WG103 ProSafe 802.11g Wireless Access Point Reference Manual

NETGEAR

NETGEAR, Inc.
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NOTE: Modifications made to the product, unless expressly approved by Netgear, could void the user’s authority to operate the equipment. NETGEAR does not assume any liability that may occur due to such condition.

NOTE: The availability of some specific channels and/or operational frequency bands are country-dependent and have been programmed in the firmware at the factory to match the intended destination. The firmware setting is not accessible by the end user.

FCC Statement

Declaration of Conformity

We, Netgear,

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declare under our sole responsibility that the product(s)
WG103 *(Model Designation)*
802.11g ProSafe Wireless Access Point *(Product Name)*
complies with Part 15 of FCC Rules.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

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

FCC CAUTION: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate this equipment.

Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Placement and Range Guidelines

Indoors, computers can connect over 802.11 wireless networks at a maximum range of several hundred feet for 802.11b/g devices. However, the operating distance or range of your wireless connection can vary significantly, based on the physical placement of the wireless access point.

For best results, identify a location for your wireless access point according to these guidelines:

- Away from potential sources of interference, such as PCs, large metal surfaces, microwaves, and 2.4 GHz cordless phones.
- In an elevated location such as a high shelf that is near the center of the wireless coverage area for all mobile devices.

Failure to follow these guidelines can result in significant performance degradation or inability to wirelessly connect to the wireless access point.

RF Exposure Warning for North America, and Australia

Warning! To meet FCC and other national safety guidelines for RF exposure, the antennas for this device (see below) must be installed to ensure a minimum separation distance of 20cm (7.9 in.) from persons. Further, the antennas shall not be colocated with other antennas or radio transmitters. See *www.netgear.com* for an updated list of wireless accessories approved to be used with the WG103 in North America and Australia.

Industry Canada Compliance Statement

This Class B Digital apparatus meets all the requirements of the Canadian Interference Causing Equipment Regulations ICES 003.

Cet appareil numerique de classe B respecte les exigences du reglement du Canada sur le materiel brouilleur NMB-003.

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

This device has been designed to operate with an antenna having a maximum gain of 5 dB. An antenna that has a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 ohms.

Radiation Exposure Statement: This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20cm (7.9 in.) between the radiator and a person.

Europe – Declaration of Conformity in Languages of the European Community

Cesky [Czech]	*NETGEAR* Inc. tímto prohlašuje, že tento WG103 ProSafe 802.11g Wireless Access Point je ve shode se základními požadavky a dalšími príslušnými ustanoveními smernice 1999/5/ES.
Dansk [Danish]	Undertegnede *NETGEAR Inc.* erklærer herved, at følgende udstyr WG103 ProSafe 802.11g Wireless Access Point overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
Deutsch [German]	Hiermit erklärt *NETGEAR Inc.*, dass sich das Gerät WG103 ProSafe 802.11g Wireless Access Point in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
Eesti [Estonian]	Käesolevaga kinnitab *NETGEAR Inc.* seadme WG103 ProSafe 802.11g Wireless Access Point vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
English	Hereby, *NETGEAR Inc.*, declares that this WG103 ProSafe 802.11g Wireless Access Point is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Español [Spanish]	Por medio de la presente *NETGEAR Inc.* declara que el WG103 ProSafe 802.11g Wireless Access Point cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ *NETGEAR Inc.* ΔΗΛΩΝΕΙ ΟΤΙ WG103 ProSafe 802.11g Wireless Access Point ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
Français [French]	Par la présente *NETGEAR Inc.* déclare que l'appareil WG103 ProSafe 802.11g Wireless Access Point est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
Italiano [Italian]	Con la presente *NETGEAR Inc.* dichiara che questo WG103 ProSafe 802.11g Wireless Access Point è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo *NETGEAR Inc.* deklarē, ka WG103 ProSafe 802.11g Wireless Access Point atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]	Šiuo *NETGEAR Inc.* deklaruoja, kad šis WG103 ProSafe 802.11g Wireless Access Point atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.

Nederlands [Dutch]	Hierbij verklaart *NETGEAR Inc.* dat het toestel WG103 ProSafe 802.11g Wireless Access Point in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
Malti [Maltese]	Hawnhekk, *NETGEAR Inc.*, jiddikjara li dan WG103 ProSafe 802.11g Wireless Access Point jikkonforma mal-htigijiet essenzjali u ma provvedimenti ohrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
Magyar [Hungarian]	Alulírott, *NETGEAR Inc.* nyilatkozom, hogy a WG103 ProSafe 802.11g Wireless Access Point megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.
Polski [Polish]	Niniejszym NETGEAR Inc. oświadcza, że WG103 ProSafe 802.11g Wireless Access Point jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
Português [Portuguese]	*NETGEAR Inc.* declara que este WG103 ProSafe 802.11g Wireless Access Point está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
Slovensko [Slovenian]	NETGEAR Inc. izjavlja, da je ta WG103 ProSafe 802.11g Wireless Access Point v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
Slovensky [Slovak]	*NETGEAR Inc.* týmto vyhlasuje, _e WG103 ProSafe 802.11g Wireless Access Point spÍňa základné po_iadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
Suomi [Finnish]	*NETGEAR Inc.* vakuuttaa täten että WG103 ProSafe 802.11g Wireless Access Point tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Svenska [Swedish]	Härmed intygar *NETGEAR Inc.* att denna WG103 ProSafe 802.11g Wireless Access Point står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.
Íslenska [Icelandic]	Hér með lýsir *NETGEAR Inc.* yfir því að WG103 ProSafe 802.11g Wireless Access Point er í samræmi við grunnkröfur og aðrar kröfur, sem gerðar eru í tilskipun 1999/5/EC.
Norsk [Norwegian]	*NETGEAR Inc.* erklærer herved at utstyret WG103 ProSafe 802.11g Wireless Access Point er i samsvar med de grunnleggende krav og øvrige relevante krav i direktiv 1999/5/EF.

Bestätigung des Herstellers/Importeurs

Es wird hiermit bestätigt, daß das WG103 ProSafe 802.11g Wireless Access Point gemäß der im BMPT-AmtsblVfg 243/1991 und Vfg 46/1992 aufgeführten Bestimmungen entstört ist. Das vorschriftsmäßige Betreiben einiger Geräte (z.B. Testsender) kann jedoch gewissen Beschränkungen unterliegen. Lesen Sie dazu bitte die Anmerkungen in der Betriebsanleitung.

Das Bundesamt für Zulassungen in der Telekommunikation wurde davon unterrichtet, daß dieses Gerät auf den Markt gebracht wurde und es ist berechtigt, die Serie auf die Erfüllung der Vorschriften hin zu überprüfen.

Certificate of the Manufacturer/Importer

It is hereby certified that the WG103 ProSafe 802.11g Wireless Access Point 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.

Please go to *http://www.netgear.com* and use the search feature to find an updated list of wireless accessories approved to be used with the WG103 in the European Community.

Product and Publication Details

Model Number:	WG103
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About This Manual

The *NETGEAR® WG103 ProSafe® 802.11g Wireless Access Point Reference Manual* describes how to install, configure and troubleshoot the WG103 ProSafe 802.11g Wireless Access Point. The information in this manual is intended for readers with intermediate computer and Internet skills.

How to Use This Book

This document describes configuration menu commands for the WG103 Access Point software. The commands can all be accessed from the Web interface.

- Chapter 1, "Introduction," describes the features and hardware of your WG103 Access Point.
- Chapter 2, "Basic Installation and Configuration," describes how to install and configure your WG103 Access Point for wireless connectivity.
- Chapter 3, "Wireless Security," describes how to wireless security for your WG103 Access Point and wireless network.
- Chapter 4, "Managing Your Network," describes how to perform network management tasks.
- Chapter 5, "Advanced Configuration," describes how to configure advanced features such as advanced wireless settings and advanced QoS settings.
- Chapter 6, "Troubleshooting," describes how to troubleshoot your WG103 Access Point.
- Appendix A, "Technical Specifications," provides WG103 Access Point specifications and factory default settings.
- Appendix B, "Related Documents," provides links to reference documents.
- Appendix C, "Command Line Reference," provides the command line interface (CLI) of your WG103 Access Point.

Conventions, Formats, and Scope

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

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

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

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

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

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

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

⚡	**Danger:** This is a safety warning. Failure to take heed of this notice may result in personal injury or death.

- **Scope**. This manual is written for the WG103 Access Point according to these specifications:

Product Version	WG103 ProSafe 802.11g Wireless Access Point
Manual Publication Date	February 2009

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

How to Use This Manual

The HTML version of this manual includes the following:

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

How to Print This Manual

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

- **Printing a page from HTML**. Each page in the HTML version of the manual is dedicated to a major topic. Select File > Print from the browser menu to print the page contents.
- **Printing from PDF**. Your computer must have the free Adobe Acrobat reader installed in order to view and print PDF files. The Acrobat reader is available on the Adobe Web site at *http://www.adobe.com*.
  - **Printing a PDF chapter.** Use the **PDF of This Chapter** link at the top left corner of any page.
    - Click the **PDF of This Chapter** link at the top left corner of any page in the chapter you want to print. The PDF version of the chapter you were viewing opens in a browser window.
    - Click the print icon in the upper left of your browser window.

– **Printing a PDF version of the complete manual**. Use the **Complete PDF Manual** link at the top left corner of any page.
  - Click the **Complete PDF Manual** link at the top left corner of any page in the manual. The PDF version of the complete manual opens in a browser window.
  - Click the print icon in the upper left corner of your browser 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.

Revision History

Part Number	Version Number	Date	Description
202-10468-01	1.0	February 2009	Initial release of this Reference Manual

Chapter 1
Introduction

This chapter introduces the WG103 ProSafe 802.11g Wireless Access Point. Minimal requirements for installation are in “System Requirements” on page 1-4.

About the Wireless Access Point

The WG103 is the basic building block of a wireless LAN infrastructure. It provides connectivity between Ethernet wired networks and radio-equipped wireless notebook systems, desktop systems, print servers, and other devices.

The WG103 antenna interacts with wireless network interface cards (NIC) in wireless devices within a fixed range or area of coverage. Typically, a wireless access point inside a building works best with devices within a 100 foot radius. The WG103 can support a small group of users in a range of several hundred feet. Most wireless access points are rated between 30-50 users simultaneously.

The WG103 acts as a bridge between the wired LAN and wireless clients. Connecting multiple WG103 access points via a wired Ethernet backbone can further lengthen the wireless network coverage. As a mobile computing device moves out of the range of one wireless access point, it moves into the range of another. As a result, wireless clients can freely roam from one wireless access point to another and still maintain seamless connection to the network.

Supported Features, Standards, and Conventions

The WG103 is easy to use and provides complete wireless and networking support.

Supported Standards and Conventions

The following standards and conventions are supported:

- **Standards Compliant**. The wireless access point complies with the IEEE 802.11g for Wireless LANs.
- **WEP support**. Support for WEP is included. 64-bit, 128-bit, and 152-bit keys are supported.

- **Full WPA and WPA2 support**. WPA and WPA2 enterprise class strong security with RADIUS and certificate authentication as well as dynamic encryption key generation. WPA-PSK and WPA2-PSK pre-shared key authentication without the overhead of RADIUS servers but with all of the strong security of WPA.
- **DHCP Client Support**. DHCP provides a dynamic IP address to PCs and other devices upon request. The WG103 can act as a client and obtain information from your DHPC server.
- **Multiple BSSIDs**. Support for multiple BSSIDs. When one AP is connected to a wired network and a set of wireless stations it is referred to as a Basic Service Set (BSS). The Basic Service Set Identifier (BSSID) is a 32-character unique identifier attached to the header of packets sent over a WLAN that differentiate one WLAN from another when a mobile device tries to connect to the network.
- **SNMP Support**. Support for Simple Network Management Protocol (SNMP) Management Information Base (MIB) management.

Key Features

The WG103 provides solid functionality, including these features

- **Multiple Operating Modes**
  - **Wireless Access Point**. Operates as a standard 802.11g wireless access point.
  - **Point-to-point bridge**. In this mode, the WG103 only communicates with another bridge-mode wireless access point. You must enter the MAC address (physical address) of the other bridge-mode wireless access point in the field provided. Wireless security should be used to protect this communication.
  - **Point-to-multi-point bridge**. Select this only if this WG103 is the “master” for a group of bridge-mode wireless access points. The other bridge-mode wireless access points must be set to point-to-point bridge mode, using the WG103’s MAC address. They then send all traffic to this “master”, rather than communicate directly with each other. Wireless security should be used to protect this traffic.
  - **Wireless repeater**. In this half-duplex mode, the WG103 only communicates with another repeater-mode wireless access point. You must enter the MAC address of both adjacent repeater-mode wireless access points in the fields provided. Wireless security should be used to protect this communication.
- **Upgradeable Firmware**. Firmware is stored in a flash memory and can be upgraded easily using only your Web browser, or remotely with a CLI or through SNMP.
- **Access Control**. The Access Control MAC address filtering feature can ensure that only trusted wireless stations can use the WG103 to gain access to your LAN.

- **Security Profiles**. When using multiple BSSIDs, you can configure unique security settings (encryption, MAC filtering, etc.) for each BSSID.
- **Simple Configuration**. If the default settings are unsuitable, they are easy to change.
- **Hidden Mode**. In this mode the SSID is not broadcast, assuring only clients configured with the correct SSID can connect.
- **Configuration Backup**. Configuration settings can be backed up to a file and restored.
- **Ethernet Interface**. Connects to 10/100 Mbps IEEE 802.3 Ethernet networks.
- **Power over Ethernet**. Power can be supplied to the WG103 over the Ethernet port from any 802.3af compliant mid-span or end-span source such as the NETGEAR FSM7326P Managed Power over Ethernet Layer 3 managed switch.
- **LED Indicators**. Power, test, LAN speed, LAN activity, and wireless activity are easily identified.
- **VLAN Support**. Short for virtual LAN, a network of computers that behave as if they are connected to the same network even though they may actually be physically located on different segments of a LAN. VLANs are configured through software rather than hardware, which makes them extremely flexible. VLANs are very useful for user/host management, bandwidth allocation and resource optimization.

802.11g Standards-based Wireless Networking

The WG103 provides a bridge between Ethernet wired LANs and 802.11g compatible wireless LAN networks. The WG103 also supports the following wireless features:

- Distributed coordinated function (CSMA/CA, Back off procedure, ACK procedure, retransmission of unacknowledged frames)
- RTS/CTS handshake
- Beacon generation
- Packet fragmentation and reassembly
- Short or long preamble
- Roaming among wireless access points on the same subnet
- Super G—a proprietary chipset feature that has been developed to give wireless data rates of up to 108 Mbps. This higher throughput is achieved by having the features–bursting, compression, dynamic turbo, and fast frames–together.

Wi-Fi Multimedia (WMM) Support

WMM is a subset of the 802.11e standard. WMM allows wireless traffic to have a range of priorities, depending on the kind of data. Time-dependent information, like video or audio, has a higher priority than normal traffic. For WMM to function correctly, wireless clients must also support WMM.

System Requirements

Before installing the WG103, make sure your system meets these requirements:

- A 10/100 Mbps local area network device such as a hub or switch.
- The category 5 UTP straight-through Ethernet cable with RJ-45 connector included in the package, or one like it
- A 100-240 V, 50-60 HZ AC power source.
- A Web browser for configuration such as Microsoft Internet Explorer 6.0 or above, or Mozilla Firefox 1.5 or above.
- At least one computer with the TCP/IP protocol installed.
- 802.11g or 802.11b-compliant devices, such as the NETGEAR WG511 Wireless Adapter.

What's In the Box?

The product package should contain the following items:

- WG103 ProSafe 802.11g Wireless Access Point.
- Power adapter and cord.
- Straight-through category 5 Ethernet cable.
- *Resource CD* for the Reference Manual.
- Installation Guide for the WG103 ProSafe 802.11g Wireless Access Point.
- Support registration card.

Contact your reseller or customer support in your area if there are any missing or damaged parts. See the Support Information Card for the telephone number of customer support in your area. You should keep the Support Information card, along with the original packing materials, and use the packing materials to repack the WG103 if you need to return it for repair. To qualify for product updates and product warranty registrations, we encourage you to register on the NETGEAR Web site at: *http://www.netgear.com*.

Hardware Description

The hardware functions of the WG103 front and rear panels are described below.

