# **D-Link**<sup>®</sup>

# DW-590 & DWL-A520

# **5GHz Wireless PCI Adapter**

User's Manual

First Edition (December, 2001) 6DWLA520..01

#### Wichtige Sicherheitshinweise

- 1. Bitte lesen Sie sich diese Hinweise sorgfältig durch.
- 2. Heben Sie diese Anleitung für den spätern Gebrauch auf.
- Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Vervenden Sie keine Flüssig- oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.
- 4. Um eine Beschädigung des Gerätes zu vermeiden sollten Sie nur Zubehörteile verwenden, die vom Hersteller zugelassen sind.
- 5. Das Gerät is vor Feuchtigkeit zu schützen.
- 6. Bei der Aufstellung des Gerätes ist auf sichern Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen. Verwenden Sie nur sichere Standorte und beachten Sie die Aufstellhinweise des Herstellers.
- Die Belüftungsöffnungen dienen zur Luftzirkulation die das Gerät vor Überhitzung schützt. Sorgen Sie dafür, daß diese Öffnungen nicht abgedeckt werden.
- 8. Beachten Sie beim Anschluß an das Stromnetz die Anschlußwerte.
- 9. Die Netzanschlußsteckdose muß aus Gründen der elektrischen Sicherheit einen Schutzleiterkontakt haben.
- Verlegen Sie die Netzanschlußleitung so, daß niemand darüber fallen kann. Es sollete auch nichts auf der Leitung abgestellt werden.
- 11. Alle Hinweise und Warnungen die sich am Geräten befinden sind zu beachten.
- 12. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.
- 13. Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. Elektrischen Schlag auslösen.
- 14. Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von authorisiertem Servicepersonal geöffnet werden.
- 15. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:
- a Netzkabel oder Netzstecker sint beschädigt.
- b Flüssigkeit ist in das Gerät eingedrungen.
- c Das Gerät war Feuchtigkeit ausgesetzt.
- d Wenn das Gerät nicht der Bedienungsanleitung ensprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.
- e Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.
- f Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.
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- 17. Wenden Sie sich mit allen Fragen die Service und Repartur betreffen an Ihren Servicepartner. Somit stellen Sie die Betriebssicherheit des Gerätes sicher.

18. Zum Netzanschluß dieses Gerätes ist eine geprüfte Leitung zu verwenden, Für einen Nennstrom bis 6A und einem Gerätegewicht großer 3kg ist eine Leitung nicht leichter als H05VV-F, 3G, 0.75mm2 einzusetzen

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### FCC Warning

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.

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 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 equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- → Reorient or relocate the receiving antenna.
- → Increase the separation between the equipment and receiver.
- → Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- → Consult the dealer or an experienced radio/TV technician for help.
- →

### **CE Mark Warning**

This is a Class B product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

### **VCCI Class B Warning**

この装置は、情報処理装置等電波障害自主規制協議会(VCCI) の基準に基づくクラスB 情報技術装置です。この装置は、家庭 環境で使用することを目的としていますが、この装置がラジオ やテレビジョン受信機に近接して使用されると、受信障害を引 き起こすことがあります。 取扱説明書に従って正しい取り扱いをして下さい。

### Notices

**NOTE:** This message denotes neutral or positive information that calls out important points to the text. A note provides information that may apply only in special cases.

**CAUTION:** Cautions call special attention to hazards that can cause system damage or data corruption, to a lesser degree than warnings.

**WARNING:** Warnings call special attention to hazards that can cause system damage, data corruption, personal injury, or death.

### Statements:

### Warning

To ensure compliance with FCC RF exposure requirements, the antenna used for this device 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 radio transmitter. Installers and end-users must follow the installation instructions provided in this user guide.

- 1. Modifications to this device, unless expressly approved by D-Link, could void the user's right to operate this equipment.
- 2. The frequency band 5150-5250 MHz is only for indoor usage to reduce potential for harmful interference to co-channel Mobile Satellite systems. The device can only be operated as an indoor unit.
- 3. High power radars are allocated as primary users (meaning they have priority) of 5250-5350 MHz and 5650-5850 MHz and these radars could cause interference and/or damage to LELAN devices used in Canada.

The PCI Card is to be used with antenna provided. Do not use other antennas that have not been approved or tested with the PCI card. Doing so will violate the grant of authorization approval and could result in a system exceeding the RF Exposure Requirements or the FCC radiation limits.

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# Preface

This user's guide provides the necessary information for first-time users to successfully install the D-Link Network Driver Interface Specification (NDIS) driver, for the purpose of evaluating and/or operating the D-Link DWL-A520 Station Reference Design in a Microsoft Windows environment. This guide also provides information for users who wish to upgrade the D-Link NDIS driver from previous releases.

This guide describes the steps required to install NDIS drivers for the D-Link DWL-A520 Wireless Network Adapter 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 802.11a 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 D-Link DWL-A520 Wireless Network Adapter 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 D-Link DWL-A520 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	Windows 98 Second Edition—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 D-Link DWL-A520 Station Reference Design.
Chapter 8	<b>RFSilent</b> —RFSilent application that allows you to enable or disable the RF Signal (radio) on all D-Link STA Reference Designs.
Chapter 9	<b>Troubleshooting</b> —Hints on fixing common Installation/Uninstallation and Device/Network Configurations issues.
Appendix A	Channel and Data Rate Selection—Describes how to select Fixed Data Rate and/or Channel Frequency for specific testing.

### **Audience**

This document is intended for D-Link customers who wish to install and evaluate the D-Link DWL-A520 Station Reference Design in the supported Microsoft Windows environments.

### **Additional Resources**

D-Link STA Reference Design hardware, software, and documentation contain proprietary information of D-Link Communications, 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:

- AR5110 Radio-on-a-Chip for 5-GHz Wireless LANs data sheet
- AR5210 MAC/Baseband Processor for IEEE 802.11a 5-GHz Wireless LAN data sheet
- AP User's Guide
- STA Reference Design Functional Specification

# 1 Introduction

The D-Link DWL-A520 Wireless Network Adapter is an IEEE 802.11a two-chip solution reference design based on the Atheros AR5110 and AR5210 chipset. This reference design implements a half-duplex, Orthogonal Frequency Division Multiplexing (OFDM) baseband processor supporting all IEEE 802.11a data rates (6 to 54 Mbps). It also supports the D-Link Turbo Mode<sup>™</sup> supporting data rates up to 108 Mbps. The host interface is compatible with the PC Card 7.1 standard. You can find information regarding the D-Link Station Reference Designs in the detailed *D-Link STA Reference Design Functional Specification*.

### **Package Contents**

Make sure the following materials are available before you begin:

- One 802.11a PCI Card
- One Installation CD-ROM containing software and utilities and this user's guide
- One 802.11a 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 802.11a-compliant device

## **Hardware Installation**

Follow these steps to install the 802.11a 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 802.11a 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.
- 10. Turn on the computer.

# **2** Windows 2000

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

Insert the D-Link DWL-A520 Wireless Network Adapter into a 32-bit CardBus slot and follow these steps to install the NDIS driver:



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)
C 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 dr	river files?
Search for driver files for the following hardwa	re device:
Ethernet Controller	
The wizard searches for suitable drivers in its any of the following optional search locations	driver database on your computer and in that you specify.
To start the search, click Next. If you are sear insert the floppy disk or CD before clicking Ne	ching on a floppy disk or CD-ROM drive, xt.
Optional search locations:	
Floppy disk 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	×
Ţ	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 D-Link driver 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 D-Link NDIS 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 D-Link NDIS 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		
General Network Identification Hardware User Profiles Advanced		
Hardware Wizard The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.		
Device Manager		
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 <u>P</u> rofiles		
OK Cancel Apply		

2. Within Device Manager, right-click "D-Link DWL-A520 Wireless Network Adapter" 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.

