NETGEAR RangeMax NEXT Wireless Notebook Adapter WN511B User Manual

NETGEAR

NETGEAR, Inc.
4500 Great America Parkway
Santa Clara, CA 95054 USA

Beta
April 2006

Technical Support

For customer support see *http://kbserver.netgear.com/kb_web_files/n10005.asp*

NETGEAR, INC. Support Information

Phone: 1-888-NETGEAR, for US & Canada only. For other countries, see your support information card.

E-mail: support@netgear.com

North American NETGEAR Web site: *http://www.netgear.com*

Statement of Conditions

In the interest of improving internal design, operational function, and/or reliability, NETGEAR reserves the right to make changes to the products described in this document without notice.

NETGEAR does not assume any liability that may occur due to the use or application of the product(s) or circuit layout(s) described herein.

© 2006 NETGEAR, Inc. NETGEAR, the NETGEAR logo, The Gear Guy and Everybody's Connecting are trademarks or registered trademarks of NETGEAR, Inc. in the United States and/or other countries. Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries. Other brand and product names are trademarks or registered trademarks of their respective holders. Information is subject to change without notice. All rights reserved.

Maximum Wireless Signal Rate Derived from IEEE Standard 802.11 Specifications

Actual data throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate.

Safety and Regulatory Notices

FCC Statement

The WN511B has been tested and complies with the specifications for a Class B digital device, pursuant to 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.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to 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 is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment or devices
- Connect the equipment to an outlet other than the receiver’s
- Consult a dealer or an experienced radio/TV technician for assistance

FCC Caution: Any change or modification to the product not expressly approved by Netgear could void the user's authority to operate the device.

FCC RF Radiation Exposure and SAR Statements

SAR Statement

The Netgear WN511B has been tested for body-worn Specific Absorption Rate (SAR) compliance. The FCC has established detailed SAR requirements and has established that these requirements have been met while installed in host notebook computer.

RF Exposure Information

The radio module has been evaluated under FCC Bulletin OET 65C (01-01) and found to be compliant to the requirements as set forth in CFR 47 Sections, 2.1093, and 15.247 (b) (4) addressing RF Exposure from radio frequency devices. This model meets the applicable government requirements for exposure to radio frequency waves. The highest SAR level measured for this device was 0.382w/kg.

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

Canadian Department of Communications Industry Canada (IC) Notice

This Class B digital apparatus complies with Canadian ICES-003 and RSS-210. Cet appareil numérique de la classe B est conforme à la norme NMB-003 et CNR-210 du Canada.

Operation is subject to the following two conditions:

1) this device may not cause interference and

2) this device must accept any interference, including interference that may cause undesired operation of the device

IMPORTANT NOTE:

IC Radiation Exposure Statement:

This equipment complies with Canada radiation exposure limits set forth for uncontrolled environments. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Europe - EU Declaration of Conformity with Regard to R&TTE Directive 1999/5/EC

A printed copy of the EU Declaration of Conformity certificate for this product is provided in the WN511B product package.

Èesky [Czech]	NETGEAR, Inc. tímto prohlašuje, že tento NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B je ve shodì se základními požadavky a dalšími pøíslušnými ustanoveními smìrnice 1999/5/ES.
Dansk [Danish]	Undertegnede NETGEAR, Inc. erklærer herved, at følgende udstyr NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
Deutsch [German]	Hiermit erklärt NETGEAR, Inc., dass sich das Gerät NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
Eesti [Estonian]	Käesolevaga kinnitab NETGEAR, Inc. seadme NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.

English	Hereby, NETGEAR, Inc., declares that this NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Español [Spanish]	Por medio de la presente NETGEAR, Inc. declara que el NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ NETGEAR, Inc. ΔΗΛΩΝΕΙ ΟΤΙ NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
Français [French]	Par la présente NETGEAR, Inc. déclare que l'appareil NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
Italiano [Italian]	Con la presente NETGEAR, Inc. dichiara che questo NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo NETGEAR, Inc. deklarç, ka NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B atbilst Direktîvas 1999/5/EK bûtiskajâm prasîbâm un citiem ar to saistîtajiem noteikumiem.
Lietuviø [Lithuanian]	Šiuo NETGEAR, Inc. deklaruoja, kad šis NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
Nederlands [Dutch]	Hierbij verklaart NETGEAR, Inc. dat het toestel NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
Malti [Maltese]	Hawnhekk, NETGEAR, Inc., jiddikjara li dan NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B jikkonforma mal-tiijiet essenzjali u ma provvedimenti orajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
Magyar [Hungarian]	Alulírott, NETGEAR, Inc. nyilatkozom, hogy a NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.
Polski [Polish]	Niniejszym NETGEAR, Inc. oœwiadcza, ¿e NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B jest zgodny z zasadniczymi wymogami oraz pozosta³ymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
Português [Portuguese]	NETGEAR, Inc. declara que este NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
Slovensko [Slovenian]	NETGEAR, Inc. izjavlja, da je ta NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B v skladu z bistvenimi zahtevami in ostalimi relevantnimi doloèili direktive 1999/5/ES.

Slovensky [Slovak]	NETGEAR, Inc. týmto vyhlasuje, že NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B spåòa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
Suomi [Finnish]	NETGEAR, Inc. vakuuttaa täten että NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Svenska [Swedish]	Härmed intygar NETGEAR, Inc. att denna NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

Product and Publication Details

Model Number:	WN511B
Publication Date:	April 2006
Product Family:	Wireless Adapter
Product Name:	NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B
Home or Business Product:	Home
Language:	English
Publication Part Number:	Beta 2

Contents

Chapter 1
About This Manual

Audience, Scope, and Conventions 1-1

Chapter 2
Basic Setup

A Road Map for “How to Get There From Here” 2-1
What You Need Before You Begin 2-4
Verify System Requirements 2-5
Observe Wireless Location and Range Guidelines 2-5
What’s in the Box? 2-6
Default Wireless Settings 2-6
Installation Instructions 2-6
Connecting to Wireless Networks and the Internet 2-10
The Smart Wizard Status Bar 2-10
Icon Colors 2-11
Removing the Software 2-12
Upgrading the Wireless Adapter Software 2-12

Chapter 3
Network Connections and Wireless Security

Understanding the Smart Wizard 3-1
Finding a Network 3-2
Profiles 3-3
Adding Profiles 3-3
Setting up a Profile to Connect to an Access Point or Router 3-3
Setting up a Computer-to-Computer (Ad Hoc) Profile 3-5
Starting a Computer-to-Computer (Ad Hoc) Network Connection 3-7
Wireless Security 3-8
Know Your Wireless Network Settings 3-8
Wireless Network Name (SSID) and Security Settings 3-9

Setting up WEP Encryption Security 3-10
Setting up WPA2-PSK Security 3-11
Setting up WPA-PSK Security 3-12
Advanced Settings 3-13
Networks Page 3-13
Statistics Page 3-15
About Page 3-16

Chapter 4
Troubleshooting

Troubleshooting Tips 4-1
Frequently Asked Questions 4-1

Appendix A
Default Configuration Settings and Technical Specifications

Default Configuration Settings A-1
Technical Specifications A-2

Appendix B
Related Documents

Chapter 1
About This Manual

Audience, Scope, and Conventions

This manual assumes that you have basic to intermediate computer and Internet skills. However, tutorial information is provided on the *NETGEAR CD*, and on the NETGEAR Web site.

