User Manual for the NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111

NETGEAR

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

202-10026-01
Version v1.0
February 2004

Technical Support

Please refer to the support information card that shipped with your product. By registering your product at 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.

E-mail: support@netgear.com

Web site: 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.

©2003 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.

February 2004

Certificate of the Manufacturer/Importer

It is hereby certified that the Model WG111 wireless USB adapter has been suppressed in accordance with the conditions set out in the BMPT- AmtsblVfg 243/1991 and Vfg 46/1992. The operation of some equipment (for example, test transmitters) in accordance with the regulations may, however, be subject to certain restrictions. Please refer to the notes in the operating instructions.

Federal Office for Telecommunications Approvals has been notified of the placing of this equipment on the market and has been granted the right to test the series for compliance with the regulations.

VCCI Statement

This equipment is in the Class B category (information equipment to be used in a residential area or an adjacent area thereto) and conforms to the standards set by the Voluntary Control Council for Interference by Data Processing

Equipment and Electronic Office Machines aimed at preventing radio interference in such residential areas. When used near a radio or TV receiver, it may become the cause of radio interference. Read instructions for correct handling.

FCC Information to User

This product does not contain any user serviceable components and is to be used with approved antennas only. Any product changes or modifications will invalidate all applicable regulatory certifications and approvals

FCC Guidelines for Human Exposure

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body.

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

Declaration Of Conformity

We NETGEAR, Inc., 4500 Great America Parkway, Santa Clara, CA 95054, declare under our sole responsibility that the model WG111 Cardbus Card Wireless Adapter complies with Part 15 of FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

Regulatory Compliance Information

This section includes user requirements for operating this product in accordance with National laws for usage of radio spectrum and operation of radio devices. Failure of the end-user to comply with the applicable requirements may result in unlawful operation and adverse action against the end-user by the applicable National regulatory authority.

NOTE: This product's firmware limits operation to only the channels allowed in a particular Region or Country. Therefore, all options described in this user's guide may not be available in your version of the product.

FCC Requirements for Operation in the United States

Radio Frequency Interference Warnings & Instructions

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

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment into an electrical outlet on a circuit different from that which the radio receiver is connected

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

NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111

Tested to Comply
with FCC Standards
FOR HOME OR OFFICE USE
PY3WG111

Modifications made to the product, unless expressly approved byNETGEAR, Inc., could void the user's right to operate the equipment.

Export Restrictions

This product or software contains encryption code which may not be exported or transferred from the US or Canada without an approved US Department of Commerce export license.

Europe - EU Declaration of Conformity

CE 0560 !	This device is a 2.4 GHz low power RF device intended for home and office use in EU and EFTA member states. In some EU / EFTA member states some restrictions may apply. Please contact local spectrum management authorities for further details before putting this device into operation.

This product is certified for Switzerland and all EU countries. Marking by the above symbol indicates compliance with the Essential Requirements of the R&TTE Directive of the European Union (1999/5/EC). This equipment meets the following conformance standards: EN300 328, EN301 489-17, EN60950

Requirements For Operation in the European Community

Countries of Operation and Conditions of Use in the European Community

The user should run the client utility program provided with this product to check the current channel of operation and confirm that the device is operating in conformance with the spectrum usage rules for European Community countries as described in this section.

This device is intended to be operated in all countries of the European Community.

Operation Using 2.4 GHz Channels in France

The following radio channel usage limitations apply in France.

The radio spectrum regulator in France, Autorité de regulation des telecommunications (ART), enforces the following rules with respect to use of 2.4GHz spectrum in various locations in France. Please check ART's web site for latest

requirements for use of the 2.4GHz band in France: http://www.art-telecom.fr/eng/index.htm. When operating in the following metropolitan regions (départements) in France, this device may be operated under the following conditions:

Indoors using any channel in the 2.4-2.4835 GHz band (Channels 1-13)

Outdoors using channels in the 2.4-2.454 GHz band (Channels 1-7)

When operating outside of the following regions (départements) in France (see table below), this product must be operated under the following conditions:

- Indoors using channels in the 2.4465-2.4835 GHz band (Channels 10-13).
- Outdoor operation not permitted.

Please refer to the ART web site for further details.

Metropolitan Regions with Eased Restrictions in 2.4GHz Band

01	Ain	36	Indre	69	Rhône
02	Aisne	37	Indre et Loire	70	Haute Saône
03	Allier	39	Jura	71	Saône et Loire
05	Hautes Alpes	41	Loir et Cher	72	Sarthe
08	Ardennes	42	Loire	75	Paris
09	Ariège	45	Loiret	77	Seine et Marne
10	Aube	50	Manche	78	Yvelines
11	Aude	54	Meurthe et Moselle	79	Deux Sèvres
12	Aveyron	55	Meuse	82	Tarn et Garonne
16	Charente	57	Moselle	84	Vaucluse
19	Corrèze	58	Nièvre	86	Vienne
2A	Corse Sud	59	Nord	88	Vosges
2B	Haute Corse	60	Oise	89	Yonne
21	Côte d'Or	61	Orne	90	Territoire de Belfort
24	Dordogne	63	Puy de Dôme	91	Essonne
25	Doubs	64	Pyrénées Atlantique	92	Hauts de Seine
26	Drôme	65	Hautes Pyrénées	93	Seine St Denis
27	Eure	66	Pyrénées Orientales	94	Val de Marne
32	Gers	67	Bas Rhin		
35	Ille et Vilaine	68	Haut Rhin		

Declaration of Conformity in Languages of the European Community

Finnish: Valmistaja NETGEAR, Inc. vakuuttaa täten että Radio LAN device tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.

Dutch: Hierbij verklaart NETGEAR, Inc. dat het toestel Radio LAN device in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.

French: Par la présente NETGEAR, Inc. déclare que l'appareil Radio LAN device est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.

Swedish: Härmed intygar NETGEAR, Inc. att denna Radio LAN device står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

Danish: Undertegnede NETGEAR, Inc. erklærer herved, at følgende udstyr Radio LAN device overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.

German: Hiermit erklärt NETGEAR, Inc., dass sich dieser/diese/dieses Radio LAN device in Übereinstimmung mit den grundlegenden Anforderungen und den anderen relevanten Vorschriften der Richtlinie 1999/5/EG befindet.

Italian: Con la presente NETGEAR, Inc. dichiara che questo Radio LAN device è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.

Spanish: Por medio de la presente NETGEAR, Inc. declara que el Radio LAN device cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.

Portugese: NETGEAR, Inc. declara que este Radio LAN device está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.

Canadian Department of Communications Radio Interference Regulations

This digital apparatus (NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111) does not exceed the Class B limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Canada ID: 4054A-WG111

Contents

Chapter 1
About This Manual

Audience, Scope, Conventions 1-1
How to Use this Manual 1-2
How to Print this Manual 1-3

Chapter 2
Introduction

About the WG111 2-1
Key Features 2-1
What's in the Box? 2-2
A Road Map for 'How to Get There From Here' 2-2

Chapter 3
Basic Setup

What You Need Before You Begin 3-1
Verifying System Requirements 3-1
Observing Location and Range Guidelines 3-2
Two Basic Operating Modes 3-2
WG111 Default Wireless Configuration Settings 3-3
Basic Installation Instructions 3-4
For Windows XP Users Installing a WG111 3-5
For Windows 2000 & 98/Me Users Installing a WG111 3-9
WG111 Wireless Connection Indicators 3-13
Interpreting the LED on the WG111 3-13
Interpreting System Tray Icon Colors 3-14
Troubleshooting 3-14
Basic Tips 3-15
Troubleshooting Frequently Asked Questions 3-15

Chapter 4
Configuration

Understanding the Configuration Options 4-1
Using Configuration Profiles 4-1

Connecting to an Access Point in Infrastructure Mode 4-2
How to Configure an Infrastructure Mode Profile 4-2
Connecting to Another PC in Ad-hoc Mode 4-3
How to Configure an Ad-hoc Mode Profile 4-3
How to Start a Computer-to-Computer (Ad-Hoc) Network 4-6
Enabling Wireless Security Features 4-6
Identifying the Wireless Network Name (SSID) and WEP Security Settings 4-6
How to Configure WEP Encryption Security 4-7
Statistics Page 4-9
Advanced Settings Page 4-9

Appendix A
Technical Specifications

Appendix B
Wireless Networking Basics

Wireless Networking Overview B-1
Infrastructure Mode B-1
Ad Hoc Mode (Peer-to-Peer Workgroup) B-2
Network Name: Extended Service Set Identification (ESSID) B-2
Authentication and WEP B-2
802.11 Authentication B-3
Open System Authentication B-3
Shared Key Authentication B-4
Overview of WEP Parameters B-5
Key Size B-6
WEP Configuration Options B-6
Wireless Channels B-7

Appendix C
Preparing Your PCs for Network Access

Preparing Your Computers for TCP/IP Networking C-1
Configuring Windows 98 and Me for TCP/IP Networking C-1
Install or Verify Windows Networking Components C-1
Enabling DHCP in Windows 98 and Me C-3
Selecting Windows' Internet Access Method C-5
Verifying TCP/IP Properties C-5
Configuring Windows 2000 or XP for TCP/IP Networking C-6

Install or Verify Windows Networking Components C-6
DHCP Configuration of TCP/IP in Windows XP or 2000 ..... C-7
DHCP Configuration of TCP/IP in Windows XP C-7
DHCP Configuration of TCP/IP in Windows 2000 ..... C-9
Verifying TCP/IP Properties for Windows XP or 2000 ..... C-11

Glossary

Index

Chapter 1
About This Manual

This chapter introduces the conventions and features of this document.

Audience, Scope, Conventions

This manual assumes that the reader has basic to intermediate computer and Internet skills. However, tutorial information is provided in the Appendices, on the *NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111 Resource CD (230-10044-01)*, and on the NETGEAR Web site.

This manual uses the following typographical conventions:

Table 1. Typographical conventions

italics	Emphasis.
bold times roman	User input.
[Enter]	Named keys in text are shown enclosed in square brackets.
SMALL CAPS	DOS file and directory names.

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 1-1. Manual Specifications

Product Version	NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111
Manual Part Number	202-10026-01
Manual Publication Date	February 2004

Note: Product updates are available on the NETGEAR Web site at *www.netgear.com/support/main.asp*.

How to Use this Manual

The HTML version of this manual includes these features.