Front Panel

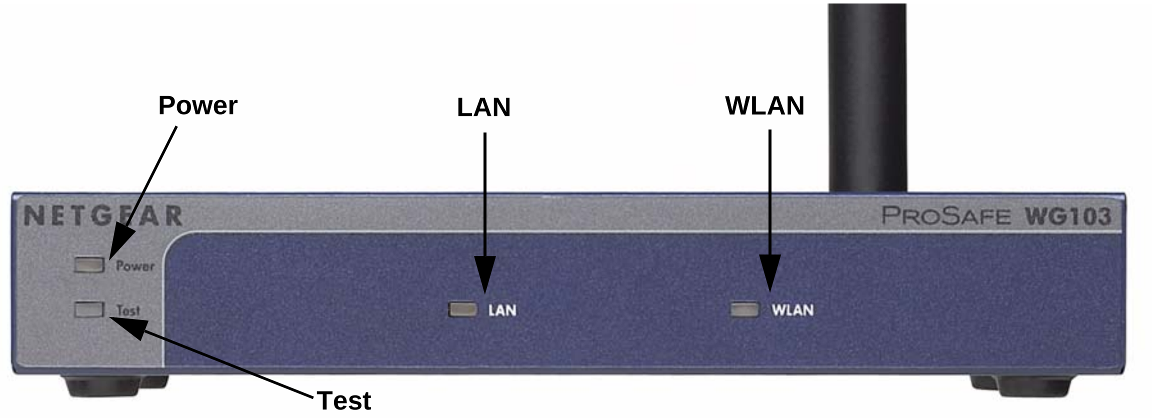


Figure 1-1

Viewed from left to right, the WG103 has these four status LEDs: PWR, TEST, LAN, and WLAN.

Table 1-1. Front Panel LEDs

LED	Description	
Power	Power Indicator	
	Off	No power. If this LED does not come on with the power adapter and cord correctly installed, see Chapter 6, “Troubleshooting.”
	On	Power is on.
Test	Self Test Indicator	
	Green Blink	Self-test in progress or loading software.
	Amber on	System fault or firmware upgrade failure

Table 1-1. Front Panel LEDs (continued)

LED	Description	
LAN	Ethernet link indicator	
	Off	No connection detected on the Ethernet link
	Amber On	10 Mbps Ethernet link detected
	Amber Flashing	Data is being transmitted or received on the 10 Mbps Ethernet link
	Green On	100 Mbps Fast Ethernet link detected.
	Green Flashing	Data is being transmitted or received on the 100 Mbps Ethernet link
WLAN	Wireless LAN Link Activity Indicator	
	Off	No wireless link activity.
	Green Blink	Wireless link activity.

Rear Panel

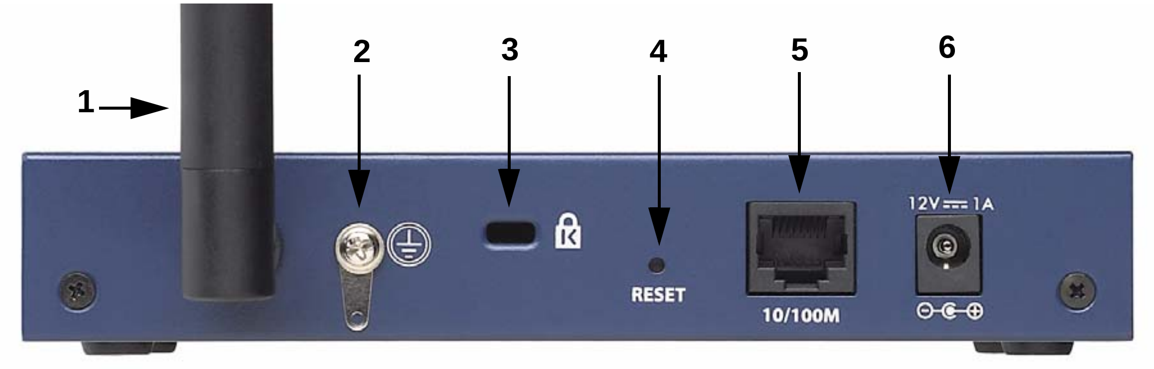


Figure 1-2

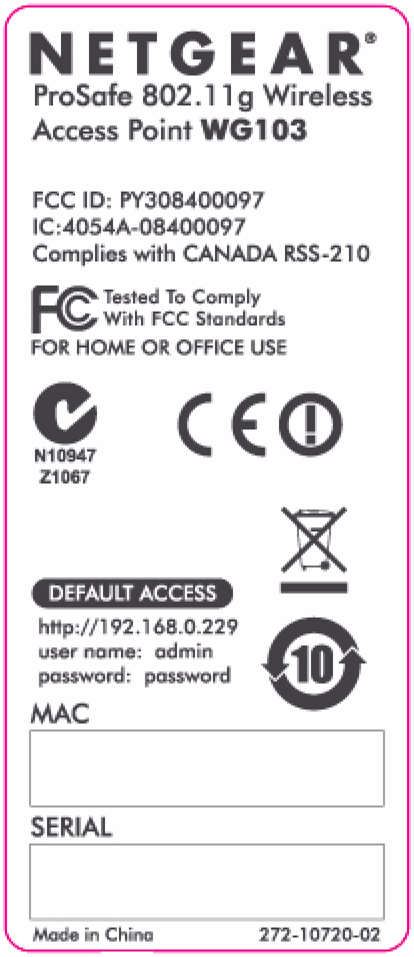
Viewed from left to right, the rear panel of the WG103 provides the following:

1. Detachable antenna.
2. Ground connector.
3. Security slot to allow you to lock the WG103 (you must provide the lock).
4. Reset button. This restores the default factory settings.

5. RJ-45 Ethernet LAN/POE Port. Use the WG103 Ethernet RJ-45 port to connect to an Ethernet LAN through a device such as a hub, switch, router, or Power Over Ethernet (POE) switch.
6. Power socket. This connects to the WG103 power adapter.

Bottom Panel

The bottom panel of the WG103 contains a label that shows compliance information, factory default login information, and the MAC and serial numbers.



NETGEAR®

ProSafe 802.11g Wireless
Access Point **WG103**

FCC ID: PY308400097
IC:4054A-08400097
Complies with CANADA RSS-210

Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE

N10947
Z1067

DEFAULT ACCESS
http://192.168.0.229
user name: admin
password: password

MAC

SERIAL

Made in China 272-10720-02

Figure 1-3

Chapter 2
Basic Installation and Configuration

This chapter describes how to install and configure your WG103 ProSafe 802.11g Wireless Access Point for wireless connectivity to your LAN. This basic configuration will enable computers with 802.11b or 802.11g wireless adapters to connect to the Internet, or access printers and files on your LAN. In planning your wireless network, consider the level of security required. Chapter 3, "Wireless Security" describes how to set up wireless security for your network.

This chapter includes:

What You Need before You Begin

You need to consider the following guidelines and requirements before you can set up your wireless access point. See also "System Requirements" on page 1-4.

Wireless Equipment Placement and Range Guidelines

The range of your wireless connection can vary significantly based on the location of the wireless access point. The latency, data throughput performance, and notebook power consumption of wireless adapters also vary depending on your configuration choices.

➡ **Note:** Failure to follow these guidelines can result in significant performance degradation or inability to wirelessly connect to the wireless access point. For complete performance specifications, see Appendix A, "Technical Specifications."

For best results, place your wireless access point according to the following guidelines:

- Near the center of the area in which your PCs will operate.
- In an elevated location such as a high shelf where the wirelessly connected PCs have line-of-sight access (even if through walls).

- Away from sources of interference, such as PCs, microwaves ovens, and 2.4 GHz cordless phones.
- Away from large metal surfaces or water.
- Putting the antenna in a vertical position provides best side-to-side coverage. Putting the antenna in a horizontal position provides best up-and-down coverage.
- If using multiple wireless access points, it is better if adjacent wireless access points use different radio frequency channels to reduce interference. The recommended channel spacing between adjacent wireless access points is five channels (for example, use channels 1 and 6, or 6 and 11, or 1 and 11).

The time it takes to establish a wireless connection can vary depending on both your security settings, and placement. WEP connections can take slightly longer to establish. Also, WEP encryption can consume more battery power on a notebook computer.

Ethernet Cabling Requirements

The wireless access point connects to your LAN via twisted-pair category 5 Ethernet cable with RJ-45 connectors.

LAN Configuration Requirements

For the initial configuration of your wireless access point, you need to connect a computer to the wireless access point.

Note: For assistance with DHCP configuration, see the online document that you can access from "Preparing Your Network" in Appendix B.

Computer Hardware Requirements

To connect to the wireless access point on your network, each computer must have a 802.11g or 802.11b wireless adapter installed.

Installing and Configuring the Wireless Access Point

Before installing the wireless access point, make sure that your Ethernet network is up and working. You will be connecting the wireless access point to the Ethernet network. Then computers with 802.11b or 802.11g wireless adapters will be able to communicate with the Ethernet network.

In order for this to work correctly, verify that you have met all of the system requirements, shown in "System Requirements" on page 1-4.

Install and configure your wireless access point in this order:

1. Connect the Wireless Access Point to a Computer.
2. Log in to the Wireless Access Point.
3. Configure LAN Access and Set the Time.
4. Configure Basic IP Settings.
5. Configure Basic Wireless Settings.
6. Configure Basic QoS Settings.

Connect the Wireless Access Point to a Computer

Set up the wireless access point:

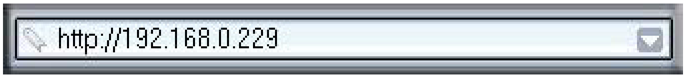
> **Tip:** Before mounting the wireless access point in a high location, first set up and test the wireless access point to verify wireless network connectivity.

1. Unpack the box and verify the contents.
2. Prepare a computer with an Ethernet adapter. If this computer is already part of your network, record its TCP/IP configuration settings.
3. Configure the computer with a static IP address of 192.168.0.210 and 255.255.255.0 as the subnet mask.
4. Connect an Ethernet cable from the wireless access point to the computer.
5. Turn on your computer, connect the power adapter to the wireless access point, and verify the following:
   - **Power LED**. The power LED (PWR) should be lit. If the power LED is not lit, check the connections and check to see if the power outlet is controlled by a wall switch that is turned off.
   - **Test LED**. The test LED (TEST) blinks when the wireless access point is first turned on.
   - **LAN LED**. The LAN LED (LAN) on the wireless access point should be lit (amber for a 10 Mbps connection and green for a 100 Mbps connection). If not, make sure the Ethernet cable is securely attached at both ends.

Log in to the Wireless Access Point

The default IP address of your wireless access point is 192.168.0.229. The wireless access point is set, by default, for the DHCP client to be disabled.

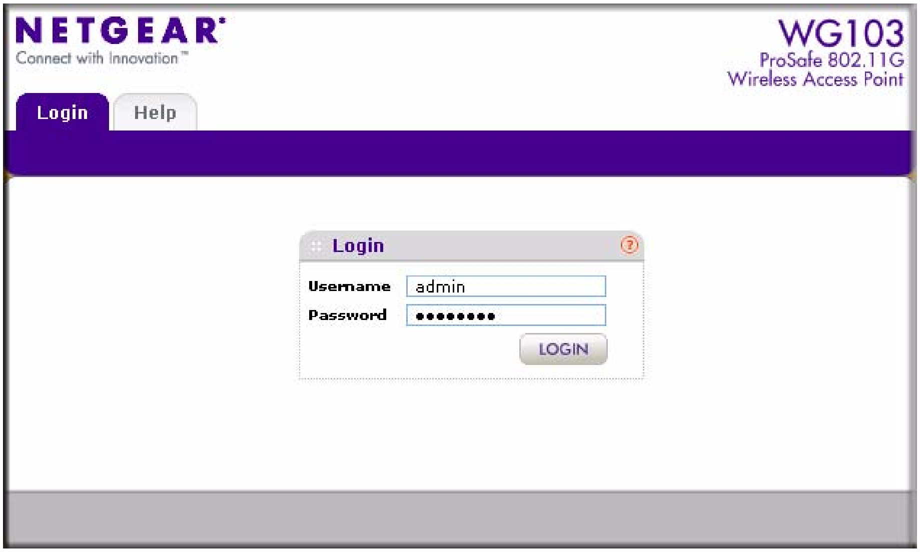
1. Open a Web browser such as Internet Explorer or Mozilla Firefox.
2. Connect to the wireless access point by entering its default address of **http://192.168.0.229** into your browser:



http://192.168.0.229

Figure 2-1

3. The Login screen opens:



Username admin
Password ●●●●●●●●●

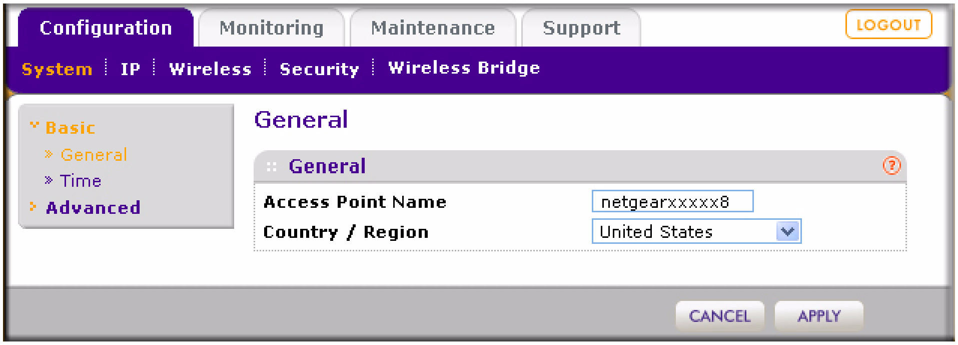
Figure 2-2

4. Enter the default user name of **admin** and the default password of **password**.
5. Click **Login**. The Web browser displays the Basic General Settings screen under the Configuration tab of the main menu as shown in Figure 2-3 on page 2-5.

Configure LAN Access and Set the Time

First, configure LAN access, and then set the time:

1. Log in to the wireless access point as described in "Log in to the Wireless Access Point" on page 2-4. The Web browser displays the General screen. (The full path to his screen is **Configuration** > **System** > **Basic** > **General**.)



Access Point Name: netgearxxxxx8

Country / Region: United States

Figure 2-3

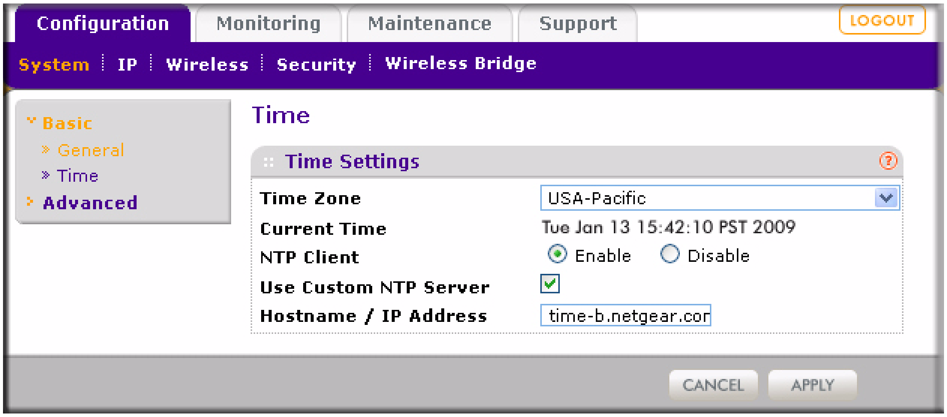
2. Specify the following fields, or use the default values, which work for most users and situations:

- **Access Point name**. This unique name is the wireless access point NetBIOS name. The device can be accessed by entering either its name or IP address in the location bar of your browser.The default wireless access point name is on the bottom label of the wireless access point. You can modify the default name with a unique name up to 15 characters long. The default is netgearxxxxxx8, where xxxxx represents the first five digits of the last six digits of the wireless access point's MAC address.These five digits are followed by an eight (8).

Note: The MAC address for the wireless access point always ends with a zero (0) but the NetBIOS name always ends with an eight (8). For example, if the MAC address 1234567890A0, then the NetBIOS name is netgear7890A8.

- **Country/Region**. This is the region where the wireless access point can be used. It may not be legal to operate the wireless features of the wireless access point in a region other than one of those identified in this field. For products sold in the United States, the Country/Region field is preset according to regulatory requirements. For products sold outside the United States, a country domain must be selected.

3. Click **Apply** to save your settings.
4. Click **Time.** The Time Settings screen appears. (The full path to his screen is **Configuration** > **System** > **Basic** > **Time**.)



