

NETGEAR Wireless-N 150 USB Adapter WNA1000 User Manual



NETGEAR®

NETGEAR, Inc.
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Technical Support

Please refer to the support information card that shipped with your product. By registering your product at <http://www.netgear.com/register>, we can provide you with faster expert technical support and timely notices of product and software upgrades.

NETGEAR, INC. Support Information

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

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North American NETGEAR website: <http://www.netgear.com>

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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.

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 WNA1000 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 WNA1000 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 1.380 W/kg.

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.

Industry Canada Statement

This device complies with RSS-210 of the Industry Canada 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.

IMPORTANT NOTE: Radiation Exposure Statement

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. To maintain compliance with IC RF exposure compliance requirements, please follow operation instruction as documented in this manual.

Europe - EU Declaration of Conformity

A printed copy of the EU Declaration of Conformity certificate for this product is provided in the WNA1000 product package.

Ěeský [Czech]	NETGEAR, Inc. tímto prohlašuje, že tento NETGEAR Wireless-N 150 USB Adapter WNA1000 je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
Dansk [Danish]	Undertegnede NETGEAR, Inc. erklærer herved, at følgende udstyr NETGEAR Wireless-N 150 USB Adapter WNA1000 overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.

Deutsch [German]	Hiermit erklärt NETGEAR, Inc., dass sich das Gerät NETGEAR Wireless-N 150 USB Adapter WNA1000 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 Wireless-N 150 USB Adapter WNA1000 vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
English	Hereby, NETGEAR, Inc., declares that this NETGEAR Wireless-N 150 USB Adapter WNA1000 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 Wireless-N 150 USB Adapter WNA1000 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 Wireless-N 150 USB Adapter WNA1000 ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/EK.
Français [French]	Par la présente NETGEAR, Inc. déclare que l'appareil NETGEAR Wireless-N 150 USB Adapter WNA1000 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 Wireless-N 150 USB Adapter WNA1000 è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo NETGEAR, Inc. deklarē, ka NETGEAR Wireless-N 150 USB Adapter WNA1000 atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]	Šiuo NETGEAR, Inc. deklaruoja, kad šis NETGEAR Wireless-N 150 USB Adapter WNA1000 atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
Nederlands [Dutch]	Hierbij verklaart NETGEAR, Inc. dat het toestel NETGEAR Wireless-N 150 USB Adapter WNA1000 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 Wireless-N 150 USB Adapter WNA1000 jikkonforma mal-tijiet essenzjali u ma provvedimenti orajn rilevanti li hemm fid-Direttiva 1999/5/EC.
Magyar [Hungarian]	Alulírott, NETGEAR, Inc. nyilatkozom, hogy a NETGEAR Wireless-N 150 USB Adapter WNA1000 megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.
Polski [Polish]	Niniejszym NETGEAR, Inc. oświadczam, że NETGEAR Wireless-N 150 USB Adapter WNA1000 jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
Português [Portuguese]	NETGEAR, Inc. declara que este NETGEAR Wireless-N 150 USB Adapter WNA1000 está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
Slovensko [Slovenian]	NETGEAR, Inc. izjavlja, da je ta NETGEAR Wireless-N 150 USB Adapter WNA1000 v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.

Slovensky [Slovak]	NETGEAR, Inc. týmto vyhlasuje, že NETGEAR Wireless-N 150 USB Adapter WNA1000 spáda základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
Suomi [Finnish]	NETGEAR, Inc. vakuuttaa täten että NETGEAR Wireless-N 150 USB Adapter WNA1000 tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Svenska [Swedish]	Härmed intygar NETGEAR, Inc. att denna <i>[utrustningstyp]</i> står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

Product and Publication Details

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About This Manual

The *NETGEAR Wireless-N 150 USB Adapter WNA1000 User Manual* describes how to install the NETGEAR Wireless-N 150 USB Adapter WNA1000 with custom setup, configuration, and troubleshooting. The information in this manual is intended for readers with intermediate computer and Internet skills.

Conventions, Formats, and Scope


The conventions, formats, and scope of this manual are described in the following paragraphs:


- **Typographical Conventions.** This manual uses the following typographical conventions:

<i>Italic</i>	Emphasis, books, CDs, file and server names, extensions
Bold	User input, IP addresses, GUI screen text
Fixed	Command prompt, CLI text, code
<i>italic</i>	URL links

- **Formats.** This manual uses the following formats to highlight special messages:

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

	Tip: This format is used to highlight a procedure that will save time or resources.
---	--

	Warning: Ignoring this type of note may result in a malfunction or damage to the equipment.
---	--

- **Scope.** This manual is written for the Wireless-N 150 USB Adapter WNA1000 according to these specifications:

Product Version	NETGEAR Wireless-N 150 USB Adapter WNA1000
Manual Publication Date	August 2009






For more information about network, Internet, firewall, and VPN technologies, see the links to the NETGEAR website in [Appendix B, “Related Documents.”](#)



Note: Product updates are available on the NETGEAR, Inc. website at <http://www.netgear.com/support>.

How to Use This Manual

The HTML version of this manual includes the following:

- Buttons,  and , for browsing forwards or backwards through the manual one page at a time
- A  button that displays the table of contents and an  button. Double-click on a link in the table of contents or index to navigate directly to where the topic is described in the manual.
- A  button to access the full NETGEAR, Inc. online knowledge base for the product model.
- Links to PDF versions of the full manual and individual chapters.

How to Print This Manual

To print this manual, your computer must have the free Adobe Acrobat reader installed in order to view and print PDF files. The Acrobat reader is available on the Adobe Web site at <http://www.adobe.com>.



Tip: If your printer supports printing two pages on a single sheet of paper, you can save paper and printer ink by selecting this feature.

Revision History

NETGEAR, Inc. is constantly searching for ways to improve its products and documentation. The following table indicates any changes that might have been made since the Wireless-N 150 USB Adapter WNA1000 was introduced.

Table 1-1. Publication Revision History

Part Number	Version Number	Date	Description
202-10575-01	v1.0	August 2009	First publication.

Chapter 1

Basic Setup

This chapter includes instructions for custom installation of your Wireless-N 150 USB Adapter WNA1000 and basic configuration. There are two methods that you can use to install the wireless-N USB adapter:

- **Express Installation uses the NETGEAR Smart Wizard** configures your adapter automatically. This method is explained in the *NETGEAR Wireless-N 150 USB Adapter WNA1000 Installation Guide*.
- **Installation with Custom Setup** lets you specify where the software is installed, and select either the **NETGEAR Smart Wizard** or the **Windows Utility** to configure your wireless-N USB adapter. See [“Installation with Custom Setup”](#) on page 1-3.

NETGEAR strongly recommends that you implement wireless security to protect your network from unauthorized access. See [Chapter 2, “Network Connections and Wireless Security.”](#)

What Is in the Box

The product package should contain the following items:

- NETGEAR Wireless-N 150 USB Adapter WNA1000
- USB cable and adapter cradle
- *NETGEAR Wireless-N 150 USB Adapter WNA1000 Installation Guide*
- *Resource CD*, including:
 - The Smart Wizard Installation Assistant
 - This manual
 - *NETGEAR Wireless-N 150 USB Adapter WNA1000 Installation Guide*
- 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 for repair.

What You Need Before You Begin

Verify that your computer meets the minimum system requirements and identify the wireless network settings of the wireless local area network (WLAN) where you will connect before you install and connect your wireless-N USB adapter.

Verify System Requirements

Before installing the wireless-N USB adapter, make sure that these minimum requirements have been met:

- You must have a PC with a Pentium 300 MHz or higher compatible processor with an available USB 2.0 or 1.1 port.



Note: The maximum speed of a USB v2.0 port is 480 Mbps. If your computer has a USB v1.1 port, the wireless-N USB adapter is limited to that port's maximum speed, which is 14 Mbps.