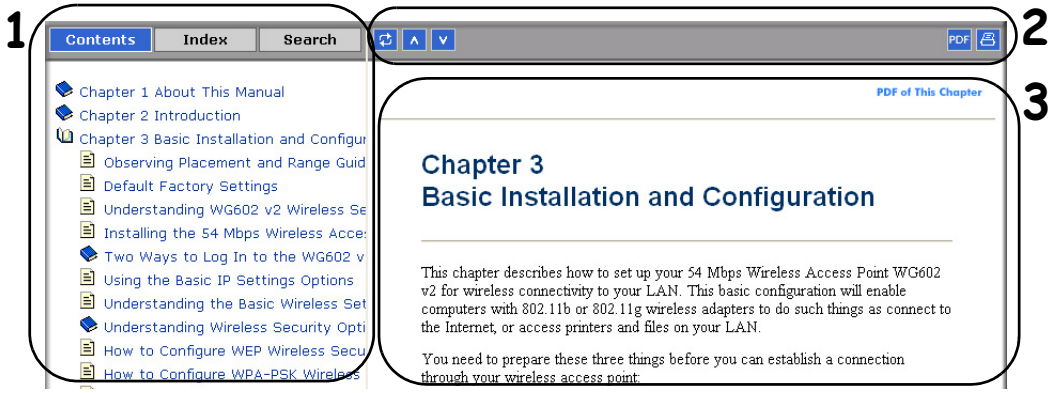


Figure 1-1: HTML version of this manual

1. **Left pane**. Use the left pane to view the Contents, Index, and Search tabs.

   To view the HTML version of the manual, you must have a version 4 or later browser with JavaScript enabled.

2. **Toolbar buttons**. Use the toolbar buttons across the top to navigate, print pages, and more.

The *Show in Contents* button locates the current topic in the Contents tab.

Previous/Next buttons display the previous or next topic.

The *PDF* button links to a PDF version of the full manual.

The *Print* button prints the current topic. Using this button when a step-by-step procedure is displayed will send the entire procedure to your printer--you do not have to worry about specifying the correct range of pages.

3. **Right pane**. Use the right pane to view the contents of the manual. Also, each page of the manual includes a **PDF of This Chapter** link at the top right which links to a PDF file containing just the currently selected chapter of the manual.

How to Print this Manual

To print this manual you can choose one of the following several options, according to your needs.

- **Printing a "How To" Sequence of Steps in the HTML View**. Use the *Print* button on the upper right of the toolbar to print the currently displayed topic. Using this button when a step-by-step procedure is displayed will send the entire procedure to your printer--you do not have to worry about specifying the correct range of pages.
- **Printing a Chapter**. Use the PDF of This Chapter link at the top right of any page.
  - Click "PDF of This Chapter" link at the top right of any page in the chapter you want to print. A new browser window opens showing the PDF version of the chapter you were viewing.
  - Click the print icon in the upper left of the window.
  - **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.
- **Printing the Full Manual**. Use the PDF button in the toolbar at the top right of the browser window.
  - Click PDF button. A new browser window opens showing the PDF version of the chapter you were viewing.
  - Click the print icon in the upper left of the window.
  - **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.

Chapter 2
Introduction

This chapter introduces the features, package contents, and appearance of the NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111.

About the WG111

The NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111 gives you ultimate mobility in your office or while you are traveling. It frees you from traditional Ethernet wiring and helps you create a wireless network for sharing your broadband Internet access among multiple PCs in and around your home. It is designed for PC computers running Microsoft® Windows®. It is a USB 2.0 device and is backwards compatible with USB 1.1 ports.

Its auto-sensing capability allows high packet transfer at up to 54 Mbps for maximum throughput or dynamic range shifting to lower speeds due to distance or operating limitations in an environment with a lot of electromagnetic interference.

The WG111 Wireless USB 2.0 Adapter provides reliable, standards-based 802.11g 54 Mbps WLAN connectivity that is protected with industry-standard security. It works with Windows 98, Me, 2000, and XP operating systems.

Key Features

The WG111 Wireless USB 2.0 Adapter provides the following features:

- Reliable IEEE 802.11g and b standards-based wireless technology.
- 54 Mbps high speed data transfer. Wireless nodes negotiate to operate in the optimal data transfer rate. In a noisy environment or when the distance between the wireless nodes is far, the wireless nodes automatically fall back to operate at lower transfer rates.
- High level of data encryption using128-bit Shared Key WEP data encryption method. A lower level of data encryption or no data encryption is available to simplify your network setup or to improve data transfer rate.

What's in the Box?

The product package should contain the following items:

- NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111
- Installation Guide for the NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111 (201-10106-01)
- *NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111 Resource CD (230-10044-01)*, including:
  - Driver and Configuration Utility Software
  - User Manual for the NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111
  - Animated Network Properties Configuration Tutorial
  - PC Networking Tutorial
- 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.

A Road Map for 'How to Get There From Here'

The introduction and adoption of any new technology can be a difficult process. Wireless technology has removed one of the barriers to networking—running wires. It allows more people to try networking while at the same time exposes them to the inherent complexity of networking. General networking concepts, setup, and maintenance can be difficult to understand. In addition, wireless technology adds issues, such as range, interference, signal quality, and security to the picture.

To help overcome potential barriers to successfully using wireless networks, the table below identifies how to accomplish such things as connecting to a wireless network, assuring appropriate security measures are taken, browsing the Internet through your wireless connection, 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's Needed?	How Do I?
Connect to a wireless network	1. Identify the wireless network name (SSID) and, if used, the wireless security settings. 2. Set up the NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111 with the settings from step 1.	1. A wireless network 2. A PC within the operating range of the wireless network. For guidelines about the range of wireless networks, see "Observing Location and Range Guidelines" on page 3-2.	To set up the WG111, see Chapter 3, "Basic Setup" and follow the instructions provided. To learn about wireless networking technology, see Appendix , "Wireless Networking Overview" for a general introduction.
Protect my wireless connection from snooping, hacking, or information theft.	1. Assure that the wireless network has security features enabled. 2. Configure my WG111 with the security settings of the wireless network. 3. Use Windows security features.	1. A wireless network with authentication and WEP encryption enabled. 2. Wireless networking equipment that supports WEP encryption, such as the WG111 and all NETGEAR wireless networking products.	To learn about wireless networking security, see "Authentication and WEP" on page B-2. To use WEP security features, see "Enabling Wireless Security Features" on page 4-6 and configure your WG111 accordingly.

Note: Secure Internet sites such as banks and online merchants use encryption security built into browsers like Internet Explorer and Netscape. Any wireless networking security features you might implement are in addition to those already in place on secure Internet sites.

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

If I Want To?	What Do I Do?	What's Needed?	How Do I?
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 active Internet connection like those from cable or DSL service providers. 2. A wireless network connected to the cable or DSL Internet service through a cable/DSL router as illustrated in "Connecting to an Access Point in Infrastructure Mode" on page 4-2. 3. TCP/IP Internet networking software installed and configured on my PC according to the requirements of the Internet service provider. 4. A browser like Internet Explorer or Netscape Navigator.	To configure your WG111 in Infrastructure Mode, see "Basic Installation Instructions" on page 3-4, and locate the section for your version of Windows. For assistance with configuring the TCP/IP Internet software on a PC, see "Preparing Your Computers for TCP/IP Networking" on page C-1 or refer to the PC Networking Tutorial on the *NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111 Resource CD (230-10044-01)* 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's Needed?	How Do I?
Exchange files between a wirelessly connected PC and other computers in a my 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 the target computer in the network in order to locate the directory or files you want to work with. 3. Use the Windows Explorer copy and paste functions to exchange files between the computers.	1. The PC I am using to connect to the wireless network needs to be configured with the Windows Client and File and Print Sharing. 2. The PC I am using to connect to the wireless network needs to be configured with the same Windows Workgroup or Domain settings as the other Windows computers in the combined wireless and wired network. 3. Any Windows networking security access rights such as login user name/ password that have been assigned in the Windows network or for sharing particular files must be provided when Windows prompts for such information. 4. If so-called Windows 'peer' Workgroup networking is being used, the drive, file system directory, or file need to be enabled for sharing.	For assistance with Windows networking software, see "Preparing Your Computers for TCP/IP Networking" on page C-1 for configuration scenarios or refer to the Help system included with your version of Windows. 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 54 Mbps Wireless USB 2.0 Adapter WG111 Resource CD (230-10044-01)* 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's 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 PC I am using to connect to the wireless network needs to be configured with the Windows Client and File and Print Sharing. 2. The PC I am using to connect to the wireless network needs to be configured with the same Windows Workgroup or Domain settings as the other Windows computers in the combined wireless and wired network. 3. 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. 4. 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 54 Mbps Wireless USB 2.0 Adapter WG111 Resource CD (230-10044-01)* and the Help information provided in the Windows system you are using. For assistance 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.

Chapter 3
Basic Setup

This chapter describes how to install your NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111 and set up basic wireless connectivity on your Wireless Local Area Network (WLAN). Advanced wireless network configuration is covered in Chapter 4, “Configuration” in this manual.

	Note: Indoors, computers can easily connect to 802.11 wireless networks at distances of several hundred feet. Because walls do not always block wireless signals, others outside your immediate area could access your network. It is important to take appropriate steps to secure your network from unauthorized access. The NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111 provides highly effective security features which are covered in “Enabling Wireless Security Features” on page 4-6 in this manual. Deploy the security features appropriate to your needs.

What You Need Before You Begin

You need to verify your computer meets the minimum system requirements and identify the wireless network configuration settings of the WLAN where you will connect before you can configure your wireless USB adapter and connect.

Verifying System Requirements

Before installing the NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111, please 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: If you do not have a USB 2.0 port on your PC, the throughput of the WG111 will be limited to the 14 Mbps of the USB 1.1 standard.

- A CD-ROM drive.
- 5 Mbytes of free hard disk space.

- Windows XP Home, Windows XP Professional, 2000, Me, 98SE or 98 Some versions of Windows may ask for the original Windows operating system installation files to complete the installation of the WG111 driver software.

Observing Location and Range Guidelines

Computers can connect over wireless networks indoors at a range which vary significantly based on the physical location of the computer with the NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111. For best results, avoid potential sources of interference, such as:

- Large metal surfaces
- Microwaves
- 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.