Atheros A	R5000 Wireless N	Network Adapter Properties			
General Advanced Settings Driver Resources					
	Atheros AR5000 \	Wireless Network Adapter			
	Driver Provider:	Atheros			
	Driver Date:	Not available			
	Driver Version:	1.2.0.3			
	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.					
<u>[</u>	<u>D</u> river Details	Update Driver			
		Close			

4. Click Next to continue.

Upgrade Device Driver Wizard						
	Welcome to the Upgrade Device Driver Wizard This wizard helps you upgrade a device driver for a hardware device.					
	l o continue, click Next.					
	< <u>B</u> ack <u>Next&gt;</u> Cancel					

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?	
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			
Selec W	et Network Adapter /hich network adapter do you want to insta	all?		
	Click the Network Adapter that matches y installation disk for this component, click I	your hardware, the Have Disk.	n click OK.	lf you have an
Network Atheros	Adapter: AR5000 Wireless Network Adapter			
⊙ Shov ⊙ Shov	v <u>c</u> ompatible hardware v <u>a</u> ll hardware of this device class		ļ	<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 "D-Link DWL-A520 Wireless Network Adapter" from the list and click Next to continue.

Upgrade	Device Driver Wizard			
Selec V	c <b>t Network Adapter</b> Vhich network adapter do you want to insta	II?		
	Click the Network Adapter that matches y installation disk for this component, click H	our hardware, t łave Disk.	hen click OK. If y	ou have an
Network Athero	. <u>A</u> dapter: s AR5000 Wireless Network Adapter			Have Disk
		< <u>B</u> ack	<u>N</u> ext >	Cancel

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

l	Update D	river Warning	$\times$
		Installing this device driver is not recommended because Windows cannot verify that it is compatible with your hardware. If the driver is not compatible, your hardware will not work correctly and your computer might becor unstable or stop working completely. Do you want to continue installing this driver?	me
		<u>Y</u> es	

10. Click Next to proceed with installation.



11. The D-Link NDIS 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.



12. Click Finish.



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

Atheros A	R5000 Wireless N	etwork Adapter Properties	? ×			
General	Advanced Setting	gs Driver Resources				
	Atheros AR5000 Wireless Network Adapter					
	Driver Provider:	Atheros				
	Driver Date:	Not available				
	Driver Version:	1.3.0.0				
	Digital Signer:	Not digitally signed				
To view Details. the drive	v details about the dri To uninstall the drive er files for this device Driver Details	iver files loaded for this device, click Driver er files for this device, click Uninstall. To upda e, click Update Driver. <u>Uninstall</u> <u>Update Driver</u>	ate			
		OK Canc	el			

14. Click Yes to restart system.



15. After system restarts, the "D-Link DWL-A520 Wireless Network Adapter" 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 D-Link software 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 "D-Link DWL-A520 Wireless Network Adapter," 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 "D-Link" 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 Help							1
🗧 🗧 🗧 🕹 🕹 🕞 🖓 Search	ers 🎯 History 🛛 🦉	° ¶X ≥	n III-				
Address 🔊 Search Results							<b>▼</b> ∂60
Search X C New	Search Be		oem8.inf In Folder: <u>C:\WINNT\inf</u> Size: 12,877 bytes Type: Setup Information				
Search for files or folders named: oem*.inf		Juits	Modified: 11/2/2001 6:48 AM				
Containing text: Atheros	Name	C:\WINN	r JT\inf		Releva	Size 13 KB	Type Setup Informal
Look in:  C:WVINNT\inf  Search Now  Stop Search	Confirm File Del	lete ile 'oem8.inf' is he Recycle Bir	a read-only file. Are you sure you ?	u want to move	×		
Search Options >> Search for other items: Files or Folders Computers			Yes	No			
Comparenz People Internet							
Type: Setup Information Size: 12.5 KB							<u> </u>

4. To complete the uninstallation, "ar5210b.sys" should also be removed from the "\WINNT\system32\drivers" folder.



# **Device Configuration**

Configuration of the D-Link DWL-A520 Wireless Network Adapter can be done through the Network Control Panel (NCP) in adapter properties. You can set the Wireless Network Adapter 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 Adapter 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 Adapter 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 DWL-A520 Wireless Network Adapter:

1. In the Device Manager, right-click "D-Link DWL-A520 Wireless Network Adapter," and click Properties to access the properties of the adapter.



2. Configuration additions, modifications, and deletions are made under the "Settings" tab of the "D-Link DWL-A520 Wireless Network Adapter" 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 802.11a wireless network, for example, "D-Link 802.11a 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 D-Link turbo 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)		
	ОК С	ancel

- 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 Configu	ation Settings		? X
General Securit	y]		
🔽 Enable Secu	ity Default Encryption Key:	First	•
- Encryption Key	s (Hex 0-9 A-F)	Key Length (bits):	
Unique Key:	*****	64 (40+24) 10 hex digits	<b>]</b>
Shared Keys:			
First:	******	64 (40+24) 10 hex digits	<u>-</u>
Second:	*******************************	152 (128+24) 32 hex digits	•
Third:	******	128 (104+24) 26 hex digits	<b>.</b>
Fourth:	******	64 (40+24) 10 hex digits	<b>I</b>
		OK Ca	ncel

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 D-Link DWL-A520 Wireless Network Adapter in infrastructure mode:

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

Network Configuration Settings	<u>?</u> ×
General Security	
Configuration Name: OF	FICE
Network Name (SSID): NE	Τ1
Network Connection: AF	(Infrastructure)
Power Saving:	
Turbo Mode: Dis	sable
Locally Administered Address: (Hex 0-9 A-F)	
	OK 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 802.11a wireless network, for example, "D-Link 802.11a 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 D-Link turbo 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 D-Link DWL-A520 Wireless Network Adapter 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 D-Link software 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: Off	
Turbo Mode: Disable	
Locally Administered Address: (Hex 0-9 A-F)	
ОК	Cancel

## **TCP/IP Setup**

After configuring the D-Link DWL-A520 Wireless Network Adapter 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 D-Link DWL-A520 Wireless Network Adapter. Right-click that connection, and click Properties.

🔁 Network and Dial-up Connections						
File Edit View Favorites Tools Advanced Help						
$] \leftarrow Back + \Rightarrow + \textcircled{1}$	← Back → → → 🔂   @ Search 🖓 Folders 🖓 History   😤 🧏 🗙 🖄 📰 -					
Address 🖻 Network and	Dial-up Connections		▼ 🔗 Go			
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	LAN Network cable unplugged	Atheros AR5000 Wireles	System			
	Disable					
1	Status					
1	Create Shortcut					
1	Delete					
	Rename					
	Properties					
	Fropercies					
🖳 Displays the properties o	of the selected connection.		11.			

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:
Client for Microsoft Networks     Deterministic Network Enhancer     Poterministic Network Enhancer     Poterministic Networks     Internet Protocol (TCP/IP)
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.

nternet Protocol (TCP/IP) Properties					
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.					
C Obtain an IP address automatical	y				
<ul> <li>Use the following IP address:</li> </ul>					
IP address:	192.168.1.21				
S <u>u</u> bnet mask:	255.255.255.0				
Default gateway:	· · ·				
C Obtain DNS server address autor	natically				
☐ Use the following DNS server add	Iresses:				
Preferred DNS server:					
<u>A</u> lternate DNS server:	<u> </u>				
	Ad <u>v</u> anced				
	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 D-Link DWL-A520 Wireless Network Adapter operating status.