This manual uses the following typographical conventions:

Table 1-1. Typographical conventions

Italics	Emphasis
Bold	User input

This manual uses the following formats to highlight special messages:

	Note: This format is used to highlight information of importance or special interest.

This manual is written according to these specifications:

Table 1-2. Manual Specifications

Product Version	NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B
Manual Part Number	Beta 2
Manual Publication Date	April 2006

	Note: Product updates in English language tare available on the NETGEAR Web site at *http://kbserver.netgear.com/downloads_support.asp.*

Chapter 2
Basic Setup

The NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B lets you connect a PC computer to wireless networks. It is designed for PC computers running Microsoft Windows. For information about product features and compatible NETGEAR products, please see the NETGEAR Web site at *http://www.netgear.com*.

This chapter describes how to install your Wireless Adapter and set up basic wireless connectivity on your Wireless Local Area Network (WLAN). Advanced wireless network set up is covered in Chapter 3, “Network Connections and Wireless Security”.

A Road Map for “How to Get There From Here”

Wireless technology has removed one of the barriers to networking—running wires. Wireless technology also adds issues such as range, interference, signal quality, and security to the picture.

The table below shows how to complete common tasks with a network: connecting to a wireless network, using security, connecting to the Internet, exchanging files with other computers, and using printers in the combined wireless and wired network.

Table 2-1. A Road Map for How to Get There From Here ...

If I Want to... ?	What Do I Do?	What Is Needed?	How Do I?
Connect to a wireless network	1. Get the wireless network name (SSID) and, if used, the wireless security settings. 2. Set up the Wireless Adapter with the settings from Step 1.	1. A wireless network 2. A computer within the operating range of the wireless network.	For set up, see “Installation Instructions” on page 2-6 and follow the instructions. For wireless network range, see “Observe Wireless Location and Range Guidelines” on page 2-5. For wireless networking, see the Web link to “Wireless Communications:” in Appendix B.

Table 2-1. A Road Map for How to Get There From Here ...

If I Want to... ?	What Do I Do?	What Is Needed?	How Do I?
Protect my wireless connection from snooping, hacking, or information theft.	1. Enable wireless security for the wireless network. 2. Set up wireless security for your Wireless Adapter to match the network. 3. Use Windows security features.	1. A wireless network with authentication and WEP, WPA-PSK, or WPA2-PSK encryption enabled. 2. Wireless networking equipment such as the WN511B that supports these security features.	To use wireless security features, see "Internet Networking and TCP/IP Addressing:" in Appendix B and set up your WN511B accordingly.
Note: Secure Internet sites such as banks and online merchants use encryption security built into Web browsers. Wireless security features that you implement are in addition to those on secure Internet sites.			
Connect to the Internet over my wireless network.	1. Activate my wireless link and verify my network connection. 2. Open an Internet browser such as Internet Explorer or Netscape Navigator.	1. An Internet service such as cable modem or DSL. 2. A network with a wireless router or access point connected to the cable/DSL modem. 3. TCP/IP Internet networking software installed and configured on your PC based on the requirements of the Internet service provider 4. An Internet browser.	To use your Wireless Adapter in Infrastructure Mode, see "Installation Instructions" on page 2-6. To set up a Profile, see. "Profiles" on page 3-3. For TCP/IP See the Web link to "Internet Networking and TCP/IP Addressing:" in Appendix B.

Table 2-1. A Road Map for How to Get There From Here ...

If I Want to... ?	What Do I Do?	What Is Needed?	How Do I?
Exchange files between a wirelessly connected computer and other computers in a combined wireless and wired network.	1. Use the Windows Network Neighborhood feature to browse for computers in the combined wireless and wired network. 2. Browse the hard drive of a computer in the network to locate the directory or files you want to work with. 3. Use the Windows Explorer functions to exchange files between the computers.	1. The computer that connects to the wireless network must be configured with: • Windows Client and File and Print Sharing • The same Windows Workgroup or Domain settings as the other Windows computers in the combined wireless and wired network. 2. When Windows prompts for security access rights such as login user name/ password, you must enter them. 3. If Windows 'peer' Workgroup networking is used, the drive, file system directory, or file need to be enabled for sharing.	Windows Domain settings are usually managed by corporate computer support groups. Windows Workgroup settings are commonly managed by individuals who set up small networks in their homes, or small offices. For TCP/IP see the Web link to "Internet Networking and TCP/IP Addressing:" in Appendix B. For assistance with setting up Windows networking, refer to the PC Networking Tutorial on the *NETGEAR CD* and the Help information provided in the Windows system you are using.

Table 2-1. A Road Map for How to Get There From Here ...

If I Want to... ?	What Do I Do?	What Is Needed?	How Do I?
Use printers in a combined wireless and wired network.	1. Use the Windows Printers and Fax features to locate available printers in the combined wireless and wired network. 2. Use the Windows Add a Printer wizard to add access to a network printer from the PC you are using to wirelessly connect to the network. 3. From the File menu of an application such as Microsoft Word, use the Print Setup feature to direct your print output to the printer in the network.	1. The computer that you are using to connect to the wireless network needs to be configured with: • Windows Client and File and Print Sharing • The same Windows Workgroup or Domain settings as the other Windows computers in the combined wireless and wired network. 2. Any Windows networking security access rights such as login user name/ password that have been assigned in the Windows network must be provided when Windows prompts for such information. 3. If so-called Windows 'peer' networking is being used, the printer needs to be enabled for sharing.	Windows Domain settings are usually managed by corporate computer support groups. Windows Workgroup settings are commonly managed by individuals who want to set up small networks in their homes, or small offices. For assistance with setting up Windows networking, refer to the PC Networking Tutorial on the *NETGEAR CD* and the Help information provided in the Windows system you are using. For help with setting up printers in Windows, refer to the Help and Support information that comes with the version of the Windows operating systems you are using.

What You Need Before You Begin

You need to verify that your computer meets the minimum system requirements and identify the wireless network settings of the wireless network where you will connect before you can set up your wireless notebook adapter and connect.

Verify System Requirements

Before installing the Wireless Adapter, please make sure that these minimum requirements have been met. You must have a computer with:

- A Pentium 300 MHz or higher compatible processor with an available Cardbus slot.
- A CD drive.
- 10 MB of free hard disk space.
- Windows 2000 and Windows XP.

Observe Wireless Location and Range Guidelines

Computers can connect over wireless networks indoors at a range which vary significantly based on the location of the computer with the Wireless Adapter. For best results, avoid potential sources of interference, such as:

- Large metal surfaces
- Microwave ovens
- 2.4 GHz Cordless phones

In general, wireless devices can communicate through walls. However, if the walls are constructed with concrete, or have metal, or metal mesh, the effective range will decrease if such materials are between the devices.

What's in the Box?

The product package should contain the following items:

- NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B
- NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B Installation Guide
- *NETGEAR CD*, including:
  - Driver and Configuration Utility Software
  - NETGEAR RangeMax NEXT Wireless Notebook Adapter WN511B User Manual
- Warranty and Support information card

If any of the parts are incorrect, missing, or damaged, contact your NETGEAR dealer. Keep the carton, including the original packing materials, in case you need to return the product.

