCP/IP properties have to be entered. Depending on the type of network the station connects to, Gateway and DNS Configuration information may also be required. IP configuration information (DHCP or assigned IP address, Gateway and DNS server IP addresses) is usually obtained from the corporate IT staff. For a simple demonstration, the station is assigned a static IP address. Choose "Specify an IP address" and enter an IP address and subnet mask. Assigning an IP address and subnet mask allows the station to interact with the AP or other stations in the same IP subnet. Click OK to complete the TCP/IP configuration.

Microsoft TCP/IP Properties				
IP Address DNS WINS Address Routing				
An IP address can be automatically assigned to this network card by a DHCP server. If your network does not have a DHCP server, ask your network administrator for an address, and then type it in the space below.				
Adapter:				
111 Atheros AR5000 Wireless Network Adapter				
○ <u>O</u> btain an IP address from a DHCP server         ● <u>S</u> pecify an IP address <u>IP Address:</u> <u>192.168.1.93</u> Subnet Mask:         255.255.0				
3 <u>d</u> brick mask. 233 : 233 : 233 : 0				
Default <u>G</u> ateway:				
A <u>d</u> vanced				
OK Cancel Apply				

9. Restart the system for the changes to take effect.



### **Device Configuration**

Configuration of the AlphanetworksWMP-G02V Wireless Network mini PCI Card can be done through the AlphanetworksNIC Configuration Control Panel applet provided by Alpha. Similar to Windows 2000, the device can be set to work in one of two modes, either infrastructure mode or ad hoc mode. See Section "Device Configuration" beginning on page 2-17 for more details on these network connection types.

Start AlphanetworksNIC Configuration utility from the Control Panel.

🗟 Control Panel							_ 🗆 ×
<u>F</u> ile <u>E</u> dit ⊻iew <u>G</u> o F <u>a</u> vorites	<u>H</u> elp						æ
Back Forward Up	Cut Copy	Paste	≌?) Undo	X 😭 Delete Propertie	es Views	-	
Address 🞯 Control Panel							•
Control	Panel						
		Add/Bemove			Date/Time		Display
Atheros NIC Configuration Configures Atheros NIC	Options	Programs	Configuration				
Microsoft Home	Aa		<u> </u>		ð	D	
Technical Support	Fonts	Intel(R) PROSet	Internet	Java Plug-in 1.3.0_01	Keyboard	Mail	Microsoft Mail Postoffice
		õ	<b>50</b>	<b>₽</b> 2	<b>S</b> P		<b>P</b>
	Modems	Mouse	Multimedia	Network	ODBC	PC Card (PCMCIA)	Ports
		real	۲	¢			
	Printers	RealPlayer	Regional Settings	SCSI Adapters	Server	Services	Sounds
	<b></b>		\$	<b>31</b>			
	System	Tape Devices	Telephony	UPS			
1 object(s) selected	Configures	Atheros NIC			💷 My Con	nuter	

Select one of the configuration(s) under the configuration list and click Modify or click New, and follow the Section "Infrastructure Mode" on page 6-8 and Section "Ad Hoc Mode" on page 6-11 to set up the station to work in infrastructure mode and ad hoc mode.

Atheros NIC Configur	ation		? X
Network Card:	AR5210N42		
Selected Configuration:	Default		
Configuration List			
Default			<u>N</u> ew
			<u>M</u> odify
			<u>D</u> elete
	Details		
Network Name (SSI Network Connection	D): <empty> : AP (Infrastructure)</empty>		
Turbo Mode : Power Management:	Disabled Normal		
Data Security:	Disabled		
		ОК	Cancel

### Infrastructure Mode

This section defines the process of configuring an AlphanetworksWMP-G02V Wireless Network mini PCI Card in infrastructure mode. Refer to Section "Device Configuration" beginning on page 2-17 for detailed descriptions of each option in the Network Configuration Settings.

- 1. Under the "General" tab, make sure the "Locally Administered Address" checkbox is unchecked. Use the following information as a guideline to choose the values of each field in the configuration window:
  - Configuration Name: This field identifies the configuration. This name must be unique. Configuration names are case insensitive. For example, "AP".

- Network Name (SSID): This is the name of the IEEE 802.11b/g wireless network. For example, "Alpha\_AP". This field has a maximum limit of 32 characters. If this field is left blank, the STA will connect to the AP with the best signal strength.
- Network Connection: AP (Infrastructure).
- Power Saving: This field allows the configuration of power management options. The options are Off, Normal, and Maximum.
- Turbo Mode: This field enables or disables AlphanetworksTurbo mode.