	-
C:\WINNT\System32\cmd.exe	
C:\>ipconfig	-
Windows 2000 IP Configuration	
Ethernet adapter Local Area Connection 2:	
Connection-specific DNS Suffix .: IP Address: 192.168.1.21 Subnet Mask: 255.255.255.0 Default Gateway	
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	
С:\>_	
	-

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.

🕅 My Computer		
<u>File E</u> dit <u>V</u> iew F <u>a</u> vorites	<u>T</u> ools <u>H</u> elp	(A)
📙 🖨 Back 👻 🔿 👻 💽 🗐 🥘 Sear	rch 🔁 Folders 🎯 History 🛛 🦉	T X M III
Address 🖳 My Computer		<b>▼</b> ∂°60
Folders	K Name ≜	Туре
🖸 Desktop	BM_PRELOAD (C:)	Local Disk
🗄 🔄 My Documents	- <u>2</u> 011102_1500 (D:)	Compact Disc
🚊 🖳 My Computer 💦 ,	📲 🖵 C\$ on '192.168.1.20' (E:)	Network Drive 📃 🚽
	<u> </u>	
Free Space: 12.0 GB, Capacity: 17.4 G	GB 🛛 🛛 🖉	My Computer

# **3** Windows Millennium Edition

# **Driver Installation**

D-Link recommends that you remove any existing D-Link NDIS driver on the PC system before installing Version **Error! Reference source not found.** release of the NDIS driver. See Section "Driver Uninstallation" on page 3-4 for the instructions on how to remove previous driver releases. When the system no longer has the D-Link NDIS driver installed, insert the DWL-A520 Wireless Network Adapter 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.



 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.



3. When the D-Link driver 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 3-6 for device configuration.



# **Driver Uninstallation**

This section provides uninstallation procedures for removing the D-Link NDIS driver from the system. Uninstallation is recommended for upgrading the NDIS driver from previous D-Link driver 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 "D-Link" text string under the \WINDOWS\INF folder. Be sure to include subfolders in the search criteria. When "D-Linknet5210b.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				18
📙 🖶 Back 👻 🤿 👻 🛅 🔯 Search 🖓 Fold	lers 🎯 History   🖺 🖸	X n III-		
Address 🔊 Search Results				💌 🤗 Go
Search ×	<b>Q</b>	Atherosnet5210b.i In Folder: <u>C:\WINDO\</u>	nf #S\INF\OTHER	
Search for Files and Folders	Search Result	Size: 17,143 bytes Modified: 7/2/2001 5:	04 PM	
Search for files or folders na <u>m</u> ed: *.inf				
Containing text:	Name	In Folder	Size Type	Modified
Atheros	Atherosnet5210b.inf	C:\WINDOWS\INF\OTHER	17 KB Setup Information	7/2/2001 5:04 PM
Leekin	Open Containing Fold	er		
	<u>O</u> pen			
C:\windows\inf	Print			
Stop Search	Install Open Wit <u>h</u>			
Search Options <<	Se <u>n</u> d To	•		
□ <u>D</u> ate	Cut			
🗆 Тұре	Сору			
Size	Create Shortcut			
Advanced Options	<u>D</u> elete			
	Rename			
Search for other items:	Properties			
🖵 Deletes the selected items.				

2. From Control Panel, launch the System Properties window. Select "D-Link DWL-A520 Wireless Network Adapter" from Device Manager, and click Remove to uninstall the device.

System Properties ? 🗙
General Device Manager Hardware Profiles Performance
• View devices by type • • • • • • • • • • • • • • • • • • •
Computer CDROM CDROM CDROM CDROM CDROM CDIsk drives CDisplay adapters CHard disk controllers CHARD disk controlle
Properties Refresh Remove Print
OK Cancel

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



# **Device Configuration**

Configuration of the D-Link DWL-A520 Wireless Network Adapter can be done through the D-Link NIC 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 2-16 for more details on these network connection types.

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

🗟 Control Panel						_ 🗆 🗵
<u>File E</u> dit <u>V</u> iew F <u>a</u> vorites <u>T</u> oo	ıls <u>H</u> elp					
📙 🖶 Back. 👻 🤿 👻 🛅 🛛 🚳 Search	Folders	History	2 4 × ×	ລ  <b>⊞</b> •		
Address 🐼 Control Panel						💌 🤗 Go
	Accessibility	Add New	Add/Remove	Atheros NIC	Automatic	Date/Time
Control Panel	Options	Hardware	Programs	Configuration	Updates	
Use the settings in Control Panel to personalize your computer. <u>Display only commonly used Control</u> Panel online.	Desktop Themes	Dial-Up Networking	Display	Folder Options	Fonts	Gaming Options
Select an item to view its description. <u>Windows Update</u> Technical Support	Internet Options	Java Plug-in 1.3.0_01	Keyboard	Wodems	Mouse	Network
	ODBC Data Sources (32bit)	Passwords	PC Card (PCMCIA)	V Power Options	<b>Printers</b>	Regional Settings
	Scanners and Cameras	Constant Scheduled Tasks	SigmaTel Audio	Softex BayManager	Sounds and Multimedia	System
	Taskbar and Start Menu	S Telephony	<b>U</b> sers	<b>*</b> Wireless Link		
34 object(s)						

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 3-8 and Section "Ad Hoc Mode" on page 3-9 to set up the station to work in infrastructure mode and ad hoc mode.

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

#### **Infrastructure Mode**

This section defines the process of configuring an D-Link DWL-A520 Wireless Network Adapter in infrastructure mode. See Section "Device Configuration" beginning on page 2-16 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 802.11a 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 D-Link turbo mode.

Network Configuration Settings		? ×
General Security		1
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)		
	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 D-Link DWL-A520 Wireless Network Adapter 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		? X
General Securit	y		
Enable Secu	The Default Encryption Key:	Unique	•
- Encryption Key	(Hex U-9 A-F)	Key Length (bits):	
Unique Key:	******	64 (40+24) 10 hex digits	•
Shared Keys:			
First:	********	64 (40+24) 10 hex digits	•
Second:	*****	152 (128+24) 32 hex digits	•
Third:	******************	128 (104+24) 26 hex digits	J
Fourth:	******	64 (40+24) 10 hex digits	•
. <u>.</u>			
		OK Ca	ncel

#### Ad Hoc Mode

This section defines the process of configuring an D-Link DWL-A520 Wireless Network Adapter in ad hoc or IBSS mode. See Section "Ad Hoc Mode" on page 2-22 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 D-Link NIC 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		<u>? ×</u>
General Security		
Configuration Name:	ALPHA_2	
Network Name (SSID):	ALPHA2	
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 D-Link software 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 D-Link DWL-A520 Wireless Network Adapter 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 → D-Link DWL-A520 Wireless Network Adapter" 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
Configuration       Identification       Access Control         The following network components are installed:       Image: Control Provide the installed:         Image: TCP/IP -> Dial-Up Adapter       Image: Control Provide the installed:         Image: TCP/IP -> Dial-Up Adapter       Image: Control Provide the installed:         Image: TCP/IP -> Dial-Up Adapter       Image: Control Provide the installed:         Image: TCP/IP -> Intel(R) PRO/100 VE Network Connection       Image: Connection         Image: TCP/IP -> NDIS 1394 Net Adapter       Image: Connection         Image: Add       Remove       Properties         Add       Remove       Properties         Primary Network Logon:       Image: Client for Microsoft Networks       Image: Client for Microsoft Networks         Image: Elle and Print Sharing       Image: Connect to the Internet and wide-area networks.	Bindings       Advanced       NetBIOS         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 does not automatically assign IP addresses, ask your network administrator for an address, and then type it in the space below.         ©       Obtain an IP address automatically         ©       Specify an IP address:         IP Address:       192.168.1.22         Subnet Mask:       255.255.255.0         IP Detect connection to network media
OK Cancel	OK Cancel

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 D-Link DWL-A520 Wireless Network Adapter operating status.