Default Wireless Settings

If this is a new wireless network installation, use the factory default settings to set up the network and verify wireless connectivity. If this is an addition to an existing wireless network, you need the wireless network and wireless security settings that are already defined.

Your Wireless Adapter factory default basic settings are:

- Network Name Service Set Identification (SSID): **NETGEAR**

	Note: In order for the Wireless Adapter to communicate with a wireless access point or wireless adapter, all devices must be set up to use the same wireless network name (SSID).

- Network Mode (Infrastructure or Ad-hoc): **Infrastructure**
- Data security WEP, WPA2-PSK, or WPA-PSK encryption: **Disabled**

The section below provides instructions for setting up the Wireless Adapter for basic wireless connectivity to an access point.

Installation Instructions

The instructions in this chapter are for an Access Point (Infrastructure) installation. Wireless security, advanced settings, and Computer-to-Computer (Ad Hoc) instructions are covered in Chapter 3, "Network Connections and Wireless Security".

Follow the instructions below to install the Wireless Adapter.

1. First, install the software.

a. Insert the *NETGEAR CD* in your computer's CD drive. If the CD main page does not appear, double-click autorun.exe on the CD.

b. Click **Install Software**. The Smart Wizard starts.

c. Follow the Wizard steps, and click **Next** to continue.

d. When the Installation Complete message appears, click **Next**.

Figure 2-1

2. Now, when prompted, insert your wireless notebook adapter.

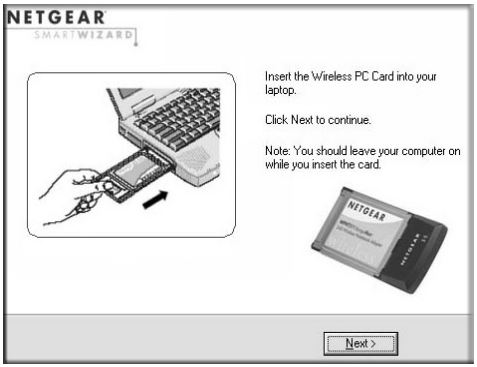

Figure 2-2

3. *For Windows XP users*, choose the wizard.

If you use Windows 2000, skip to Step 4, below.

a. Choose the NETGEAR Smart Wizard (recommended) or the Windows XP Configuration utility.

If you choose the Windows XP option, then you must read the Windows XP documentation for instructions.

b. Click **Next** to accept the NETGEAR Smart Wizard.

Figure 2-3

4. Use the Smart Wizard to set up your Wireless Adapter

a. When prompted, click **Next** to let the wizard help you connect to a network (recommended).

Figure 2-4

b. Select the wireless network from the drop-down list, and the wizard records your choice.

Note: Hidden networks do not broadcast the Network Name (SSID). These networks are included in the drop-down list, but the Network Name (SSID) is blank.

If the network uses security, then the Smart Wizard detects it.

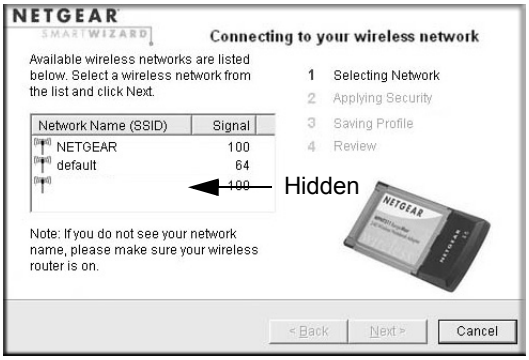

Figure 2-5

c. Follow the Wizard steps for Security (if used) and for saving a Profile.

d. After you have reviewed the settings, click Finish.

The icon appears in the System Tray and on the desktop. The wizard initiates your wireless connection. It could take up to a minute for your wireless connection to be established.

The Smart Wizard Settings page opens.

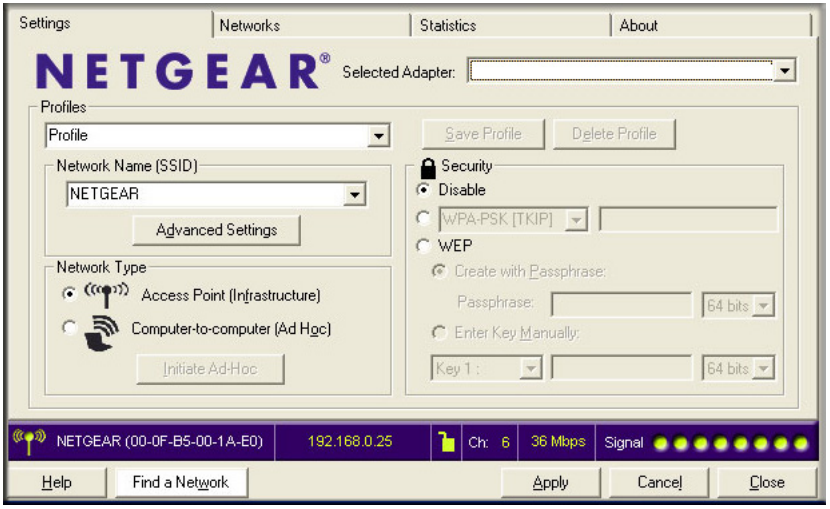

Figure 2-6

5. Use the status bar to verify your wireless connectivity. For more information about connecting, see "Connecting to Wireless Networks and the Internet" on page 2-10.

Connecting to Wireless Networks and the Internet

The Wireless Adapter has indicators that show the status of your connection to a wireless network and to the Internet:

- **Icon:** After you install the software, this icon appears on the desktop and in the lower right of the Windows task bar. It is color coded to show the status of the connection. See "The Smart Wizard Status Bar" on page 2-10.
- **Smart Wizard Status Bar:** Clicking on the system tray icon opens the Smart Wizard. The status bar at the bottom of the page shows details about your wireless and Internet connection.

The Smart Wizard Status Bar

Click the icon to open the Smart Wizard so you can view the status bar. The Smart Wizard Settings page opens. The status bar is at the bottom of the page.

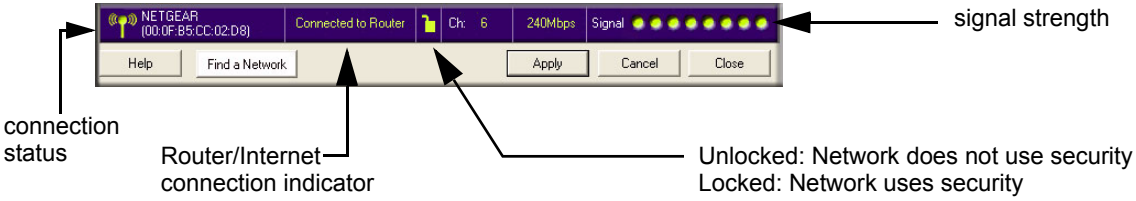

Figure 2-7

Connection Status: The color shows the connection status.

Signal Strength: Shows the signal strength of the wireless network. If the signal is poor, then try moving closer to the wireless access point.

Lock icon: Shows if security is used on the network.