Two Basic Operating Modes

The WG111 Wireless USB 2.0 Adapter can operate in the following two basic modes:

- **Infrastructure Mode:** An 802.11 networking framework in which devices and computers communicate with each other by first going through an access point (AP). 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.
- **Ad-Hoc Mode:** An 802.11 networking framework in which devices or computers communicate directly with each other, without the use of an AP. 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.

Both of these configuration options are available with the WG111 Wireless USB 2.0 Adapter. Infrastructure configuration procedures for basic network connectivity are covered below. Advanced infrastructure configuration procedures and ad-hoc configuration are covered in Chapter 4, “Configuration” of this manual.

WG111 Default Wireless Configuration 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 will need to identify the wireless configuration and security parameters already defined.

Your NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111 factory default basic settings are:

- Network Name Service Set Identification (SSID): **Any** (First available network)

  Note: In order for the WG111 Wireless USB 2.0 Adapter to communicate with a wireless access point or wireless adapter, all devices must be configured with the same wireless network name (SSID).

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

The section below provides instructions for setting up the NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111 for basic wireless connectivity to an access point. The procedures below provide step-by-step installation instructions for Windows PCs. Use the procedure that corresponds to the version of Windows you are using.

Basic Installation Instructions

Use the procedure below that corresponds to the version of Windows you are using.

For Windows XP Users Installing a WG111

1

Install the WG111 driver and configuration utility software.

a. Power on your PC, let the operating system boot up completely, and log in as needed.

b. Insert the Resource CD for the WG111 into your CD-ROM drive. The CD main page shown at the right will load.

c. Click **Install Driver and Utility**.

Follow the InstallShield Wizard steps.

You will be prompted to choose the country you are located in. Select your location from the list.

d. Click **Finish** when done, and if prompted restart your computer.

WG111 Resource CD

Note: If this screen fails to load automatically, browse to the CD and double-click on **autorun.exe**.

InstallShield Wizard

Note: If a Windows XP Certification warning appears, click **Continue Anyway** to proceed.

2

Install the NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111.

a. Locate an available USB port on your PC. Connect the USB cable to the WG111 and insert the other end of the cable into the USB slot on your PC.

After a short delay, the Found New Hardware Wizard displays.

Note: Click **Continue Anyway** if you are prompted with a Windows XP Logo testing message.

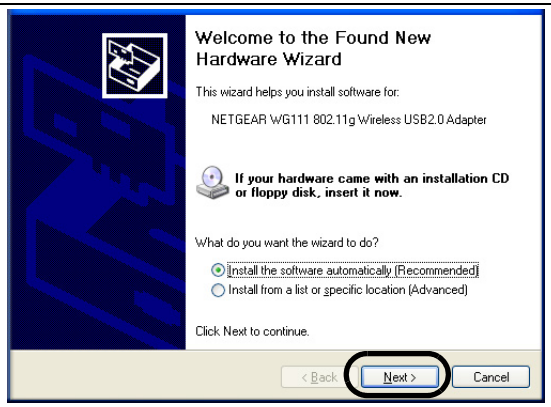
b. Next you will be prompted to enable the NETGEAR Smart Wireless Settings Utility configuration utility.

Click **Yes** to accept this option.

If you choose No, you must read the Windows XP documentation for an explanation of how to use the Windows XP wireless network configuration utility

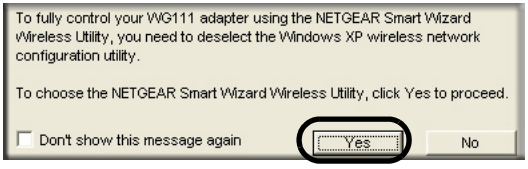
c. Click **Finish** when done, and if prompted restart your computer.

You will see the WG111 system tray icon on the lower right portion of the Windows task bar.



Add New Hardware Wizard

Note: If the USB port in your computer is not a USB v2.0 type port but rather a USB v1.1 type port, you will see a “HI_SPEED USB Device Plugged into non-I-SPEED USB Hub” message. The WG111 will work but the USB v1.1 port maximum speed is 14 Mbps whereas the maximum speed of a USB v2.0 port is 480 Mbps. So, when the WG111 is connected to a USB v1.1 port, the communications speed will be limited to the maximum of the USB v1.1 port.



Enable NETGEAR Utility Configuration

WG111 System Tray Icon

3

Configure your WG111.

a. Click the icon on the Windows desktop or in the system tray to open the WG111 Smart Wizard Wireless Settings Utility.

The utility opens to the Settings tab page.

Click Help for instructions on using the Smart Wizard Wireless Utility.

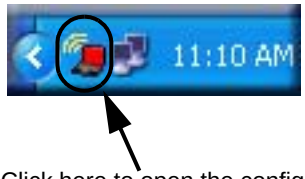
b. Change the Network Name SSID to match your network.

Tip: As an alternative to typing in the SSID, you can use the drop-down list or the Networks tab to view the available wireless networks, and choose the one you want.

c. Click **Apply** to activate the connection.

You can also enter a profile name and click Save Profile to store the current settings.

Tip: Create profiles called *work* and *home*. Then, activate whichever one you need for your current location.



Click here to open the configuration utility.

WG111 system tray icon

Smart Wizard Wireless Utility Settings page

Tip: Click Help to view the context-sensitive help information.

Note: The NETGEAR default settings are **Infrastructure mode**, with **Any** (first available network that replies) for the wireless network name SSID, and WEP disabled. If your WLAN settings are different from the NETGEAR default settings, you will not connect. Set up your WG111 accordingly.

Note: This procedure assumes you are connecting to a wireless network which is not using WEP security. If your network includes WEP settings, click the Settings tab page and configure the WG111 accordingly. For help with these steps, click the Help button in the WG111 Configuration Utility to view context- sensitive help information, or see "Enabling Wireless Security Features" on page 4-6.

4

Verify wireless connectivity to your network.

a. Verify that the status monitor information at the bottom of the utility matches your wireless network.

b. Check the color of the WG111 icon in the Windows system tray: green or yellow indicates a working connection; red indicates no connection.

c. Check the WG111 LED: blinking means attempting to connect; solid indicates a good connection; off means the WG111 is not plugged in.

d. Verify connectivity to the Internet or network resources.

Note: If you are unable to connect, see "Troubleshooting" on page 3-14.

For Windows 2000 & 98/Me Users Installing a WG111

1

Install the WG111 driver and configuration utility software.

Note: Windows 2000 may require you to be logged on with administrator rights.

a. Power on your PC, let the operating system boot up completely, and log in as needed.

b. Insert the Resource CD for the WG111 into your CD-ROM drive. The CD main page shown at the right will load.

c. Click **Install Driver and Utility**.

Follow the InstallShield Wizard steps.

You will be prompted to choose the country you are located in. Select your location from the list.

d. Click **Finish** when done, and if prompted restart your computer.

WG111 Resource CD

Note: If this screen fails to load automatically, browse to the CD and double-click on **autorun.exe**.

InstallShield Wizard

Note: If a Windows 2000 Digital Signature warning appears, click **Yes** to proceed.

2

Install the NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111.

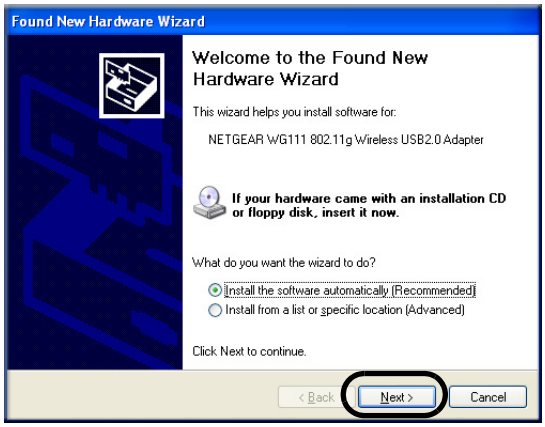
a. Locate an available USB port on your PC. Connect the USB cable to the WG111 and insert the other end of the cable into the USB slot on your PC.

After a short delay, the Found New Hardware Wizard displays.

Note: Click **Yes** if you are prompted with a Digital Signature Not Found message.

b. Click **Finish** when done, and if prompted restart your computer.

a. You will see the WG111 system tray icon on the lower right portion of the Windows task bar.



Found New Hardware Wizard

Note: If your computer does not have a USB v2.0 port but rather a USB v1.1 type port, the WG111 will be limited to the maximum speed of the USB v1.1 port. USB v1.1 port maximum speed is 14 Mbps whereas the maximum speed of a USB v2.0 port is 480 Mbps.

WG111 System Tray Icon

3

Configure your WG111 and save the Profile.

a. Click on the WG111 icon on the Windows desktop or in the system tray to open the WG111 configuration utility.

The utility opens to the Settings tab page.

Click Help for instructions on using the Smart Wizard Wireless Utility.

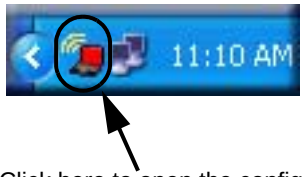
b. For the Network Name (SSID), use the default of **Any** (First available network) or type an SSID for your network.

Tip: As an alternative to typing in the SSID, you can use the drop-down list or the Networks tab to view the available wireless networks, and choose the one you want.

c. Click **Apply** to activate the connection.

d. You can also enter a profile name and click **Save Profile** to store the current settings.

Tip: If you use your desktop PC to connect to a wireless network at work and at home, create profiles called *work* and *home*. Then, activate whichever one you need for wherever you are located.



Click here to open the configuration utility.

WG111 system tray icon

WG111 Configuration Utility

Note: The NETGEAR default settings are **Infrastructure mode**, with **Any** (first available network that replies) for the wireless network name SSID, and WEP disabled. If your WLAN settings are different from the NETGEAR default settings, you will not connect. Set up your WG111 accordingly.

Note: This procedure assumes you are connecting to a wireless network which is not using WEP security. If your network includes WEP settings, click the Security tab page and configure the WG111 accordingly. For help with these steps, click the Help button in the WG111 Configuration Utility to view context- sensitive help information, or see "Enabling Wireless Security Features" on page 4-6.

4

Verify wireless connectivity to your network.

a. Verify that the status monitor information at the bottom of the utility matches your wireless network.

b. Check the color of the WG111 icon in the Windows system tray: green or yellow indicates a working connection; red indicates no connection.

c. Check the WG111 LED: blinking means attempting to connect; solid indicates a good connection; off means the WG111 is not plugged in.

d. Verify connectivity to the Internet or network resources.