S MS-DOS Prompt
8 x 12 🗸 🛄 🛍 🔂 🗃 📇 🗛
C:\WINDOWS\Desktop>ipconfig
Windows IP Configuration
0 Ethernet adapter :
IP Address : 192.168.1.22 Subnet Mask : 255.255.255.0 Default Gateway :
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.

Q			
My Compute	<b>Open</b> Explore S <u>e</u> arch		
	Map <u>N</u> etwork Drive Djsconnect Network Drive Create <u>S</u> hortcut		
Map Netw	Rena <u>m</u> e P <u>r</u> operties		<u>?</u> ×
<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**

D-Link recommends that you remove any existing D-Link NDIS driver on the PC system before installing Version 1.3 release of the NDIS driver. See Section "Driver Uninstallation" on page 4-4 for the instructions on how to remove previous driver releases. When the system no longer has the D-Link NDIS driver installed, insert the DWL-A520 Wireless Network Adapter into a 32-bit CardBus slot, and follow these steps to install the NDIS driver:



Add New Hardware Wiz	ard
Add New Hardware Wiz	ard This wizard searches for new drivers for: PCI Ethernet Controller A device driver is a software program that makes a hardware device work.
	< <u>Back</u> Cancel

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



3. Insert the D-Link Software 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:         □:\ndis\bin\production\ndis5         ☑ D:\ndis\bin\production\ndis5
	< Back Next > Cancel

4. When the D-Link driver 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 4-7 for device configuration.

System S	Settings Change 🛛 🕅
?	To finish setting up your new hardware, you must restart your computer.
	Yes No

## **Driver Uninstallation**

This section provides uninstallation procedures for removing the D-Link NDIS driver from the system. Uninstallation is recommended for upgrading the NDIS driver from previous D-Link driver 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 "D-Link" text string under the \WINDOWS\INF folder. Be sure to include subfolders in the search criteria.

💐 Find: All Files	<u>_   ×</u>
<u>File Edit View Options H</u> elp	
Name & Location Date Advanced	1
	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	

2. When "D-Linknet5210b.inf" has been found, delete it by right-clicking the file and choose "Delete."

Find: Files named *.inf containing text Atheros         File       Edit         View       Options         Help						
ſ	Name & Location Date Advanced					C Charles 1
	<u>N</u> ar	ned:	×.inf		•	Stop
	Containing text: Atheros				Ne <u>w</u> Search	
	Loo	ik in:	c:\windows\inf		•	Q
	Include <u>subfolders</u> <u>B</u> rowse				1	
						-
	ame Athe	rospet5210b			Size 13KB	Setup Information
		<b>Open</b> Print Install Quick View				
Trend PC-cillin 98 의 Add to Zip 의 Add to Atherosnet5210b.zip 의 Zip and E-Majl Atherosnet5210b.zip			P			
		Send <u>T</u> o		•		
		Си <u>t</u> <u>С</u> ору				
		Create <u>S</u> hor	rtout			
		<u>D</u> elete Bename				
		Properties				Þ
Del	etes t	he selected i	tems.			11.

3. From Control Panel, launch the Network properties window. Select "D-Link DWL-A520 Wireless Network Adapter" from the list, and click Remove to uninstall the device.

· · · · · · · · · · · · · · · · · · ·			
Configuration Identification Access Control			
The following network components are installed:			
🔳 Client for Microsoft Networks			
E Atheros AR5000 Wireless Network Adapter			
■∰ Dial-Up Adapter			
Bintel 8255x-based PCI Ethernet Adapter (10/100)			
Birling Fast Intrared Port			
Add <u>Remove</u> <u>Properties</u>			
Primary Network Logon:			
Client for Microsoft Networks			
<u>File and Print Sharing</u>			
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.



# **Device Configuration**

Configuration of the D-Link DWL-A520 Wireless Network Adapter can be done through the D-Link NIC 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 2-16 for more details on these network connection types.

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

File       Edit       View       Go       Favorites       Help         Back       Forward       Up       Cut       Copy       Paste       Undo       Delete       Properties         Address       Image: Control Panel	* *
Here	»
Address Control Panel	
Accessibility Add New Add/Remove Date/Time Atheros NIC	
Control Options Hardware Programs Configuration	
Panel     Image: Constraint of the settings in     Image: Constraint of the settings in     Image: Constraint of the setting of	
Control Panel to personalize your computer.       Image: Control Panel to personalize your	
Microsoft Home         Modems         Mouse         Multimedia         Page         Spire           Technical Support         Modems         Mouse         Multimedia         Network         ODBC Data Sources (32bit)	
Passwords PC Card Power Printers Regional (PCMCIA) Management Settings	
Sounds System Telephony Users	

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 4-8 and Section "Ad Hoc Mode" on page 4-10 to set up the station to work in infrastructure mode and ad hoc mode.

Atheros NIC Configura	ation		?×
Network Card:	[0003]Atheros AR5000	Wireless Network A	Adapter 💌
Selected Configuration:	Default		
Configuration List			
Default			<u>N</u> ew
			Modify
			<u>D</u> elete
Selected Configuration	Details		
Network Name (SSIL Network Connection	): <empty> : AP (Infrastructure)</empty>		
Turbo Mode : Power Saving:	Disabled Normal		
Locally Admin. Addre Data Security:	ss: Not Used Disabled		
			Canaal
			Lancer

## **Infrastructure Mode**

This section defines the process of configuring an D-Link DWL-A520 Wireless Network Adapter in infrastructure mode. See Section "Device Configuration" beginning on page 2-16 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 802.11a 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 D-Link turbo mode.

Network Configuration Settings		?×
General Security		
Configuration Name:	ALPHA	1
Network Name (SSID):	ALPHA_1	i
Network Connection:	AP (Infrastructure)	]
Power Saving:	Off 📃	Í Í
Turbo Mode:	Disable 💌	]
Locally Administered Address: (Hex 0-9 A-F)		J
	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 D-Link DWL-A520 Wireless Network Adapter 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 Securi	у	
🔽 Enable Secu	rity Default Encryption Key:	Unique
- Encryption Key	s (Hex 0-9 A-F)	Key Length (hits):
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 D-Link DWL-A520 Wireless Network Adapter in ad hoc or IBSS mode. See Section "Ad Hoc Mode" on page 2-22 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 D-Link NIC 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)		
	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 D-Link software 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 D-Link DWL-A520 Wireless Network Adapter 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 → D-Link DWL-A520 Wireless Network Adapter" 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 The following network components are installed: The following network components a	Bindings Advanced DNS Configuration Gateway WINS Configu An IP address can be automatically assigned t If your network does not automatically assigned to vour network administrator for an address. and	NetBIOS Iration IP Address to this computer. IP addresses, ask I then type it in	
Y TCP/IP -> Atheros AR5000 Wireless Network Adapter         Y TCP/IP -> Dial-Up Adapter         Y TCP/IP -> Intel 8255x-based PCI Ethernet Adapter (10/10 •         Image: Add         Add         Remove       Properties         Primary Network Logon:         Client for Microsoft Networks	the space below. © Detain an IP address automatically © Specify an IP address: IP Address: 192.168.1.20 Subnet Mask: 255.255.255.0		
Eile and Print Sharing Description TCP/IP is the protocol you use to connect to the Internet and wide-area networks. OK Cancel	  ОК	Cancel	
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 D-Link DWL-A520 Wireless Network Adapter operating status.