Router/Internet Connection Indicator: This shows the progress of your connection. By default, this feature is on.

Figure 2-8

This connection indicator is useful in isolating a problem. For example, if you are connected to a router, but not to the Internet, then check the router's Internet connection.

Connection Indicator	Description
Connected to Internet or IP Address	Wireless Internet connection OK.
Connected to Router	Wireless connection to router OK but no Internet connection at router.
___.___.___.___ or 169.254..x.x	Wireless connection to a router OK but problem with the router. See Chapter 4, "Troubleshooting".

If you right-click in the System Tray icon, you can disable the Internet notification feature by clearing check mark on this line. If you do so, then only the IP address is shown.

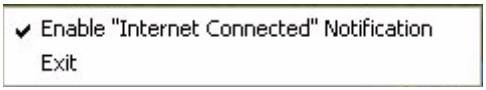

Figure 2-9

Icon Colors

The icon is on the desktop and in the Windows System Tray. The System Tray resides on one end of the taskbar in the Microsoft Windows desktop.

Color	Condition	Description
Red	The wireless notebook adapter has no connection to any other wireless node.	The Wireless Adapter can not link to any other wireless node or the link is lost. Check your configuration or try moving to a location where the wireless signal quality is better.
Yellow	The wireless notebook adapter has a connection with another wireless node.	The wireless link is weak. You may need to move to a better spot, such as closer to the wireless access point. Also, look for possible interference such as a 2.4 GHz cordless phone or large metal surface.
Green	The wireless notebook adapter has a connection with another wireless node.	The wireless notebook adapter has established good communication with an access point and the signal quality is strong.

Removing the Software

You can remove the Wireless Adapter software in these two ways:

- Navigate the Windows Start menu to the Wireless Notebook Adapter program group, select the uninstall option, and follow the screen prompts.
- Navigate the Windows Start menu to the Control Panel Add or Remove Program item, select the Wireless Notebook Adapter option, and follow the screen prompts.

Upgrading the Wireless Adapter Software

Upgrades may be available at the NETGEAR Web site. To install an upgrade, follow these steps.

1. Go to *http://kbserver.netgear.com*
2. Click the latest version of upgrade.
3. Examine the Release Note. Make sure to read any warnings and Known Problems.
4. Download the upgrade using the link in the Release Note.
5. Follow the Release Note installation instructions.

Chapter 3
Network Connections and Wireless Security

This chapter explains how to use your Wireless Adapter to connect to your Wireless Local Area Network (WLAN) and how to set up wireless security for the Wireless Adapter so that it matches the wireless security settings for your network.

Understanding the Smart Wizard

	Note: These instructions explain how to use the NETGEAR Smart Wizard to change the Wireless Adapter wireless settings. If you use Windows XP, and chose the Windows XP configuration utility during installation, then you must disable it now. Open the network connections from the System Tray icon, click the Properties button, click the Wireless Networks tab and then clear the “Use Windows to configure my wireless network settings” check box.

When you have installed the software from the *NETGEAR CD*, the icon appears on your desktop and in the Windows System Tray. The Windows System Tray is located on the Windows taskbar. You can either double-click this icon on the desktop, or click it in the System Tray at any time, to use the Smart Wizard. This software automatically restarts when you reboot your computer.

The Smart Wizard provides a complete and easy to use set of tools to:

- Choose the network that you want to use.
- Configure wireless settings for your wireless USB adapter.
- Monitor wireless network connections.
- Save your settings in profiles.
- Remove or reinstall the wireless adapter software.

The following sections in this chapter explain how to use the Smart Wizard.

Finding a Network

During the Wireless Adapter software installation, the Smart Wizard lists the available networks. After installation you can use the Find a Network button on the Network tab at any time to view the available networks and select the one that you want to use.

	Note: Make sure that you know the security settings for the network that you want to use. For example, if WEP is used then you need to know the WEP key. If you use secure networks frequently, set up profiles for each network with the wireless network and security settings.

Follow the steps below to Find a Network.

1. Use the icon to open the Smart Wizard.

   The Settings tab page opens.
2. Click Find a Network.
3. Select a network from the drop-down list. If you select a hidden network then you must enter the SSID. Click Next.
4. Follow the steps of the wizard to specify the wireless security if used, and to create a profile.
5. Review you settings, and click Finish.

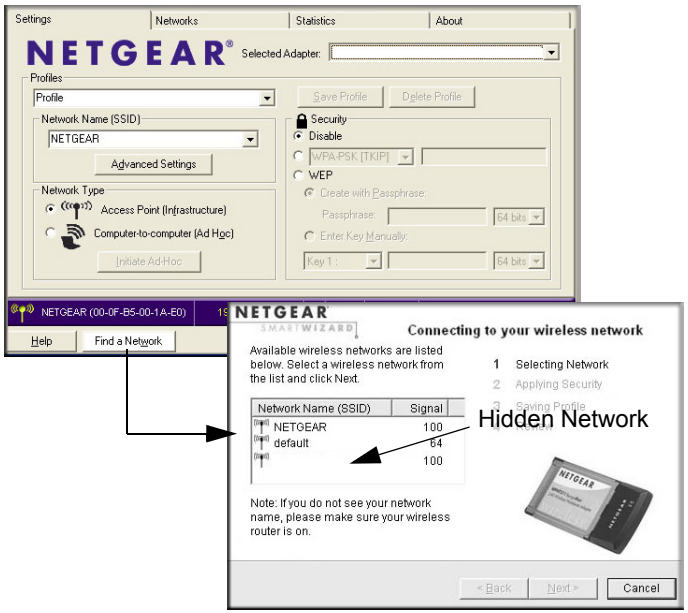

Figure 3-1

The Smart Wizard initiates your wireless connection. You can use the Status Bar to verify your network connection. For more information, see "The Smart Wizard Status Bar" in Chapter 2.

Profiles

The WN511B Smart Wizard uses profiles to store all the settings for a particular wireless network. There are two special profile names: Default and Profile.

Default: The Profile named Default automatically scans for any available network. You cannot change this profile name.

Profile: If you do not enter a name in the Profile Name box, then the name Profile is used to save your settings. If you do this more than once then you will be asked if you want to replace the previous settings stored in Profile.

Adding Profiles

You can store multiple profiles and recall the one which matches the network you want to join.

If you use your computer to connect to different wireless networks, you can create a profile for each wireless network. Then, you can easily load the profile that has all the settings that you need to join the network you are using at the time.

There are two types of wireless network profiles that you can set up:

- **Access Point (Infrastructure) —** connect to an access point or router with the 802.11 infrastructure mode. For example, this mode is used when computers in a house connect to an access point that is attached to a router, which lets multiple computers share a single cable or DSL broadband Internet connection.
- **Computer-to-Computer (Ad Hoc) —** connect directly to another computer with the 802.11 ad hoc mode. For example, Ad Hoc mode is used when two Windows computers are configured with file and print sharing enabled and you want to exchange files directly between them.

For more information on 802.11 wireless network modes, see the wireless reference document at:

http://documentation.netgear.com/reference/enu/wireless/index.htm.

Setting up a Profile to Connect to an Access Point or Router

Follow these instructions to set up the Wireless Notebook Adapter to connect to a wireless access point or router.