Note: If you are unable to connect, see "Troubleshooting" on page 3-14.

WG111 Wireless Connection Indicators

The NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111 provides the following three indicators which give you feedback on the status of your wireless connection:

- The status LED on the NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111 indicates the condition of wireless link.
- The color of the SysTray icon is on the System Tray portion of the taskbar in the Microsoft Windows desktop indicates the status of the connection.

Interpreting the LED on the WG111

Status LED

The status LED is described in this table.

Table 3-1: LED Descriptions

LED	Meaning
OFF	• The WG111 in not plugged in to the PC. • Power save mode (default from power up or reset).
Blink	Looking for network association.
On	Associated or joined with network.

Interpreting System Tray Icon Colors

The System Tray (SysTray) resides on one end of the taskbar in the Microsoft Windows desktop.

Color	Condition	Description
Red	The WG111 has no connection to any wireless node.	The WG111 is not able to 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 WG111 has a connection with another wireless node.	The wireless link is weak. You may deed 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 WG111 has a connection with another wireless node.	The WG111 has established good communication with an access point and the signal quality is strong.

Troubleshooting

Use the information below to solve common problems you may encounter. Also, please refer to the knowledge base on the NETGEAR web site at *www.netgear.com/support/main.asp*.

Also, for problems with accessing network resources, the Windows software might not be installed and configured properly on your computers. Please refer to "Preparing Your Computers for TCP/IP Networking" on page C-1.

Basic Tips

If you have problems connected to your wireless network, try the tips below.

Symptom	Cause	Solution
The LED is not lit.	The WG111 is not connected to the USB port properly or the WG111 software is not loaded.	Remove and reinsert the WG111. Check the Windows device manager to see if the WG111 is recognized and enabled. Reload the WG111 software, if necessary. Try to install the WG111 in a different USB slot on your system if one is available.
The wireless LED blinks and cannot connect to an access point.	The WG111 is attempting to connect to an access point, but cannot connect.	The access point may not be powered on. Or, the access point and the WG111 are not configured with the same wireless parameters. Check the SSID and WEP settings.
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 the "A Road Map for 'How to Get There From Here'" on page 2-2 for additional suggestions.

Troubleshooting Frequently Asked Questions

1. Question: The product literature says the WG111 can operate at 54 Mbps. Why do I see no more than 11 Mbps speed on my WG111 Smart Configuration Utility status line?

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

2. Question: The product literature says the WG111 can operate at 54 Mbps. Why do I see no more than 14 Mbps speed on my WG111?

If your computer does not have a USB v2.0 port but rather a USB v1.1 type port, the WG111 will be limited to the maximum speed of the USB v1.1 port. USB v1.1 port maximum speed is 14 Mbps whereas the maximum speed of a USB v2.0 port is 480 Mbps. PC computers can be upgraded with optional add-on USB v2.0 adapters that provide one or more USB v2.0 ports.

3. Question: Why does the utility kept asking me to Save my settings when I'm trying to close the utility?

   Answer**:** This is because you've made changes to the settings and the utility is offering you the chance to save the changes. If you want to avoid these Profile setting prompts, simply hit Apply before you Close the utility program.

4. Question: Why doesn't Ad Hoc mode work correctly after I enter a SSID and click Apply?

   Answer**:** You need to click the Initiate Ad Hoc button before you click Apply.

   Here is how you start an Ad Hoc network:

   a. Fill in the Network Name (SSID).
   b. Select the Computer-to-Computer (Ad-Hoc) network Type.
   c. Click initiate Ad Hoc.
   d. Accept default settings or make proper changes and click OK
   e. Click on Apply

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

5. Question: How do I know if my WG111 card has received a valid IP address from my Wireless Router/AP?

   Answer: One easy way is to open up the WG111 utility program and check the "IP Address" in the About page.

6. Question for XP Professional and XP Home users only: How do I use XP's own Wireless configuration utility that came with the OS?

   Answer: The NETGEAR WG111 software is designed in such way that user will be asked to choose one of the utility programs during initial software installation. Be sure the WG111 is connected to the PC and follow these instructions to change your selection. Go to Control Panel> Network Connections> Wireless Network Connection > Properties> Wireless Networks tab> for the WG111 and check or uncheck "Use Windows to configure my wireless network settings".

7. Question: Is this WG111 IEEE 802.11g standards compliant?

   Answer: Yes, the WG111 complies with the IEEE 802.11g standards.

8. Question: It is nice to have a browser-based type of Manual on the Resource CD, but how do I get a PDF copy of it, like the Installation Guide?

   Answer: In the Manual HTML page, there is a PDF button image at the top right hand corner of the web page. Click on the PDF button brings up the PDF file of the entire manual. You can also Print, Email, Bookmark pages using the appropriate icons next to the PDF button.

Chapter 4
Configuration

This chapter describes how to configure your NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111 for wireless connectivity on your Wireless Local Area Network (WLAN) and use the data security encryption features.

	Note: The instructions in this section refer to the NETGEAR WG111 configuration utility. For Windows XP users to use the NETGEAR configuration utility, the Windows XP configuration utility must be deselected. If you did not enable the NETGEAR utility when you installed the WG111 Wireless USB 2.0 Adapter, 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.

Understanding the Configuration Options

The WG111 configuration utility provides a complete and easy to use set of tools to:

- Configure wireless settings.
- Monitor wireless network connections.
- Save your settings in configuration profiles.

The section below introduces these capabilities of the configuration utility.

Using Configuration Profiles

The WG111 configuration utility uses profiles to store all the configuration settings for a particular wireless network. You can store multiple profiles and recall the one which matches the network you want to join.

For example, if you use your notebook PC to connect to a wireless network in an office and a wireless network in your home, you can create a profile for each wireless network. Then, you can easily load the profile that has all the configuration settings you need to join the network you are using at the time.

There are two types of wireless network connections you can configure:

- **Infrastructure Mode —** uses the 802.11 infrastructure mode.
- **Ad-hoc Mode —** uses the 802.11 ad-hoc mode

For more information on 802.11 wireless network modes, see "Wireless Networking Overview" on page B-1 of this manual.

Connecting to an Access Point in Infrastructure Mode

This section provides instructions for configuring the NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111 to connect to a wireless access point.

How to Configure an Infrastructure Mode Profile

Follow the instructions below to configure an infrastructure mode profile for connecting to an access point.

1. **Run the WG111 Configuration Utility.**
   a. Make sure the WG111 software is installed and the WG111 is connected to your PC.
   b. Open the configuration utility by clicking on the WG111 icon in the Windows system tray.
   c. Click on the Settings tab to display the view shown above.
2. **Configure the wireless Network settings.**
   a. In the Network Type section, be sure that Infrastructure is selected.
   b. Enter the SSID. This is also called the Wireless Network Name.

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

      Tip: You can click the Network tab to view a list of the available wireless networks and their SSIDs at the location where you are.
3. **Save your settings in a Profile.**

a. Type a descriptive name for the Profile in the “Profiles” field.

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

c. Click Apply.

d. Click Close to exit the configuration utility 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 configuration utility for the current connection status.

Note: If you cannot connect, see the “Troubleshooting” on page 3-14. 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 “Preparing Your Computers for TCP/IP Networking” on page C-1.

Connecting to Another PC in Ad-hoc Mode

The peer-to-peer setting of the WG111 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.

How to Configure an Ad-hoc Mode Profile

Note: Ad-hoc mode will not work using DHCP settings. Ad-hoc mode requires either static IP addresses (such as **`192.168.0.1)`**. For instructions on setting up static IP addresses on a Windows PC, refer to the PC Networking Tutorial included on the *NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111 Resource CD (230-10044-01)*.

Follow the instructions below to configure an Ad-hoc mode profile.

1. Run the WG111 Configuration Utility.

a. Make sure the WG111 software is installed and the WG111 is connected to your PC.

b. Open the configuration utility by clicking on the WG111 icon in the Windows system tray.

c. Click the Settings tab.

d. Select Ad-hoc for the Network Type.

e. Enter the SSID for the Ad-Hoc network.

f. Click Apply.

2. Save your settings in a Profile.

a. Type a descriptive name in the “Profiles” field.

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

c. Click Apply.

d. Click Close to exit the configuration utility.

3. Configure the PC network settings.

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

Note: For instructions on configuring static IP addresses, refer to the networking tutorial on your *NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111 Resource CD (230-10044-01)*.

b. Restart the PCs.

4. Verify wireless connectivity between your peer devices.

Verify connectivity by using the Ping program:

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

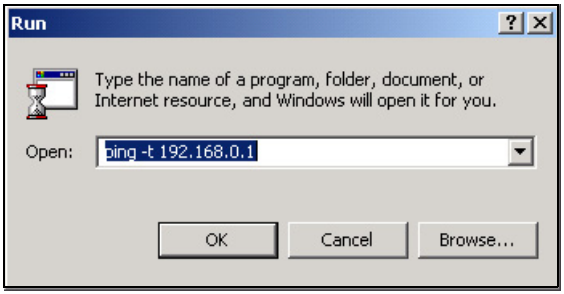


Figure 4-1: Windows Run program dialog box

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. This will cause a continuous ping to 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 4-2: Ping test results

At this point the connection is established.

You may need to reboot in certain Windows operating systems such as Windows 98.

Note: If you cannot connect, see the "Troubleshooting" on page 3-14. 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 "Preparing Your Computers for TCP/IP Networking" on page C-1.

How to Start a Computer-to-Computer (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. The Ad-Hoc Setting dialog box will appear.
4. Choose the wireless settings for your Ad-Hoc computer-to-computer network.

   If you notice interference problems with another nearby wireless device, select a channel that is not being used by any other wireless networks near your wireless adapter. Use the Networks tab page to identify the channels in use in your area.
5. Click OK.

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

Enabling Wireless Security Features

You can strengthen the security of your wireless connection by enabling Wired Equivalent Privacy (WEP) encryption of the wireless data communications. For more information on 802.11 wireless security, see "Authentication and WEP" on page B-2.

In addition to the WG111 wireless 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.

The procedures below identify how to configure the WEP encryption settings of your NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111.

Identifying the Wireless Network Name (SSID) and WEP 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 be able to provide this information.

- ***Wireless Network Name (SSID):*** The Service Set Identification (SSID) identifies the wireless local area network. **Any** (First available network) is the default WG111 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): _____

- ***WEP Security Encryption key:*** The default WEP encryption key number is 1, and the default key size is 64 bits.