Time Zone	USA-Pacific
Current Time	Tue Jan 13 15:42:10 PST 2009
NTP Client	● Enable ○ Disable
Use Custom NTP Server	☑
Hostname / IP Address	time-b.netgear.cor

Figure 2-4

Specify the following fields:

- **Time Zone.** Select the time zone to match your location.
- **Current Time**. The current time, as used on the wireless access point, is displayed.
- **NTP Client.** Select one of the following radio buttons:
  – **Enable**. Your wireless access point synchronizes with a Network Time Protocol (NTP) server.
  – **Disable**. Your wireless access point does not synchronize with an NTP server.
- **Use Custom NTP Server.** Enable this check box if you want to use a custom NTP server.
- **Hostname / IP Address.** Provide the hostname or IP address of the time server that the wireless access point must use to keep its time correct. The default is time-b.netgear.com.

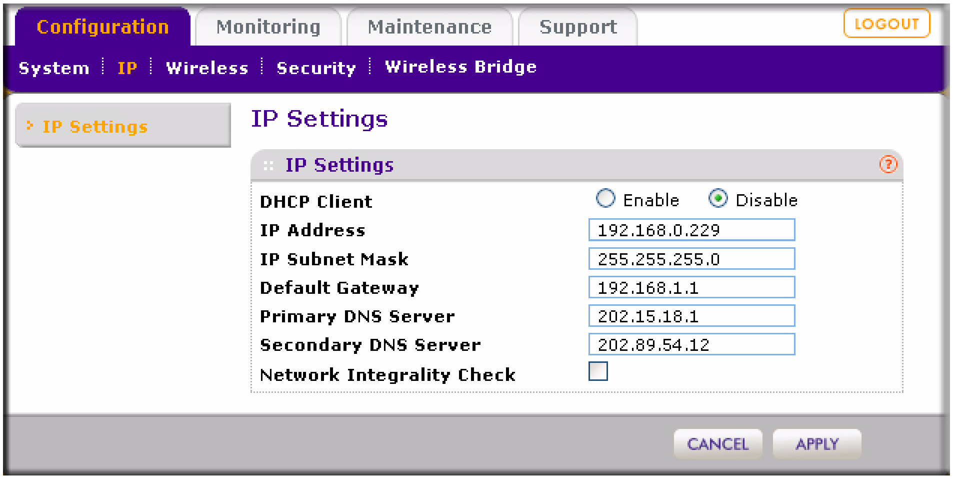
Note: You must have an Internet connection to use an NTP server that is not on your local network.

5. Click **Apply** to save your settings.

Configure Basic IP Settings

Configure the basic IP settings:

1. Log in to the wireless access point as described in "Log in to the Wireless Access Point" on page 2-4.
2. Select **Configuration** > **IP**. The IP Settings screen displays:



IP Settings

IP Settings

DHCP Client	○ Enable ● Disable
IP Address	192.168.0.229
IP Subnet Mask	255.255.255.0
Default Gateway	192.168.1.1
Primary DNS Server	202.15.18.1
Secondary DNS Server	202.89.54.12
Network Integrality Check	□

Figure 2-5

Specify the following fields:

- **DHCP Client**. By default, the Dynamic Host Configuration Protocol (DHCP) client is disabled. After installation, you can enable DHCP to let the wireless access point get its TCP/IP configuration from the DHCP server on your network. The wireless access point gets the IP address, subnet mask and the default gateway settings automatically from the DHCP server if DHCP is enabled.
- **IP Address.** The default IP address is 192.168.0.229. If you want to change the address, enter an unused IP address from the address range that is used on your LAN, or enable DHCP.
- **IP Subnet Mask.** Enter the subnet mask value used on your LAN. The default is 255.255.255.0.
- **Default Gateway.** Enter the IP address of the gateway for your LAN. For more complex networks, enter the address of the router for the network segment to which the wireless access point is connected.

- **Primary DNS Server.** Enter the IP address of the domain name system (DNS) server you wish to use.
- **Secondary DNS Server.** Enter the IP address of a secondary DNS server, which will be used when the primary DNS server is not available
- **Network Integrity Check.** Select this check box to enable the wireless access point to validate that the upstream link is active before allowing wireless associations.If you select this check box, you must ensure that your default gateway is configured.

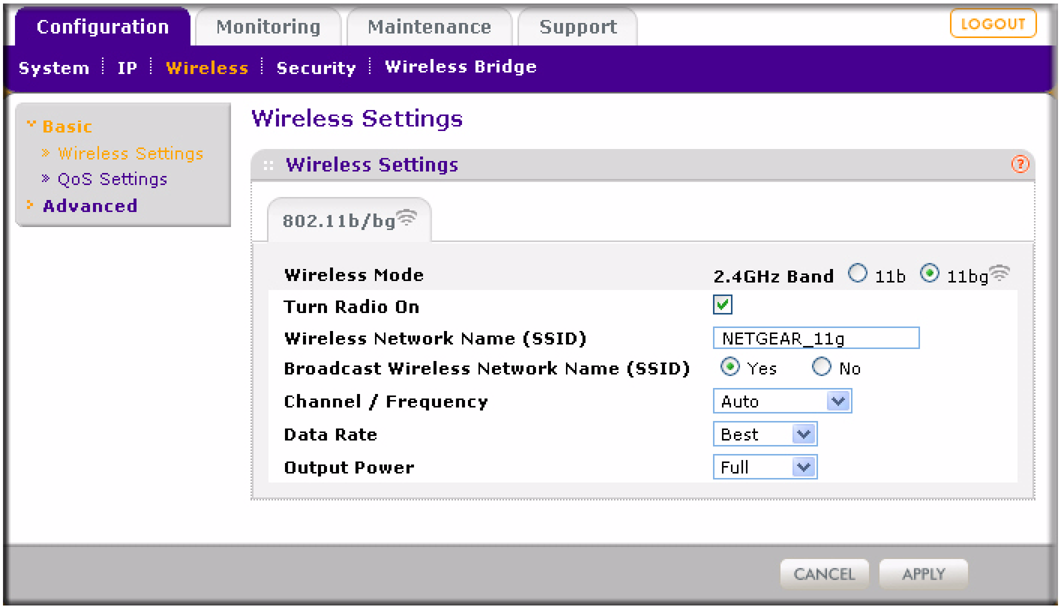
3. Click **Apply** to save your settings.

Configure Basic Wireless Settings

⚠	**Warning:** If you configure the wireless access point from a wireless computer and you change the wireless access point’s SSID, channel or wireless security settings, you will lose your wireless connection when you click Apply. You must then change the wireless settings of your computer to match the wireless access point’s new settings.

To configure the basic wireless settings:

1. Log in to the wireless access point as described in “Log in to the Wireless Access Point” on page 2-4.
2. Select **Configuration** > **Wireless**. The Wireless Settings screen displays (see Figure 2-6 on page 2-9).



Wireless Settings

Wireless Settings

802.11b/bg

Wireless Mode — 2.4GHz Band ○ 11b ● 11bg

Turn Radio On ☑

Wireless Network Name (SSID) NETGEAR_11g

Broadcast Wireless Network Name (SSID) ● Yes ○ No

Channel / Frequency Auto

Data Rate Best

Output Power Full

Figure 2-6

3. Specify the following fields:
   - **Wireless Mode**. Select the desired wireless operating mode. The options are:
     - **11b**. All 802.11b wireless stations can be used. 802.11g wireless stations can still be used if they can operate in 802.11b mode.
     - **11bg**. Both 802.11g and 802.11b wireless stations can be used. This is the default mode.
   - **Turn Radio On**. On by default, you can also turn off the radio to disable access through the wireless access point. Doing so can be helpful for configuration, network tuning, or troubleshooting activities.

Wireless Network Name (SSID). The SSID is also known as the wireless network name. The SSID separates network traffic from different wireless networks. To connect any wireless device to a wireless network, you need to use the SSID. The wireless access point default SSID is: NETGEAR_11g for the first profile, NETGEAR_11g-1 for the second profile, NETGEAR_11g-2 for the third profile, NETGEAR_11g-3 for the fourth profile, and so on. You can enter a value of up to 32 alphanumeric characters. For more information about SSIDs, see "Security Profiles" on page 3-3.

➡ **Note:** The SSID of any wireless adapters must match the SSID of the wireless access point. If they do not match, a wireless connection to the wireless access point cannot be established.

- **Broadcast Wireless Network Name (SSID)**. Select a radio button to enable or disable broadcast of the SSID. If you disable broadcast of the SSID, only stations that know the SSID can connect to the wireless access point. Disabling the SSID broadcast somewhat hampers the wireless network discovery feature of some products. Broadcast of the SSID is enabled by default.
- **Channel / Frequency**. This drop-down menu lets you specify which operating frequency is used. The default setting is Auto. You should not need to change the channel unless you notice interference problems, or are setting up the wireless access point near another wireless access point.Observe the following guidelines:
  - Wireless access points use a fixed channel. You can select the channel used. This lets you choose a channel that provides the least interference and best performance. In the USA and Canada, 11 channels are available.
  - If using multiple wireless access points, it is better if adjacent wireless access points use different channels to reduce interference. The recommended channel spacing between adjacent wireless access points is five channels (for example, use channels 1 and 6, or 6 and 11).
  - In “infrastructure” mode, wireless stations normally scan all channels, looking for a wireless access point. If more than one wireless access point can be used, the one with the strongest signal is used. This can only happen when the wireless access points use the same SSID.

  See the online document that you can access from “Wireless Networking Basics” in Appendix B for more information about wireless channels.
- **Data Rate.** This drop-down menu lets you specify the transmit data rate of the wireless network. The default settings is Best. The smallest data rate that you can select is 1 Mbps; the largest is 54 Mbps.
- **Output Power.** This drop-down menu lets you specify the transmit signal strength of the wireless access point. The options are Full, Half, Quarter, Eighth, and Minimum. Decrease the transmit power if two or more wireless access points are close together and using the same channel frequency. The default settings is Full.

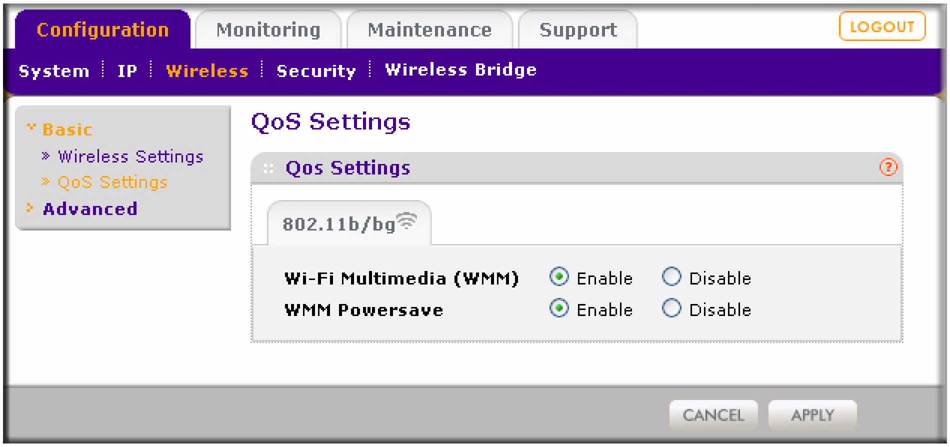
4. Click **Apply** to save your settings.

Configure Basic QoS Settings

The QoS screen lets you modify the quality of service (QoS) settings for upstream traffic flowing from a client station to the wireless access point and the downstream traffic flowing from the wireless access point to a client station.

To configure the basic QoS settings:

1. Log in to the wireless access point as described in "Log in to the Wireless Access Point" on page 2-4.
2. Select **Configuration** > **Wireless** > **Basis** > **QoS Settings**. The basic QoS Settings screen displays:



QoS Settings

Qos Settings

Wi-Fi Multimedia (WMM) ● Enable ○ Disable

WMM Powersave ● Enable ○ Disable

Figure 2-7

3. Specify the following fields:
   - **Wi-Fi Multimedia (WMM)**. Select the **Enable** radio button to ensure that applications that require better throughput and performance are provided special queues with higher priority. For example, video and audio applications are given higher priority over applications, such as FTP. This feature is enabled by default.
   - **WMM Powersave**. Select the **Enable** radio button to let power-saving devices that connect to the wireless access point conserve power. This feature is enabled by default.
4. Click **Apply** to save your settings.

Testing Basic Wireless Connectivity

After you have installed and configured the wireless access point as explained in the previous section, test your computers for wireless connectivity:

1. Configure the wireless adapters of your computers so that they all have the same SSID and channel that you have configured on the wireless access point.
2. Verify that your computers have a wireless link to the wireless access point and are able to obtain an IP address through DHCP from the wireless access point.

If you have trouble connecting to the wireless access point, see Chapter 6, "Troubleshooting."

Now that your computers can connect to the wireless access point, you can configure the wireless security as described in Chapter 3, "Wireless Security."

Deploying the Wireless Access Point

After you have tested basic wireless connectivity (see the previous section) and have set up wireless security as described in Chapter 3, "Wireless Security," you are ready to deploy the wireless access point in your network. If needed, you can now reconfigure the computer that you used for this process back to its original TCP/IP settings.

To deploy the wireless access point

1. Disconnect the wireless access point and position it where you will deploy it. The best location is elevated, such as wall mounted or on the top of a cubicle, at the center of your wireless coverage area, and within line of sight of all the mobile devices.
2. Position the antenna. Vertical positioning provides best side-to-side coverage. Horizontal positioning provides best top-to-bottom coverage.

> **Note:** Consult the antenna positioning and wireless mode configuration information in Chapter 5, "Advanced Configuration."

3. Connect an Ethernet cable from your wireless access point to a LAN port on your router, switch, or hub.

Note: By default, the wireless access point is set with the DHCP client disabled. If your network uses dynamic IP addresses, you must change this setting.

4. Connect the power adapter to the wireless access point, and plug the power adapter in to a power outlet. The PWR and LAN LEDs should light up.

Tip: The wireless access point supports Power Over Ethernet (PoE). If you have a switch that provides PoE, you will not need to use the power adapter to power the wireless access point. This can be especially convenient when the wireless access point is installed in a high location far away from a power outlet.

5. Verify wireless connectivity.

   Using a computer with an 802.11b or 802.11g wireless adapter with the correct wireless settings (see "Testing Basic Wireless Connectivity" on page 2-12), verify connectivity by using a browser such as Internet Explorer or Mozilla Firefox to browse the Internet, or check for file and printer access on your network.

Note: If you are unable to connect, see Chapter 6, "Troubleshooting."

Chapter 3
Wireless Security

This chapter describes how to use your WG103 ProSafe 802.11g Wireless Access Point to set up wireless security for your wireless network.

This chapter includes:

- "Wireless Data Security Options" on this page
- "Security Profiles" on page 3-3
- "Configuring the RADIUS Server Settings" on page 3-9
- "Configuring WEP" on page 3-10
- "Configuring WPA" on page 3-12
- "Restricting Wireless Access by MAC Address" on page 3-14

Wireless Data Security Options

Indoors, computers can connect over 802.11g wireless networks at a maximum range of 300 feet. Typically, a wireless access point inside a building works best with devices within a 100 foot radius. Such distances can allow for others outside your immediate area to access your network.

Unlike wired network data, your wireless data transmissions can extend beyond your walls and can be received by anyone with a compatible adapter. For this reason, use the security features of your wireless equipment. The wireless access point provides highly effective security features that are covered in detail in this chapter. Deploy the security features appropriate to your needs.