1. Use the icon to open the Smart Wizard. The Settings page opens.

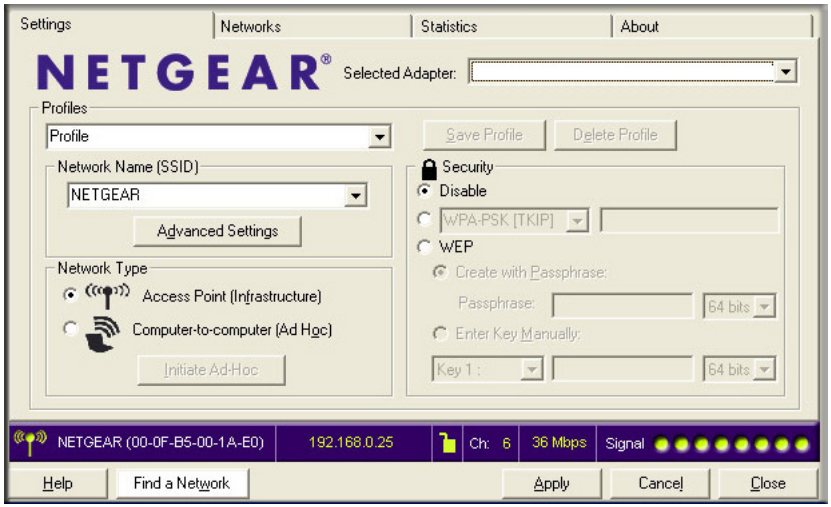

Figure 3-2

2. Enter the network settings.
   a. In the Network Type section, be sure that Access Point (Infrastructure) is selected.
   b. In the Profile box, type the name of the profile.
   c. In the Network Name (SSID) field select a network or enter the SSID.

→	**Note:** You will not get a wireless network connection unless the network SSID matches exactly the SSID used by the access point.

3. Save your settings in a Profile.
   a. Click Save Profile.

      All the configuration settings are saved in this profile.
   b. Click **Apply**.
   c. Click Close to exit the wizard, or Cancel to return to the previous settings.
4. Verify wireless connectivity to your network.

   Verify connectivity by using a browser such as Netscape or Internet Explorer to connect to the Internet, or check for file and printer access on your network.

You can check the status bar in the Smart Wizard for the current connection status.

	Note: If you cannot connect, see Chapter 4, "Troubleshooting. Also, for problems with accessing network resources, the Windows Client and File and Print Sharing software might not be installed and configured properly on your computers. Please refer to "Internet Networking and TCP/IP Addressing:" in Appendix B.

Setting up a Computer-to-Computer (Ad Hoc) Profile

The Computer-to-Computer setting uses Ad Hoc mode. Ad Hoc mode is an 802.11 networking framework in which devices or computers communicate directly with each other, without the use of an access point. For example, this mode is used when two Windows computers are configured with file and print sharing enabled and you want to exchange files directly between them.

	Note: Ad Hoc mode will not work using DHCP settings. Ad Hoc mode requires either static IP addresses (such as **`192.168.0.1`**) or the IPX protocol. For instructions on setting up static IP addresses on a Windows PC, refer to the PC Networking Tutorial included on the *NETGEAR CD*.

Follow the instructions below to create an Ad Hoc mode profile.

1. Use the icon to open the Smart Wizard. The Settings page opens.

2. Enter the network settings.

   a. Select Computer-to-Computer (Ad Hoc) for the Network Type.

   b. Select or enter the Network Name (SSID) for the Ad Hoc network.

   c. In the Profile box, type the name of the profile.

   d. Click **Apply**.

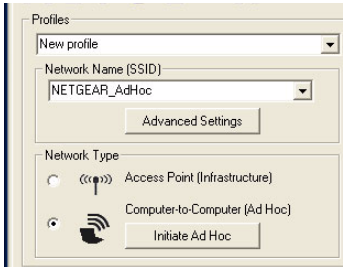

Figure 3-3

3. Save your settings in a Profile.

a. Click Save Profile.

All the configuration settings are saved in this profile.

b. Click **Apply**.

c. Click Close to exit the Smart Wizard, or Cancel to return to the previous settings.

4. Configure the PC network settings.

a. Configure each PC with either a static IP address or with the IPX protocol.

b. Restart the PCs.

5. Verify wireless connectivity between your peer devices.

You can use the ping utility to verify your wireless connection:

a. On the Windows taskbar click Start, and then click Run.

b. Assuming the target PC is configured with 192.168.0.1 as its IP address, type **`ping -t 192.168.0.1`** and then click OK.

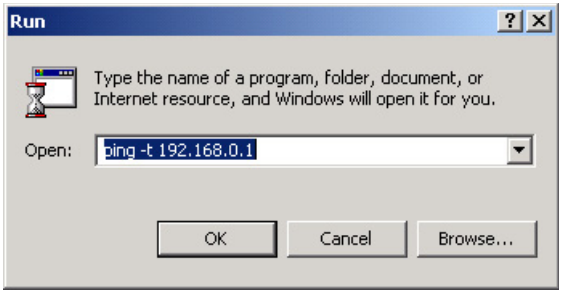

Figure 3-4

c. This sends a continuous ping to the device with the 192.168.0.1 static IP address. The ping response should change to “reply.”

```
Request timed out.
Request timed out.
Reply from 192.168.0.1: bytes=32 time=40ms TTL=127
Reply from 192.168.0.1: bytes=32 time=41ms TTL=127
Reply from 192.168.0.1: bytes=32 time=30ms TTL=127
```

Figure 3-5

At this point the connection is established. For more information about using ping, see *http://kbserver.netgear.com/kb_web_files/N101453.asp*.

→	**Note:** If you cannot connect, see “Removing the Software” in Chapter 2. Also, for problems with accessing network resources, the Windows Client and File and Print Sharing software might not be installed and configured properly on your computers. Please see the link to “Internet Networking and TCP/IP Addressing:” in Appendix B.

Starting a Computer-to-Computer (Ad Hoc) Network Connection

	Note: Ad Hoc is supported in 802.11b and 802.11g only. It is not supported at the draft 802.11n specification.

1. On the Settings tab page of the Smart Wizard, select or type the Network Name (SSID).
2. Select the Computer-to-Computer (Ad Hoc) network type.
3. Click Initiate Ad Hoc. The Ad Hoc Setting dialog box opens:

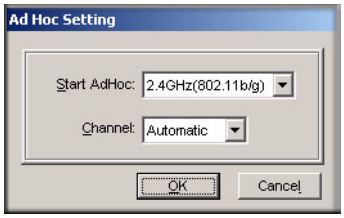

Figure 3-6

4. In the Start Ad Hoc field, choose the wireless standard (802.11b, or 802.11g) for your Ad Hoc computer-to-computer network.
5. In the Channel field, Automatic should work.

	Note: If there is interference from another nearby wireless device, use the Networks tab page to see which channels are in use in your area. Then use a different channel. For example, if your neighbors use channel 6 and the signal strength is strong, then channels 4-8 would probably be poor choices for you.

6. Click OK.

   The Wireless Adapter automatically selects the highest connection speed.

Wireless Security

Many networks use wireless security to encrypt wireless data communications. If you try to connect to a network with wireless security the Smart Wizard detects it. Before you can use that network you must set up the Wireless Adapter with the same SSID, wireless security, and security settings as that network. If you do not know what these are, contact the person who set up the network.