- A CD drive.
- 10 Mbytes of free hard disk space.
- Vista, Windows XP Home, Windows XP Professional, or Windows 2000. Some versions of Windows ask for the original Windows operating system installation files to complete the installation of the WNA1000 driver software.



Note: Windows XP users must install SP2 or install the KB822603 hot fix (update), which fixes the USB 2.0 host controller driver. Go to the following link to install the hot fix:

<http://www.microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=733dd867-56a0-4956-b7fe-e85b688b7f86>

Observe Wireless Location and Range Guidelines

For best performance, place the wireless-N USB adapter at least 4 feet (over 1 meter) away from the wireless router or access point.

Computers can connect over wireless networks indoors at a range that varies significantly based on the physical location of the computer with the wireless-N USB adapter. For best results, avoid

potential sources of interference, such as the following:

- 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 decreases if such materials are between the devices.

Installation with Custom Setup



Note: For Express installation, see the *NETGEAR Wireless-N 150 USB Adapter WNA1000 Installation Guide*.

With Custom setup you can specify where the files are installed. You can also choose whether or not you want to install the Smart Wizard.

- **Custom installation with the Smart Wizard.** Select either **Configure Manually** or **Configure Automatically**. The Smart Wizard provides a complete and easy-to-use set of tools to:
 - View details about wireless networks in your area.
 - Manage your network connections and connect securely using Push 'N' Connect (WPS).
 - Configure wireless settings for your wireless-N USB adapter.
 - Save your wireless network settings in profiles.
- **Custom** installation excluding the Smart Wizard. You can choose not to install the Smart wizard and to use only the **Windows Utility to install and manage** your wireless network. If you choose to do this, you will not be able to use the Smart Wizard to configure your wireless-N USB adapter or to connect to a wireless network.

Installing the Software and Adapter

To install the wireless-N USB adapter with custom setup:

1. **Insert the Resource CD.** If the CD main page does not display, browse the files on the CD and double-click *Autorun.exe*.
2. **Click Install the Software.** The **Software Update Check** screen displays.

3. **If you are connected to the Internet, click Check for Updates. If not, click Install from CD.**
4. **The NETGEAR Smart Wizard Welcome screen displays. Click I Agree to accept the license agreement and click Next.**
5. **For the Setup Type, select Custom, and then click Next:**

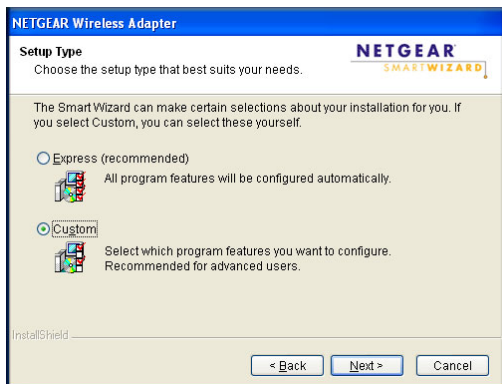


Figure 1-1

6. **Browse to select the destination folder for your wireless adapter software, and then click Next.**

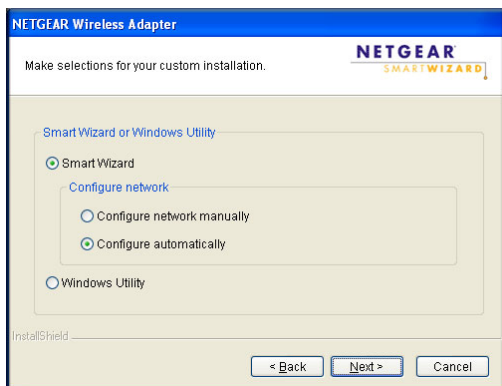


Figure 1-2

7. **Select one of the following methods to configure and manage your wireless network:**
 - **Smart Wizard. Allows you to manage your wireless networks with the NETGEAR WNA1000 software and to connect securely using Push 'N' Connect.**

- **Configure network manually.** Specify the settings for your wireless-N USB adapter in the Settings screen.
 - **Configure automatically.** Allow the Smart Wizard to automatically configure the settings for your wireless-N USB adapter.
 - **Windows Utility. Connect to and manage your wireless networks** using only the Windows configuration utility. For more information about Windows utilities, see the Windows documentation or the NETGEAR application note at:
<http://documentation.netgear.com/reference/enu/winzerocfg/index.htm>.
8. When prompted, locate an available USB port on your PC. Connect the wireless adapter to the USB port. You can attach the wireless USB adapter directly to the USB port or use the USB cable (see “[Using the USB Adapter Cradle](#)” on page 1-7)
9. **Follow the prompts to complete the installation. If you selected Smart Wizard, then click Next and continue with** “[Connecting to a Wireless Network](#)” on page 1-5.

Connecting to a Wireless Network

If you installed the Smart Wizard, you can use the WNA1000 software to connect to a wireless network.

Smart Wizard, Configure Network Manually

The Settings screen displays. See “[Wireless Network Name \(SSID\) and Security Settings](#)” on page 2-14 and “[Joining a Network](#)” on page 2-2.

Smart Wizard, Configure Automatically

You are prompted to connect wirelessly with one of the following screens:

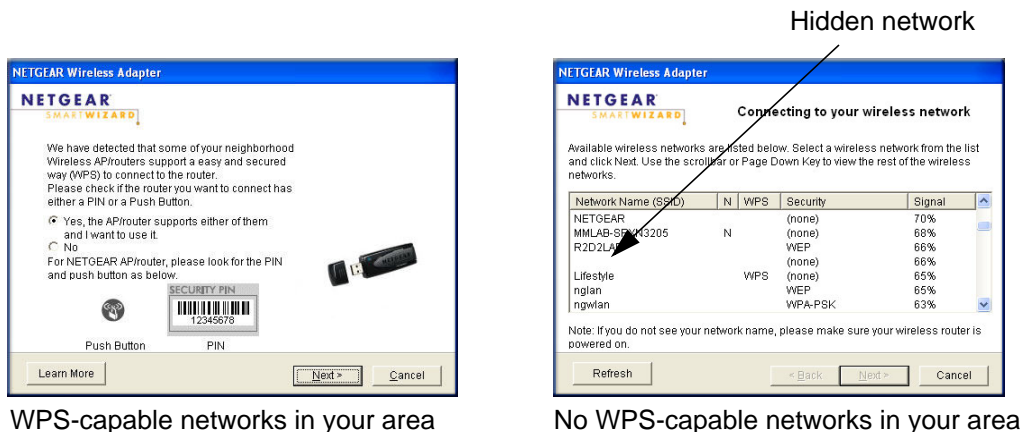


Figure 1-3

➔

Note: If you are not sure if your router supports WPS, select **No** to connect. If your router does not support WPS and you select **Yes**, the router or access point connection will time out and no wireless network connection will be established.

1. Follow the on-screen prompts to connect to a wireless network:
 - If your router supports WPS and you want to use WPS to create a secure **connection**, **leavetheradiobuttonselected,andclickNexttocontinue.FollowtheSmartWizard** steps to connect using WPS.
 - If your router does not support WPS, select your wireless network name from the **list of wireless networks and click Next to continue. (If your wireless network** has implemented security, you need to know which type of security (WEP, WPA-PSK, or WPA2-PSK) and you need the passphrase to complete your setup.
2. Create a wireless settings Profile.
 - a. If your wireless network has implemented security, and you did not use Push **N' Connect**, **select the radio button for the security type and enter the security** passphrase in the Passphrase field.
 - b. In the Profile field, create a unique name for your settings. If you do not select a profile name, your settings will be saved using the default name **Profile**.

- c. **Click Apply. Your settings are saved to the Profile you selected.**
- d. The WNA1000 icon appears in the system tray and on the desktop. The Smart Wizard Settings tab also displays (see “[Smart Wizard Status Bar](#)” on page 1-10) and the adapter initiates your wireless connection. It can take up to a minute to complete your connection.

Using the USB Adapter Cradle

You can use the USB cable to extend the range of your adapter and obtain better wireless reception. Follow the instructions to attach the USB cable, plastic cradle, and loop-and hook fasteners to a computer monitor.