Network Configuration Settings		? ×
General Security		
Configuration Name:	AP	
Network Name (SSID):	Atheros_AP	
Network Connection:	AP (Infrastructure)	
Power Saving:	Normal	
Turbo Mode:	Disable	
Locally Administered Address: (Hex 0-9 A-F)		
	ОК С	ancel

Usually, infrastructure mode is used in an enterprise environment where APs are installed and maintained by corporate IT staff. Much of the data in the enterprise network is confidential. It is important to configure security to make sure only stations with appropriate keys can receive sensitive data. The AlphanetworksWMP-G02V Wireless Network mini PCI Card and NDIS driver support key lengths of 40-bits, 104-bits and 128-bits. Typically, the appropriate encryption and decryption keys will be supplied by the corporate IT staff.

Network Configura	ation Settings ? 🗙
General Security	1
🔽 Enable Securit	Default Encryption Key: Unique
Encryption Keys	(Hex 0-9 A-F)
Unique Keur 🗵	
Shared Keys:	
First:  *	152 (128+24) 32 hex digits
Second:	64 (40+24) 10 hex digits 💌
Third:	64 (40+24) 10 hex digits 💌
Fourth:	64 (40+24) 10 hex digits 💌
	OK Cancel

### Ad Hoc Mode

This section defines the process of configuring an AlphanetworksWMP-G02V Wireless Network mini PCI Card in ad hoc or IBSS mode. Refer to Section "Ad Hoc Mode" on page 2-23 for detail descriptions of ad hoc operation.

- Similar to the set up of AP Infrastructure mode described in the previous section, ad hoc mode is also configured by changing the options in "Network Configuration Settings" window. Use the following information as a guideline to choose the values of each field in the configuration window:
  - Configuration Name: This field identifies the configuration. This name must be unique. Configuration names are case insensitive. For example, "Ad Hoc".
  - Network Name (SSID): A Network Name is mandatory for ad hoc mode. The SSID for all stations in a single ad hoc network must be the same.
  - Network Connection: Ad Hoc.
  - Power Saving: Power saving mode is not currently supported in an ad hoc network.
  - Turbo Mode: All stations participating in the ad hoc network must have the same rate setting.
  - Locally Administered Address: This field defines the locally administered MAC address (LAA). To enter a value in the address field, the check box needs to be selected.

Network Configuration Settings		? ×
General Security		
Configuration Name:	Ad Hoc	
Network Name (SSID):	Adhoc	
Network Connection:	Ad Hoc	
Power Saving:	Off	
Turbo Mode:	Disable	
Locally Administered Address: (Hex 0-9 A-F)		
	OK	Cancel

2. You may optionally set up security features, but it is not typically a requirement, since the duration of the ad hoc network tends to be limited. Currently, only shared key security is supported in ad hoc mode. Future Alphanetworkssoftware implementations will provide unique key support.

Network Configu	ation Settings	? ×
General Security	4	
	•	
🗹 Enable Secur	Default Encryption Key:	First 💌
Encryption Keys	s (Hex 0-9 A-F)	Key Length (bits):
Unique Key:	201001000000000000000000000000000000000	152 (128+24) 32 hex digits
Shared Keys:		
First:	***************************************	152 (128+24) 32 hex digits 💌
Second:		64 (40+24) 10 hex digits 💌
Third:		64 (40+24) 10 hex digits 💌
Fourth:		64 (40+24) 10 hex digits 💌
		OK Cancel

3. In ad hoc mode, a station will scan the air for an existing BSS. If no BSS is found, the station will establish a BSS for other stations to join. When other stations scan the air and find an established BSS in place, they join that BSS to form an ad hoc network. If a specific set of stations requires ad hoc network connectivity, it is recommended to have one station establish a BSS first before configuring the remaining stations. This will prevent the scenario of several stations trying to form a BSS at the same time, which may result in multiple singular BSSs being established rather than a single BSS with multiple stations.

### **Verify Connection**

You may use LinkMon utility to monitor the operating status of AlphanetworksWMP-G02V Wireless Network mini PCI Card once the STA is connected. Please refer to Chapter 7 for descriptions of LinkMon utility. If the STA is configured properly then you will be able to perform ping test as well as other network applications that a wired Ethernet device can perform.