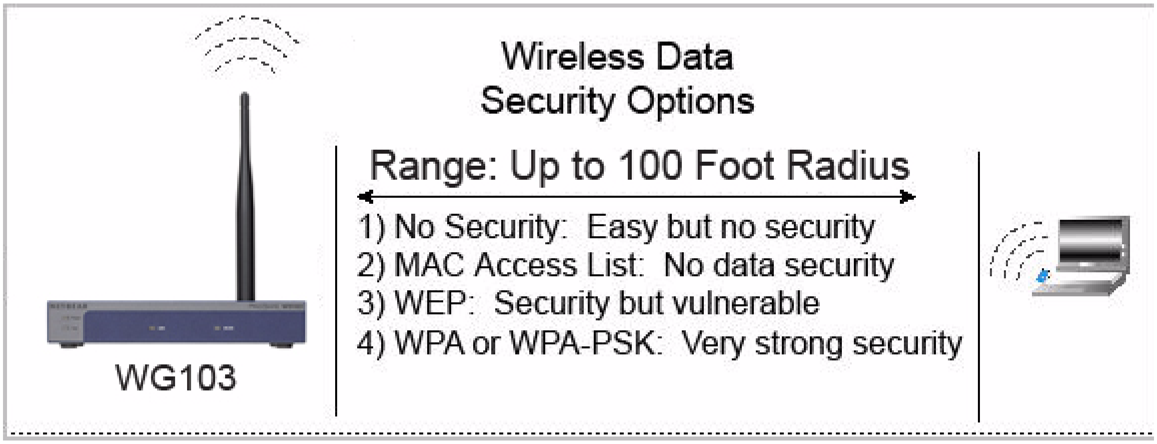

WG103
Wireless Data
Security Options
Range: Up to 100 Foot Radius
1) No Security: Easy but no security
2) MAC Access List: No data security
3) WEP: Security but vulnerable
4) WPA or WPA-PSK: Very strong security

Figure 3-1

There are several ways you can enhance the security of your wireless network:

- **Use Multiple BSSIDs combined with VLANs**. You can configure combinations of VLANS and BSSIDs with stronger or less restrictive access security according to your requirements. For example, visitors could be given wireless Internet access but be excluded from any access to your internal network. For information about how to configure BSSIDs, see "Creating and Editing Security Profiles" on page 3-5.
- **Restrict Access based by MAC address**. You can allow only trusted PCs to connect so that unknown PCs cannot wirelessly connect to the wireless access point. Restricting access by MAC address adds an obstacle against unwanted access to your network, but the data broadcast over the wireless link is fully exposed. For information about how to restrict access by MAC address, see "Restricting Wireless Access by MAC Address" on page 3-14.
- **Turn off the broadcast of the wireless network name (SSID)**. If you disable broadcast of the SSID, only devices that have the correct SSID can connect. This nullifies the wireless network discovery feature of some products, such as Windows XP, but the data is still exposed. For information about how to turn of broadcast of the SSID, see "Creating and Editing Security Profiles" on page 3-5.
- **WEP**. Wired Equivalent Privacy (WEP) data encryption provides data security. WEP Shared Key authentication and WEP data encryption block all but the most determined eavesdropper. This data encryption mode has been superseded by WPA-PSK and WPA2-PSK. For information about how to configure WEP, see "Configuring WEP" on page 3-10.

- **WPA, WPA-PSK, WPA2, or WPA2-PSK**. Wi-Fi Protected Access (WPA and WPA2) data encryption provides data security. The very strong authentication along with dynamic per frame rekeying of WPA make it virtually impossible to compromise. For information about how to configure WEP, see "Configuring WPA" on page 3-12.
- **WPA with RADIUS (WPA-802.1x)**, **WPA2 with RADIUS (WPA2-802.1x)**, **or WPA and WPA2 with RADIUS (WPA-802.1x+WPA2-802.1x)**. Wi-Fi Protected Access (WPA and WPA2) data encryption provides data security. The very strong authentication along with dynamic per frame rekeying of WPA make it virtually impossible to compromise. For information about how to configure WEP, see "Configuring WPA" on page 3-12.

Security Profiles

Security profiles let you configure unique security settings for each SSID. The wireless access point supports up to eight BSSIDs that you can configure in the Profile Settings screen (see "Creating and Editing Security Profiles" on page 3-5). To set up a security profile you select its network authentication type, data encryption, wireless client security separation, and VLAN ID:

- Network Authentication
  The wireless access point is set by default as an open system with no authentication. When you configure network authentication, bear in mind the following:
  - If you are using Access Point mode, then all options are available. In other modes such as Repeater or Bridge, some options may be unavailable.
  - Not all wireless adapters support WPA or WPA2. Windows XP, Windows 2000 with Service Pack 3, and Windows Vista do include the client software that supports WPA. However, client software is required on the client. Consult the product documentation for your wireless adapter and WPA or WPA2 client software for instructions on configuring WPA2 settings.

  You can configure the wireless access point to use the types of network authentication that are shown in Table 3-1 on page 3-7.
- Data Encryption
  Select the data encryption that you want to use. The available options depend on the network authentication setting above (otherwise, the default is None). The Data Encryption settings are explained in Table 3-2 on page 3-8.

- Wireless Client Security Separation
  If enabled, the associated wireless clients (using the same SSID) will not be able to communicate with each other. This feature is used for hotspots and other public access situations. The default settings is disabled.
- VLAN ID
  If enabled and if the network devices (hubs and switches) on your LAN support the VLAN (802.1Q) standard, the default VLAN ID for the wireless access point will be associated with each profile. The default profile VLAN ID must match the IDs that are used by the other network devices.

Before You Change the SSID and WEP Settings

For a new wireless network, print or copy this form and fill in the settings. For an existing wireless network, the network administrator can provide this information. Be sure to set the Country/Region correctly as the first step. Store this information in a safe place.

- **SSID*:*** The Service Set Identification (SSID) identifies the wireless local area network. You may customize it by using up to 32 alphanumeric characters. Write your SSID on the line.

  SSID: ____________________________________

  Note: The SSID in the wireless access point is the SSID you configure in the wireless adapter card. All wireless nodes in the same network must be configured with the same SSID:
- **Authentication**
  Circle one: Open System or Shared Key. Choose “Shared Key” for more security.

  Note: If you select shared key, the other devices in the network will not connect unless they are set to Shared Key and have the same keys in the same positions as those in the WG103.
- **WEP Encryption Keys**
  For all four 802.11b keys, choose the Key Size. Circle one: 64, 128, or 152 bits

  Key 1: ____________________________________

  Key 2: ____________________________________

  Key 3: ____________________________________

  Key 4: ____________________________________
- **WPA-PSK (Pre-Shared Key) WPA2-PSK (Pre-Shared Key)**
  Record the WPA-PSK key: Record the WPA2-PSK key:

  Key: ________________________________ Key: ________________________________

- **WPA RADIUS Settings**
  For WPA, record the following settings for the primary and secondary RADIUS servers:

  Server Name/IP Address: Primary ____________________ Secondary _____________________

  Port: ____

  Shared Secret: ____

- **WPA2 RADIUS Settings**
  For WPA2, record the following settings for the primary and secondary RADIUS servers:

  Server Name/IP Address: Primary ____________________ Secondary _____________________

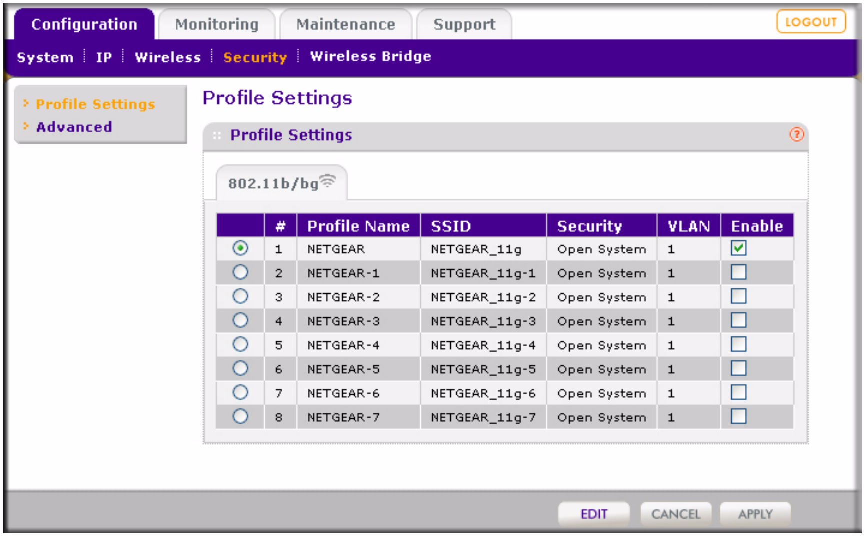
  Port: ____

  Shared Secret: ____

Creating and Editing Security Profiles

To create or edit a security profile with its own unique BSSID:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Configuration** > **Security** > **Profile Settings**. The Profile Settings screen displays information about the eight profiles:



Profile Settings

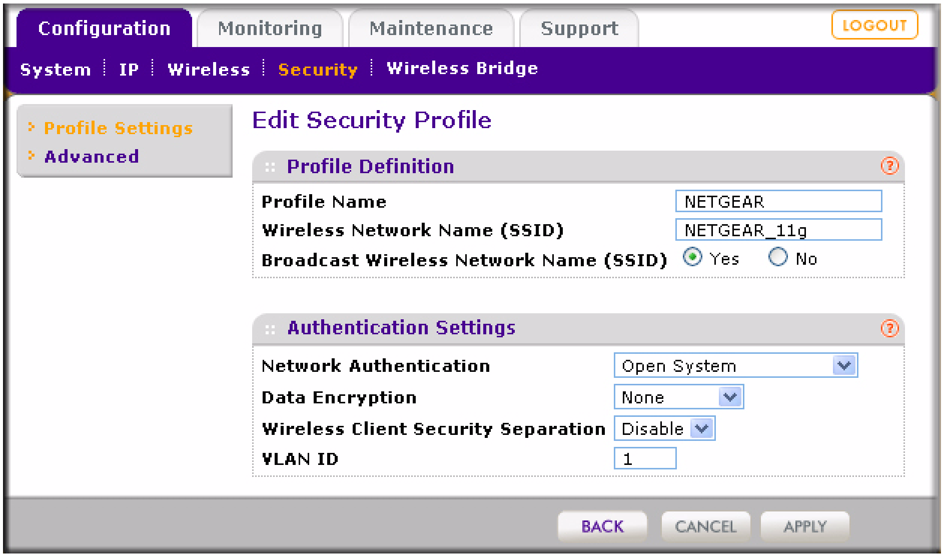
Profile Settings

802.11b/bg

	#	Profile Name	SSID	Security	VLAN	Enable
●	1	NETGEAR	NETGEAR_11g	Open System	1	☑
○	2	NETGEAR-1	NETGEAR_11g-1	Open System	1	□
○	3	NETGEAR-2	NETGEAR_11g-2	Open System	1	□
○	4	NETGEAR-3	NETGEAR_11g-3	Open System	1	□
○	5	NETGEAR-4	NETGEAR_11g-4	Open System	1	□
○	6	NETGEAR-5	NETGEAR_11g-5	Open System	1	□
○	7	NETGEAR-6	NETGEAR_11g-6	Open System	1	□
○	8	NETGEAR-7	NETGEAR_11g-7	Open System	1	□

Figure 3-2

3. To select a security profile without editing it, select the corresponding check box in the Enable column and proceed to step 6. To edit a security profile, select the corresponding radio button from the list, and click **Edit**. The Edit Security Profile screen opens for the selected security profile. Figure 3-3 shows an example with a Open System network authentication.



Edit Security Profile

Profile Definition

Profile Name: NETGEAR

Wireless Network Name (SSID): NETGEAR_11g

Broadcast Wireless Network Name (SSID): ● Yes ○ No

Authentication Settings

Network Authentication: Open System

Data Encryption: None

Wireless Client Security Separation: Disable

VLAN ID: 1

Figure 3-3

4. Enter the profile definitions in the Edit Security Profile screen:

- **Security Profile Name**. Use a name that makes it easy to recognize the profile, and to tell profiles apart.
- **Wireless Network Name (SSID)**. The SSID is also known as the wireless network name. The SSID separates network traffic from different wireless networks. To connect any wireless device to a wireless network, you need to use the SSID. The wireless access point default SSID is: NETGEAR_11g for the first profile, NETGEAR_11g-1 for the second profile, NETGEAR_11g-2 for the third profile, NETGEAR_11g-3 for the fourth profile, and so on. You can enter a value of up to 32 alphanumeric characters.

  Some concepts and guidelines regarding the SSID are explained below:

  – A Basic Service Set (BSS) is a group of wireless stations and a single wireless access point, all using the same SSID.

  – An Extended Service Set (ESS) is a group of wireless stations and multiple wireless access points, all using the same ID (ESSID).

- Different wireless access points within an ESS can use different channels. To reduce interference, adjacent wireless access points *should* use different channels.
- Roaming is the ability of wireless stations to connect wirelessly when they physically move from one BSS to another within the same ESS. The wireless station automatically changes to the wireless access point with the least interference or best performance.

- **Broadcast Wireless Network Name (SSID)**. These radio buttons let you enable and disable the SSID broadcast. If disable the SSID broadcast, then only stations that know the SSID can connect. Disabling the SSID broadcast somewhat hampers the wireless network discovery feature of some products. The default is to enable SSID broadcast.

5. Enter the authentication settings in the Edit Security Profile screen:

- **Network Authentication**. Use the information in the following table to set the network authentication.

Table 3-1. Network Authentication Types

Field	Description
Open System	Can be used with WEP encryption, or no encryption. See "Configuring WEP" on page 3-10.
Shared Key	WEP must be used. At least one shared key must be entered. See "Configuring WEP" on page 3-10.
Legacy 802.1x	You must configure the RADIUS Server Settings to use this option. See "Configuring WPA" on page 3-12.
WPA with Radius	You must configure the RADIUS Server Settings to use this option. See "Configuring WPA" on page 3-12.
WPA2 with Radius	WPA2 is a later version of WPA. Only select this if all clients support WPA2. If selected, you must use AES encryption, and configure the RADIUS Server Settings Screen. See "Configuring WPA" on page 3-12.
WPA & WPA2 with Radius	This selection allows clients to use either WPA (with TKIP) or WPA2 (with AES). If selected, encryption must be TKIP + AES, and you must also configure the RADIUS Server Settings Screen. See "Configuring WPA" on page 3-12.
WPA-PSK	You must use TKIP encryption, and enter the WPA passphrase (Network key). See "Configuring WPA" on page 3-12.

Table 3-1. Network Authentication Types (continued)

Field	Description
WPA2-PSK	WPA2 is a later version of WPA. Select this option only if all clients support WPA2. If selected, you must use AES encryption, and enter the WPA passphrase (Network key). See "Configuring WPA" on page 3-12.
WPA-PSK & WPA2-PSK	This option allows clients to use either WPA (with TKIP) or WPA2 (with AES). If selected, encryption must be TKIP + AES. The WPA passphrase (Network key) must also be entered. See "Configuring WPA" on page 3-12.

- **Data Encryption**. Use the information in the following table to configure the data encryption. Note that the types of data encryption that are available depend on the selection of the network authentication type.

Table 3-2. Data Encryption Settings

Field	Description
None	No encryption is used.
64 bits WEP	Standard WEP encryption, using 40/64 bit encryption. See "Configuring WEP" on page 3-10.
128 bits WEP	Standard WEP encryption, using 104/128 bit encryption. See "Configuring WEP" on page 3-10.
152 bits WEP	Proprietary mode that will only work with other wireless devices that support this mode. See "Configuring WEP" on page 3-10.
TKIP	This is the standard encryption method used with WPA. See "Configuring WPA" on page 3-12.
AES	This is the standard encryption method for WPA2. Some clients may support AES with WPA, but this is not supported by this wireless access point. See "Configuring WPA" on page 3-12.
TKIP + AES	This setting supports both WPA and WPA2. Broadcast packets use TKIP. For unicast (point-to-point) transmissions, WPA clients use TKIP, and WPA2 clients use AES. See "Configuring WPA" on page 3-12.

- **Wireless Client Security Separation**. Wireless client security separation must be enabled to block unicast, multicast, and broadcast traffic between the clients of the same virtual access point (VAP). From the pull-down menu, select one of the following options:
  - **Disable**. Allows unicast, multicast, and broadcast traffic between all wireless stations.
  - **Enable**. Blocks unicast, multicast, and broadcast traffic between all wireless stations.

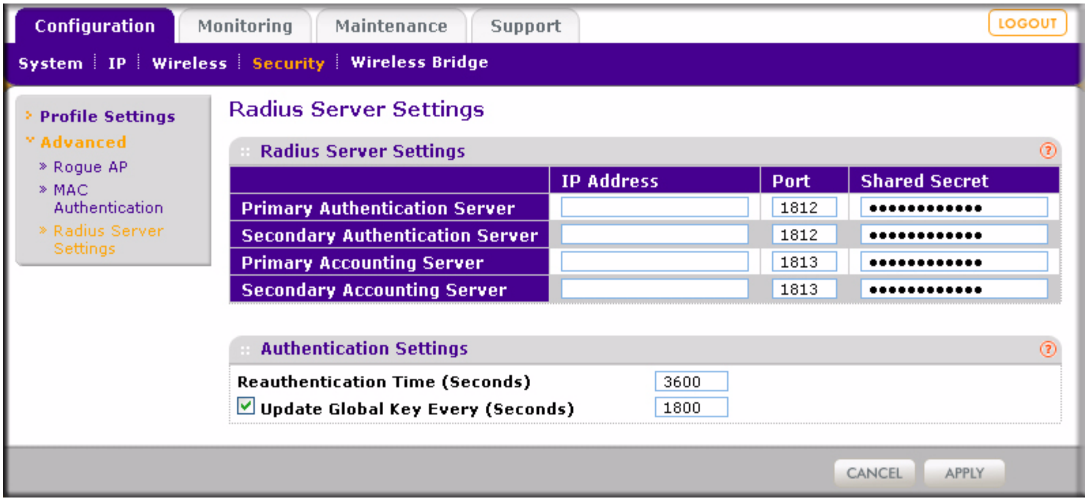
- **VLAN ID**. Enter the VLAN ID that is associated with this profile.