1. Attach the prickly side of one fastener to the middle back of the plastic cradle.
2. Attach the smooth side of the fastener to the back of your monitor, near the top for better reception.

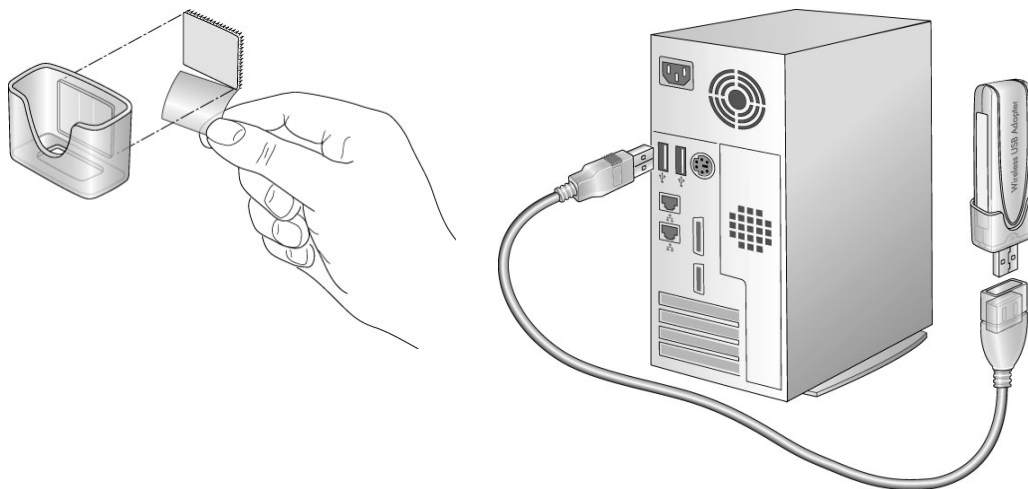


Figure 1-4

3. Insert the adapter in the plastic cradle and attach the USB cable to the adapter and the computer.

4. Attach the cradle with the adapter to the side of the PC monitor where you placed the fastener.

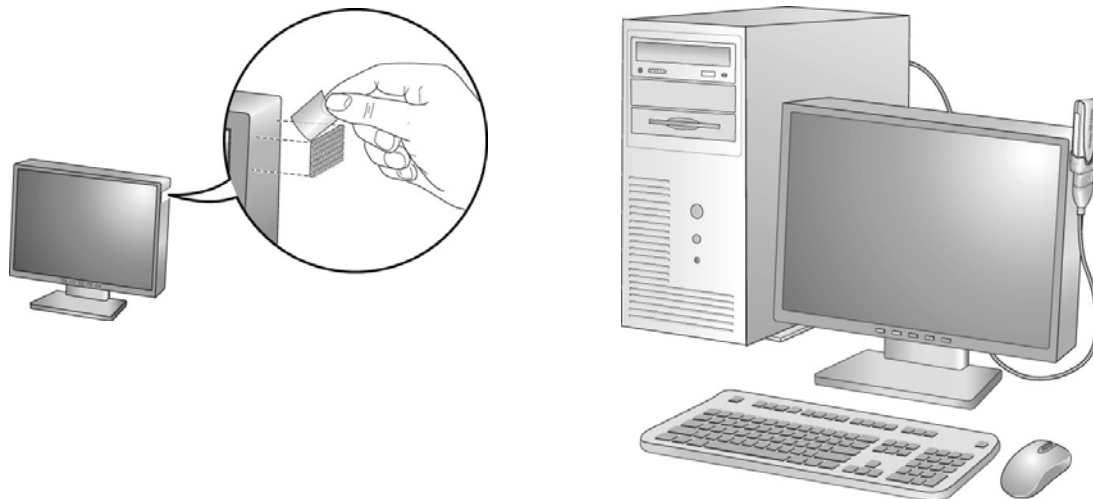



Figure 1-5




Monitoring Your Wireless Network and the Internet Connections

The wireless-N USB adapter has indicators in three locations that show the status of your connection to a wireless network and to the Internet:

- **WNA1000 icon.** After you install the WNA1000 software, the  icon appears on the desktop and in the right on the Windows task bar. It is color coded to show the status of the connection. See the following section, [“WNA1000 Icon”](#).
- **Smart Wizard status bar.** Clicking on the system tray icon opens the Smart Wizard. The status bar at the bottom of the screen shows details about your wireless and Internet connection. See [“Smart Wizard Status Bar”](#) on page 1-10, and [“Viewing Wireless Networks in Your Area”](#) on page 2-1.
- **Adapter LED.** The LED on the wireless-N USB adapter indicates the condition of your wireless link. See [“Wireless-N USB Adapter LED”](#) on page 1-11.

WNA1000 Icon

The WNA1000 icon is on the desktop and in the Windows system tray, on one end of the task bar in the Microsoft Windows desktop. The WNA1000 icon will change colors depending on the condition of the adapter. The following table describes the colors and conditions indicated.

Color	Condition	Description
Red 	The wireless-N USB adapter has no connection to any other wireless node.	The wireless-N USB adapter cannot 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-N USB adapter has a connection with another wireless node.	The wireless link is weak. Move to a better location, 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-N USB adapter has a connection with another wireless node.	The wireless-N USB adapter has established good communication with an access point, and the signal quality is strong.

If you right-click the WNA1000 icon in the system tray, you can disable its Internet notification feature by clearing the check mark enabling notification, as shown in the following figure. If you do so, then only the IP address is shown.



Figure 1-6

In Vista, there is one more option: Enable NETGEAR Smart Wizard.

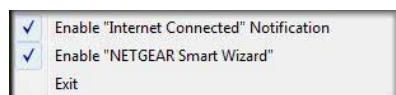



Figure 1-7

If you clear the check mark for Enable NETGEAR Smart Wizard, the NETGEAR Smart Wizard is disabled, and you must set up the wireless adapter with Vista auto-configuration.

Smart Wizard Status Bar

Click the  icon to open the Smart Wizard Settings tab. The status bar is located at the bottom of the Settings tab.

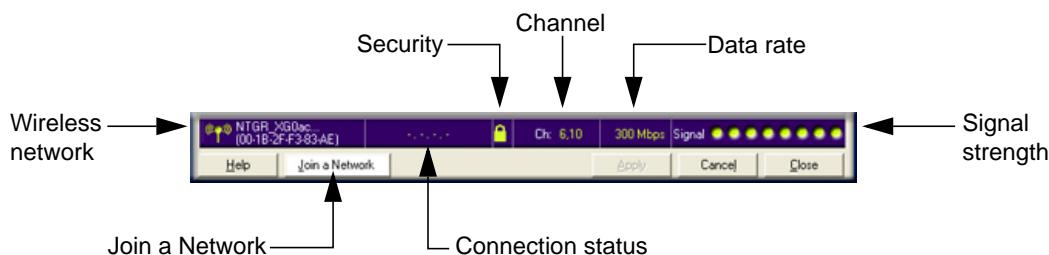



Figure 1-8

The following table describes how to interpret the Smart Wizard status bar.

Understanding the Status Bar	
Wireless network	Identifies which wireless network you have joined.
Security	<ul style="list-style-type: none"> A closed lock indicates that security is enabled. An open lock indicates an open network without wireless security.
Channel	The wireless channel used by the network. If many wireless networks in your area use the same channel, they can interfere with one another.
Data rate	To optimize the wireless data rate (throughput), connect to a network with a high-speed router or access point and a high-speed Internet connection. See Chapter 3, "Wireless Network Performance" .
Signal strength	More dots indicates a stronger signal. Usually, you experience higher throughput when the signal is strongest.
Join a Network	Click Join a Network to start the Connection Wizard.
Connection status	<p>The status of your network connection.</p> <ul style="list-style-type: none"> Connected to Internet. The wireless Internet connection is OK. Connected to Router. The wireless connection to the router is OK, but the router is not connected to the Internet. <p>169.254.x.x or _____.____.____. The wireless connection to the router is OK, but there is a problem with the router. See the online help or Chapter 4, "Troubleshooting".</p>

Wireless-N USB Adapter LED

The LED on the wireless-N USB adapter indicates the condition of the wireless link, as described in the following table.