 Choose Start > Programs > Accessories > Command Prompt to open the command prompt window. Type "ipconfig" to determine if the TCP/IP configuration has taken effect. To test IP connectivity in ad hoc or infrastructure mode, use the "ping <ipaddress>" command.

C:\WINNT\System32\cmd.exe	_ 🗆 ×
Microsoft(R) Windows NT(TM) (C) Copyright 1985-1996 Microsoft Corp.	
C:\>ipconfig	
Windows NT IP Configuration	
Ethernet adapter AR5210N41:	
IP Address : 192.168.1.93 Subnet Mask : 255.255.255.0 Default Gateway :	
C:\>ping 192.168.1.90	
Pinging 192.168.1.90 with 32 bytes of data:	
Reply from 192.168.1.90: bytes=32 time<10ms TTL=128 Reply from 192.168.1.90: bytes=32 time<10ms TTL=128 Reply from 192.168.1.90: bytes=32 time<10ms TTL=128 Reply from 192.168.1.90: bytes=32 time<10ms TTL=128	
C:∖>	

2. To map the drive on another machine to your computer, right-click "My Computer" and click "Map Network Drive...."



3. Specify the path of a network-shared folder.

Map Networ	< Drive		×
<u>D</u> rive:	🗇 F:	•	ОК
<u>P</u> ath:	\\192.168.1.90\C\$	•	Cancel
Connect As:			<u>H</u> elp
	Reconnect at Logon		
Shared Direct	ories:	<b>⊠</b> <u>Е</u> хра	and by Default
🔆 Microso	ft Windows Network		
1			

4. After mapping the drive, you can perform file transfers, video streaming, and all other network data transfers that are normally performed with wired 10/100 Ethernet connections.

## **Driver Uninstallation**

This section provides uninstallation procedures for removing the AlphanetworksNDIS driver from the system.

1. To remove the NDIS driver from the system, go to Control Panel and open Network properties.



2. Under the Adapters tab, choose AlphanetworksWMP-G02V Wireless Network mini PCI Card and click Remove.

Network			? ×
Identification Se	vices Protocols	Adapters Bin	dings
Network Adapter	s:		
I] Atheros A	R5000 Wireless	Network Adapter	
Add	<u>R</u> emove	Properties	Update
Item Notes:			
Atheros AR5000	Wireless Networ	k Adapter	
		OK	Cancel

3. Click OK to confirm the removal of the AlphanetworksWMP-G02V Wireless Network mini PCI Card.



4. AlphanetworksWMP-G02V Wireless Network mini PCI Card is no longer listed under the Adapters tab. Click Close to continue.

Network			? ×
Identification Ser	vices   Protocols	Adapters Bir	ndings
Network Adapters	:		
	. 1	ь <u>с</u> 1	
<u>Aad</u>	<u>H</u> emove	Properties	Update
Item Notes:			
J			
		Close	Cancel

5. Restart the system to complete the un-installation of AlphanetworksNDIS 4.0 driver.



# 7 LinkMon

### Installation

LinkMon is a Graphical User Interface (GUI) program that provides detailed operational status and statistics for the AlphanetworksWMP-G02V Wireless Network mini PCI Card. The LinkMon executable file, linkmon.exe, is included on the AlphanetworksRelease Version CD, and is in the folder \ndis\bin\production\. Copy this file from the CD to a local drive for execution.

Since Windows 98 SE does not have native support for WMI, which is required to make LinkMon work correctly, an upgrade from Microsoft is needed. Use the procedures described in the following section to acquire and install the necessary WMI module from Microsoft. This is only required for Windows 98 SE installations.

- 1. Download WMI installer from Microsoft (wmi9x.exe) and save it to your hard disk.
- 2. Execute WMI installer by double-clicking wmi9x.exe.

En Edit Year So Tyra	ites Hob			
de - Eu	1 X D	Paste Undo De	Acto Properties Views	-
Agabasa 🔁 C Willinstattor We	68			×
WMI install for Win98	Nane Symmetrics (	Size Type 3.02968 Application	Modiled 7/11/01 B D0 AM	
Select as itam to view its description.				
	2.9540	國務	Conputer	

3. Click Next to continue.



4. Click "I accept this agreement" and then click Next to continue.



5. Click Next to continue.



6. The installer now installs files to the SYSTEM directory.



7. The system must be rebooted for the WMI installation files to become effective. When the system completes the rebooting process, launch LinkMon.