6. Click **Apply** to save your settings.

Configuring the RADIUS Server Settings

To view or change the RADIUS server settings:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Configuration** > **Security** > **Advanced** > **Radius Server Settings**. The Radius Server Settings screen displays:



Radius Server Settings

Radius Server Settings

	IP Address	Port	Shared Secret
Primary Authentication Server		1812	●●●●●●●●●●●●
Secondary Authentication Server		1812	●●●●●●●●●●●●
Primary Accounting Server		1813	●●●●●●●●●●●●
Secondary Accounting Server		1813	●●●●●●●●●●●●

Authentication Settings

Reauthentication Time (Seconds) 3600

☑ Update Global Key Every (Seconds) 1800

Figure 3-4

3. View or change the RADIUS server and authentication settings:
   - **Primary Authentication Server**
     Secondary Authentication Server
     Primary Accounting Server
     Secondary Accounting Server

For authentication, accounting, or both authentication and accounting using RADIUS, you must configure primary servers. Complete the IP Address, Port No. and Shared Secret fields to enable communication with the RADIUS server. You can configure a secondary RADIUS server that is used in case the primary RADIUS server fails.

  – **IP Address**. The IP address of the RADIUS server.
  – **Port Number**. The port number of the RADIUS server. The default port for an authentication server is 1812; the default port for a accounting server is 1813.
  – **Shared Secret**. This value is shared between the wireless access point and the RADIUS server while authenticating the supplicant.

- **Reauthentication Time (Seconds)**. The time interval in seconds after which the supplicant will be authenticated again with the RADIUS server. The default is 3600 seconds.
- **Update Global Key Every (Seconds)**. Select this check box to enable re-keying of the global key, and enter a value in seconds. The global key re-key can be done based on time interval in seconds. The default is 1800 seconds.

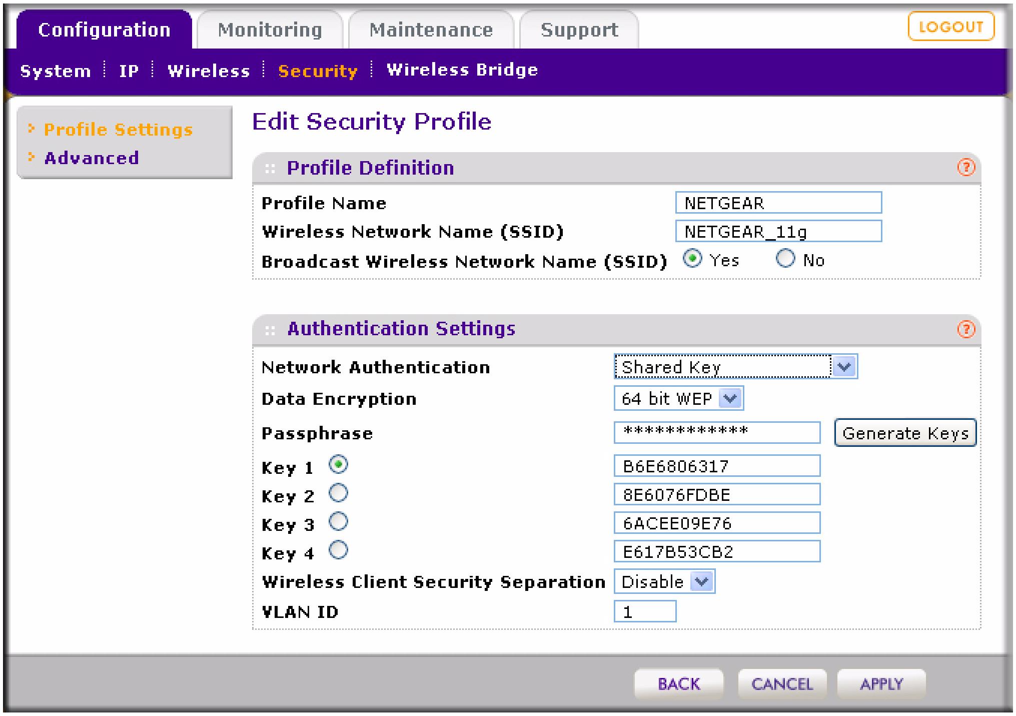
4. Enter the settings, and click **Apply**.

Configuring WEP

> **Note:** If you use a wireless computer to configure wireless security settings, you will be disconnected when you click Apply. Reconfigure your wireless computer to match the new settings, or access the wireless access point from a wired computer to make further changes.

To configure WEP data encryption:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin**, and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Configuration** > **Security** > **Profile Settings**. The Profile Settings screen displays (see Figure 3-2 on page 3-5.)
3. Select a profile by selecting the corresponding radio button from the list, and click **Edit**. The Edit Security Profile screen displays. Figure 3-5 on page 3-11 shows an example with a Shared Key network authentication.



Edit Security Profile

Profile Definition

Profile Name: NETGEAR

Wireless Network Name (SSID): NETGEAR_11g

Broadcast Wireless Network Name (SSID): ● Yes ○ No

Authentication Settings

Network Authentication: Shared Key

Data Encryption: 64 bit WEP

Passphrase: ************

Key 1 ●: B6E6806317

Key 2 ○: 8E6076FDBE

Key 3 ○: 6ACEE09E76

Key 4 ○: E617B53CB2

Wireless Client Security Separation: Disable

VLAN ID: 1

Figure 3-5

4. From the Network Authentication pull-down menu, select **Open System** or **Shared Key**.

> **Note:** The authentication scheme is separate from the data encryption. You can select an authentication scheme that requires a shared key but still leaves the data transmissions unencrypted. If you require strong security, use both the Shared Key and WEP encryption settings.

5. From the Data Encryption pull-down menu, select **64 bit WEP**, **128 bit WEP**, or **152 bit WEP**.

6. **Passphrase**. To use a passphrase to generate the WEP keys, enter a word or group of characters, and click **Generate Keys**. The four key fields will be automatically populated with key values. You can also enter the keys manually.

7. **Key 1**, **Key 2**, **Key 3**, **Key 4**. If you choose to enter the keys manually, enter hexadecimal digits (any combination of 0–9, a–f, or A–F). Select the key to be used as the default key. Data transmissions are always encrypted using the default key. The other keys can only be used to decrypt received data. These key values must be identical on all computers and access points in your network.
8. **Wireless Client Security Separation if required**. Enable this option, if required. (For more information, see "Security Profiles" on page 3-3.)
9. **VLAN ID**. Enter the VLAN ID that is associated with this profile.
10. Click **Apply** to save your settings.

For more information about WEP, see the online document that you can access from "Wireless Networking Basics" in Appendix B.

Configuring WPA

WPA-PSK data encryption provides data security. The very strong authentication along with dynamic per frame rekeying of WPA makes it virtually impossible to compromise.

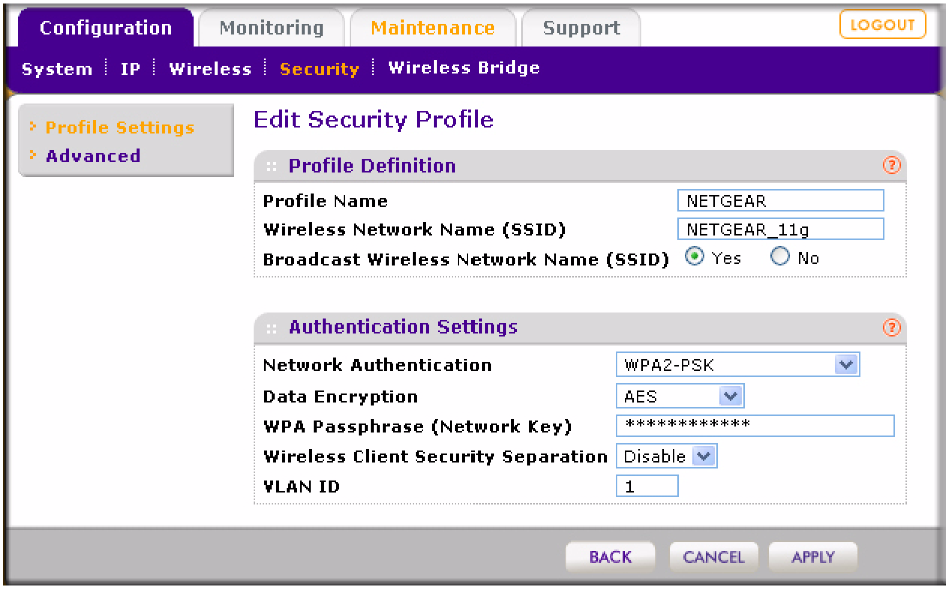
Not all wireless adapters support Wi-Fi Protected Access (WPA). Consult the product documentation for your wireless adapter for instructions for configuring WPA settings.

> **Note:** If you use a wireless computer to configure wireless security settings, you will be disconnected when you click Apply. Reconfigure your wireless computer to match the new settings, or access the wireless access point from a wired computer to make further changes.

To configure WPA data encryption:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Configuration** > **Security** > **Profile Settings**. The Profile Settings screen displays (see Figure 3-2 on page 3-5.)

3. Select a profile by selecting the corresponding radio button from the list, and click **Edit**.The Edit Security Profile screen displays. Figure 3-5 shows an example with a WPA2-PSK network authentication.



Edit Security Profile

Profile Definition

Profile Name	NETGEAR
Wireless Network Name (SSID)	NETGEAR_11g
Broadcast Wireless Network Name (SSID)	● Yes ○ No

Authentication Settings

Network Authentication	WPA2-PSK
Data Encryption	AES
WPA Passphrase (Network Key)	************
Wireless Client Security Separation	Disable
VLAN ID	1

Figure 3-6

4. From the Network Authentication pull-down menu, select the WPA or WPA2 option of your choice:
   - **Legacy 802.1X**.
   - **WPA with Radius**.
   - **WPA2 with Radius**.
   - **WPA & WPA2 with Radius**.
   - **WPA-PSK**.
   - **WPA2-PSK**.
   - **WPA-PSK & WPA2-PSK**.

   Some options require that you configure one ore more RADIUS servers (see "Configuring the RADIUS Server Settings" on page 3-9).

5. If you have selected WPA-PSK, WPA2-PSK, or WPA-PSK & WPA2-PSK, enter the passphrase in the WPA Passphrase (Network Key) field. All wireless stations must use the same passphrase (network key). The passphrase must be from 8 to 63 characters in length.

6. **Wireless Client Security Separation if required**. Enable this option, if required. (For more information, see "Security Profiles" on page 3-3.)
7. **VLAN ID**. Enter the VLAN ID associated with this profile.
8. To save your settings, click **Apply**.

For more information about WPA, see the online document that you can access from "Wireless Networking Basics" in Appendix B.

Restricting Wireless Access by MAC Address

For increased security, you can restrict access to the wireless network to allow only specific computers or wireless cards based on their MAC addresses. You can restrict access to only trusted computers so that unknown computers cannot wirelessly connect to the wireless access point. MAC address filtering adds an obstacle against unwanted access to your network, but the data broadcast over the wireless link is fully exposed.

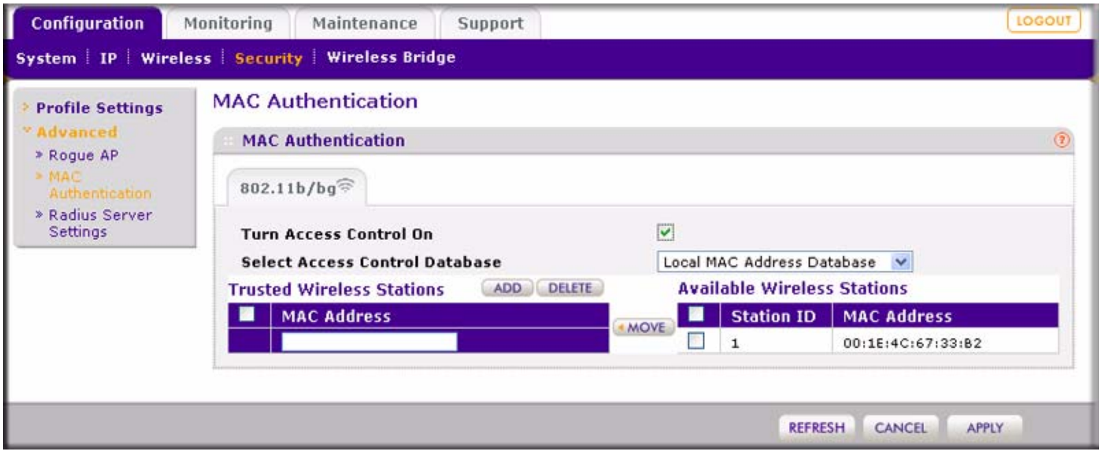
Note: For wireless adapters, you can usually find the MAC address printed on the wireless adapter.

To restrict access based on MAC addresses:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin**, and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.

   Note: When configuring the wireless access point from a wireless computer whose MAC address is not in the access control list, if you select Turn Access Control On, you will lose your wireless connection when you click Apply. You must then access the wireless access point from a wired computer or from a wireless computer which is on the access control list to make any further changes.

2. Select **Configuration** > **Security** > **Advanced** > **MAC Authentication**. The MAC Authentication screen displays.



Turn Access Control On ☑

Select Access Control Database: Local MAC Address Database

Trusted Wireless Stations

□	MAC Address

Available Wireless Stations

□	Station ID	MAC Address
□	1	00:1E:4C:67:33:B2

Figure 3-7

3. Select the **Turn Access Control On** check box.

4. From the Select Access Control Database pull-down menu, select to use a remote MAC address database that is stored on a RADIUS server or to use the local MAC address database that is stored on the wireless access point:

   - **Remote MAC Address Database**. You must configure the RADIUS server settings first (see "Configuring the RADIUS Server Settings" on page 3-9).
   - **Local MAC Address Database**. There are two methods to enter a MAC address in the Trusted Wireless Stations table:
     - Select a station ID and MAC address from the list of available wireless cards that the wireless access point has found in your area (click **Refresh** to refresh the list), and then click **Move** to enter the MAC address in the Trusted Wireless Stations table.
     - Manually enter the MAC address for a device that you plan to use in the Trusted Wireless Stations table, and then click **Add**.

   Repeat these procedures for each additional device you want to add to the list. To delete a MAC address from the Trusted Wireless Stations table, select the address, and then click **Delete**.

5. Click **Apply** to save your settings. Now, only devices on this list will be allowed to wirelessly connect to the wireless access point.

Chapter 4
Managing Your Network

This chapter describes how to use the management features of your WG103 ProSafe 802.11g Wireless Access Point.

This chapter includes:

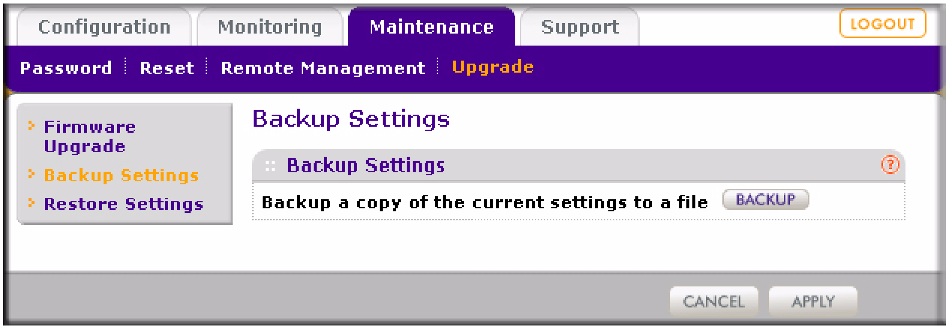
Backing Up, Restoring, and Erasing Your Settings

The configuration settings of the wireless access point are stored in a configuration file in the wireless access point. This file can be backed up to a computer, restored from a computer, or reverted to factory default settings. The following procedures explain how to do these tasks.

Backing up the Configuration

To back up the configuration:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Maintenance** > **Upgrade** > **Backup Settings.** The Backup Settings screen displays (see Figure 4-1 on page 4-2).