Wireless-N USB Adapter	LED	Meaning
	Off	<ul style="list-style-type: none">• The wireless-N USB adapter is not plugged in to the USB port.• The wireless-N USB adapter is in power save mode (default from power up or reset).
	Blinking	<ul style="list-style-type: none">• The wireless-N USB adapter is scanning for a network.• The wireless-N USB adapter is sending or receiving data.
	Solid	The wireless-N USB adapter is connected to a wireless network, but it is not sending or receiving data.

Removing the WNA1000 Software

You can remove the wireless adapter software in these two ways:

- Select the Windows Start menu > All Programs > NETGEAR WNA1000 Adapter program group > Uninstall NETGEAR WNA1000 Software, and then follow the screen prompts.
- Select Windows Start menu > Control Panel > Add or Remove Program, and then select the NETGEAR WNA1000 Adapter option, and follow the screen prompts.

Upgrading the WNA1000 Software

Upgrades might be available at the NETGEAR website. To install an upgrade, follow these steps.

1. Write down the settings for any profiles that you want to save. They will not be retained.
2. Download the upgrade from the NETGEAR website Support page.
3. Remove the WNA1000 software from your computer.
4. Remove the WNA1000 adapter from your computer, and if prompted restart your computer.
5. Run the installer that you downloaded (the file ends in .exe).
6. Follow the installer instructions, and if prompted, restart your computer.

Chapter 2

Network Connections and Wireless Security


This chapter explains how to use your wireless-N USB adapter to connect to your wireless local area network (WLAN) and how to set up wireless security for the wireless-N USB adapter so that it matches the wireless security settings for your network.

During installation, if you selected the **Custom** Setup Type, and the **Windows Utility** radio button, the features described in this chapter will not be available. If this is the case, and you want to use the Smart Wizard, remove the WNA1000 software (see [“Removing the WNA1000 Software” on page 1-10](#)). Then use the Resource CD to reinstall the software. Either select the **Express** Setup Type, or use the **Custom** Setup Type, and leave the **Smart Wizard** radio button selected.

Viewing Wireless Networks in Your Area

You can use the Networks tab to view all available wireless networks in your area. You can also scan to search for wireless networks and refresh the tab.

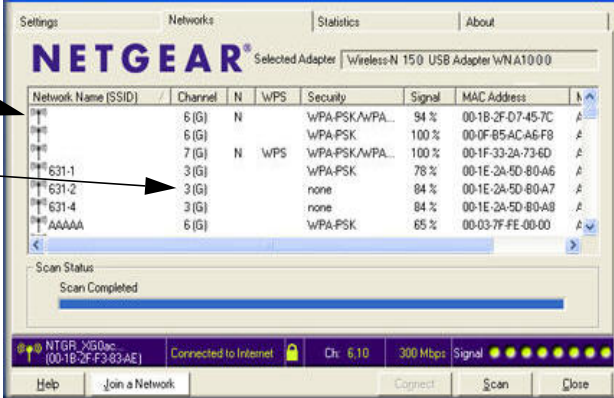
To view information about wireless networks:

1. Click the  icon to open the Smart Wizard.
2. Click the Networks tab to display the following screen:

You can click a column heading to sort.

If many networks use the same channel they can interfere with each other.

The status bar shows your network connection and Internet connection.




Network Name (SSID)	Channel	N	WPS	Security	Signal	MAC Address
	6 (G)	N		WPA-PSK/WPA...	94 %	00:1B:2F:D7:45:7C
	6 (G)			WPA-PSK	100 %	00:0F:B5:AC:A6:F8
	7 (G)	N	WPS	WPA-PSK/WPA...	100 %	00:1F:33:2A:73:6D
631-1	3 (G)			WPA-PSK	78 %	00:1E:2A:5D:80:A6
631-2	3 (G)			none	84 %	00:1E:2A:5D:80:A7
631-4	3 (G)			none	84 %	00:1E:2A:5D:80:A8
AAAAA	6 (G)			WPA-PSK	65 %	00:03:7F:FE:00:00

Figure 2-1

Network Tab Field or Button	Description
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 is blank even though the rest of the information is still displayed.
Channel	The channel determines which operating frequency is used.
N	The access point supports wireless N mode.
WPS	The access point supports WPS.
Security	Identifies whether the wireless network uses security settings such as WPA2-PSK, WPA-PSK, or WEP.
Signal	The signal strength of the communications.
MAC Address	The hardware address (MAC address) of the wireless device broadcasting this information.
Mode	The type of wireless network — Access. Point (Infrastructure) or Computer-to-Computer (Ad Hoc)
Help button	Display online help.
Join a Network button	View networks and join a network. See “Joining a Network” .
Connect button	Connect to the network that you selected
Scan button	Check for wireless networks. Clicking Scan refreshes the screen.
Close button	Close the window.

Joining a Network

During the WNA1000 software installation, the Smart Wizard lists the available networks. After installation you can use the Join 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 wireless security settings for the network that you want to use. For example, if a network uses WEP, you must know the WEP key in order to connect to it. If you use secure networks frequently, set up profiles for each network with the wireless network and security settings.
---	---

To join a network:

1. Use the  icon to open the Smart Wizard. On the status bar, click **Join a Network**.

2. If the Smart Wizard detects an access point or router with WPS, it displays the WPS screen (Figure 2-3 on page 2-5). WPS is described in “Using Push 'N' Connect (WPS) to Connect to a Wireless Network”. To connect without using WPS, select **No**, and click **Next**.
3. Select a network from the drop-down list. If you select a hidden network, then you must enter the SSID. Click **Next**.

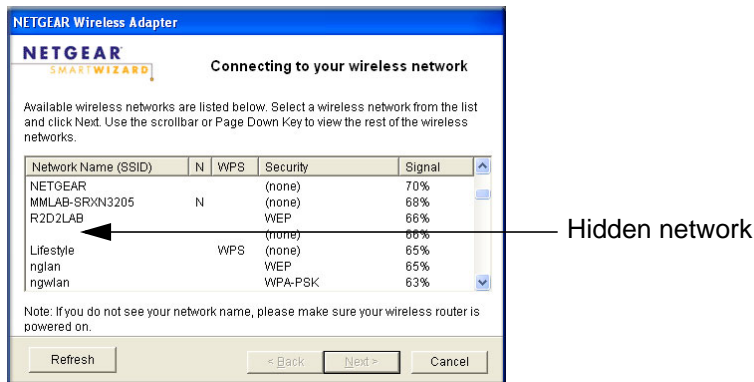


Figure 2-2

4. Follow the steps of the wizard to specify the wireless security if used, and to create a profile.
5. Review your settings, and click **Finish**.
6. You can use the status bar to verify your network connection. For more information, see “Smart Wizard Status Bar” on page 1-9. Click **Close** to exit the Smart Wizard.

Using Push 'N' Connect (WPS) to Connect to a Wireless Network

This feature is based on the Wi-Fi Protected Setup (WPS) standard (for more information, see <http://www.wi-fi.org>). WPS automatically configures the network name (SSID) and wireless security for the access point or router and the wireless-N USB adapter. Note that WPS is not a new security feature—it makes existing security features easier to configure.

To use WPS with your wireless-N USB adapter you need:

- An access point or router that supports WPS. It will have a WPS symbol.

- The computer with the wireless-N USB adapter must be running Windows 2000, XP, or Vista (32/64 bits).



Notes: If you connect using WPS and later lose the settings, they can be restored by reconnecting using the WPS procedures described in this section.