The Wireless Adapter supports the following types of wireless security:

- Wi-Fi Protected Access 2 Pre-Shared Key (WPA2-PSK)
- Wi-Fi Protected Access Pre-Shared Key (WPA-PSK)
- Wired Equivalent Privacy (WEP)

For more information about wireless security, see the Web link to "Wireless Communications:" in Appendix B, or the wireless reference document at:

http://documentation.netgear.com/reference/enu/wireless/index.htm

In addition to the wireless security features, networks should use LAN network security features such as requiring a user name and password to access the shared resources in the network.

The procedures below explain how to configure the wireless encryption settings of your Wireless Adapter.

Know Your Wireless Network Settings

You will need to know the settings for your wireless network. The form on the next page is set up so that you can record this information. You can use either of these two methods to keep track of these settings:

- Print the form on the next page and fill it out. If you are uncomfortable writing out secure information, put a "hint" to yourself instead of the actual information. Put the form someplace where it will be very easy for you to remember, or save two copies and put them in different places.
- Save the information in a document on your computer. Later you can search for words such as SSID to locate the information.

Wireless Network Name (SSID) and Security Settings

Print this form, fill in the configuration parameters and put it in a safe place for possible future reference. For an existing wireless network, the person who set up the network will have this information.

- ***Network Name (SSID):*** The Service Set Identification (SSID) identifies the wireless local area network. **Any (First available network)** is the default WN511B wireless network name (SSID). You may customize it using up to 32 alphanumeric characters. Write your customized wireless network name (SSID) on the line below.

	Note: The SSID in the wireless access point is the SSID you configure in the wireless USB adapter. For the access point and wireless nodes to communicate with each other, all must be configured with the same SSID.

  Wireless network name (SSID): _____

- **If WEP Authentication is Used.**
  - **WEP Encryption key size**. Identify one: **64-bit** or **128-bit**. The encryption key size must the wireless network settings.
  - **Data Encryption (WEP) Keys**. There are two methods for creating WEP data encryption keys. Whichever method you use, record the key values in the spaces below.
    - **Passphrase method**. _____ These characters *are* case sensitive. Enter a word or group of printable characters and click the Generate Keys button. Not all wireless devices support the passphrase method.
    - **Manual method**. These values *are not* case sensitive. For 64-bit WEP, enter 10 hex digits (any combination of 0-9 or a-f). For 128-bit WEP, enter 26 hex digits.

    Key 1: _____ Key 2: _____

    Key 3: _____ Key 4: _____

- **If WPA2-PSK or WPA-PSK Authentication is Used.**
  - **Passphrase**: _____ These characters *are* case sensitive. Enter a word or group of printable characters. When you use WPA-PSK, the other devices in the network will not connect unless they are set to WPA-PSK as well and are configured with the correct Passphrase.

Use the procedures below to set up basic security settings in the WN511B.

Setting up WEP Encryption Security

Follow the steps below to configure WEP Encryption Security.

1. Run the Wireless Adapter Smart Wizard.
   a. Make sure the software is installed and the Wireless Adapter is into the Cardbus slot in your computer.
   b. Use the icon to open the Smart Wizard. The Settings tab page opens.

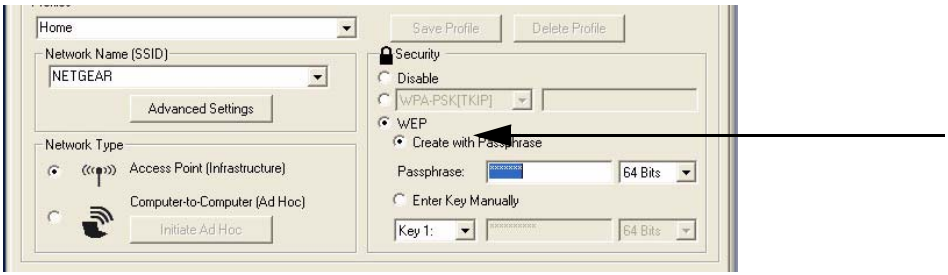

Figure 3-7

2. Configure the Security settings.
   a. In the Profile box, select the profile or type in a profile name.
   b. In the Network Name (SSID) field select the network, or enter the SSID.

→	**Note:** You will not get a wireless network connection unless the network SSID matches exactly what is configured in the access point.

   c. In the Security section, select WEP.
3. Select the WEP encryption strength you will use.

   The choices are:
   - 64-bit WEP data encryption
   - 128-bit WEP data encryption

→	**Note:** The 128-bit encryption keys require more processing, and slow performance slightly.

4. Select Create with Passphrase and enter the passphrase. The configuration utility will automatically generate the WEP keys.

	Note: The characters are case sensitive. Be sure to use the same passphrase for all the wireless devices in the network.

If the passphrase method is not available in the other devices, you must manually enter the keys to match exactly what is in the access point and other 802.11b wireless devices.

5. Save your settings in a Profile.
   a. Click Save Profile. All the configuration settings are saved in this profile.
   b. Click **Apply**.
   c. Click Close to exit the configuration utility.

Setting up WPA2-PSK Security

Follow the steps below to configure WPA2-PSK Security.

1. Run the Wireless Adapter Smart Wizard.
   a. Make sure the software is installed and the Wireless Adapter is fully inserted in a Cardbus port in your computer.
   b. Use the icon to open the Smart Wizard. The Settings tab page opens.

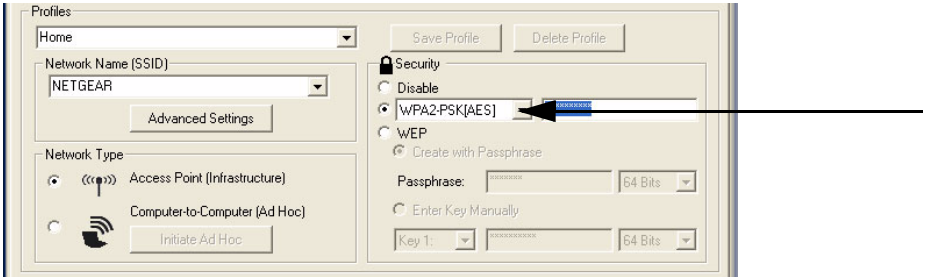

Figure 3-8

2. Configure the Security settings.
   a. In the Profile box, select the profile or type in a profile name.

b. In the Network Name (SSID) field select the network, or enter the SSID.

	Note: You will not get a wireless network connection unless the network SSID matches exactly what is configured in the access point.

c. In the Security section, select WPA2-PSK [AES].

For more information about WPA2-PSK security, see the Web link to "Wireless Communications:" in Appendix B.

3. Save your settings in a Profile.

a. Click the Save Profile button. All the configuration settings are saved in this profile.

b. Click **Apply**.

c. Click Close to exit the Smart Wizard.

Setting up WPA-PSK Security

Follow the steps below to configure WPA-PSK Security.

1. Run the Wireless Adapter Smart Wizard.

a. Make sure the software is installed and the Wireless Adapter is fully inserted in a Cardbus slot in your computer.

b. Use the icon to open the Smart Wizard. The Settings tab page opens.