### **Features**

There are five tabs in LinkMon used to display STA information:

- General tab
- Frame Statistics tab
- Transmit Retries tab
- Station tab
- Driver tab

Under the General tab of the LinkMon program property sheet is general information about the program and its operations.

A LinkMon			_ 🗆 🗙
Action Options Help			
Atheros AR5000 Wireless Network Adap	pter	•	
General Frame Statistics   Transmit Retries   S	tation Driver		
Card Name: Atheros AR5000 Wireless Mac Address: 00-03-7F-00-14-D8 Device Name: \DEVICE\{E04A72F3-43 Device ID: 0007 Class Subkey: 0013 Driver: C:\WINNT\System32\DF Driver Version: 1.3.0.0 Driver Date: 02 Nov 2001 06:48:46	s Network Adapter 7E-4722-9F56-084CB14 RIVERS\ar5210b.sys	BF6E7}	
Connection Information			
Turbo Mode: Off	Channel / Freq	juency: 52 / 5.26 GH	z
Network Type: Infrastructure	Link	Status: Connected	
WEP: Enabled	Transm	it Rate: 24 Mbps	
Power Save State: Awake	Receiv	e Rate: 24 Mbps	
Ready	CONNECTED	Tx 24 Mbps	Rx 24 Mbps

Under the Frame Statistics tab is statistical information showing the number of frames being sent and received, retry count on frames sent, frame checksum error counts for received frames, and receive signal strength indicator (RSSI) information. These fields are described in the Station Programmer's Guide under Appendix A as OIDs. LinkMon supports most of the OIDs listed in that section.

A LinkMon		_ 🗆 🗵
<u>A</u> ction <u>O</u> ptions <u>H</u> elp		
🕨 🕨 📕 Atheros AR5000 Wireless Netwo	rk Adapter 🗾	
General Frame Statistics Transmit Retri	ies Station Driver	
Transmit Statistics	Receive Statistics	
Frames Sent: 0	Frames Received: 0	
One Batury 0	Duplicate Frames: 0	
Une heay. 0	Multiple Duplicates: 0	
Excessive Retries: 0	Multicast Frames: 0	
FIFO Underruns: 0	FIFO Overruns: 0	
Huma Country 0	HW Reported FCS Errors: 4	
Hung Count. 0	SW Reported FCS Errors: 0	
ACK Receive Errors: 0	WEP Decryption Errors: 2	
Last ACK RSSI: 23	Last Frames RSSI: 23	
Ready	CONNECTED Tx 24 Mbps Rx 24 N	Mbps

Under the Transmit Retries tab is detailed transmit retry statistical information for transmitted frames.

A LinkMon				_ 🗆 🗙
Action Options Help				
🕨 📕 🗛 Atheros AR5000 Wireless Network Adag	pter		-	
General     Frame Statistics     Transmit Retries     Si       Transmit Retries:     Count     1     0       1     0     0     0       2     0     0     0       3     0     4     0       5     0     6     0       7     0     7     0       8     0     9     0       10     0     0	tation Driver Transmit I Frames S Excessive FIFO Unc Hung Cou ACK Rec Last ACK	nfo ent: ent: lerrun: unt: eive Errors: RSSI:	0 0 0 0 23	
Ready	CONNECTED	Tx 24 Mbps		Rx 24 Mbps

Under the Station tab is detailed BSS information including SSID, BSSID, association status, operating channel frequency, and information about scanned APs.

$\Lambda$	LinkMon					
Ac	tion <u>O</u> ption:	s <u>H</u> elp				
	Ather	ros AR 5000	) Wireless Network Adap	oter	<b>•</b>	
6	ieneral   Frar	me Statistic	s Transmit Retries St	ation Driver		
	Network Nam	ne (SSID):	DemoAP_4		Station Status:	Associated
	AP Address ()	Besini	00.03.75.40.01.10		Channel/Frequency:	64 / 5.32 GHz
	Scan List:	555123.			Regulatory Domain:	Ox10 FCC (US)
	Channel	RSSI	BSSID	Network Na	me (SSID)	
	52	24	00-03-7F-A0-00-95	Test_Alpha	I	
	60	10	00-03-7F-A0-00-41	videoap	11 5-4 65 00 00 00	
	64	21	00-03-7F-A0-01-13 00-03-7F-04-00-22	Atheros 602 Blue AP	. I TA WLAN 00:00:00	
	64	33	00-03-7F-A0-01-10	DemoAP 4		
	56	11	00-03-7F-A0-00-78	Test_Alpha	1	
_						
Rea	idy			CONNECTED	Tx 36 Mbps	Rx 24 Mbps

Under the Driver tab is statistical data pertaining to NDIS driver operation.