Backup Settings

Backup Settings

Backup a copy of the current settings to a file

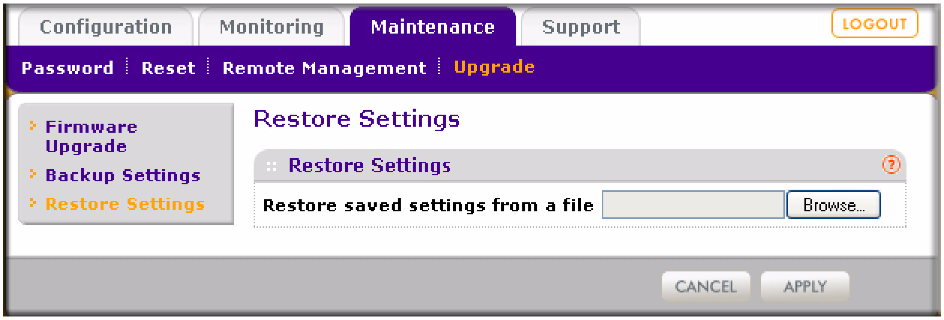
Figure 4-1

3. To save your settings, click **Backup**. Your browser extracts the configuration file from the wireless access point and prompts you for a location on your computer to store the file. You can give the file a meaningful name at this time, such as WG103.cfg.

Restoring the Configuration

To restore your settings from a saved configuration file:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Maintenance** > **Upgrade** > **Restore Settings.** The Restore Settings screen displays.



Restore Settings

Restore Settings

Restore saved settings from a file

Figure 4-2

3. Enter the full path to the file on your computer or click **Browse** to locate the file.
4. Click **Apply** to upload the file. After completing the upload, the wireless access point reboots automatically.

Rebooting and Restoring the Default Configuration

You can erase the wireless access point configurations, and return to the factory default settings. After erasing, the wireless access point's password will be **password**, the SSID will be NETGEAR, the DHCP client will be disabled, the default LAN IP address will be **192.168.0.229**, and the access wireless access point name is reset to the name printed on the label on the bottom of the unit.

Using the Reset Button to Reboot or Restore Factory Default Settings

If you do not know the login password or IP address, you can still restore the factory default configuration settings with the Reset button. This button is on the rear panel of the wireless access point (see "Rear Panel" on page 1-6). The Reset button has two functions:

- **Reboot**. When pressed and released, the wireless access point reboots (restarts).
- **Reset to Factory Defaults**. When pressed and held down, it clears all data and restores all settings to the factory default values.

To clear all data and restore the factory default values:

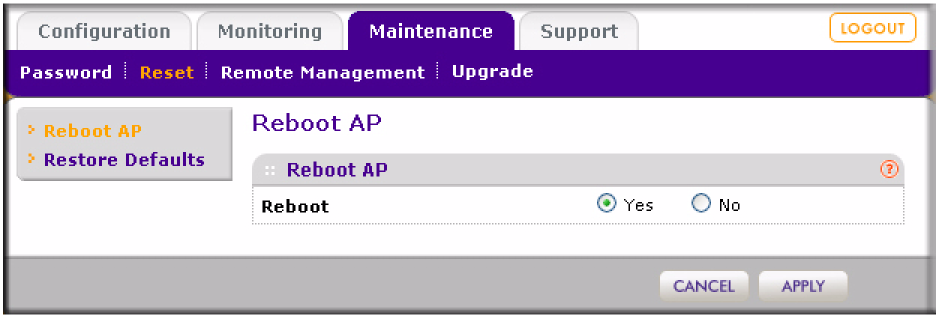
1. Hold the Reset button until the LEDs blink twice, usually more than five seconds.
2. Release the Reset button.

The factory default configuration has now been restored, and the wireless access point is ready for use.

Using the Software to Reboot the Wireless Access Point

To use the software to reboot the wireless access point:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Maintenance** > **Reset** > **Reboot AP.** The Reboot AP screen displays (see Figure 4-3 on page 4-4).



Reboot ● Yes ○ No

Figure 4-3

3. Select the **Yes** radio button.

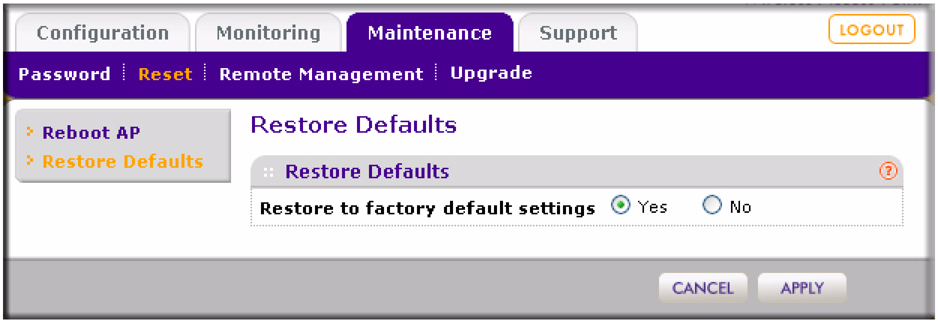
4. Click **Apply** to reboot the wireless access point.

Using the Software to Restore Factory Default Settings

To use the software to restore all settings to the factory default values:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.

2. Select **Maintenance** > **Reset** > **Restore Defaults.** The Restore Defaults screen displays.



Restore to factory default settings ● Yes ○ No

Figure 4-4

3. Select the **Yes** radio button.

4. Click **Apply**. The factory default settings will be restored.

Upgrading the Wireless Access Point Firmware

> ⚠ **Warning:** When uploading firmware to the wireless access point, do not interrupt the Web browser by closing the window, clicking a link, or loading a new page. If the browser is interrupted, the upload may fail, corrupt the firmware, and render the wireless access point completely inoperable.

You cannot upgrade the firmware from a computer that is connected to the wireless access point with a wireless link. You must use a computer that is connected to the wireless access point with an Ethernet cable.

The wireless access point firmware is stored in flash memory, and can be upgraded as NETGRA releases new firmware. You can download the upgrade file (in tar format) from the NETGEAR Web site.

> ➡ **Note:** The Web browser used to upload new firmware into the wireless access point must support HTTP uploads, such as Microsoft Internet Explorer 6.0 or later, or Mozilla Firefox 1.5 or later.

To upgrade the firmware on the wireless access point:

1. Download the upgrade file from NETGEAR and save it to your hard disk.

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.

2. Back up the current configuration as described in "Backing up the Configuration" on page 4-1.

3. Select **Maintenance** > **Upgrade** > **Firmware Upgrade.** The Firmware Upgrade screen displays Figure 4-5 on page 4-6).

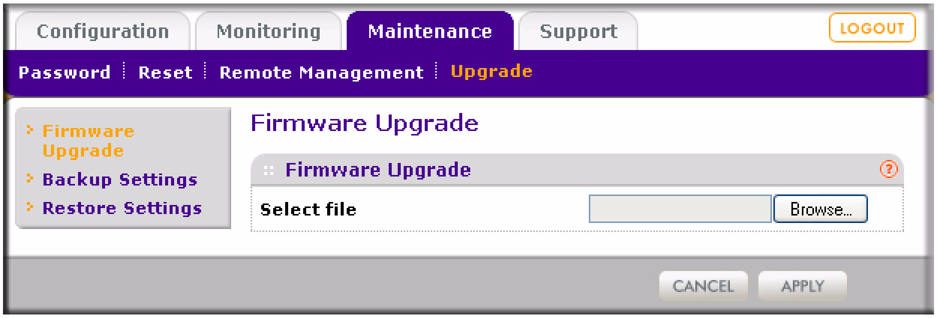


Figure 4-5

4. Click **Browse** to navigate to the location where the upgrade file is stored.
5. Click **Apply** to upgrade the firmware.

When the upload completes, your wireless access point automatically restarts. In some cases, you might need to reconfigure the wireless access point after upgrading.

Network Management Information

The wireless access point provides a variety of status and usage information, which are discussed in the following sections.

Viewing the Activity Log

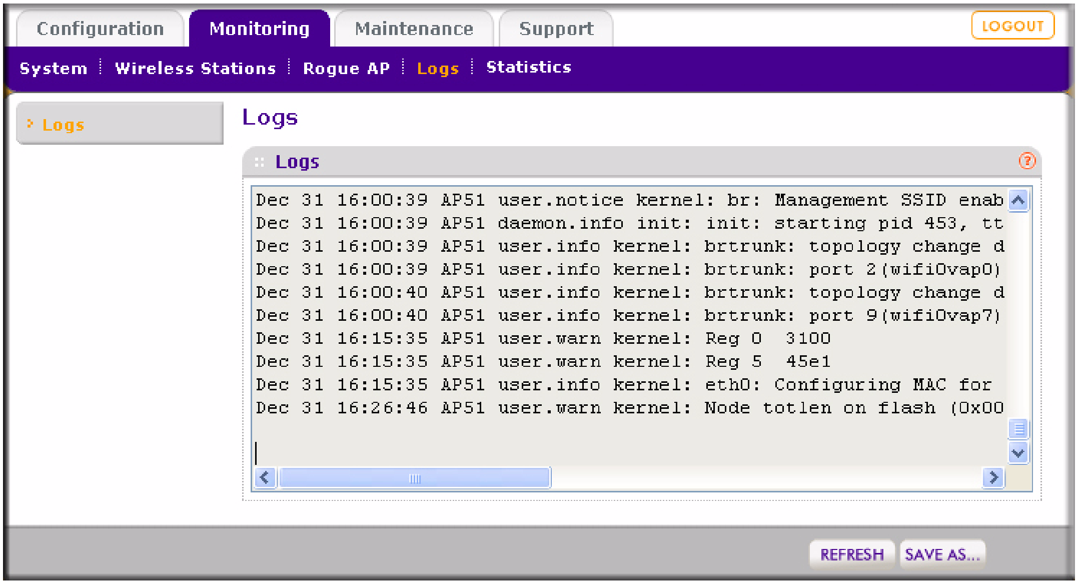
You can view the activity log on screen or send it to a syslog server.

Viewing the Activity Log on Screen

To view the activity log on screen:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.

2. Select **Monitoring** > **Logs**. The Logs screen displays.



```
Dec 31 16:00:39 AP51 user.notice kernel: br: Management SSID enab
Dec 31 16:00:39 AP51 daemon.info init: init: starting pid 453, tt
Dec 31 16:00:39 AP51 user.info kernel: brtrunk: topology change d
Dec 31 16:00:39 AP51 user.info kernel: brtrunk: port 2(wifi0vap0)
Dec 31 16:00:40 AP51 user.info kernel: brtrunk: topology change d
Dec 31 16:00:40 AP51 user.info kernel: brtrunk: port 9(wifi0vap7)
Dec 31 16:15:35 AP51 user.warn kernel: Reg 0  3100
Dec 31 16:15:35 AP51 user.warn kernel: Reg 5  45e1
Dec 31 16:15:35 AP51 user.info kernel: eth0: Configuring MAC for
Dec 31 16:26:46 AP51 user.warn kernel: Node totlen on flash (0x00
```

Figure 4-6

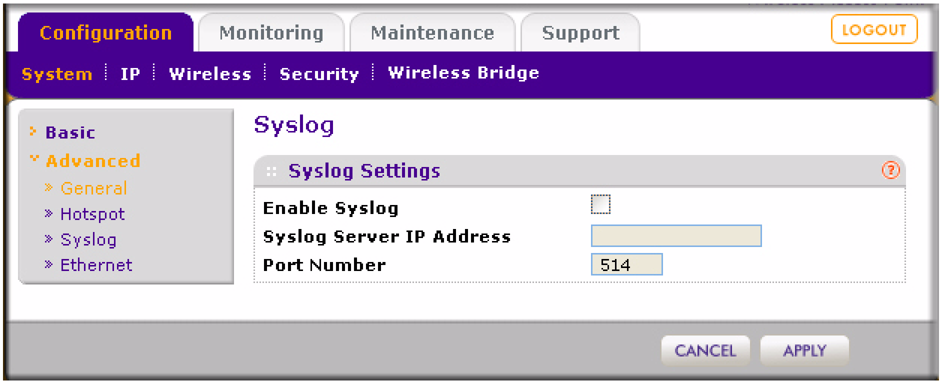
The Activity Log Window displays the wireless access point’s system activity.

To save the screen to a file, click **Save As**. To refresh the screen, click **Refresh**.

Sending the Activity Log to a Syslog Server

To send the activity log to a syslog server:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Configuration** > **System** > **Advanced** > **Syslog**. The Syslog screen displays (see Figure 4-7 on page 4-8).



Syslog

Syslog Settings

Enable Syslog □

Syslog Server IP Address

Port Number 514

Figure 4-7

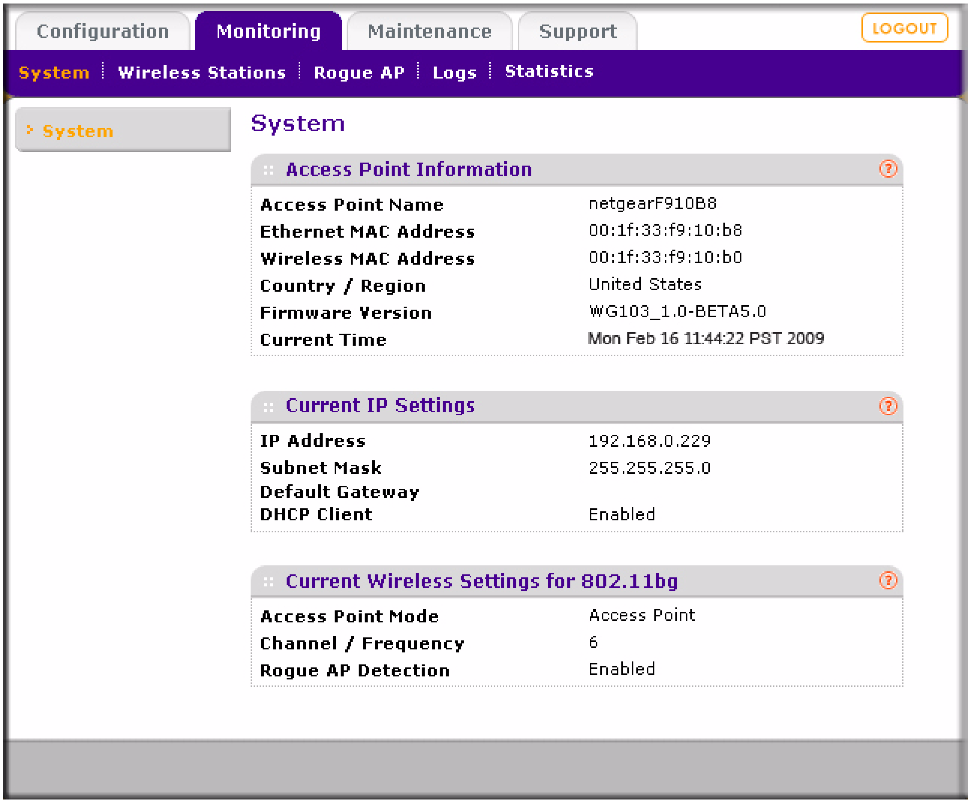
3. Enter the syslog information in the following fields:
   - **Enable Syslog**. Select this check box to enable the syslog server.
   - **Syslog Server IP address**. The IP address of the syslog server.
   - **Port Number**. The port number that is configured on the syslog server on your LAN. The default port is 514.
4. Click **Apply**. The wireless access point sends all the system activity information to the specified IP address.

Viewing System Information

The System Information is a summary of the wireless access point configuration settings.

To view the system information screen:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Monitoring** > **System**. The System information screen displays (see Figure 4-8 on page 4-9). Table 4-1 on page 4-9 describes the system information fields.



System

Access Point Information

Access Point Name	netgearF910B8
Ethernet MAC Address	00:1f:33:f9:10:b8
Wireless MAC Address	00:1f:33:f9:10:b0
Country / Region	United States
Firmware Version	WG103_1.0-BETA5.0
Current Time	Mon Feb 16 11:44:22 PST 2009

Current IP Settings

IP Address	192.168.0.229
Subnet Mask	255.255.255.0
Default Gateway	
DHCP Client	Enabled

Current Wireless Settings for 802.11bg

Access Point Mode	Access Point
Channel / Frequency	6
Rogue AP Detection	Enabled

Figure 4-8

Table 4-1. System Information Fields

Field	Description
Access Point Information. You can configure these settings in "Configure LAN Access and Set the Time" on page 2-5.	
Access Point Name (NetBIOS name)	The default name may be changed if desired.
MAC Address	The MAC Address of the wireless access point's Ethernet port.
Country/Region	The domain or region for which the wireless access point is licensed for use. It may not be legal to operate this wireless access point in a region other than one of those identified in this field.
Firmware Version	The version of the firmware currently installed.
Current Time	System time as available on the wireless access point.