MS-DOS Prompt
Auto 🖬 🗈 🔂 🗃 🗗 A
C:\WINDOWS>ipconfig
Windows 98 IP Configuration
0 Ethernet adapter :
IP Address : 192.168.1.22 Subnet Mask : 255.255.255.0 Default Gateway :
C:\WINDOWS>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 Shortcut		
	Rename		
	Floperdes		
Map Netwo	rk Drive		? ×
<u>D</u> rive:	⊂ F:	•	OK
<u>P</u> ath:	\\192.168.1.21\C\$	•	Cancel
1	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)**

D-Link recommends that you remove any existing D-Link drivers on the PC system before installing Version **Error! Reference source not found.** release of the NDIS driver. See Section "Driver Uninstallation" on page 5-4 for the instructions on how to remove previous driver releases. With no existing D-Link NDIS driver installed, insert the D-Link DWL-A520 Wireless Network Adapter 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
$\bigcirc$ 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 D-Link NDIS 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
	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. ( <u>Tell me why this testing is important.</u> ) <b>Continuing your installation of this software may impair</b> 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

4. Click Finish to complete driver installation, and refer to Section "Device Configuration" on page 5-6 for device configuration.

Found New Hardware Wizard				
	Completing the Found New Hardware Wizard			
	The wizard has finished installing the software for:			
	Atheros AR5000 Wireless Network Adapter			
	Click Einish to close the wizard			
	< Back Finish Cancel			

## **Driver Uninstallation**

This section provides uninstallation procedures for removing the D-Link NDIS driver from the system. Uninstallation is recommended for upgrading the NDIS driver from previous D-Link driver releases.

1. To remove the NDIS driver from the OS, go to Device Manager, right click "D-Link DWL-A520 Wireless Network Adapter," and choose Uninstall.

🖳 Device Manager		
File Action View Help		
Atheros  Atheros  Computer  Computer Computer  Computer  Computer  Computer  Computer  Computer  Computer		
Acyobards     Mice and other pointing devices     Modems     Monitors     Moni	Update Driver Disable Uninstall Scan for hardware changes Properties	
Uninstalls the driver for the selected device.		

2. Click OK to uninstall the device.

Confirm	ı 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 "D-Link" 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 5-16.

Similar to Windows 2000, configuration of the D-Link DWL-A520 Wireless Network Adapter can be done through the Network Control Panel (NCP) in adapter properties. You can set the Wireless Network Adapter to work in one of two modes: infrastructure mode or ad hoc mode. See Section "Device Configuration" beginning on page 2-16 for more details on these network connection types.

To launch NCP go to Device Manager, right-click "D-Link DWL-A520 Wireless Network Adapter," and select Properties to access to the properties of the adapter.

🖳 Device Manager		
File Action View Help		
Atheros     Infrared devices		
Keyboards     Mice and other pointing devices     Modems     Monitors     Network adapters		
	Update Driver Disable Uninstall Scan for hardware changes <b>Properties</b>	*
Opens property sheet for the current selection.		

Configuration additions, modifications, and deletions are made under the "Settings" tab of "D-Link DWL-A520 Wireless Network Adapter Properties." Select one of the configurations under the configuration, click Modify or New and complete the steps in Section "Infrastructure Mode" on page 5-8 or Section "Ad Hoc Mode" on page 5-9 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 <u>N</u> ew	
( <u>M</u> odify)	
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>	
OK Canc	el

#### **Infrastructure Mode**

This section defines the process of configuring an D-Link DWL-A520 Wireless Network Adapter in infrastructure mode. See Section "Device Configuration" beginning on page 2-16 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 802.11a 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 D-Link turbo 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 D-Link DWL-A520 Wireless Network Adapter 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	uration Settings				?×
General Securit	у				
🔽 Enable Secu	ritye	Default Encryption Key:	Uniq	lne	•
– Encryption Key	s (Hex 0-9 A-F)		К	ey Length (bits):	
Unique Key:	*****		6	64 (40+24) 10 hex (	digits 💌
Shared Keys:					
First:	******		e	64 (40+24) 10 hex (	digits 💌
Second:	*****	****	- F	152 (128+24) 32 hex	digits 💌
Third:	*****			128 (104+24) 26 hex	: digits 💌
Fourth:	*****		F	64 (40+24) 10 hex (	digits 💌
				OK	Cancel

#### Ad Hoc Mode

This section defines the process of configuring an D-Link DWL-A520 Wireless Network Adapter in ad hoc or IBSS mode. See Section "Ad Hoc Mode" on page 2-22 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)		
	ОК	Cancel

 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 D-Link software 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 D-Link DWL-A520 Wireless Network Adapter 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 D-Link DWL-A520 Wireless Network Adapter. 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.

上 Wireless Network Connection 4 Properties 🛛 ? 🗙	Internet Protocol (TCP/IP) Properties	? 🗙
General Wireless Networks Authentication Advanced	General	
Connect using: B 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.	or
Configure	Obtain an IP address automatically	
This connection uses the following items:	O Use the following IP address:	
Client for Microsoft Networks	<u>I</u> P address: 192.168.1.20	
✓ ➡ File and Printer Sharing for Microsoft Networks ✓ 3⊂ Internet Protocol (TCP/IP)	Subnet mask: 255 . 255 . 255 . 0	
	Default gateway:	
Install Uninstall Properties	O Obtain 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	Advanced	i
OK Cancel	OK Car	ncel

 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 D-Link DWL-A520 Wireless Network Adapter.

🗪 Select C:\WINNT\System32\cmd.exe	- 🗆 X
Ethernet adapter Wireless Network Connection 4:	<b>_</b>
Connection-specific DNS Suffix . : IP Address : 192.168.1.20 Subnet Mask : 255.255.255.0 Default Gateway :	
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 Cal Decuments and Catting DOEN	-

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...."

FAE	
Internet	My Documents
E-mail Outlook Express	My Recent Documents >
•	🖄 My Pictures
Notepad	🕑 My Music
Command Prompt	My Computer
A charter to the later	Explore
	Search
Paint	Manage
	Map Network Drive
MSN Explorer	Disconnect Network Drive
4.	✓ Show on Desktop
Nindows Media Player	Rename
$\checkmark$	Properties
	Search
All Programs 📡	7 Run
	2 Log Off O Turn Off Computer
And the second	

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 can help you connect to a shared network folder and assign a drive letter to the connection so that you can access the folder using My Computer. Specify the drive letter for the connection and the folder that you want to connect to:		
	<u>D</u> rive:	Y:	*
	F <u>o</u> lder:	\\192.168.1.21\C\$	✓ Browse
	Example: \\server\share		
		Reconnect at logon	
		Connect using a <u>different u</u>	ser name.
		<u>Sign up for online storage o network server</u> .	r connect to a
		< <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 D-Link DWL-A520 Wireless Network Adapter, Windows XP provides zeroconfiguration 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 D-Link DWL-A520 Wireless Network Adapter), 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 5-8 or Section "Ad Hoc Mode" on page 5-9 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 5-6. 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 D-Link NCP configuration settings, by clearing the "Use Windows to configure my wireless network settings" check box.