  Note: The key number as well as the key value used by all wireless nodes must be the same. If they are different, you will not be able to connect.

  WEP Encryption Key Size, circle one: 64 or 128 bits

  WEP Encryption Passphrase, if used: _____

  A Passphrase is used to automatically generate the WEP hexadecimal numbers for the key. If the wireless network Access Point uses a Passphrase, you can also use that here. Otherwise, you will have to manually enter the hexadecimal numbers.

  WEP Hexadecimal Numbers: _____

  The WEP Hexadecimal Numbers are needed if a Passphrase is not used in the wireless network access point, but rather if the key is manually entered.

Use the procedures below to configure basic security settings in the WG111.

How to Configure WEP Encryption Security

Follow the steps below to configure WEP Encryption Security.

1. **Run the WG111 Configuration Utility.**

   a. Make sure the WG111 software is installed and the WG111 is connected to your PC.

   b. Open the configuration utility by clicking on the WG111 icon in the Windows system tray.

   c. Click on the Settings tab to display the view shown above.

2. **Configure the Security settings.**

   a. Select the Use WEP Encryption check box.

b. Enter the SSID. This is also called the Wireless Network Name.

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

Tip: You can click the Networks tab to view a list of the available wireless networks and their SSIDs at your location.

3. Save your settings in a Profile.

a. Type a descriptive name in the “Profiles” field.

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

c. Click Apply.

d. Click Close to exit the configuration utility.

4. **Select the WEP encryption strength you will use.**

The choices are:

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

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

5. 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.

6. The Default Key setting must match what is set in the access point and the other 802.11 wireless devices.

7. Click Apply for the changes to take effect.

Statistics Page

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

- **Transmit/Receive Performance (%):** A real time graph identifying the total, receive, and transmit utilization as a percentage the total possible.
- **Total/Receive/Transmit Graph:** Identifies the trend of transmit/receive data communications over time.
- **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 received errors.

Advanced Settings Page

The Advanced settings should not require adjustment. Except for the power saving setting, changing any of the settings incorrectly on this page could cause your wireless connection to fail.

- **Preamble:** A long transmit preamble may provide a more reliable connection or slightly longer range. A short transmit preamble might give slightly better performance.
- **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:** Select the wireless protocols you will use. Depending on your wireless adapter, you can choose some or all of the available 802.11 wireless protocols. Note that if the wireless network you are communicating with uses the 108 Mbps 802.11g mode, you must include that in your selection (for example, if you are using the WG111 with the NETGEAR WGT624 108 Mbps Wireless Firewall Router).
- **Fragmentation Threshold:** This is the maximum packet size used for fragmentation. Packets larger than the size programmed in this field will be fragmented. The Fragmentation Threshold value must be larger than the RTS/CTS Threshold value.
- **RTS/CTS Threshold:** The packet size that is used to determine whether to 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.

Appendix A
Technical Specifications

This appendix provides technical specifications for the NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111.

Antennae	1 Integrated internal antenna
Standards	802.11g, 802.11b
Radio Data Rate	1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps (Auto Rate Sensing)
Frequency	2.4GHz to 2.5GHz CCK and OFDM Modulation)
Power	3.3V Bus powered
Emissions	FCC, CE
Bus interface	USB
Provided drivers	Microsoft Windows XP, 2000, Me, 98
Operating Environment	Operating temperature: 0 to 55 degree C
Encryption	40-bit (also called 64-bit) and 128-bit WEP data encryption
Warranty	Limited 1-year warranty

Appendix B
Wireless Networking Basics

This chapter provides an overview of Wireless networking.

Wireless Networking Overview

The WG111 Wireless USB 2.0 Adapter conforms to the Institute of Electrical and Electronics Engineers (IEEE) 802.11b standard for wireless LANs (WLANs) and a product update will bring the WG111 into conformance to the 802.11g standard when it is ratified. On an 802.11b or g wireless link, data is encoded using direct-sequence spread-spectrum (DSSS) technology and is transmitted in the unlicensed radio spectrum at 2.5GHz. The maximum data rate for the wireless link is 11 Mbps, but it will automatically back down from 11 Mbps to 5.5, 2, and 1 Mbps when the radio signal is weak or when interference is detected. The 802.11g auto rate sensing rates are 1, 2, 5.5, 6, 9, 12, 18, 24, 36, 48, and 54 Mbps.

The 802.11 standard is also called Wireless Ethernet or Wi-Fi by the Wireless Ethernet Compatibility Alliance (WECA, see *http://www.wi-fi.net*), an industry standard group promoting interoperability among 802.11 devices. The 802.11 standard offers two methods for configuring a wireless network - ad hoc and infrastructure.

Infrastructure Mode

With a wireless Access Point, you can operate the wireless LAN in the infrastructure mode. This mode provides wireless connectivity to multiple wireless network devices within a fixed range or area of coverage, interacting with wireless nodes via an antenna.

In the infrastructure mode, the wireless access point converts airwave data into wired Ethernet data, acting as a bridge between the wired LAN and wireless clients. Connecting multiple Access Points via a wired Ethernet backbone can further extend the wireless network coverage. As a mobile computing device moves out of the range of one access point, it moves into the range of another. As a result, wireless clients can freely roam from one Access Point domain to another and still maintain seamless network connection.

Ad Hoc Mode (Peer-to-Peer Workgroup)

In an ad hoc network, computers are brought together as needed; thus, there is no structure or fixed points to the network - each node can generally communicate with any other node. There is no Access Point involved in this configuration. This mode enables you to quickly set up a small wireless workgroup and allows workgroup members to exchange data or share printers as supported by Microsoft networking in the various Windows operating systems. Some vendors also refer to ad hoc networking as peer-to-peer group networking.

In this configuration, network packets are directly sent and received by the intended transmitting and receiving stations. As long as the stations are within range of one another, this is the easiest and least expensive way to set up a wireless network.

Network Name: Extended Service Set Identification (ESSID)

The Extended Service Set Identification (ESSID) is one of two types of Service Set Identification (SSID). In an ad hoc wireless network with no access points, the Basic Service Set Identification (BSSID) is used. In an infrastructure wireless network that includes an access point, the ESSID is used, but may still be referred to as SSID.

An SSID is a thirty-two character (maximum) alphanumeric key identifying the name of the wireless local area network. Some vendors refer to the SSID as network name. For the wireless devices in a network to communicate with each other, all devices must be configured with the same SSID.

Authentication and WEP

The absence of a physical connection between nodes makes the wireless links vulnerable to eavesdropping and information theft. To provide a certain level of security, the IEEE 802.11 standard has defined two types of authentication methods, Open System and Shared Key. With Open System authentication, a wireless PC can join any network and receive any messages that are not encrypted. With Shared Key authentication, only those PCs that possess the correct authentication key can join the network. By default, IEEE 802.11 wireless devices operate in an Open System network.

Wired Equivalent Privacy (WEP) data encryption is used when the wireless devices are configured to operate in Shared Key authentication mode. There are two shared key methods implemented in most commercially available products, 64-bit and 128-bit WEP data encryption.

802.11 Authentication

The 802.11 standard defines several services that govern how two 802.11 devices communicate. The following events must occur before an 802.11 Station can communicate with an Ethernet network through an access point such as the one built in to the WG111:

1. Turn on the wireless station.
2. The station listens for messages from any access points that are in range.
3. The station finds a message from an access point that has a matching SSID.
4. The station sends an authentication request to the access point.
5. The access point authenticates the station.
6. The station sends an association request to the access point.
7. The access point associates with the station.
8. The station can now communicate with the Ethernet network through the access point.

An access point must authenticate a station before the station can associate with the access point or communicate with the network. The IEEE 802.11 standard defines two types of authentication: Open System and Shared Key.

- Open System Authentication allows any device to join the network, assuming that the device SSID matches the access point SSID. Alternatively, the device can use the “Any” SSID option (case sensitive) to associate with any available Access Point within range, regardless of its SSID.
- Shared Key Authentication requires that the station and the access point have the same WEP Key to authenticate. These two authentication procedures are described below.

Open System Authentication

The following steps occur when two devices use Open System Authentication:

1. The station sends an authentication request to the access point.
2. The access point authenticates the station.
3. The station associates with the access point and joins the network.

This process is illustrated in below.

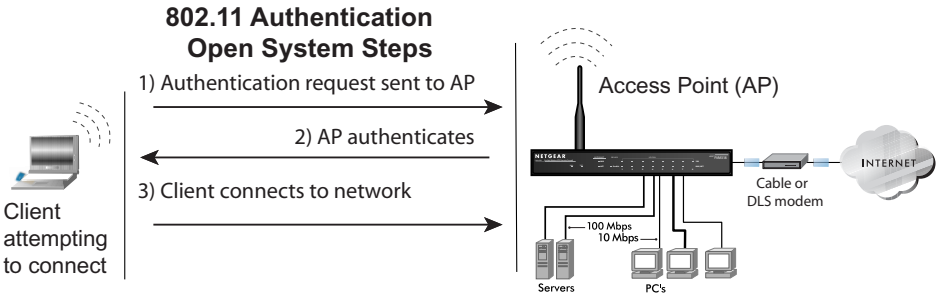


Figure 4-3: 802.11 open system authentication

Shared Key Authentication

The following steps occur when two devices use Shared Key Authentication:

1. The station sends an authentication request to the access point.
2. The access point sends challenge text to the station.
3. The station uses its configured 64-bit or 128-bit default key to encrypt the challenge text, and sends the encrypted text to the access point.
4. The access point decrypts the encrypted text using its configured WEP Key that corresponds to the station's default key. The access point compares the decrypted text with the original challenge text. If the decrypted text matches the original challenge text, then the access point and the station share the same WEP Key and the access point authenticates the station.
5. The station connects to the network.

If the decrypted text does not match the original challenge text (i.e., the access point and station do not share the same WEP Key), then the access point will refuse to authenticate the station and the station will be unable to communicate with either the 802.11 network or Ethernet network.

This process is illustrated in below.