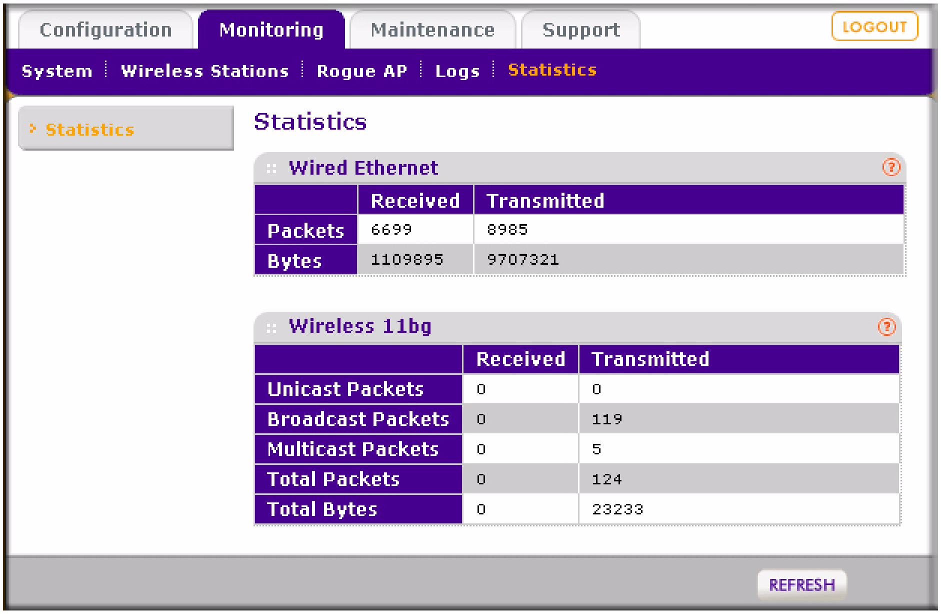
Table 4-1. System Information Fields (continued)

Field	Description
Current IP Settings You can configure these settings in "Configure Basic IP Settings" on page 2-7.	
IP Address	The IP address of the wireless access point.
Subnet Mask	The subnet mask for the wireless access point.
Default Gateway	The default gateway for the wireless access point communication.
DHCP Client	If this is enabled, the current IP address was obtained from a DHCP server on your network. Disabled indicates a static IP configuration.
Current Wireless Settings	
Access Point Mode	The operating mode of the wireless access point: access point, point-to-point bridge, multi-point bridge, or repeater. To change these settings, see "Wireless Bridging and Repeating" on page 5-9.
Channel/Frequency	The channel the wireless port uses. The default channel setting is automatic channel selection. To change these settings, see "Configure Basic Wireless Settings" on page 2-8. For the frequencies used on each channel, see the online document that you can access from "Wireless Networking Basics" in Appendix B.
Rogue AP Detection	Indicates whether rogue AP detection is enabled or not. To change these settings, see "Enabling Rogue AP Detection" on page 4-20.

Viewing Statistics

To view the network traffic statistics for the wired (Ethernet LAN) and wireless (WLAN) interfaces of the wireless access point:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Monitoring** > **Statistics**. The Statistics screen displays (see Figure 4-9 on page 4-11). Table 4-2 on page 4-11 describes the statistics fields.



Statistics

Wired Ethernet

	Received	Transmitted
Packets	6699	8985
Bytes	1109895	9707321

Wireless 11bg

	Received	Transmitted
Unicast Packets	0	0
Broadcast Packets	0	119
Multicast Packets	0	5
Total Packets	0	124
Total Bytes	0	23233

Figure 4-9

Click **Refresh** to update the current statistics.

Table 4-2. Network Statistics

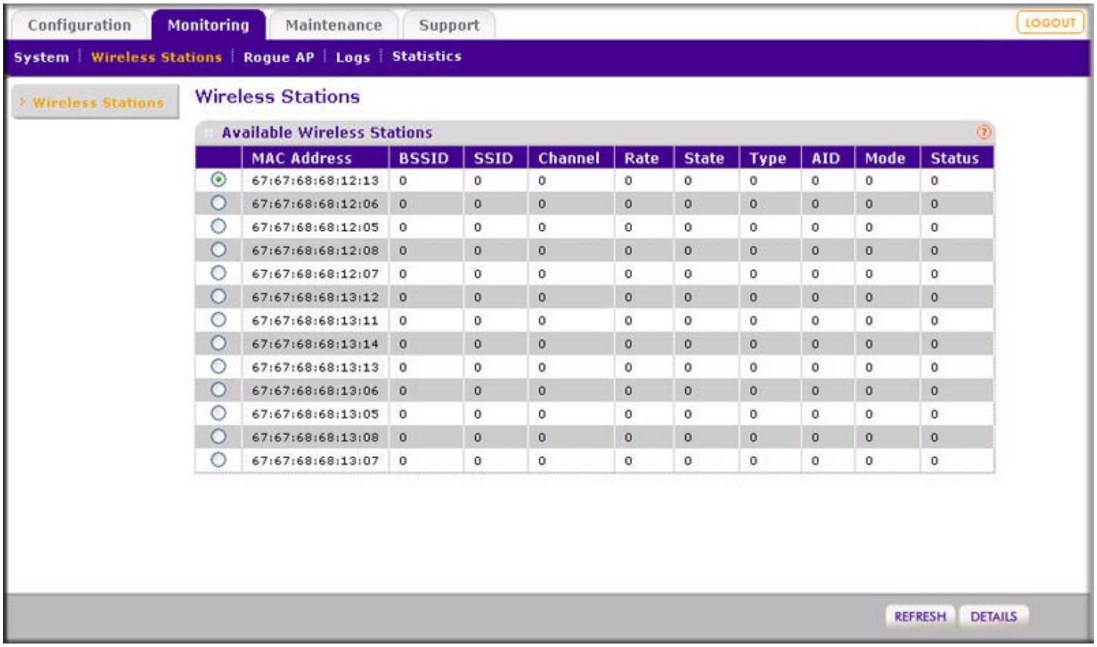
Field	Description
Wired Ethernet	Received/Transmitted
Packets	The number of packets sent since the wireless access point was restarted.
Bytes	The number of bytes sent since the wireless access point was restarted.
Wireless LAN	Received/Transmitted
Unicast Packets	The Unicast packets sent since the wireless access point was restarted.
Broadcast Packets	The Broadcast packets sent since the wireless access point was restarted.
Multicast Packets	The Multicast packets sent since the wireless access point was restarted.
Total Packets	The Wireless packets sent since the wireless access point was restarted.
Total Bytes	The Wireless bytes sent since the wireless access point was restarted.

Viewing the Available Wireless Stations Table

The Available Wireless Stations table contains a table of all wireless devices associated with the wireless access point for the wireless network name (SSID).

To display the Available Wireless Stations table:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Monitoring** > **Wireless Stations**. The Available Wireless Stations table displays.



Wireless Stations

Available Wireless Stations

	MAC Address	BSSID	SSID	Channel	Rate	State	Type	AID	Mode	Status
●	67:67:68:68:12:13	0	0	0	0	0	0	0	0	0
○	67:67:68:68:12:06	0	0	0	0	0	0	0	0	0
○	67:67:68:68:12:05	0	0	0	0	0	0	0	0	0
○	67:67:68:68:12:08	0	0	0	0	0	0	0	0	0
○	67:67:68:68:12:07	0	0	0	0	0	0	0	0	0
○	67:67:68:68:13:12	0	0	0	0	0	0	0	0	0
○	67:67:68:68:13:11	0	0	0	0	0	0	0	0	0
○	67:67:68:68:13:14	0	0	0	0	0	0	0	0	0
○	67:67:68:68:13:13	0	0	0	0	0	0	0	0	0
○	67:67:68:68:13:06	0	0	0	0	0	0	0	0	0
○	67:67:68:68:13:05	0	0	0	0	0	0	0	0	0
○	67:67:68:68:13:08	0	0	0	0	0	0	0	0	0
○	67:67:68:68:13:07	0	0	0	0	0	0	0	0	0

Figure 4-10

For each device, the table shows details such as the MAC address, BSSID, SSID, channel, rate, and status (whether or not the device is allowed to communicate with the wireless access point). For full details about a wireless station, select the corresponding radio button, and click **Details**.

Note that if the wireless access point is rebooted, the table data is lost until the wireless access point rediscovers the devices. To force the wireless access point to look for associated devices, click **Refresh**.

Note: A wireless network can include multiple wireless access points, all using the same network name (SSID). This extends the reach of the wireless network. Users can roam from one wireless access point to another, providing seamless network connectivity. If this is the case, only the stations associated with this wireless access point are shown in the Available Wireless Stations table.

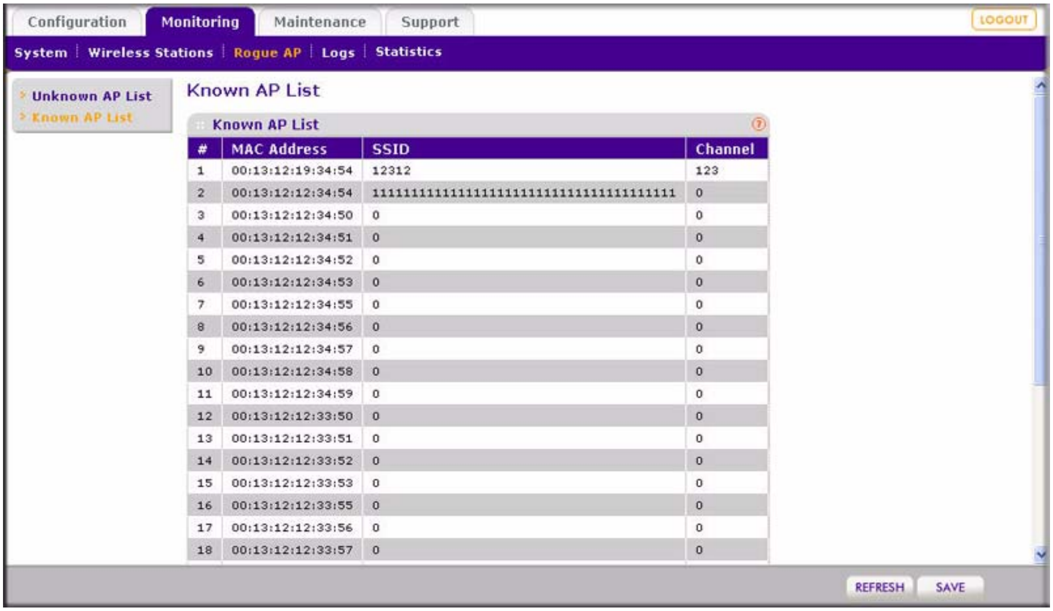
Viewing AP Statistics

The wireless access point can detect both unknown (rogue) and known APs and wireless stations. For information about excluding rogue APs and wireless stations, see "Enabling Rogue AP Detection" on page 4-20.

Viewing the Unknown AP List

To display the Unknown AP List:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Monitoring** > **Rogue AP** > **Unknown AP List**. The Unknown AP List displays:



Known AP List

Known AP List

#	MAC Address	SSID	Channel
1	00:13:12:19:34:54	12312	123
2	00:13:12:12:34:54	1111111111111111111111111111111111111111	0
3	00:13:12:12:34:50	0	0
4	00:13:12:12:34:51	0	0
5	00:13:12:12:34:52	0	0
6	00:13:12:12:34:53	0	0
7	00:13:12:12:34:55	0	0
8	00:13:12:12:34:56	0	0
9	00:13:12:12:34:57	0	0
10	00:13:12:12:34:58	0	0
11	00:13:12:12:34:59	0	0
12	00:13:12:12:33:50	0	0
13	00:13:12:12:33:51	0	0
14	00:13:12:12:33:52	0	0
15	00:13:12:12:33:53	0	0
16	00:13:12:12:33:55	0	0
17	00:13:12:12:33:56	0	0
18	00:13:12:12:33:57	0	0

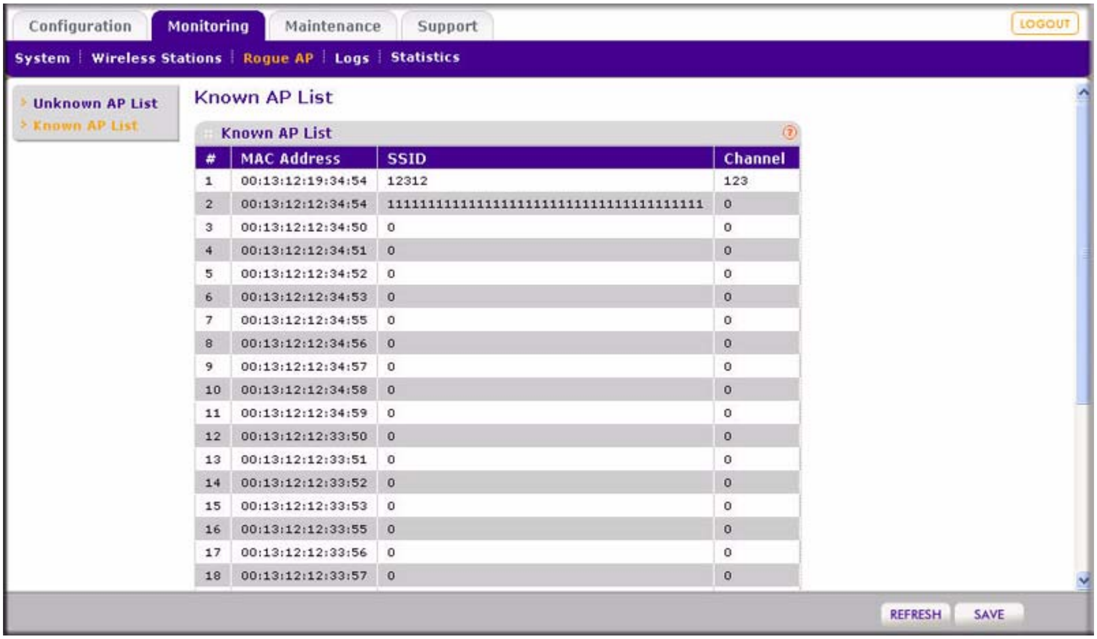
Figure 4-11

To save the screen to a file, click **Save**. The default file name is WG103UnknownAP.cfg. To refresh the screen, click **Refresh**.

Viewing the Known AP List

To display the Known AP List:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Monitoring** > **Rogue AP** > **Known AP List**. The Known AP List displays:



Known AP List

Known AP List

#	MAC Address	SSID	Channel
1	00:13:12:19:34:54	12312	123
2	00:13:12:12:34:54	111111111111111111111111111111111111111	0
3	00:13:12:12:34:50	0	0
4	00:13:12:12:34:51	0	0
5	00:13:12:12:34:52	0	0
6	00:13:12:12:34:53	0	0
7	00:13:12:12:34:55	0	0
8	00:13:12:12:34:56	0	0
9	00:13:12:12:34:57	0	0
10	00:13:12:12:34:58	0	0
11	00:13:12:12:34:59	0	0
12	00:13:12:12:33:50	0	0
13	00:13:12:12:33:51	0	0
14	00:13:12:12:33:52	0	0
15	00:13:12:12:33:53	0	0
16	00:13:12:12:33:55	0	0
17	00:13:12:12:33:56	0	0
18	00:13:12:12:33:57	0	0

Figure 4-12

To save the screen to a file, click **Save**. The default file name is WG103KnownAP.cfg. To refresh the screen, click **Refresh**.

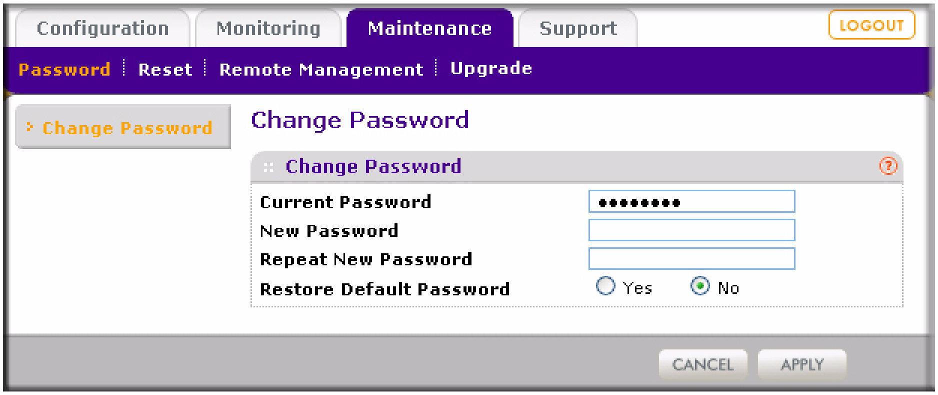
Changing the Administrator Password

The default password for the is **password**. Change this password to a more secure password. You cannot change the user name.