🕂 Wireless Net	twork Con	nection 4 Pro	perties	?×	
General Wireles	s Networks	Authentication	Advanced		
✓ Use <u>W</u> indow	vs to configur	e my wireless net(	work settings		
Available <u>n</u> etv	vorks:				
To connect to	) an available	network, click C	onfigure.		
i Test_Alp	Test_Alpha     Configure     Adhoc Network				
			R <u>e</u> fresh		
Preferred netw Automatically below:	vorks: connect to a	vailable networks	in the order list	ed	
			Move <u>u</u>		
			Move <u>d</u> ov	vn	
<u>A</u> dd	<u>R</u> emo	ve Pr <u>o</u> per	ties		
Learn about <u>se</u> configuration.	atting up wire	less network	Ad <u>v</u> an	ced	
			K C	ancel	

#### **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 Proper	rties <b>?X</b>
General Wireless Networks Authentication Ad	vanced
Use Windows to configure my wireless network	settings
Available networks:	
To connect to an available network, click Config	gure.
👔 Test_Alpha	<u>C</u> onfigure
Adhoc_Network	Befresh
C Preferred networks:	
Automatically connect to available networks in the below:	he order listed
	Move <u>up</u>
	Move <u>d</u> own
Add <u>R</u> emove Properties	
Learn about <u>setting up wireless network</u> configuration.	Advanced
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 D-Link NCP 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 D-Link NDIS 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 D-Link NCP configuration instead.

Wireless Network Prop	erties ?×			
Network <u>n</u> ame (SSID):	Test_Alpha			
Wireless network key (WE	P]			
This network requires a ke	ey for the following:			
✓ Data encryption (WEP enabled)				
Network <u>A</u> uthentical	tion (Shared mode)			
Network <u>k</u> ey:				
Key format:	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-computer (ad hoc) network; wireless access points are not used				

#### 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 Netwo	ork Con	nection 4 Pro	perties	?×	
General Wireless N	letworks	Authentication	Advanced		
Use <u>W</u> indows to	✓ Use <u>W</u> indows to configure my wireless network settings				
Available network	Available networks:				
To connect to an	ı available	enetwork, click C	Configure.	,	
Adhoc_Net	work		R <u>e</u> fresh	51	
- Proferred network					
Automatically cor	nnect to a	vailable networks	in the order liste	ed	
			Move <u>up</u>		
			Move <u>d</u> ow	m	
<u>A</u> dd	<u>R</u> emo	ve Pr <u>o</u> per	rties		
Learn about <u>settin</u> configuration.	iq up wire	less network	Advanc	ed	
			K Ca	ancel	

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 D-Link NCP 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 D-Link NDIS 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 D-Link NCP configuration instead.

Wireless Network Prop	erties <b>?X</b>	
Network <u>n</u> ame (SSID):	Adhoc_Network	
Wireless network key (WE	P)	
This network requires a ke	y for the following:	
Data encryption (WE	P 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>computer-to-computer</u> (ad hoc) network; wireless access points are not used		
	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-to-computer (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 non-preferred networks" check box should be cleared.

Advanced ?X
Networks to access
O Any available network (access point preferred)
O Access point (infrastructure) networks only
O Computer-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".



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:
I 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 Prope	rties ? 🗙
General Wireless Networks Authentication Ad	dvanced
Use Windows to configure my wireless networ	k settings
Available <u>n</u> etworks:	
To connect to an available network, click Confi	igure.
i Test_Alpha → Adhoc_Network	
	R <u>e</u> fresh
below:	Move <u>up</u>
	Move <u>d</u> own
Add <u>R</u> emove Properties	-
Learn about <u>setting up wireless network</u> configuration.	Advanced
ОК	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 Prop	erties <b>?X</b>					
Network <u>n</u> ame (SSID):	Test_Network					
Wireless network key (WE	P)					
This network requires a ke	y for the following:					
Data encryption (WE	P 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):						
✓ 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 Properties 🛛 🕐 🗙							
General	Wireless Networks	Authentication	Advanced				
🗹 Use	Use Windows to configure my wireless network settings						
Availa	able <u>n</u> etworks:						
Toco	onnect to an available	network, click C	onfigure.				
11	<sup>r</sup> est_Alpha		<u>C</u> onfigure				
97	Adhoc_Network		R <u>e</u> fresh				
<u>P</u> refer Autor below	rred networks: natically connect to a r.	vailable networks	in the order listed				
7	Test_Network		Move <u>up</u>				
i 97	Fest_Alpha Adhoc_Network		Move <u>d</u> own				
	<u>\dd</u> <u>R</u> emo	ve Pr <u>o</u> per	ties				
Learn <u>config</u>	about <u>setting up wire</u> uration.	<u>ess network</u>	Advanced				
OK 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 ?X
Networks to access
Any available network (access point preferred)
○ Access point (infrastructure) networks only
O Computer-to-computer (ad hoc) networks only
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 D-Link NDIS driver installation uses an approach that is different from the installation used in other Operating Systems. In order to install D-Link DWL-A520 Wireless Network Adapter 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 D-Link DWL-A520 Wireless Network Adapter into a 32-bit CardBus slot, and follow these steps to install the NDIS driver:

1. CardWizard will detect the insertion of the D-Link CardBus card and show the following screen. Click Correct to continue.

Wizard	×
Wizard Information	Correct
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 ready in this same	Help
instali disk ready in this case.	Exit
Er	nable AutoCorrection 🥅

2. Click OK to continue.

CardWizard for Windows NT					
CardWizard cannot locate the driver for this card. Click "OK" 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.

Network			? X
Identification Ser	vices Protocols	Adapters Bin	dings
Network Adapter	s:		
<u>A</u> dd	<u>R</u> emove	Properties	Update
Item Notes:			
		OK	Cancel

4. Click Have Disk.



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

Insert Dis	k	$\times$
F	Insert disk with software provided by the software or hardware manufacturer. If the files can be found at a different location, for example on another drive type a new path to the files below.	OK Cancel
	d:\ndis\bin\production\ndis4	

6. Make sure D-Link DWL-A520 Wireless Network Adapter is selected. Click OK to continue.

Select OEM Option	×
Choose a software supported by t	nis hardware manufacturer's disk.
Atheros AR5000 Wireless Netwo	rk Adapter
OK Ca	incel <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	X
Map Registers:	256	•
QoS (802.11e):	Disabled	•
Transmit Power Control:	Highest Power	
	OK	Cancel

8. Windows NT 4.0 binds TCP/IP protocol to D-Link DWL-A520 Wireless Network Adapters 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:					
[1] Atheros AR5000 Wireless Network Adapter					
<ul> <li><u>O</u>btain an IP address from a DHCP server</li> <li><u>Specify</u> an IP address</li> </ul>					
IP Address: 192 . 168 . 1 . 93					
Subnet Mask: 255 . 255 . 0					
Default <u>G</u> ateway:					
Advanced					
OK Cancel Apply					

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



## **Device Configuration**

Configuration of the D-Link DWL-A520 Wireless Network Adapter can be done through the D-Link NIC Configuration Control Panel applet provided by D-Link. 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 2-16 for more details on these network connection types.

Start D-Link NIC Configuration utility from the Control Panel.