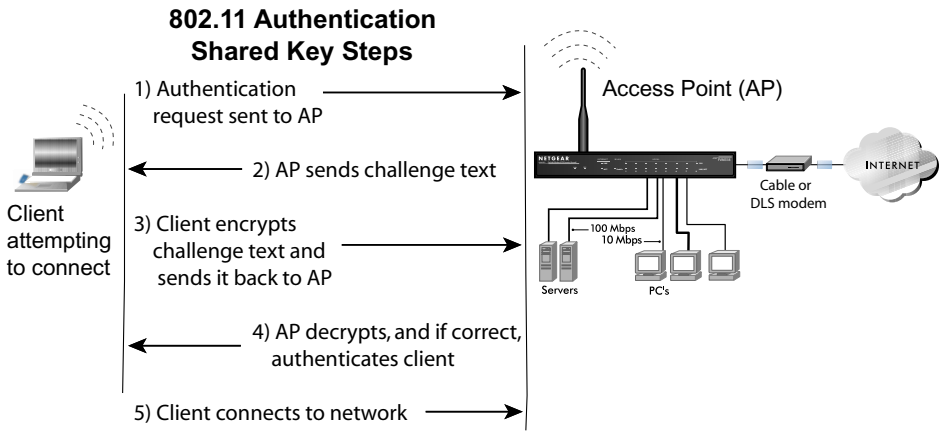


Figure 4-4: 802.11 shared key authentication

Overview of WEP Parameters

Before enabling WEP on an 802.11 network, you must first consider what type of encryption you require and the key size you want to use. Typically, there are three WEP Encryption options available for 802.11 products:

1. **Do Not Use WEP:** The 802.11 network does not encrypt data. For authentication purposes, the network uses Open System Authentication.

2. **Use WEP for Encryption:** A transmitting 802.11 device encrypts the data portion of every packet it sends using a configured WEP Key. The receiving 802.11b device decrypts the data using the same WEP Key. For authentication purposes, the 802.11b network uses Open System Authentication.

3. **Use WEP for Authentication and Encryption:** A transmitting 802.11 device encrypts the data portion of every packet it sends using a configured WEP Key. The receiving 802.11 device decrypts the data using the same WEP Key. For authentication purposes, the 802.11 network uses Shared Key Authentication.

Note: Some 802.11 access points also support **Use WEP for Authentication Only** (Shared Key Authentication without data encryption).

Key Size

The IEEE 802.11 standard supports two types of WEP encryption: 40-bit and 128-bit.

The 64-bit WEP data encryption method, allows for a five-character (40-bit) input. Additionally, 24 factory-set bits are added to the forty-bit input to generate a 64-bit encryption key. (The 24 factory-set bits are not user-configurable). This encryption key will be used to encrypt/decrypt all data transmitted via the wireless interface. Some vendors refer to the 64-bit WEP data encryption as 40-bit WEP data encryption since the user-configurable portion of the encryption key is 40 bits wide.

The 128-bit WEP data encryption method consists of 104 user-configurable bits. Similar to the forty-bit WEP data encryption method, the remaining 24 bits are factory set and not user configurable. Some vendors allow passphrases to be entered instead of the cryptic hexadecimal characters to ease encryption key entry.

128-bit encryption is stronger than 40-bit encryption, but 128-bit encryption may not be available outside of the United States due to U.S. export regulations.

When configured for 40-bit encryption, 802.11 products typically support up to four WEP Keys. Each 40-bit WEP Key is expressed as 5 sets of two hexadecimal digits (0-9 and A-F). For example, “12 34 56 78 90” is a 40-bit WEP Key.

When configured for 128-bit encryption, 802.11b products typically support four WEP Keys but some manufacturers support only one 128-bit key. The 128-bit WEP Key is expressed as 13 sets of two hexadecimal digits (0-9 and A-F). For example, “12 34 56 78 90 AB CD EF 12 34 56 78 90” is a 128-bit WEP Key.

Note: Typically, 802.11 access points can store up to four 128-bit WEP Keys but some 802.11 client adapters can only store one. Therefore, make sure that your 802.11 access and client adapters configurations match.

WEP Configuration Options

The WEP settings must match on all 802.11 devices that are within the same wireless network as identified by the SSID. In general, if your mobile clients will roam between access points, then all of the 802.11 access points and all of the 802.11 client adapters on the network must have the same WEP settings.

Note: Whatever keys you enter for an AP, you must also enter the same keys for the client adapter in the same order. In other words, WEP key 1 on the AP must match WEP key 1 on the client adapter, WEP key 2 on the AP must match WEP key 2 on the client adapter, etc.

Note: The AP and the client adapters can have different default WEP Keys as long as the keys are in the same order. In other words, the AP can use WEP key 2 as its default key to transmit while a client adapter can use WEP key 3 as its default key to transmit. The two devices will communicate as long as the AP's WEP key 2 is the same as the client's WEP key 2 and the AP's WEP key 3 is the same as the client's WEP key 3.

Wireless Channels

IEEE 802.11b and g wireless nodes communicate with each other using radio frequency signals in the ISM (Industrial, Scientific, and Medical) band between 2.4 GHz and 2.5 GHz. Neighboring channels are 5 MHz apart. However, due to spread spectrum effect of the signals, a node sending signals using a particular channel will utilize frequency spectrum 12.5 MHz above and below the center channel frequency. As a result, two separate wireless networks using neighboring channels (for example, channel 1 and channel 2) in the same general vicinity will interfere with each other. Applying two channels that allow the maximum channel separation will decrease the amount of channel cross-talk, and provide a noticeable performance increase over networks with minimal channel separation.

The radio frequency channels used are listed in Table 4-1:

Table 4-1. 802.11b and g Radio Frequency Channels

Channel	Center Frequency	Frequency Spread
1	2412 MHz	2399.5 MHz - 2424.5 MHz
2	2417 MHz	2404.5 MHz - 2429.5 MHz
3	2422 MHz	2409.5 MHz - 2434.5 MHz
4	2427 MHz	2414.5 MHz - 2439.5 MHz
5	2432 MHz	2419.5 MHz - 2444.5 MHz
6	2437 MHz	2424.5 MHz - 2449.5 MHz
7	2442 MHz	2429.5 MHz - 2454.5 MHz
8	2447 MHz	2434.5 MHz - 2459.5 MHz
9	2452 MHz	2439.5 MHz - 2464.5 MHz
10	2457 MHz	2444.5 MHz - 2469.5 MHz
11	2462 MHz	2449.5 MHz - 2474.5 MHz
12	2467 MHz	2454.5 MHz - 2479.5 MHz
13	2472 MHz	2459.5 MHz - 2484.5 MHz

Note: The available channels supported by the wireless products in various countries are different.

The preferred channel separation between the channels in neighboring wireless networks is 25 MHz (5 channels). This means that you can apply up to three different channels within your wireless network. There are only 11 usable wireless channels in the United States. It is recommended that you start using channel 1 and grow to use channel 6, and 11 when necessary, as these three channels do not overlap.

Appendix C
Preparing Your PCs for Network Access

This appendix describes how to prepare your PCs to connect to the Internet through the NETGEAR 54 Mbps Wireless USB 2.0 Adapter WG111.

For adding file and print sharing to your network, please consult the Windows help information included with the version of Windows installed on each computer on your network.

Preparing Your Computers for TCP/IP Networking

Computers access the Internet using a protocol called TCP/IP (Transmission Control Protocol/ Internet Protocol). Each computer on your network must have TCP/IP installed and selected as its networking protocol. If a Network Interface Card (NIC) is already installed in your PC, then TCP/ IP is probably already installed as well.

Most operating systems include the software components you need for networking with TCP/IP. Windows 95 or later includes the software components for establishing a TCP/IP network.

In your TCP/IP network, each PC and the wireless access point must be assigned a unique IP addresses. Each PC must also have certain other TCP/IP configuration information such as a subnet mask (netmask), a domain name server (DNS) address, and a default gateway address. In most cases, you should install TCP/IP so that the PC obtains its specific network configuration information automatically from a DHCP server during startup.

Configuring Windows 98 and Me for TCP/IP Networking

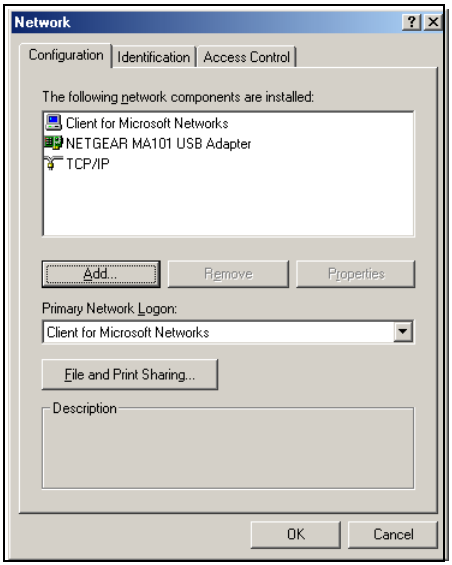
As part of the PC preparation process, you may need to install and configure TCP/IP on your PC. Before starting, locate your Windows CD; you may need to insert it during the TCP/IP installation process.

Install or Verify Windows Networking Components

To install or verify the necessary components for IP networking:

1. On the Windows taskbar, click the Start button, point to Settings, and then click Control Panel.
2. Double-click the Network icon.

   The Network window opens, which displays a list of installed components:



   You must have an Ethernet adapter or an WG111, the TCP/IP protocol, and the Client for Microsoft Networks.

	Note: It is not necessary to remove any other network components shown in the Network window in order to install the adapter, TCP/IP, or Client for Microsoft Networks.

   If you need to add TCP/IP:

   a. Click the Add button.
   b. Select Protocol, and then click Add.
   c. Select Microsoft.
   d. Select TCP/IP, and then click OK.

   If you need to add the Client for Microsoft Networks:

   a. Click the Add button.
   b. Select Client, and then click Add.
   c. Select Microsoft.
   d. Select Client for Microsoft Networks, and then click OK.

   If you need to add File and Print Sharing for Microsoft Networks:

a. Click the Add button.
b. Select Client, and then click Add.
c. Select Microsoft.
d. Select File and Print Sharing for Microsoft Networks, and then click OK.

3. Restart your PC for the changes to take effect.

Enabling DHCP in Windows 98 and Me

After the TCP/IP protocol components are installed, each PC must be assigned specific information about itself and resources that are available on its network. The simplest way to configure this information is to allow the PC to obtain the information from a DHCP server in the network.

You will find there are many similarities in the procedures for different Windows systems when using DHCP to configure TCP/IP.

The following steps will walk you through the configuration process for each of these versions of Windows.