A LinkMon	
Action Options Help	
Atheros AR5000 Wireless Network Adapter	
General Frame Statistics Transmit Retries Station Driver	
NDIS Statistics	_ []
NDIS Resets: 0	
Self Induced Resets: 0	
NDIS Send Requests: 0	
NDIS Send Request Denied: 0	
Driver Information	
Ndis Version:     5.0       Driver:     C:\WINNT\System32\DRIVERS\ar5210b.sys       Driver Version:     1.3.0.0       Driver Date:     02 Nov 2001 06:48:46       INI File:     < not used>	
Ready CONNECTED Tx 36 Mbps Rx 24 Mbps	

The Action menu enables a NDIS driver unloading and reloading, and network interface card (NIC) reset. Note that driver unload option is not available in Windows Me, Windows 98SE, and Windows NT 4.0. NIC reset is also not available in Windows NT 4.0.

A LinkMon				
Action Options He	elp			
Stop	5000 Wireless Network Ada	pter	•	
Unload Driver NIC Reset	atistics   Transmit Retries   S	itation Driver		1
Exit	NDIS Resets: 0			
Self Ind	duced Resets: 0			
NDIS Se	end Requests: 0			
NDIS Send Re	quest Denied: 0			
Driver Information	on			
Ndis Version: Driver: Driver Version: Driver Date: INI File:	5.0 C:\WINNT\System32\E 1.3.0.0 02 Nov 2001 06:48:46 <not used=""></not>	)RIVERS\ar5210b.sys		
Ready		CONNECTED	Tx 24 Mbps	Rx 24 Mbps

On the Options menu, choose Settings....

LinkMon			
Action Options Help			
Settings Wireless Network Ad	dapter	•	
General Frame Statistics Transmit Retries	Station Driver		
NDIS Statistics			
NDIS Resets: 0			
Self Induced Resets: 0			
NDIS Send Requests: 0			
NDIS Send Request Denied: 0			
Driver Information			
Ndis Version: 5.0 Driver: C:\WINNT\System32 Driver Version: 1.3.0.0 Driver Date: 02 Nov 2001 06:48:46 INI File: <not used=""></not>	\DRIVERS\ar5210b.s	ys	
eady		Tx 24 Mbps	 Rx 24 Mbps

Under the Display tab, you can select the data display modes of "Cumulative" or "Relative." "Cumulative" mode displays statistical LinkMon data collected from the beginning of driver load. "Relative" mode displays differences in the statistical data since the last update.

Settings		×
Display Log File		
Data Display: Refresh Interval (ms):	Cumulative	
	OK Cancel	

Under the Log File tab, the logging function can be enabled to log to a file the statistical information collected by the LinkMon utility, for later reference or post processing by an application such as Microsoft Excel.

Settings				×
Display Log File				
🖂 🔽 Enable Log	ging			
Log File Path:	c:\test.log		Browse	
		OK	Ca	ancel

# 8 RFSilent

This chapter describes the RFSilent application that allows you to enable or disable the RF Signal (radio) on all AlphanetworksSTA Reference Designs. The RFSilent is a Windows-based application that appears in the right-hand corner of your Windows taskbar.

## **System Requirements**

The RFSilent application communicates with most Windows applications using Windows Management Instrumentation (WMI). For Windows NT 4.0, RFSilent communicates through the Input and Output Control (IOCTL) mechanism.

If you are using Windows 98SE, WMI does not come pre-installed and you must install it prior to using RFSilent. Refer to the following procedure to acquire and install the required WMI module from Microsoft.

### Windows 98SE Environment

If you want to use the RFSilent application in a Windows 98SE environment, you must install WMI.

Follow these steps to install WMI:

- 1. Download the WMI installer (wmi9x.exe) from Microsoft and save it to your hard disk.
- 2. Execute the WMI Installer by double-clicking wmi9x.exe.
- 3. Click Next to continue.

- 4. Click "I accept this agreement" and then click Next to continue.
- 5. Click Next to continue.