To connect the wireless-N USB adapter to an access point or router that supports WPS, there are several methods:

- **Starting with the adapter**, do one of the following:
 - Connect during initial installation. See the *NETGEAR Wireless-N 150 USB Adapter WNA1000 Installation Guide*, provided in the package and on the *Resource CD*.
 - Click the Join a Network button on the Smart Wizard Settings screen (see “[Smart Wizard Status Bar](#)” on page 1-9).
 - Click an access point or router that supports WPS in the Networks tab (see “[Viewing Wireless Networks in Your Area](#)” on page 2-1).
- **Starting with the router or access point**. Log in to the router or access point, then follow the router or access point’s prompts to connect a WPS client.

You can use either a push button or PIN entry to connect using WPS:

- **Push Button Configuration**. Press a push button or push dome on the access point or router, or click an on-screen button in the software. This is a fairly new technology, so not all access points and routers provide a push button. See “[Using a WPS Push Button to Connect to a Wireless Access Point or Router](#)” on page 2-5.
- **PIN entry**. Use the router or access point’s Personal Identification number (PIN), or use the wireless-N USB adapter’s PIN. See “[Generating a PIN to Connect to a Wireless Access Point or Router](#)” on page 2-6.

Using a WPS Push Button to Connect to a Wireless Access Point or Router

To join a network using a push button:



1. Click the  icon to open the Smart Wizard. On the status bar, click **Join a Network**. The adapter detects a network with WPS:




Figure 2-3



Note: If you are not sure if your router supports WPS, select **No** to connect. If your router does not support WPS and you select **Yes**, the router or access point connection will time out and no wireless network connection will be established.

2. If your router supports WPS, select **Yes**, and then click **Next**.
3. Select **Yes** (to use a push button), and then click **Next**.
4. Log in to the access point or router that you have selected.
5. From the router's main menu, select **Add WPS Client**. On the Add WPS Client screen, select **Push Button**.
6. To start the WPS process, either press the push button on the access point or router, or click the  icon on the Add WPS Client screen.

- Within 2 minutes, return to the WNA1000 Smart Wizard screen, and click . The Smart Wizard initiates your wireless connection.



Note: The adapter security is set to WPA-PSK [TKIP] by default. Some WPS routers support WPA2-PSK [AES], with the same SSID and passphrase. You can change the adapter to WPA2-PSK [AES] using the Security setting in the Settings screen.

- You can use the Status Bar to verify your network connection. For more information, see [“Smart Wizard Status Bar” on page 1-9](#). Click **Close** to exit the Smart Wizard.

Generating a PIN to Connect to a Wireless Access Point or Router

There are two ways to enable the wireless-N USB adapter to join a wireless network: using the router or access point's security PIN; or using the wireless-N USB adapter's security PIN (the wireless-N USB adapter can generate a PIN to connect to the router).

To use either the router's security PIN or the adapter's security PIN:


- Click the  icon to open the Smart Wizard of the wireless-N USB adapter. On the status bar, click **Join a Network** (or click the **Networks** tab and select the network). The wireless-N USB adapter detects a network with WPS.



Figure 2-4

- To use a PIN, select **No**, and then click **Next**, then do either of the following:

- To use the wireless router or access point's security PIN, enter it in the field provided, as shown in Figure 2-5. The adapter will connect with the router.

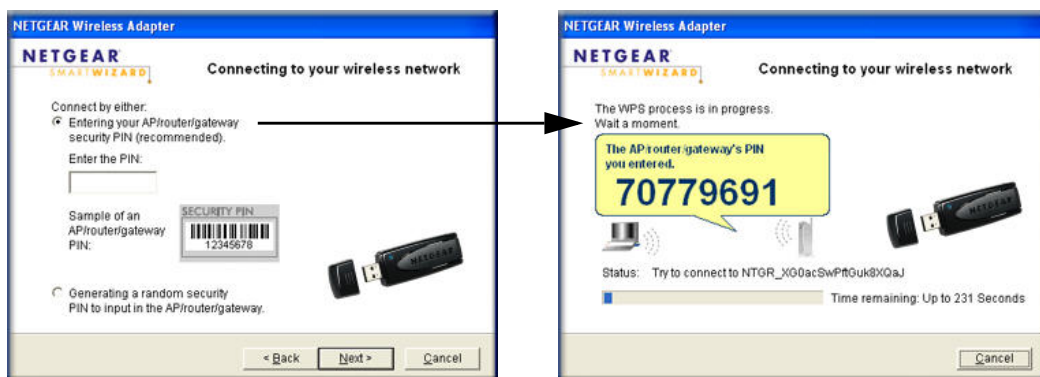


Figure 2-5

- To use the adapter's security PIN, select the radio button for the adapter to generate a random PIN, as shown in Figure 2-6. The adapter generates and displays a random PIN.
 - Write down the generated PIN.



Figure 2-6

- On the access point or router that you have selected, log in to the router or access point, then follow the prompts to enter the adapter's PIN.

The router will connect to the adapter.



Note: The adapter security is set to WPA-PSK [TKIP] by default. Some WPS routers support WPA2-PSK [AES], with the same SSID and passphrase. You can change the adapter to WPA2-PSK [AES] using the Security setting in the Settings screen.

3. You can use the Status Bar to verify your network connection. For more information, see [“Smart Wizard Status Bar” on page 1-9](#).

Creating a Profile

The WNA1000 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** field, the name Profile is used to save your settings. If you do this more than once, you are asked if you want to replace the previous settings stored in Profile.

You can store multiple profiles and recall the one that 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.
- **Computer-to-Computer (Ad Hoc).** Connect directly to another computer with the 802.11 Ad Hoc mode.

For more information about wireless network modes, see the link to the online document in wireless reference document at: [“Wireless Communications:” in Appendix B](#).

Access Point Profiles

To set up a profile:

1. Click the  icon to open the Smart Wizard. The Settings tab displays:

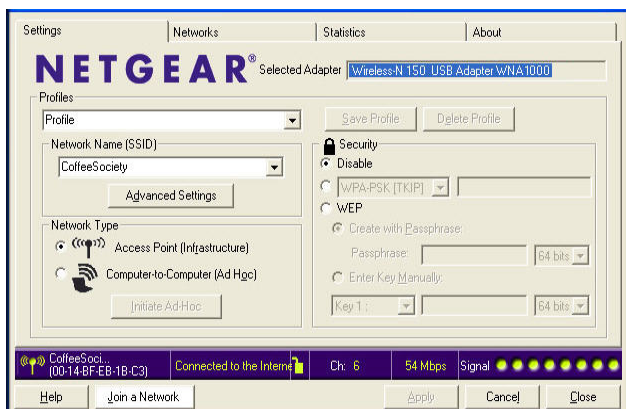


Figure 2-7

2. Enter the network settings.
 - a. In the Network Type section, make sure that **Access Point (Infrastructure)** is selected.
 - b. In the **Profile** field, type a name for 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. Click **Save Profile**.
All the configuration settings are saved in this profile.
4. To use the profile, click **Apply**.
5. Verify wireless connectivity to your network.

Use a browser 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”](#). For problems with accessing network resources, the Windows client and file and print sharing software might not be installed and configured correctly on your computers. See the link 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 a router or 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 does not work using DHCP settings. Ad Hoc mode requires either static IP addresses (such as 192.168.0.1) or the IPX protocol. For help setting up static IP addresses, see the PC Networking Tutorial on the Resource CD.

To create an Ad Hoc mode profile:

1. Click the  icon to open the Smart Wizard. The Settings tab displays:



Figure 2-8

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** field, type the name of the profile.
 - d. Click **Apply**.
3. Save your settings in a profile.
 - a. Click **Save Profile**, and all the configuration settings are saved in this profile.
 - b. Click **Apply**, then click **Close** to exit the Smart Wizard, or click **Cancel** to return to the previous settings.
4. Configure the computer network settings.
 - a. Configure each computer with either a static IP address or with the IPX protocol.
 - b. Restart the computers.
5. Verify wireless connectivity between your peer devices with the ping program:
 - a. On the Windows taskbar, select Start > Run.