1 Locate your **Network Neighborhood** icon.

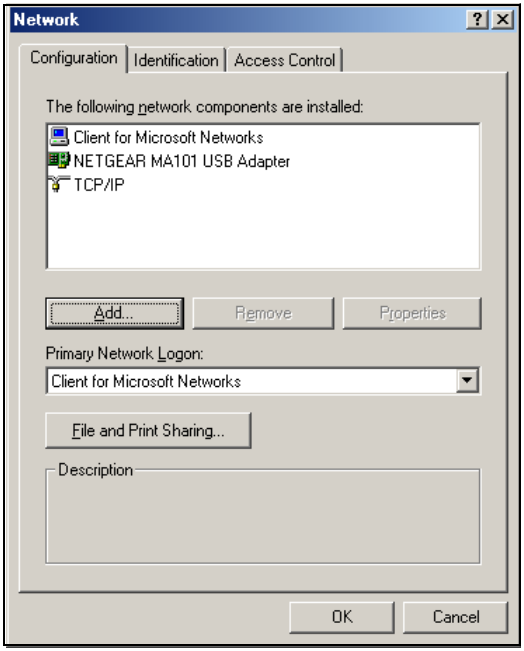
- If the Network Neighborhood icon is on the Windows desktop, position your mouse pointer over it and right-click your mouse button.
- If the icon is not on the desktop,
  - Click **Start** on the task bar located at the bottom left of the window.
  - Choose **Settings**, and then **Control Panel**.
  - Locate the **Network Neighborhood** icon and click on it. This will open the Network panel as shown below.

2

Verify the following settings as shown:

- Client for Microsoft Network exists
- Ethernet adapter is present
- TCP/IP is present
- **Primary Network Logon** is set to Windows logon

Click on the **Properties** button. The following TCP/IP Properties window will display.



3

By default, the **IP Address** tab is open on this window.

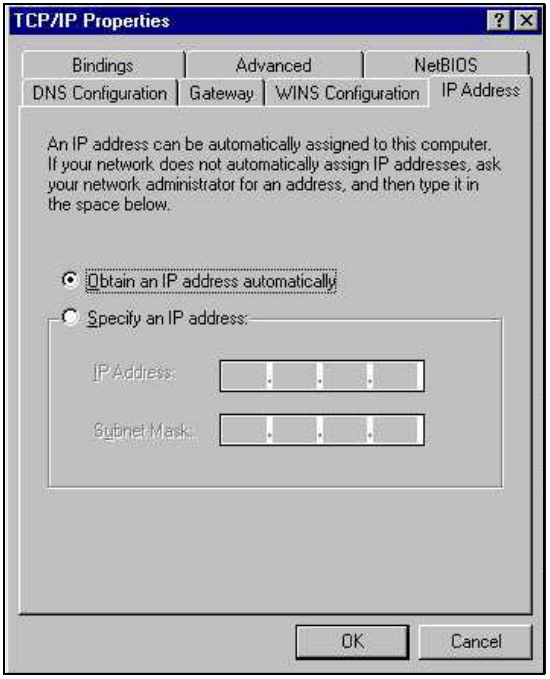
- Verify the following:

  Obtain an IP address automatically is selected. If not selected, click in the radio button to the left of it to select it. This setting is required to enable the DHCP server to automatically assign an IP address.

- Click **OK** to continue.

Restart the PC.

Repeat these steps for each PC with this version of Windows on your network.



Selecting Windows' Internet Access Method

1. On the Windows taskbar, click the Start button, point to Settings, and then click Control Panel.
2. Double-click the Internet Options icon.
3. Select "I want to set up my Internet connection manually" or "I want to connect through a Local Area Network" and click Next.
4. Select "I want to connect through a Local Area Network" and click Next.
5. Uncheck all boxes in the LAN Internet Configuration screen and click Next.
6. Proceed to the end of the Wizard.

Verifying TCP/IP Properties

After your PC is configured and has rebooted, you can check the TCP/IP configuration using the utility *winipcfg.exe*:

1. On the Windows taskbar, click the Start button, and then click Run.

2. Type **`winipcfg`**, and then click OK.

   The IP Configuration window opens, which lists (among other things), your IP address, subnet mask, and default gateway.

3. From the drop-down box, select your Ethernet adapter.

   The window is updated to show your settings, which should match the values below if you are using the default TCP/IP settings that NETGEAR recommends for connecting through a router or gateway:

   - The IP address is between 192.168.0.2 and 192.168.0.254
   - The subnet mask is 255.255.255.0
   - The default gateway is 192.168.0.1

Configuring Windows 2000 or XP for TCP/IP Networking

As part of the PC preparation process, you may need to install and configure TCP/IP on each networked PC. Before starting, locate your Windows CD; you may need to insert it during the TCP/IP installation process.

Install or Verify Windows Networking Components

To install or verify the necessary components for IP networking:

1. On the Windows taskbar, click the Start button, point to Settings, and then click Control Panel.
2. Double-click the Network and Dialup Connections icon.
3. If an Ethernet adapter is present in your PC, you should see an entry for Local Area Connection. Double-click that entry.
4. Select Properties.
5. Verify that ‘Client for Microsoft Networks’ and ‘Internet Protocol (TCP/IP)’ are present. If not, select Install and add them.
6. Select ‘Internet Protocol (TCP/IP)’, click Properties, and verify that “Obtain an IP address automatically is selected.
7. Click OK and close all Network and Dialup Connections windows.
8. Then, restart your PC.

DHCP Configuration of TCP/IP in Windows XP or 2000

You will find there are many similarities in the procedures for different Windows systems when using DHCP to configure TCP/IP.

The following steps will walk you through the configuration process for each of these versions of Windows.

DHCP Configuration of TCP/IP in Windows XP

1

Locate your **Network Neighborhood** icon.

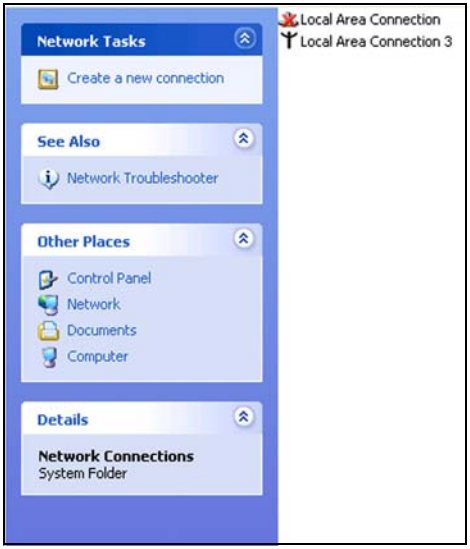
- Select **Control Panel** from the Windows XP Start Menu.
- Select the **Network Connections** icon on the Control Panel. This will take you to the next step.

2

Now the Network Connection window displays.

The Connections List that shows all the network connections set up on the PC, located to the right of the window.

- Right-click on the **Connection with the wireless icon** and choose **Status**.



3

Now you should be at the Local Area Network Connection Status window. This box displays the connection status, duration, speed, and activity statistics.

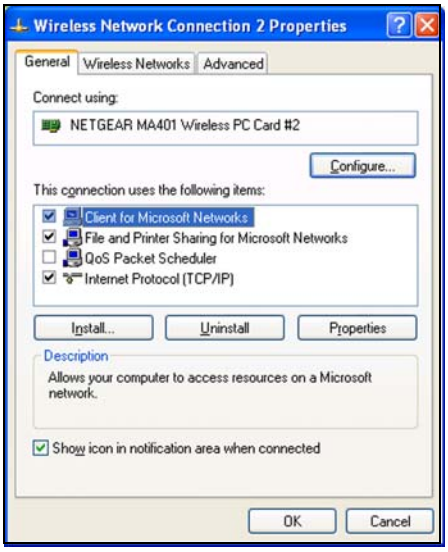
Administrator logon access rights are needed to use this window.

- Click the **Properties button** to view details about the connection.

4

The TCP/IP details are presented on the Support tab page.

- Select **Internet Protocol,** and click **Properties** to view the configuration information**.**



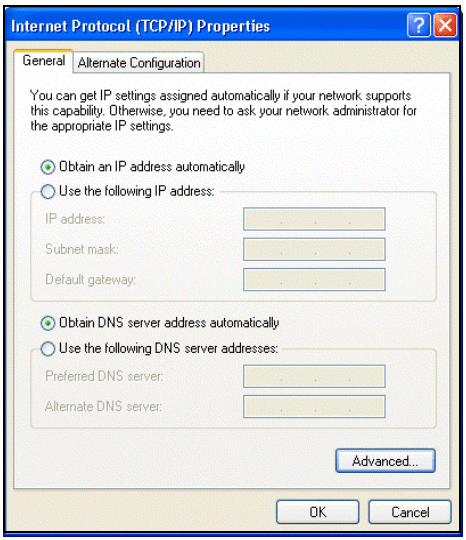
5

Verify that **Obtain an IP address automatically** radio button is selected and that the **Obtain DNS server address automatically** radio button is selected.

• Click the **OK** button.

This completes the DHCP configuration in Windows XP.

Repeat these steps for each PC with this version of Windows on your network.



DHCP Configuration of TCP/IP in Windows 2000

After you install a network card, TCP/IP for Windows 2000 is configured and set to DHCP without your having to configure it. However, if there are problems, following the steps below to configure TCP/IP with DHCP for Windows 2000.

1

Click on the **My Network Places** icon on the Windows desktop. This will bring up a window called Network and Dial-up Connections.

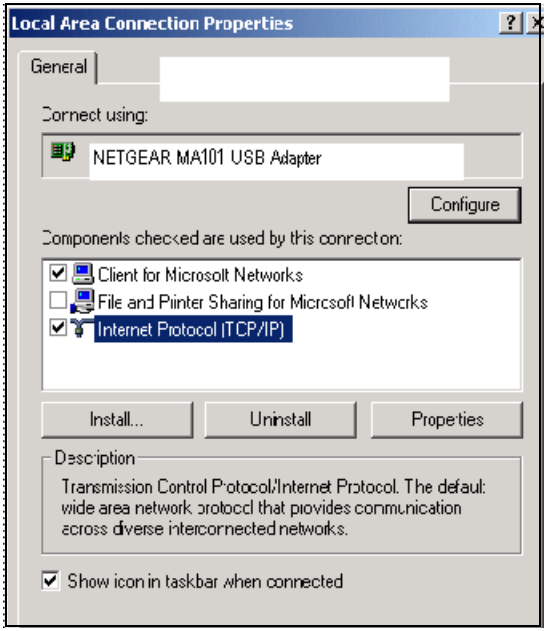
• Right click on **Local Area Connection** and select **Properties**.