🔯 Control Panel							_ 🗆 ×
∫ <u>F</u> ile <u>E</u> dit <u>V</u> iew <u>G</u> o F <u>a</u> vorites <u>H</u>	<u>l</u> elp						Ø
Back Forward Up	X D Cut Copy	Paste	ピク) Undo	Delete Propertie	es Views	-	
Address 🖼 Control Panel							-
Control Pa	anel						
Atheros NIC Configuration	Accessibility Options	Add/Remove Programs	Atheros NIC Configuration	Console	Date/Time	Devices	Display
Configures Atheros NIC Microsoft Home Technical Support	Fonts	Intel(R) PROSet	<b>E</b> Internet	Java Plug-in 1.3.0_01	Keyboard	Mail	Microsoft Mail Postoffice
	Modems	Mouse	<b>Syn</b> Multimedia	Network	ODBC	PC Card (PCMCIA)	Ports
	Printers	<b>real</b> RealPlayer	Regional Settings	SCSI Adapters	server	Services	Sounds
	system	Tape Devices	Relephony	<b>уО</b> UPS			
1 object(s) selected	Configures A	theros NIC			🖳 My Cor	nputer	
Select one of the configuration(s) under the configuration list and click Modify or click New, and follow the Section "Infrastructure Mode" on page 6-7 and Section "Ad Hoc Mode" on page 6-10 to set up the station to work in infrastructure mode and ad hoc mode.

Atheros NIC Configur	ation		? ×
Network Card:	AR5210N42		
Selected Configuration:	Default		
Configuration List			
Default			<u>N</u> ew
			<u>M</u> odify
			<u>D</u> elete
- Selected Configuration	Details		
Network Name (SSI Network Connection	0): <empty> : AP (Infrastructure)</empty>		
Turbo Mode : Power Management:	Disabled Normal		
Locally Admin. Addre Data Security:	ess: Not Used Disabled		
		OK	Cancel

#### **Infrastructure Mode**

This section defines the process of configuring an D-Link DWL-A520 Wireless Network Adapter in infrastructure mode. Refer to Section "Device Configuration" beginning on page 2-16 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 802.11a wireless network. For example, "*D-Link\_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 D-Link Turbo mode.

Network Configuration Settings		? ×
General Security		1
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)		
	OK	Cancel

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 D-Link DWL-A520 Wireless Network Adapter 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 Configu	ration Settings ? 🗙
General Securit	ر ا
🔽 Enable Secu	rity Default Encryption Key: Unique 🔽
Encryption Key	s (Hex 0-9 A-F)
Unique Keur	
Onique Key.	152 (128+24) 32 hex digits 💌
Shared Keys:	
First:	152 (128+24) 32 hex digits
Second:	64 (40+24) 10 hex digits 💌
Third	C4 ((0:20,10 hor 4-b)
Triita.	
Fourth:	64 (40+24) 10 hex digits 💌
	OK Cancel

#### Ad Hoc Mode

This section defines the process of configuring an D-Link DWL-A520 Wireless Network Adapter in ad hoc or IBSS mode. Refer to Section "Ad Hoc Mode" on page 2-22 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

 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 D-Link software implementations will provide unique key support.

Network Configura	tion Settings	? ×
General Security		1
Enable Security	Default Encryption Key:	First 💌
Encryption Keys	(Hex 0-9 A-F)	Keu Length (bits):
Unique Key:	*****	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 D-Link DWL-A520 Wireless Network Adapter 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.

MS 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 ITL=128 Reply from 192.168.1.90: bytes=32 time<10ms ITL=128 Reply from 192.168.1.90: bytes=32 time<10ms ITL=128 Reply from 192.168.1.90: bytes=32 time<10ms ITL=128	
C:\>	

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

My Compute	¥
	<u>O</u> pen
	Explore
	<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

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

Map Networl	k Drive		×
<u>D</u> rive:	🗇 F:	-	OK
<u>P</u> ath:	\\192.168.1.90\C\$	•	Cancel
Connect As:			<u>H</u> elp
	Reconnect at Logon		
Shared Direct	tories:	<b>⊠</b> <u>E</u> xp	and by Default
ᅷ 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 D-Link NDIS driver from the system.

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

📾 Control P	anel				
<u>_</u> Eile <u>E</u> dit <u>V</u> i	ew <u>H</u> elp				
Ġ.		S	MS - S	<b>112</b>	٣ <u></u>
Accessibility Options	Add/Remove Programs	APM 2.0 for NT	Console	Date/Time	Devices
	<b>A</b> <u>a</u>	<b>(</b>	ىتىسىر ئۇلىتى	Ì	Ø
Display	Fonts	Internet Options	Keyboard	Modems	Mouse
52	₽¢	Ð		P	
Multimedia	Network	ODBC Data Sources	PC Card (PCMCIA)	Ports	Printers
8	¢	5	<b>\$</b>	ſ	inter y
Regional Settings	SCSI Adapters	Server	Services	Sounds	System
		<u></u>			
Tape Devices	Telephony	UPS			
Configures netv	work hardware an	id software			li.

2. Under the Adapters tab, choose D-Link DWL-A520 Wireless Network Adapter and click Remove.

Network			? ×
Identification Se	rvices Protocols	Adapters Bin	dings
Network Adapter	'S:		
III) Atheros A	AR5000 Wireless	Network Adapter	
Add	<u>R</u> emove	Properties	<u>U</u> pdate
Atheros AR5000	) Wireless Networ	k Adapter	
		OK	Cancel

3. Click OK to confirm the removal of the D-Link DWL-A520 Wireless Network Adapter.



4. D-Link DWL-A520 Wireless Network Adapter is no longer listed under the Adapters tab. Click Close to continue.

Network ?	×
Identification Services Protocols Adapters Bindings	
Network Adapters:	
Add <u>B</u> emove <u>P</u> roperties <u>U</u> pdate	
Item Notes:	
Close Cancel	

5. Restart the system to complete the un-installation of D-Link NDIS 4.0 driver.



# **T** LinkMon

#### Installation

LinkMon is a Graphical User Interface (GUI) program that provides detailed operational status and statistics for the D-Link DWL-A520 Wireless Network Adapter. The LinkMon executable file, linkmon.exe, is included on the D-Link Release Version **Error! Reference source not found.** 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.



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.

$\Lambda$ LinkMon			_ 🗆 🗙
Action Options Help			
Atheros AR5000 Wireless Network Ada	pter	•	
General Frame Statistics Transmit Retries S Network Interface Card Card Name: Atheros AR5000 Wireles Mac Address: 00-03-7F-00-14-D8 Device Name: VDEVICE\{E04A72F3-43 Device ID: 0007	tation Driver	:7)	
Device ID: 0007 Class Subkey: 0013 Driver: C:\WINNT\System32\D Driver Version: 1.3.0.0 Driver Date: 02 Nov 2001 06:48:46	RIVERS\ar5210b.sys		
Connection Information			
Turbo Mode: Off	Channel / Frequence	y: - 52 / 5.26 GH	Hz
Network Type: Infrastructure	Link Statu	is: Connected	
WEP: Enabled	Transmit Ra	te: 24 Mbps	
Power Save State: Awake	Receive Ra	te: 24 Mbps	
Ready	CONNECTED Tx 2	4 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.