The installer now copies the necessary files to the SYSTEM directory.

6. Reboot the system.

## **RFSilent Setup**

The RFSilent application allows you to enable or disable AlphanetworksSTA References Designs. You can enable or disable the RFSilent application through user-defined settings. Refer to a description of driver parameters in the *AP Programmer's Reference Guide*.

## **Operation**

The RFSilent application is a Windows-based application that, once enabled, appears as an icon (RF) in the right-hand corner of your Windows taskbar (see Figure 8-1). You can automatically launch RFSilent at system boot-up by entering a shortcut statement in the Startup folder.

	Ln 19, Co	ol 45	REC COL O	IVR READ
💋 Pe	erforc	<u>J</u>	🛞 🔣 🚺 rf	2:42 PM

Figure 8-1. RFSilent Icon

Position your cursor over the RF Icon in your toolbar and use your right or left mouse button to display the RFSilent application selections (see Figure 8-2). The radio button on the side of menu selections indicates the current state of the RFSilent application.

<ul> <li>Disable RF Signal</li> </ul>		
Enable RF Signal		
About		
Exit		

Figure 8-2. RFSilent Menu Selections

Refer to Table 8-1 for a description of the RFSilent menu selections.

<b>RFSilent Menu Item</b>	Descriptions
Disable RF Signal	Use this selection to disable AlphanetworksSTA Reference Design.
Enable RF Signal	Use this selection to enable AlphanetworksSTA Reference Design.
About	Displays copyright, version information, and the build date for the RFSilent application.
Exit	Quits the RFSilent application.

Table 8-1. RFSilent Menu Descriptions

# 9 Troubleshooting

This chapter provides solutions to common problems that usually occur during the installation and operation of the AlphanetworksWMP-G02V Wireless Network mini PCI Card. Read the following descriptions if you are having problems. If you cannot find an answer here, please contact an Alphanetworksfield application engineer for assistance.

## 1. My computer does not recognize the AlphanetworksCardBus reference card.

Make sure the CardBus card is properly inserted into a 32-bit CardBus slot. If Windows does not detect the hardware upon insertion of the card, the system could have a previous AlphanetworksNDIS driver installed. Remove the old driver and try again.

## 2. The AlphanetworksWMP-G02V Wireless Network mini PCI Card does not work properly after the driver is installed.

Re-insert the CardBus card into the slot. A beep should be heard if the adapter is properly inserted. Go to Device Manager and make sure the AlphanetworksWMP-G02V Wireless Network mini PCI Card exists under the network adapters device node. If you see the yellow exclamation mark then there are conflicting resources. In this case, make sure the computer system has a free IRQ and make sure you have installed the proper driver. Uninstall the driver, restart the system, and repeat the driver installation steps if necessary.

### 3. Stations cannot associate in ad hoc mode.

Make sure the same service set identifier is specified for all stations that need to join the same ad hoc network. Set up one station to establish a BSS and wait briefly before setting up other stations. This prevents several stations from trying to establish a BSS at the same time, which can result in multiple singular BSSs being established, rather than a single BSS with multiple stations associated to it.

## 4. The station cannot access the Internet in the infrastructure configuration.

Make sure the station is associated and joined with the AP. If Wired Equivalent Privacy (WEP) security is enabled on the AP, the station must have the proper WEP keys specified. Also make sure TCP/IP properties are correctly configured.

### Federal Communication Commission Interference Statement

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

#### Statement Needed to be Shown on End Product

Since this module is installed inside the end product, the end product should be affixed a label on visible area showing that this product contain a RF module, and also its FCC ID.

#### **IMPORTANT NOTE:**

#### 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 20cm between the radiator & your body.

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

This device is intended only for OEM integrators under the following conditions:

1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and

2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as the 2 conditions above are met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

**IMPORTANT NOTE:** In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and Obtaining a separate FCC authorization.

### End Product Labelling

This transmitter module is authorized only for use in devices where the antenna may be installed such that 20 cm may be maintained between the antenna and users (for example access points, routers, wireless ASDL modems, and similar equipment). The final end product must be labeled in a visible area with the following: " Contains TX FCC ID: RRK2003060017-2".

### Manual Information That Must be Included

The users manual for end users must include the following information in a prominent location "

IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter."

The users manual for OEM integrators must include the following information in a prominent location "IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Chapter 皆誤!