2

The **Local Area Connection Properties** dialog box appears. Verify that you have the correct Ethernet card selected in the **Connect using:** box and that the following two items are displayed and selected in the box of "Components checked are used by this connection:"

- Client for Microsoft Networks and
- Internet Protocol (TCP/IP)

Click **OK**.



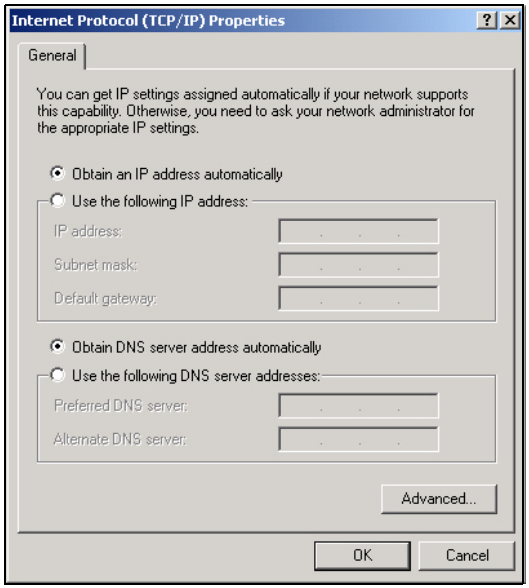
3

With Internet Protocol (TCP/IP) selected, click on **Properties** to open the Internet Protocol (TCP/IP) Properties dialogue box. Verify that

- **Obtain an IP address automatically** is selected.
- **Obtain DNS server address automatically** is selected.

Click **OK** to return to Local Area Connection Properties. Click **OK** again to complete the configuration process.

Restart the PC. Repeat these steps for each PC with this version of Windows on your network.



Verifying TCP/IP Properties for Windows XP or 2000

To check your PC's TCP/IP configuration:

1. On the Windows taskbar, click the Start button, and then click Run.

   The Run window opens.

2. Type **`cmd`** and then click OK.

   A command window opens

3. Type **`ipconfig /all`**

   Your IP Configuration information will be listed, and should match the values below if you are using the default TCP/IP settings that NETGEAR recommends for connecting through a router or gateway:

   - The IP address is between 192.168.0.2 and 192.168.0.254
   - The subnet mask is 255.255.255.0
   - The default gateway is 192.168.0.1

4. Type **`exit`**

Glossary

Use the list below to find definitions for technical terms used in this manual.

10BASE-T
IEEE 802.3 specification for 10 Mbps Ethernet over twisted pair wiring.

100BASE-Tx
IEEE 802.3 specification for 100 Mbps Ethernet over twisted pair wiring.

802.11b
IEEE specification for wireless networking at 11 Mbps using direct-sequence spread-spectrum (DSSS) technology and operating in the unlicensed radio spectrum at 2.5GHz.

802.11g
An IEEE specification for wireless networking at 54 Mbps using direct-sequence spread-spectrum (DSSS) technology and operating in the unlicensed radio spectrum at 2.5GHz. 802.11g is backwards compatible with 802.11b.

ADSL
Short for asymmetric digital subscriber line, a technology that allows data to be sent over existing copper telephone lines at data rates of from 1.5 to 9 Mbps when receiving data (known as the downstream rate) and from 16 to 640 Kbps when sending data (known as the upstream rate).
ADSL requires a special ADSL modem. ADSL is growing in popularity as more areas around the world gain access.

DHCP
An Ethernet protocol specifying how a centralized DHCP server can assign network configuration information to multiple DHCP clients. The assigned information includes IP addresses, DNS addresses, and gateway (router) addresses.

DNS
Short for Domain Name System (or Service), an Internet service that translates domain names into IP addresses.
Because domain names are alphabetic, they're easier to remember. The Internet however, is really based on IP addresses. Every time you use a domain name, therefore, a DNS service must translate the name into the corresponding IP address. For example, the domain name www.example.com might translate to 198.105.232.4. The DNS system is, in fact, its own network. If one DNS server doesn't know how to translate a particular domain name, it asks another one, and so on, until the correct IP address is returned.

Domain Name

A descriptive name for an address or group of addresses on the Internet. Domain names are of the form of a registered entity name plus one of a number of predefined top level suffixes such as .com, .edu, .uk, etc. For example, in the address mail.NETGEAR.com, mail is a server name and NETGEAR.com is the domain.

DSL

Short for digital subscriber line, but is commonly used in reference to the asymmetric version of this technology (ADSL) that allows data to be sent over existing copper telephone lines at data rates of from 1.5 to 9 Mbps when receiving data (known as the downstream rate) and from 16 to 640 Kbps when sending data (known as the upstream rate).

ADSL requires a special ADSL modem. ADSL is growing in popularity as more areas around the world gain access.

Dynamic Host Configuration Protocol

DHCP. An Ethernet protocol specifying how a centralized DHCP server can assign network configuration information to multiple DHCP clients. The assigned information includes IP addresses, DNS addresses, and gateway (router) addresses.

ESSID

The Extended Service Set Identification (ESSID) is a thirty-two character (maximum) alphanumeric key identifying the wireless local area network.

Gateway

A local device, usually a router, that connects hosts on a local network to other networks.

IETF

Internet Engineering Task Force. Working groups of the IETF propose standard protocols and procedures for the Internet, which are published as RFCs (Request for Comment) at *www.ietf.org*.

An open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet.

IP

Internet Protocol is the main internetworking protocol used in the Internet. Used in conjunction with the Transfer Control Protocol (TCP) to form TCP/IP.

IP Address

A four-byte number uniquely defining each host on the Internet, usually written in dotted-decimal notation with periods separating the bytes (for example, 134.177.244.57).

Ranges of addresses are assigned by Internic, an organization formed for this purpose.

IPX

Short for Internetwork Packet Exchange, a networking protocol used by the Novell NetWare operating systems.

Like UDP/IP, IPX is a datagram protocol used for connectionless communications. Higher-level protocols, such as SPX and NCP, are used for additional error recovery services.

ISP
Internet service provider.

Internet Protocol
The main internetworking protocol used in the Internet. Used in conjunction with the Transfer Control Protocol (TCP) to form TCP/IP.

LAN
A communications network serving users within a limited area, such as one floor of a building.

local area network
LAN. A communications network serving users within a limited area, such as one floor of a building.
A LAN typically connects multiple personal computers and shared network devices such as storage and printers. Although many technologies exist to implement a LAN, Ethernet is the most common for connecting personal computers.

MAC address
The Media Access Control address is a unique 48-bit hardware address assigned to every network interface card. Usually written in the form 01:23:45:67:89:ab.

Mbps
Megabits per second.

NetBIOS
The Network Basic Input Output System is an application programming interface (API) for sharing services and information on local-area networks (LANs).
Provides for communication between stations of a network where each station is given a name. These names are alphanumeric names, up to 16 characters in length.

Network Address Translation
NAT. A technique by which several hosts share a single IP address for access to the Internet.

NIC
Network Interface Card. An adapter in a computer which provides connectivity to a network.

packet
A block of information sent over a network. A packet typically contains a source and destination network address, some protocol and length information, a block of data, and a checksum.

router
A device that forwards data between networks. An IP router forwards data based on IP source and destination addresses.

Routing Information Protocol
RIP. A protocol in which routers periodically exchange information with one another so that they can determine minimum distance paths between sources and destinations.

router
A device that forwards data between networks. An IP router forwards data based on IP source and destination addresses.

SSID
A Service Set Identification is a thirty-two character (maximum) alphanumeric key identifying a wireless local area network. For the wireless devices in a network to communicate with each other, all devices must be configured with the same SSID.
This is typically the configuration parameter for a wireless adapter. It corresponds to the ESSID in the wireless Access Point and to the wireless network name. *See also* Wireless Network Name and ESSID.

Subnet Mask
A mask used to determine what subnet an IP address belongs to. Subnetting enables a network administrator to further divide an IP address into two or more subnets.

TCP/IP
The main internetworking protocols used in the Internet. The Internet Protocol (IP) used in conjunction with the Transfer Control Protocol (TCP) form TCP/IP.

WAN
A long distance link used to extend or connect remotely located local area networks. The Internet is a large WAN.

WEB Proxy Server
A Web proxy server is a specialized HTTP server that allows clients access to the Internet from behind a firewall.
The proxy server listens for requests from clients within the firewall and forwards these requests to remote Internet servers outside the firewall. The proxy server reads responses from the external servers and then sends them to internal client clients.

WEP
Wired Equivalent Privacy is a data encryption protocol for 802.11b wireless networks.
All wireless nodes and access points on the network are configured with a 64-bit or 128-bit Shared Key for data encryption.

wide area network

WAN. A long distance link used to extend or connect remotely located local area networks. The Internet is a large WAN.

Wi-Fi

A trade name for the 802.11b wireless networking standard, given by the Wireless Ethernet Compatibility Alliance (WECA, see http://www.wi-fi.net), an industry standards group promoting interoperability among 802.11b devices.

Windows Internet Naming Service

WINS. Windows Internet Naming Service is a server process for resolving Windows-based computer names to IP addresses.

If a remote network contains a WINS server, your Windows PCs can gather information from that WINS server about its local hosts. This allows your PCs to browse that remote network using the Windows Network Neighborhood feature.

WINS

WINS. Windows Internet Naming Service is a server process for resolving Windows-based computer names to IP addresses.

Wireless Network Name (SSID)

Wireless Network Name (SSID) is the name assigned to a wireless network. This is the same as the SSID or ESSID configuration parameter.

Index

Numerics

802.11b 1

A

ad-hoc mode 2

B

BSSID 2

E

ESSID 2

F

features 1

I

infrastructure mode 2

IP networking
  for Windows 1, 6

L

LEDs
  description 13

O

Open System authentication 2

S

Shared Key authentication 2

SSID 3, 2

T

TCP/IP properties
  verifying for Windows 5

W

WEP 3, 6, 2

Wi-Fi 1

Windows, configuring for IP routing 1, 6

winipcfg utility 5

Wired Equivalent Privacy. *See* WEP

Wireless Ethernet 1

wireless network name 3