$\mathbf{A}^{L}$	inkMon		_ 🗆 X
Acti	on <u>O</u> ptions <u>H</u> elp		
	Atheros AR5000 Wireless Network Adapt		•
Ge	eneral Frame Statistics Transmit Retries Sta	on Driver	
Г	Transmit Statistics	Receive Statistics	
	Frames Sent: 0	Frames Received:	0
	One Petrus 0	Duplicate Frames:	0
	one neuy. o	Multiple Duplicates:	0
	Excessive Retries: 0	Multicast Frames:	0
	FIFO Underruns: 0	FIFO Overruns:	0
	Huma Count: 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
Read	ły	DNNECTED Tx 24 Mbps	Rx 24 Mbps

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

$\Lambda$ LinkMon				
<u>A</u> ction <u>O</u> ptions <u>H</u> elp				
Atheros AR5000 Wireless Network Adapt	er	<b>•</b>		
General         Frame Statistics         Transmit Retries         Statistics           Transmit Retries:         Retry         Count         1         0         2         0         3         0         4         0         5         0         6         0         7         0         8         0         9         0         10         10 <td< td=""><td>ation Driver Transmit Info Frames Sent: Excessive Retries: FIFO Underrun: Hung Count: ACK Receive Errors: Last ACK RSSI:</td><td>0 0 0 0 0 23</td></td<>	ation Driver Transmit Info Frames Sent: Excessive Retries: FIFO Underrun: Hung Count: ACK Receive Errors: Last ACK RSSI:	0 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> ptions	: <u>H</u> elp				
	Ather	os AR5000 W	/ireless Network Adapt	er		
[	àeneral   Fran	ne Statistics	Transmit Retries Sta	tion Driver		1
	Network Nam	e (SSID): De	emaAP_4		Station Status:	Associated
	۵P ۵ddress (F	י חח יתוצא	-03-7E-60-01-10		Channel/Frequency:	64 / 5.32 GHz
	Scan List:	,551D). [00			Regulatory Domain:	0x10 FCC (US)
	Channel	RSSI	BSSID	Network Nar	me (SSID)	
	52	24	00-03-7F-A0-00-95	Test_Alpha		
	60	10 7	00-03-7F-A0-00-41	videoap	11- V/LAN 00-00-00	
	64	21	00-03-7F-A0-01-13 00-03-7F-04-00-22	Atheros 802. Blue AP	TTA WEAN 00:00:00	
	64	33	00-03-7F-A0-01-10	DemoAP 4		
	56	11	00-03-7F-A0-00-78	Test_Alpha1	l	
Rea	ady			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 Ada	pter	▼			
General Frame Statistics Transmit Retries Station Driver					
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=""></not>					
Ready		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.

$\Lambda$ LinkMon					
Action Options H	elp				
Stop	5000 Wireless	Network Adaj	pter	•	
Unload Driver NIC Reset	atistics   Transn	nit Retries∫ S	tation Driver		
Exit	NDIS Resets:	0			
Self In	duced Resets:	0			
NDIS S	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 1.3.0.0 02 Nov 20 <not used=""></not>	\System32\D D1 06:48:46	RIVERS \ar5210b.sys		
Ready			CONNECTED	Tx 24 Mbps	Rx 24 Mbps

On the Options menu, choose Settings....

${f A}$ LinkMon			_ 🗆 🗙
Action Options Help			
Settings Wireless Network Ada	pter		
General Frame Statistics Transmit Retries S	tation 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\E Driver Version: 1.3.0.0 Driver Date: 02 Nov 2001 06:48:46 INI File: <not used=""></not>	)RIVERS\ar5210b.sys		
Ready	CONNECTED	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	
	0	K 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 Logging	
Log File Path: c:\test.log	Browse
P	
	UK Cancel

## **8** RFSilent

This chapter describes the RFSilent application that allows you to enable or disable the RF Signal (radio) on all D-Link STA 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 D-Link STA 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, C	ol 45	REC COL O	VR READ //
📕 Perforc	<u>e</u> l (	🕸 🎛 🚺 rf	2:42 PM

Figure 8-1. RFSilent Icon

Position your cursor over the RF lcon 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.

Table 8-1. RFSilent Menu Descriptions

<b>RFSilent Menu Item</b>	Descriptions	
Disable RF Signal	Use this selection to disable D-Link STA	

RFSilent Menu Item	Descriptions
	Reference Design.
Enable RF Signal	Use this selection to enable D-Link STA Reference Design.
About	Displays copyright, version information, and the build date for the RFSilent application.
Exit	Quits the RFSilent application.

# **9** Troubleshooting

This chapter provides solutions to common problems that usually occur during the installation and operation of the D-Link DWL-A520 Wireless Network Adapter. Read the following descriptions if you are having problems. If you cannot find an answer here, please contact an D-Link field application engineer for assistance.

## 1. My computer does not recognize the D-Link CardBus 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 D-Link NDIS driver installed. Remove the old driver and try again.

## 2. The D-Link DWL-A520 Wireless Network Adapter 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 D-Link DWL-A520 Wireless Network Adapter 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.

## A Channel and Data Rate Selection

This section provides basic information for selecting fixed data rate and channel frequency in the NDIS driver. This becomes necessary if you want to test the D-Link Wireless Network Adapter at a specific channel with the rate adaptation controls turned off.

To select channel frequency and data rate in the Windows environment with NDIS driver installed:

- 1. Choose Start > Run, and type "regedit" to open Registry Editor.
- 2. For Windows 2000 and Windows XP, locate the following registry key, and select Find from the Edit menu:

HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\

For Windows 98SE and Windows Me, locate the following registry key, and select Find from the Edit menu:

HKEY\_LOCAL\_MACHINE\System\CurrentControlSet\

3. Type "clist" and click Find Next to find the registry key. Note that if you have multiple instances of the D-Link Wireless Network Adapter installed, for example, the NDIS driver is installed more than once, then you will need to click Find Next to locate the current instance of the device that is in use.

4. Double-click on clist and enter the channel number in the "Value Data" field. Enter the IEEE channel number from the following table. For example, enter 40 to select channel frequency of 5.20 GHz. The channel numbers follow the IEEE format where:

Channel Number	Channel Frequency	Regulator Domain
26	5.13 GHz	N/A (not calibrated)
28	5.14 GHz	N/A (not calibrated)
30	5.15 GHz	N/A (not calibrated)
32	5.16 GHz	N/A (not calibrated)
34	5.17 GHz	TELEC
36	5.18 GHz	FCC
38	5.19 GHz	TELEC
40	5.20 GHz	FCC
42	5.21 GHz	TELEC
44	5.22 GHz	FCC
46	5.23 GHz	TELEC
48	5.24 GHz	FCC
50	5.25 GHz	N/A (not calibrated)
52	5.26 GHz	FCC
54	5.27 GHz	N/A (not calibrated)
56	5.28 GHz	FCC
58	5.29 GHz	N/A (not calibrated)
60	5.30 GHz	FCC
62	5.31 GHz	N/A (not calibrated)
64	5.32 GHz	FCC
66	5.33 GHz	N/A (not calibrated)
68	5.34 GHz	N/A (not calibrated)
70	5.35 GHz	N/A (not calibrated)
72	5.36 GHz	N/A (not calibrated)
74	5.37 GHz	N/A (not calibrated)
76	5.38 GHz	N/A (not calibrated)
78	5.39 GHz	N/A (not calibrated)
80	5.40 GHz	N/A (not calibrated)

Channel Frequency (in GHz) = 5 + 0.005 \* (Channel Number)

Channel Number	Channel Frequency	Regulator Domain
82	5.41 GHz	N/A (not calibrated)
84	5.42 GHz	N/A (not calibrated)
86	5.43 GHz	N/A (not calibrated)

5. To select the fixed data rate at which you want the station to transmit, double-click on rateCtrlEnable from the same registry key location where clist resides, and enter 0 to disable rate adaptation. Double-click on TransmitRate and enter the value specified in the following table to select the actual data rate. For example, enter 3 for 18 Mbps.

Rate Number	Data Rate
0	6 Mbps
1	9 Mbps
2	12 Mbps
3	18 Mbps
4	24 Mbps
5	36 Mbps
6	48 Mbps
7	54 Mbps

- 6. For the changes to take effect:
  - If you are running Windows 98SE or Windows Me, close Register Editor and restart the systems.
  - If you are running Windows 2000 or Windows XP, unload and load the driver from LinkMon.
- 7. To undo these changes and go back to normal operation where the channel and data rate are dynamically set, change rateCtrlEnable to 1 and clear the clist value.