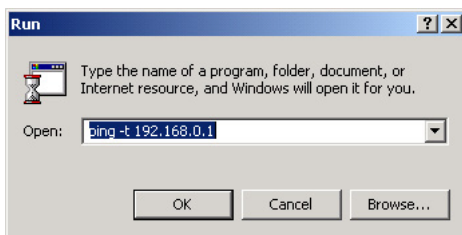


Figure 2-9

- 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**.

- c. A continuous ping will be sent 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 2-10

At this point the connection is established.



Note: If you cannot connect, see [“Troubleshooting Tips” on page 4-1](#). For problems accessing network resources, the Windows client and file and print sharing software might not be installed or configured correctly on your computers. See the link to [“Internet Networking and TCP/IP Addressing:” in Appendix B](#).

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

1. On the Settings tab of the Smart Wizard, select or type the network name (SSID).
2. Select the **Computer-to-Computer (Ad Hoc)** network type.



Note: for Windows Vista computers, you must have administrator rights. Otherwise, this option is not available for selection.

3. Click **Initiate Ad Hoc**. The Ad Hoc Setting screen displays:

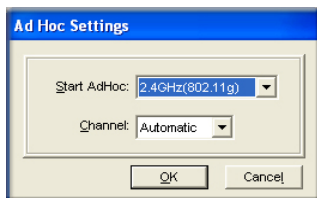


Figure 2-11

4. In the **Start Ad Hoc** drop-down list, select the wireless standard (802.11g or 802.11b) for your Ad Hoc computer-to-computer network.

5. In the **Channel** drop-down list, **Automatic** should work. If you notice interference problems with another nearby wireless device, select a channel that is not being used by other nearby wireless networks. Use the Networks tab to view the channels in use in your area.
6. Click **OK**.



Note: The channel number differs depending on the country. The connection speed automatically defaults to the highest speed.

About Wireless Security

Many networks use wireless security to encrypt wireless data communications. To connect to a network with wireless security, you must set up the wireless-N USB adapter with exactly the same kind of wireless security settings. If you use the Smart Wizard to set up security, you can take advantage of Push 'N' Connect (WPS) to set up WPA-PSK [TKIP] security (see [“Using Push 'N' Connect \(WPS\) to Connect to a Wireless Network”](#) on page 2-3). Otherwise, you can manually set one of the following types of wireless security used for home networks:

- **WPA-PSK [TKIP] or WPA2-PSK [AES]**. See [“Setting Up WPA-PSK \[TKIP\] or WPA2-PSK \[AES\] Security”](#) on page 2-15.
- **WEP**. See [“Setting Up WEP Encryption Security”](#) on page 2-16.

For more information about wireless security, see the link to [“Wireless Communications:”](#) in [Appendix B](#). In addition to the wireless-N USB adapter’s security features, you should also configure appropriate LAN network security features such as requiring a user name and password to access the shared resources in your network.

Wireless Network Name (SSID) and Security Settings

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

- **Network Name (SSID).** The service set Identification (SSID) identifies the wireless local area network. **Any (First available network)** is the default WNA1000 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-N 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 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 cannot connect unless they are set to WPA-PSK as well, and are configured with the correct passphrase.
- **If WEP authentication is used:**
 - **WEP encryption key size.** Identify one: **64-bit** or **128-bit**. The encryption key size must match 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: _____

Setting Up WPA-PSK [TKIP] or WPA2-PSK [AES] Security

To configure WPA-PSK security:

1. Run the WNA1000 Smart Wizard.
 - a. Make sure that the WNA1000 software is installed and the wireless-N USB adapter is fully inserted in a USB port in your computer.
 - b. Use the  icon to open the Smart Wizard. The Settings tab displays.
2. Configure the Security settings.
 - a. In the **Profile** field, select the profile, or type in a profile name.
 - b. In the **Network Name (SSID)** field, and then 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]** or **WPA2-PSK [AES]**, and enter the passphrase.




Figure 2-12

For more about WPA2-PSK, see the 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**, and then click **Close** to exit the Smart Wizard.

Setting Up WEP Encryption Security

Follow the steps below to configure WEP encryption security:

1. Run the WNA1000 Smart Wizard.
 - a. Make sure that the WNA1000 software is installed and the wireless-N USB adapter is connected to the USB port in your computer.
 - b. Use the  icon to open the Smart Wizard. The Settings tab displays.
2. Configure the Security settings.
 - a. In the **Profile** field, 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**.

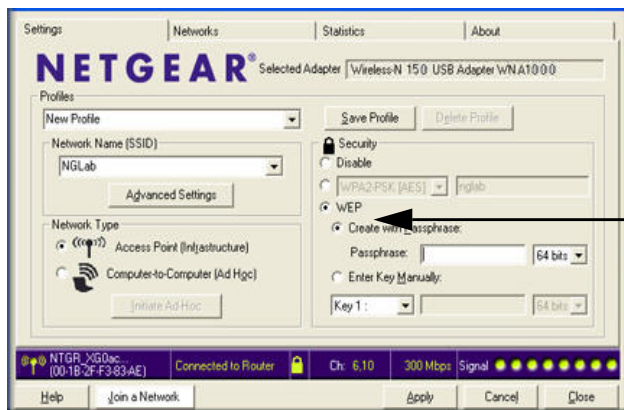


Figure 2-13

3. Select the WEP encryption strength you will use.

- 64-bit WEP data encryption
- 128-bit WEP data encryption



Note: Larger encryption keys require more processing and may slow the communications response times.

4. Select **Create with Passphrase**, and enter the passphrase. The configuration utility automatically generates 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 the **Save Profile** button. All the configuration settings are saved in this profile.
- b. Click **Apply**.
- c. Click **Close** to exit the configuration utility.

Monitoring Statistics

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

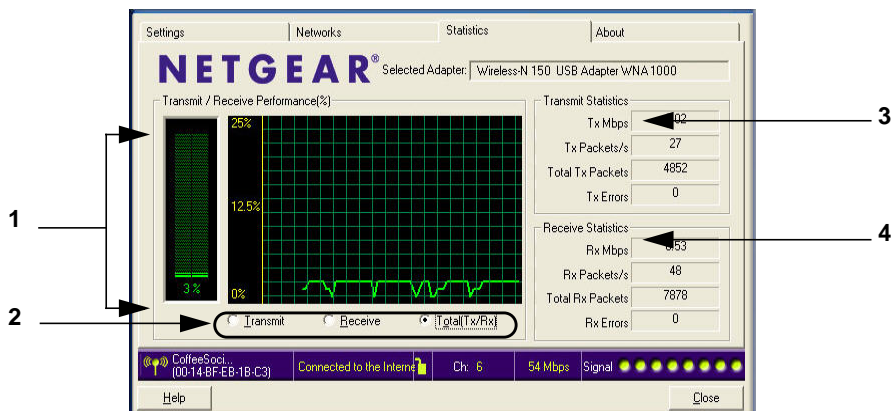


Figure 2-14

Table 1. Statistics Descriptions

Label	Description
1. Transmit/Receive Performance (%)	A real-time graph identifies the total, receive, and transmit utilization as a percentage of the total possible.
2. 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.
3. Transmit Statistics	Identifies transmit megabits per second (Mbps), transmit packets per second (Tx Packets/s), total transmitted packets, and transmit errors.
4. Receive Statistics	Identifies receive megabits per second (Mbps), receive packets per second (Rx Packets/s), total received packets, and reception errors.

About Your Smart Wizard

The About tab displays the current version information.