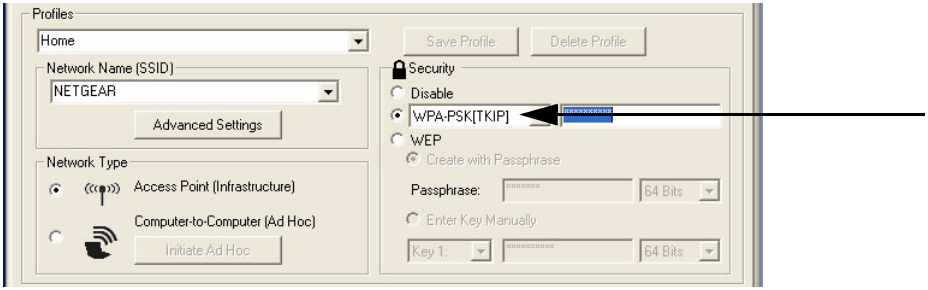

Figure 3-9

2. Configure the Security settings.

a. In the Profile box, select the profile or type in a profile name.

b. In the Network Name (SSID) field select the network, or enter the SSID.

	Note: You will not get a wireless network connection unless the network SSID matches exactly what is configured in the access point.

c. In the Security section, select WPA-PSK [TKIP].

For more information on WPA security, see the Web link to "Wireless Communications:" in Appendix B.

3. Save your settings in a Profile.

a. Click Save Profile. All the configuration settings are saved in this profile.

b. Click **Apply**.

c. Click Close to exit the Smart Wizard.

Advanced Settings

Most people do not need to change the Wireless Adapter Advanced Settings. If you cannot connect without making changes, or if your Internet Service Provider (ISP) or network administrator recommend changes, then some of these will be important to you.

On the Settings tab click Advanced Settings. Use the Help button to understand these options.

Networks Page

The Networks Page scans and displays all available wireless networks in your area.

1. Use the icon to open the Smart Wizard. The Settings tab page opens.
2. Click the Networks tab.

The following buttons are at the bottom of the Networks tab:

- **Help:** Display online help.
- **Find a Network:** Use the wizard to help you connect to a network. See "Finding a Network" on page 3-2.
- **Connect:** Connect to the network that you selected.
- **Scan:** Check for wireless networks.
- **Close:** Close the window of the Wizard.

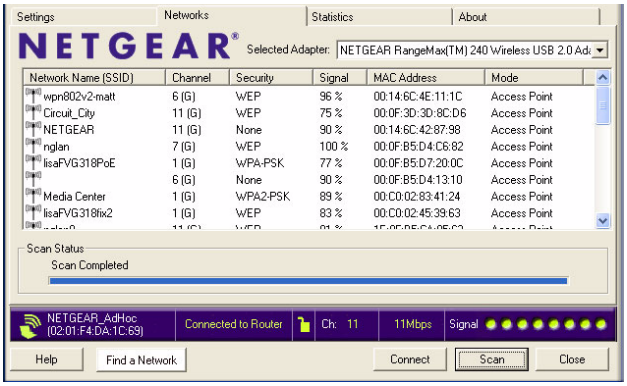

Figure 3-10

The screen also shows the following information for each network scanned:

- **Network Name (SSID):** The name assigned to a wireless network. This is the same as the SSID or ESSID configuration parameter. Note that as a security measure, some wireless access points do not broadcast their SSID. In such cases, the SSID field will be blank even though the rest of the information will still be displayed.
- **Channel:** The channel determines which operating frequency will be used.
- **Security:** Identifies whether the wireless network uses WEP or WPA-PSK security settings.
- **Signal:** Identifies the signal strength of the communications.
- **MAC Address:** Identifies the hardware address (MAC Address) of the wireless device broadcasting this information.
- **Mode:** Identifies the type of wireless network — Access Point (Infrastructure) or Computer-to-Computer (Ad Hoc).

	Note: You can click Scan to see which networks are broadcasting in your area. This refreshes the page.

Statistics Page

The Statistics page provides real time and historical trend information on the data traffic and performance of your wireless adapter.

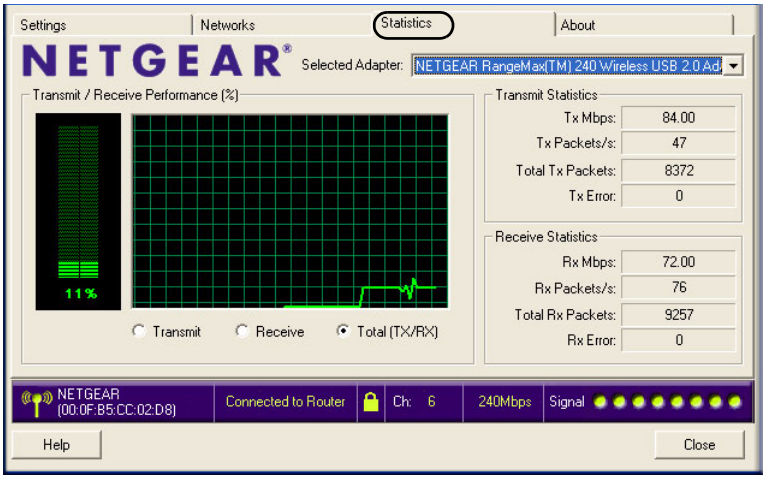

Figure 3-11

- **Transmit/Receive Performance (%):** A real time graph identifying the total, receive, and transmit utilization as a percentage the total possible.
- **Transmit, Receive, and Total (TxRx):** Radio buttons let you select whether to display the transmit performance, the receive performance, or both in the same graph.
- **Transmit Statistics:** Identifies transmit megabits per second (Mbps), transmit packets per second (Tx Packets/s), total transmitted packets, and transmit errors.
- **Receive Statistics:** Identifies receive megabits per second (Mbps), receive packets per second (Rx Packets/s), total received packets, and reception errors.

About Page

The About page displays the current software version information.

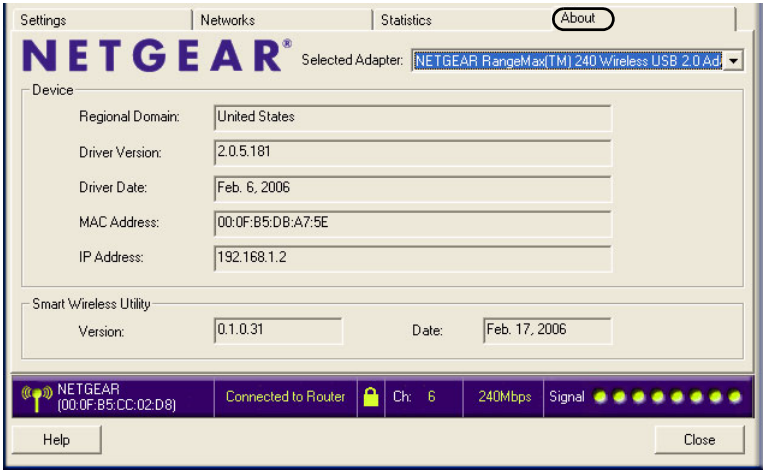

Figure 3-12

The following information is displayed in the About page:

- **Regional Domain:** This is the region setting for the wireless adapter. The approved channels for the region are automatically scanned. Governments regulate the channels used for wireless transmission. Operating the wireless adapter in a different region may violate local laws.
- **Driver Version:** The wireless adapter driver version.
- **Driver Date:** The wireless adapter driver date.
- **MAC Address:** The MAC address of the adapter. The Media Access Control address is a unique 48-bit hardware address assigned to every network interface card. Some wireless networks will restrict access based on a list of known MAC addresses. If you are communicating with such a network, you would have to provide the address shown here to the network administrator before you would be allowed to connect. Restricting access by MAC address adds an obstacle against unwanted access to your network. However, if the only wireless security that your network uses is MAC addressing, your data is easy for hackers to read.
- **IP Address:** The IP address assigned to this adapter.
- **Smart Wireless Utility:** The version and date of the Smart Wizard.