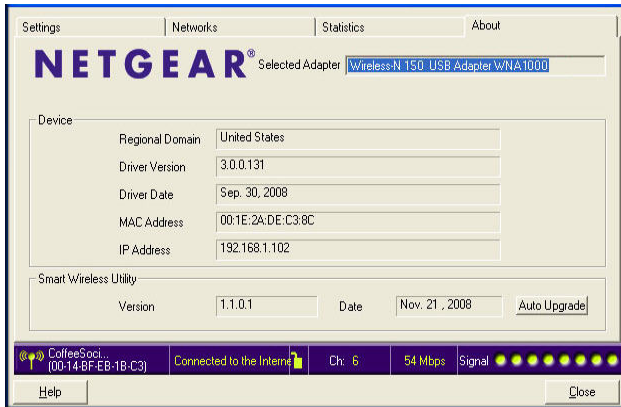


Figure 2-15

About Tab Field		Description
Device	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 might violate local laws
	Driver version	The wireless adapter driver version.
	Driver Date	The wireless adapter driver release date.
	MAC Address	The MAC (Media Access Control) address of the adapter. This is a unique 48-bit hardware address assigned to every network interface card. Some wireless networks restrict access based on a list of known MAC addresses. If you are communicating with such a network, you must provide the address shown here to the network administrator before you are allowed to connect. Restricting access by MAC address adds an obstacle against unwanted access to your network. However, unless you use data encryption security, the data broadcast over the wireless link is fully exposed.
	IP Address	The IP address assigned to this adapter.
Smart Wireless Utility	Version	The version of the Smart Wizard.
	Date	The release date of the Smart Wizard.

Advanced Settings

The default advanced settings usually work fine. Except for the power saving setting, changing the settings incorrectly could cause your wireless connection to fail. Change them only if you have a specific reason to do so. To go to advanced settings, click the **Advanced Settings** button on the Settings tab.



Note: For Windows Vista computers, you must have administrator rights to access the Advance Settings screen.

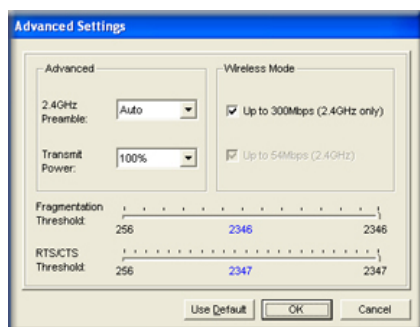


Figure 2-16

- **2.4GHz Preamble.** An Auto setting might give slightly better performance. A Long setting might provide a more reliable connection or slightly longer range.
- **Transmit Power.** Lowering the output power level lets you reduce the chance of interference with other nearby access points but reduces the range of your adapter.
- **Wireless Mode.** Depending on your wireless adapter, you can choose some of the available 802.11 wireless protocols.
- **Fragmentation Threshold.** This is the maximum packet size used for fragmentation. Packets larger than the size programmed in this field will be fragmented. The Fragment Threshold value must be larger than the RTS Threshold value.
- **RTS/CTS Threshold.** The packet size that is used to determine whether it should use the CSMA/CD (Carrier Sense Multiple Access with Collision Detection) mechanism or the CSMA/CA (Carrier Sense Multiple Access with Collision Avoidance) mechanism for packet transmission. CSMA/CD is slightly more efficient.

Chapter 3 Wireless Network Performance

This chapter explains how to use your Wireless-N 150 USB Adapter WNA1000 to connect to your wireless local area network (WLAN) and how to maximize the performance of your WNA1000 within your network. Included are scenarios for setting up your network in a mixed use environment and the trade-off of using different types of technology—wireless, wired, Powerline, etc.

Optimizing Wireless Performance

The speed and operating distance or range of your wireless connection can vary significantly based on the location of the wireless router. You should choose a location for your router that will maximize the network speed.

The following list describes how to optimize wireless router performance.

- Identify critical wireless links.
If your network has several wireless devices, decide which wireless devices need the highest data rate, and locate the router near them. Many wireless products have automatic data-rate fallback, which allows increased distances without losing connectivity. This also means that devices that are farther away might be slower. Therefore, the most critical links in your network are those where the traffic is high and the distances are great. Optimize those first.
- Choose placement carefully. For best results, place your router:
 - Near the center of the area in which your computers will operate.
 - In an elevated location such as a high shelf where the wirelessly connected computers have line-of-sight access (even if through walls).
- Avoid obstacles to wireless signals.
 - Keep wireless devices at least two feet from large metal fixtures such as file cabinets, refrigerators, pipes, metal ceilings, reinforced concrete, and metal partitions.
 - Keep the devices away from large amounts of water such as fish tanks and water coolers.
- Reduce interference.

Avoid windows unless communicating between buildings.

Place wireless devices away from various electromagnetic noise sources, especially those in the 2400–2500 MHz frequency band. Common noise-creating sources are:

- Computers and fax machines (no closer than 1 foot)
- Copying machines, elevators, and cell phones (no closer than 6 feet)
- Microwave ovens (no closer than 10 feet)
- Choose your settings.
 - Use a scanning utility to determine what other wireless networks are operating nearby, and choose an unused channel.
 - Turn off SSID Broadcast, and change the default SSID. Other nearby devices might automatically try to connect to your network several times a second, which can cause significant performance reduction.

Optimizing Your Network Bandwidth

The speed of network connections depends on the type of equipment that you use. Try to use high-speed technologies for network connections with the heaviest traffic to avoid lower-speed bottlenecks in the path. [Figure 3-1 on page 3-3](#) shows a home network that includes many different connection speeds.

In this network, the two PCs with gigabit (1000 Mbps) Ethernet adapters have a gigabit connection through the router to the storage server. With a high-speed router this connection allows for extremely fast backups or quick access to large files on the server. The PC connected through a pair of Powerline HD adapters is limited to the 200 Mbps speed of the Powerline HD connection. Although any of the links in this example would be sufficient for high-traffic applications such as streaming HD video, the use of older devices such as 10 Mbps Ethernet or 802.11b wireless would create a significant bottleneck.

Figure 3-1

In planning your network, think about which tasks will have the heaviest traffic flow between them. Examples are:

- A media center in one room streaming high-definition video from a server in another room
- A storage device that is used for backing up your computers

SOHO Networking Technologies

Common connection types and their speed and security considerations are:

- **Broadband Internet**

Your Internet connection speed is determined by your modem type, such as ADSL or cable modem, as well as the connection speed of the sites to which you connect, and general Internet traffic. ADSL and cable modem connections are asymmetrical, meaning they have a lower data rate *to* the Internet (upstream) than *from* the Internet (downstream). Keep in mind that when you connect to someone else who also has an asymmetrical connection, the data rate between your sites is limited by each side's upstream data rate. A typical residential ADSL or cable modem connection provides a downstream throughput of about 1 to 3 megabits per second (Mbps). Newer technologies such as ADSL2+ and Fiber to the Home (FTTH) increase the connection speed to tens of Mbps.

- **Wireless**

A high-speed wireless router can provide a wireless data throughput of up to 300 Mbps using technology called multiple-input multiple-output (MIMO), in which multiple antennas transmit multiple streams of data. The use of multiple antennas also provides excellent range and coverage. With the introduction of the newer WPA and WPA2 encryption and authentication protocols, wireless security is extremely strong.

To get the best performance, use newer adapters such as RangeMax adapters for your computers. A high-speed router might be compatible with older 802.11b and 802.11g adapters, but the use of these older wireless technologies in your network can result in lower throughput overall (typically less than 10 Mbps for 802.11b and less than 40 Mbps for 802.11g). In addition, many older wireless products do not support the latest security protocols, WPA and WPA2.

- **Powerline**

For connecting rooms or floors that are blocked by obstructions or are distant vertically, consider networking over your building's AC wiring. NETGEAR's Powerline HD family of products delivers up to 200 Mbps to any outlet, while the older-generation XE family of products delivers 14 Mbps or 85 Mbps. Data transmissions are encrypted for security, and you can configure an individual network password to prevent neighbors from connecting.

The Powerline HD family of products can coexist on the same network with older-generation XE family products or HomePlug 1.0 products, but they are not interoperable with these older products.

- **Wired Ethernet**

As Gigabit Ethernet ports become common on newer computers, wired Ethernet remains a good choice for speed, economy, and security. Gigabit Ethernet can extend up to 100 meters with twisted-pair wiring of CAT-5e or better. A wired connection is not susceptible to interference, and eavesdropping would require a physical connection to your network.