Chapter 4
Troubleshooting

This chapter provides information about troubleshooting your Wireless Adapter. After each problem description, instructions are given to help you diagnose and solve the problem. For information about connecting to wireless networks and the Internet, see "Connecting to Wireless Networks and the Internet" in Chapter 2.

Also, for problems with accessing network resources, the Windows software might not be installed and configured properly on your computers. Please refer to the link to "Internet Networking and TCP/IP Addressing:" in Appendix B.

Troubleshooting Tips

Symptom	Cause	Solution
I can connect to an access point, but I cannot connect to other computers on the network or the Internet.	This could be a physical layer problem or a network configuration problem.	Check to make sure that the access point is physically connected to the Ethernet network. Make sure that the IP addresses and the Windows networking parameters are all configured correctly. Restart the cable or DSL modem, router, access point, and notebook PC. Refer to "A Road Map for 'How to Get There From Here'" on page 2-2 for additional suggestions.

Frequently Asked Questions

Use the information below to solve common problems you may encounter. Also, please refer to the knowledge base on the NETGEAR Web site at *http://kbserver.netgear.com*. Unless you can solve a problem right away, go online and upgrade to the latest firmware for your adapter, using the link above.

The Smart Wizard keeps asking me to save my settings

This is because you have made changes to the settings and the Smart Wizard is offering you the chance to save the changes. If you want to avoid these Profile setting prompts, simply click **Apply** before you close the Smart Wizard.

Ad Hoc mode is not working correctly

You need to click the Initiate Ad Hoc button before you click **Apply**. Here is how you start an Ad Hoc network:

1. Fill in the Network Name (SSID).
2. Select the Computer-to-Computer (Ad Hoc) Network Type.
3. Click Initiate Ad Hoc.
4. Accept the default settings or make your changes and click OK
5. Click **Apply**.

	Note: Be sure all computers in your Ad Hoc network are configured with static IP addresses in the same subnet.

How to use the wireless configuration utility that comes with Windows XP

During the software installation the wizard prompts you to choose either the NETGEAR Smart Wizard or the Windows configuration utility. Be sure the Wireless Adapter is inserted in the Cardbus slot in the computer and follow these instructions to change your selection.

1. Go to Control Panel and select Network Connections.
2. Right click on the connection and select Properties.
3. Click the Wireless Networks tab.
4. Select or clear the WN511B “Use Windows to configure my wireless network settings” check box.

Did the Wireless Adapter receive a valid IP address from the Wireless Router/AP?

The easiest way is to click the System Tray icon to open the Wireless Adapter Smart Wizard. Then check the IP address in the About page.

I cannot connect to the AP that I want from the Networks browser list.

The access point is available and there is good signal strength. There are a few possibilities:

- If the access point (AP) is WPA-PSK protected, you need the correct WPA-PSK passphrase. Otherwise, the Wireless Adapter will still be connected to the previous access point and you will not be able to change to the WPA-PSK access point.
- If the access point is WEP protected (either 64-bit or 128-bit encryption), you will be prompted to enter the WEP encryption security information.

The Wireless Adapter is not getting an IP address

You probably upgraded your Wireless Adapter software and did not reboot your system.

To get an IP address assigned, you can either restart your computer or choose another access point to connect to. If there are no additional access points for you to choose from, restart your system and connect to your desired access point again.

Note: It does not usually help to shut down the Smart Wizard or disable/enable the adapter.

Why do I see no more than 54 Mbps on the status bar?

The Wireless Adapter can operate at 240 Mbps. You are probably connecting to a standard 802.11g network. If you use the NETGEAR WPNT834 RangeMax™ 240 Wireless Router you will see network speeds up to 240 Mbps.

If you are connecting to an 802.11b network, the maximum 802.11b speed is 11 Mbps.

Why do I see two Wireless Adapter icons in the System Tray?

If you see two icons in the System Tray at the bottom right corner of the screen, you have an older software version installed on your system and it needs to be removed. See “Removing the Software” in Chapter 2 or “Upgrading the Wireless Adapter Software” in Chapter 2.

Appendix A
Default Configuration Settings and Technical Specifications

Default Configuration Settings

The following table lists the default settings of your Wireless Adapter.

Feature		Description
Smart Wizard		Enabled
Wireless		
	Wireless Communication	Enabled
	Wireless Network Name (SSID)	NETGEAR
	Security	Disabled
	Network Type	Infrastructure
	Transmission Speed	Auto*
	Country/Region	United States (varies by region)
	Operating Mode	g and b, 270 Mbps
	Data Rate	270 Mbps

*. Maximum wireless signal rate (IEEE Standard 802.11n draft specification). Actual throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate.

Technical Specifications

This table below describes technical specifications for the NETGEAR RangeMax™ NEXT Wireless Notebook Adapter WN511B.

Antennas	2 separate PCB internal antennas
Standards	802.11g, 802.11b
Radio Data Rate	1, 2, 5.5, 6, 6.5, 9, 11, 12, 13.5, 18, 19.5, 24, 26, 27, 36, 39, 40, 40.5, 48, 52, 54, 58.5, 65, 72, 80, 81, 84, 96, 104, 108, 117, 120, 121.5, 130, 135, 144, 160, 168, 192, 216, 240, and 270 Mbps
Frequency	2.4GHz to 2.5GHz CCK and OFDM Modulation
Power	3.3V bus powered
Emissions	FCC Part 15 Class B, CE, C-Tick
Bus interface	Cardbus 5V
Provided drivers	Microsoft Windows XP and Windows 2000
Operating Environment	Operating temperature: 0 to 45 degree C
Encryption	40-bit (also called 64-bit) and 128-bit WEP data encryption, WPA2-PSK, and WPA-PSK
Warranty	Limited 1-year warranty

Appendix B
Related Documents

This appendix provides links to reference documents you can use to gain a more complete understanding of the technologies used in your NETGEAR product.

Document	Link
Internet Networking and TCP/IP Addressing:	*http://documentation.netgear.com/reference/enu/tcpip/index.htm*
Wireless Communications:	*http://documentation.netgear.com/reference/enu/wireless/index.htm*
Preparing a Computer for Network Access:	*http://documentation.netgear.com/reference/enu/wsdhcp/index.htm*
Virtual Private Networking (VPN):	*http://documentation.netgear.com/reference/enu/vpn/index.htm*
Glossary:	*http://documentation.netgear.com/reference/enu/glossary/index.htm*