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

Assessing Your Network Speed Requirements

Because your Internet connection is likely to operate at a much lower speed than your local network, faster local networking technologies might not improve your Internet experience. However, many emerging home applications require high data rates. For example:

- Streaming HD video requires 10 to 30 Mbps per stream. Because latency and packet loss can disrupt your video, plan to provide at least twice the capacity you need.
- Streaming MP3 audio requires less than 1 Mbps per stream and does not strain most modern networks. Like video, however, streaming audio is also sensitive to latency and packet loss, so a congested network or a noisy link can cause problems.
- Backing up computers over the network has become popular due to the availability of inexpensive mass storage. [Table 3-1](#) shows the time to transfer 1 gigabyte (1 GB) of data using various networking technologies.

Table 3-1. Theoretical Transfer Time for 1 Gigabyte

Network Connection	Theoretical Raw Transfer Time
Gigabit Wired Ethernet	8 seconds
RangeMax Dual Band Wireless-N	26 seconds
Powerline HD	40 seconds
100 Mbps Wired Ethernet	80 seconds
802.11g wireless	150 seconds
802.11b wireless	700 seconds
10 Mbps Wired Ethernet	800 seconds
Cable Modem (3 Mbps)	2700 seconds
Analog Modem (56 kbps)	144,000 seconds (40 hours)

Chapter 4 Troubleshooting

This chapter provides information about troubleshooting your Wireless-N 150 USB Adapter WNA1000. For information about connecting to wireless networks and the Internet, see “[Basic Setup](#)” in Chapter 1.

Troubleshooting Tips

Use the following information to solve common problems you may encounter. Also, refer to the knowledge base on the NETGEAR website at <http://www.netgear.com/support>.

Table 4-1. Troubleshooting Tips

Problem	Action
The LED is not lit.	The wireless-N USB adapter is not connected to the USB port correctly or the WNA1000 software is not loaded. <ul style="list-style-type: none">• Remove and reinsert the WNA1000.• Check the Windows device manager to see if the wireless-N USB adapter is recognized and enabled. Reload the WNA1000 software, if necessary.• Try to install the wireless-N USB adapter in a different USB slot on your system if one is available.
The LED blinks, but the wireless-N USB adapter is not connected to a router or access point.	The wireless-N USB adapter is trying to connect, but is unsuccessful. <ul style="list-style-type: none">• The router might not be powered on.• The router and the wireless-N USB adapter are not configured with the same wireless parameters. Check the SSID and wireless security settings.
Push 'N Connect WPS time out error during installation.	This can occur if there are WPS routers in the area but your router does not support WPS. Make sure that you selected the correct router. To select a network to join, see “ Joining a Network ” on page 2-2. For a WPS-capable router, see “ Using Push 'N' Connect (WPS) to Connect to a Wireless Network ” on page 2-3.

Table 4-1. Troubleshooting Tips (continued)

Problem	Action
I cannot connect to a router or access point. The router is available, and there is good signal strength.	<ul style="list-style-type: none"> • If the router is WPA-PSK protected, you need the correct WPA-PSK passphrase. Otherwise, the WNA1000 might still be connected to the previous connection, and you cannot change to the WPA-PSK router. • If the router is WEP protected (either 64- or 128- bit encryption), you are prompted to enter the WEP encryption security information.
The connection status in the Status Bar shows that I am connected to a router or access point, but not to the Internet.	Check the router's Internet connection.
Throughput is only 54 Mbps or only 14 Mbps.	<p>The wireless-N USB adapter can operate at faster speeds.</p> <ul style="list-style-type: none"> • At 54 Mbps you are probably connecting to a standard 802.11g network. See Chapter 3, "Wireless Network Performance". • If you do not have a USB 2.0 port on your PC, the throughput is limited to the 14 Mbps of the USB 1.1 standard.
The Smart Wizard keeps asking me to save settings.	If you change the settings, the Smart Wizard offers you the chance to save the changes. To avoid this prompt, simply click Apply before you close the Smart Wizard.
Two WNA1000 icons are in the system tray.	You have an older software version installed on your system and it needs to be removed. See "Removing the WNA1000 Software" in Chapter 1 or "Upgrading the WNA1000 Software" in Chapter 1 .
I can connect to the access point, but not to the other computers on the network or to the Internet.	<p>This could be a physical layer problem or a network configuration problem.</p> <ol style="list-style-type: none"> 1. Check to make sure that the access point is physically connected to the Ethernet network. 2. Make sure that the IP addresses and the Windows networking parameters are all configured correctly. See the link to "Internet Networking and TCP/IP Addressing:" in Chapter B. 3. Restart the cable or DSL modem, router, access point, and computer.

Table 4-1. Troubleshooting Tips (continued)

Problem	Action
How can I view the IP address for the wireless-N USB adapter?	To view the wireless-N USB adapter IP address, click the WNA1000 icon to open the Smart Wizard. Then check the IP address in the About page.
No IP address is assigned to the Wireless-N 150 USB Adapter WNA1000.	<p>This can occur if you upgraded your WNA1000 software and did not reboot your system.</p> <ul style="list-style-type: none">• Either restart your computer, or connect to a different access point.• It does not usually help to shut down the Smart Wizard or disable or enable the wireless-N USB adapter.

Ad Hoc Mode Is Not Working Correctly

You must 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)** field.
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 that all computers in your Ad Hoc network are configured with static IP addresses in the same subnet.

Windows XP Occasional Connection Problems

Windows XP users who apply Windows XP Hotfix (SP2) Q815485 from the Windows XP Update Service might not be able to connect to the Internet, might have dropped wireless connections, or both when using the Wireless-N 150 USB Adapter WNA1000. You can delete this Hotfix from the Add or Remove Programs utility in the Control Panel.

To delete Windows XP Hotfix (SP2) Q815485:

1. Select Start > Control Panel > Add/Remove Programs.
2. Select Windows XP Hotfix (SP2) Q815485, and then click **Remove**.
 - You might receive an error message that states that some program on the computer may not work correctly if the update is removed.
 - You can ignore this error message, and then click **Yes** to remove the update.
3. Restart your computer, and rerun the Smart Display Setup Wizard.

This should solve your connection issue. You can restore this hotfix by following this link:

<http://microsoft.com/downloads/details.aspx?FamilyId=009D8425-CE2B-47A4-ABEC-274845DC9E91&displaylang=en>

Appendix A Technical Specifications and Factory Default Settings

Technical Specifications

The following table provides technical specifications for the wireless-N USB adapter.

Antenna	1 integrated internal wireless antenna
Standards	802.11n, 802.11g, or 802.11b
Radio Data Rate	1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54, 08, 140, 246, and 300 Mbps (Auto Rate Sensing)
Frequency	2.4 GHz to 2.5 GHz CCK and OFDM Modulation)
Power	5V Bus powered
Emissions	FCC, CE
Bus interface	USB 2.0
Provided drivers	Microsoft Vista, Windows XP, and Windows 2000
Operating Environment	Operating temperature: 0 to 45° C
Encryption	WPA2-PSK, WPA-PSK, and 40-bit (also called 64-bit) and 128-bit WEP data encryption
Warranty	Limited 1-year warranty

Factory Default Settings

The following table lists the default settings of your wireless-N USB adapter.

Feature		Description
Smart Wizard		Enabled
Wireless		
	Wireless Communication	Enabled
	Wireless Network Name (SSID)	Any (will connect to first wireless network that responds)
	Security	Disabled
	Network Type	Infrastructure
	Transmission Speed	Auto ^a
	Country/Region	United States (varies by region)
	Operating Mode	802.11n, 802.11g, 802.11b
	Data Rate	Up to 300 Mbps

- a. Maximum wireless signal rate (IEEE Standard 802.11). 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.

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
Windows XP and Vista Wireless Configuration Utilities Application Note	http://documentation.netgear.com/reference/enu/winzerocfg/index.htm
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