> **Tip:** Be sure to change the wireless access point default password to a very secure password. The ideal password should contain no dictionary words from any language, and should be a mixture of letters (both upper case and lower case), numbers, and symbols. Your password can be up to 30 characters.

To change the password:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Maintenance** > **Password** > **Change Password**. The Change Password screen displays:



Change Password

Change Password

Current Password	●●●●●●●●●
New Password	
Repeat New Password	
Restore Default Password	○ Yes ● No

Figure 4-13

To change the password:

1. Enter the old password.
2. Enter the new password twice.
3. Next to Restore Default Password, select the **No** check box.
4. Click **Apply** to save your change.

To restore the default password:

1. Next to Restore Default Password, select the **Yes** check box.
2. Click **Apply** to save your change.

Remote Management

You can remotely configure, upgrade, and check the status of your wireless access point by using Simple Network Management Protocol (SNMP) or by using the command-line interface (CLI) via a secure shell (SSH) or (secure) Telnet connection.

SNMP Remote Management

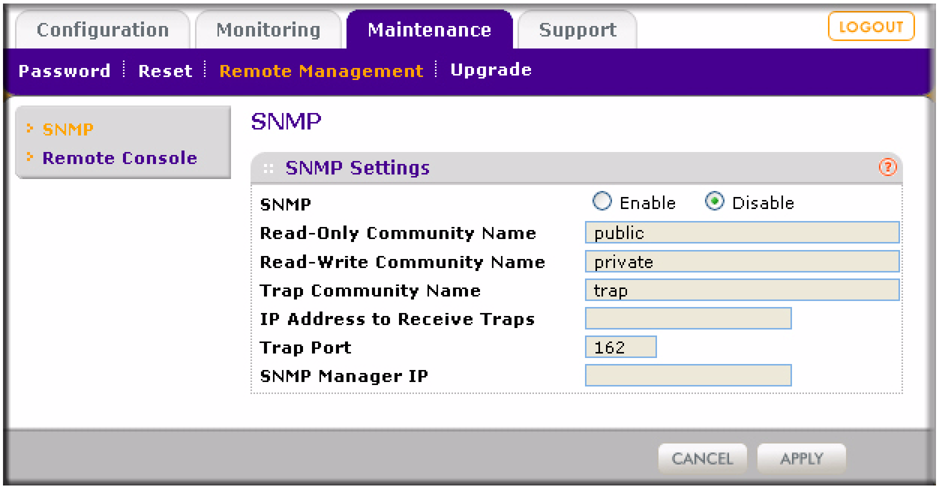
Simple Network Management Protocol (SNMP) forms part of the internet protocol suite as defined by the Internet Engineering Task Force (IETF). SNMP is used in network management systems to monitor network-attached devices for conditions that warrant administrative attention.

SNMP exposes management data in the form of variables on the managed systems, which describe the system configuration. These variables can then be queried (and sometimes set) by managing applications

Enable SNMP to allow SNMP network management software such as HP OpenView to manage the wireless access point via the SNMPv1/v2 protocol.

To enable remote management:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Maintenance** > **Remote Management** > **SNMP**. The SNMP Settings screen displays (see Figure 4-14 on page 4-17).



SNMP

SNMP Settings

SNMP	○ Enable ● Disable
Read-Only Community Name	public
Read-Write Community Name	private
Trap Community Name	trap
IP Address to Receive Traps	
Trap Port	162
SNMP Manager IP	

Figure 4-14

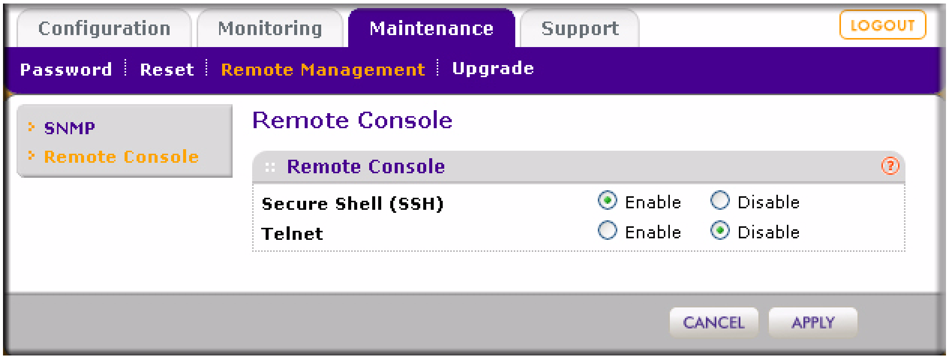
3. Select the **Enable** radio button to enable SNMP remote management.
4. Enter the following information according to the requirements of your location:
   - **Read-Only Community Name**. The community string to allow the SNMP manager to read the MIB objects of the wireless access point. The default setting is public.
   - **Read-Write Community Name**. The community string to allow the SNMP manager to read and write the MIB objects of the wireless access point. The default setting is private.
   - **Trap Community Name**. The community name that is associated with the IP address to receive traps.
   - **IP Address to Receive Traps**. Enter the IP address of the device that should receive the traps that are sent from the wireless access point. If you do not want traps to be sent, leave this field blank.
   - **Trap Port**. The port number where traps will be sent. The default port is 514.
   - **SNMP Manager IP address**. Enter the IP address of the SNMP manager. If this address is set to 255.255.255.255, any SNMP manager will be allowed.
5. Click **Apply** to save your changes.

Remote Console

The remote console lets you enable secure shell (SSH) and (secure) Telnet.

To use the remote console:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Maintenance** > **Remote Management** > **Remote Console**. The Remote Console screen displays:



Remote Console

Remote Console

Secure Shell (SSH) ● Enable ○ Disable

Telnet ○ Enable ● Disable

Figure 4-15

3. Make your selection:
   - **Secure Shell (SSH)**. Select the **Enable** radio button to allow remote access to the wireless access point through secure shell and secure Telnet. The default is Enable.
   - **Telnet**. Select the **Enable** radio button to restrict access to the wireless access point through regular Telnet. The default is Disable.

Using the Secure Telnet Interface

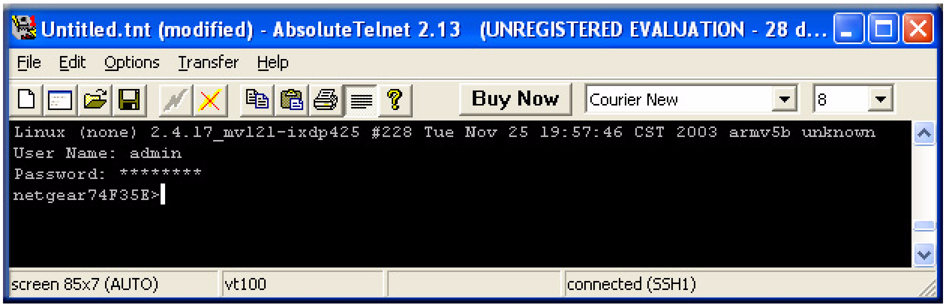
The wireless access point includes a secure Telnet command line interface (CLI). You can access the CLI from a secure Telnet client over the Ethernet port or over the serial console port.

> **Note:** You must use a secure Telnet client such as Absolute Telnet. Also, when you configure the client, use the SSH1, 3DES option. If you use the Telnet client to connect over the Ethernet port, use the IP address of the wireless access point as the host name.

To use the CLI from a console port:

1. Using a null-modem cable, connect a VT100/ANSI terminal or a workstation to the port labeled Console. If you attached a PC, Apple Macintosh, or UNIX workstation, start a secure terminal-emulation program.
2. Configure the terminal-emulation program to use the following settings:
   - Baud rate: 9600 bps
   - Data bits: 8
   - Parity: none
   - Stop bit: 1
   - Flow control: none

   These settings appear below the connector on the back panel.
3. Press **Enter**. A screen similar to the following appears:


Untitled.tnt (modified) - AbsoluteTelnet 2.13 (UNREGISTERED EVALUATION - 28 d...
File Edit Options Transfer Help
Buy Now
Courier New
8
screen 85x7 (AUTO)
vt100
connected (SSH1)

```
Linux (none) 2.4.17_mvl21-ixdp425 #228 Tue Nov 25 19:57:46 CST 2003 armv5b unknown
User Name: admin
Password: ********
netgear74F35E>
```

Figure 4-16

4. Enter the login name and password (**admin** and **password** are the defaults).

   After successful login, the <*Access Point Name*> prompt should appear. In this example, the prompt is netgear74F35E.

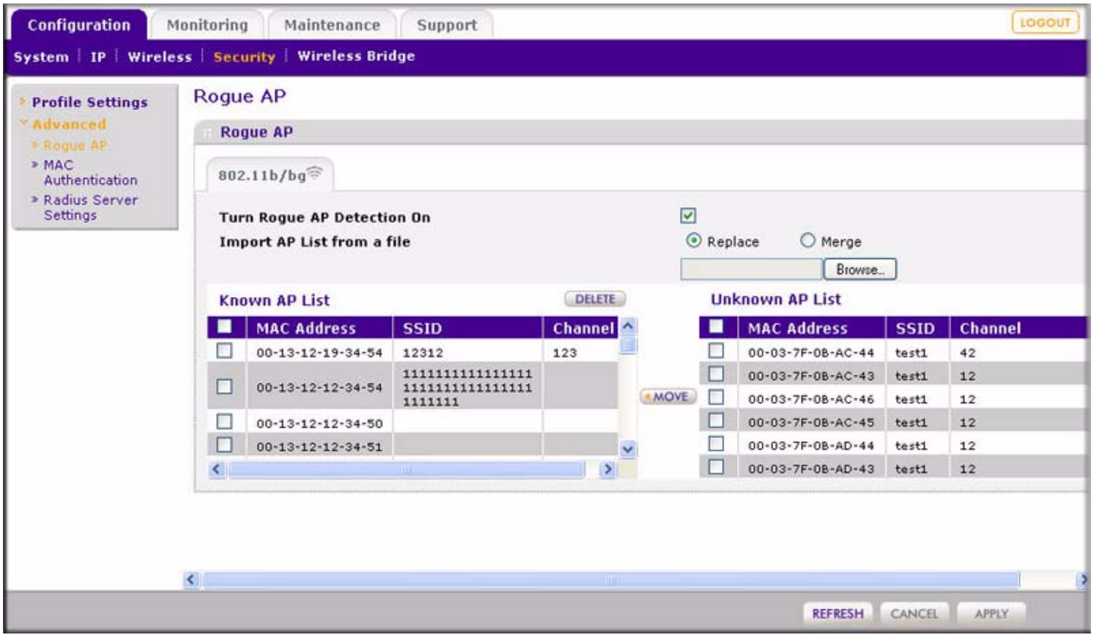
   Enter **help** to display the CLI command help. The CLI commands are listed in Appendix C, “Command Line Reference.”

Enabling Rogue AP Detection

The wireless access point can detect unknown (rogue) APs and wireless stations and can prevent them from connecting to the wireless access point.

To enable rogue AP detection:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Configuration** > **Security** > **Advanced** > **Rogue AP**. The Rogue AP screen displays:



Turn Rogue AP Detection On ☑

Import AP List from a file ● Replace ○ Merge [Browse..]

Known AP List

□	MAC Address	SSID	Channel
□	00-13-12-19-34-54	12312	123
□	00-13-12-12-34-54	1111111111111111 1111111111111111 1111111	
□	00-13-12-12-34-50		
□	00-13-12-12-34-51		

Unknown AP List

□	MAC Address	SSID	Channel
□	00-03-7F-0B-AC-44	test1	42
□	00-03-7F-0B-AC-43	test1	12
□	00-03-7F-0B-AC-46	test1	12
□	00-03-7F-0B-AC-45	test1	12
□	00-03-7F-0B-AD-44	test1	12
□	00-03-7F-0B-AD-43	test1	12

Figure 4-17

3. Select the **Turn Rogue AP Detection On** check box to enable rogue AP detection.
4. Click **Apply** to activate rogue AP detection. The wireless access point continuously scans the wireless network and collects information about all APs detected on its channel.

   There are several other actions you can initiate from the Rogue AP screen. These actions are described in Table 4-3 on page 4-21.

Table 4-3. Rogue AP Screen Actions

Action	Description
Import AP List from a file	See "Importing Rogue APs List from a File" on this page.
Refresh	Under the Unknown AP List, click **Refresh** to discover the APs
Move	Select an AP from the Unknown AP List by selecting the corresponding check box, and then click **Move** to add the AP to the Known AP List.
Delete	Select an AP from the Known AP List by selecting the corresponding check box, and then click **Delete** to remove an AP from the Known AP List.
Apply	Click **Apply** to save your changes.

Importing Rogue APs List from a File

To replace the existing Known AP list:

1. Create a text file that contains the MAC address of each known AP, separated by a space. The following example shows a list of six known APs that an administrator might upload to the wireless access point:

   ```
   00:0c:41:d7:ee:a5 00:0f:b5:92:cd:49 00:12:17:70:85:3d
   00:14:bf:ae:b1:e4 00:40:f4:f8:47:03 00:0c:41:d7:ee:b4
   ```

2. Select one of the following options:
   - Select the **Replace** radio button to replace the existing list of known APs.
   - Select the **Merge** radio button to add the new MAC addresses to the existing list.
3. Click **Browse** and navigate to the location where you saved the text file.
4. Select the file and click **Open**.
5. Click **Apply** to upload the list to the wireless access point.

Chapter 5
Advanced Configuration

This chapter describes how to configure the advanced features of your WG103 ProSafe 802.11g Wireless Access Point. These features can generally be found under Advanced under the main options of the Configuration tab such as System, Wireless, and Security (as an example, see Figure 5-1 on page 5-2).

This chapter includes:

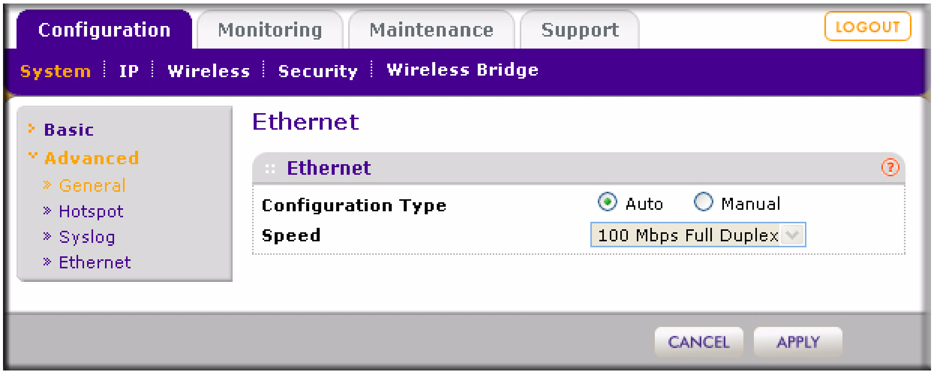
- "Ethernet Link Configuration" on this page.
- "Hotspot Settings" on page 5-2. This section describes how to redirect HTTP requests.
- "802.1Q VLAN Settings" on page 5-3
- "Configuring Advanced Wireless LAN Settings" on page 5-5
- "Configuring Advanced QoS Settings" on page 5-6. This section describes how to configure station and access point Enhanced Distributed Channel Access (EDCA) settings.
- "Wireless Bridging and Repeating" on page 5-9

Ethernet Link Configuration

The Ethernet link configuration settings allow you to select or set the type of Ethernet link for the wireless access point.

To configure Ethernet links:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Configuration** > **System** > **Advanced** > **Ethernet**. The Ethernet settings screen displays (see Figure 5-1 on page 5-2).



Ethernet

Ethernet

Configuration Type ● Auto ○ Manual

Speed 100 Mbps Full Duplex

Figure 5-1

3. Select the **Configuration Type**. Select automatic or manual configuration:
   - **Auto**. Detects and sets the speed and type of the Ethernet link automatically.
   - **Manual**. Lets you select from four different speeds and types:

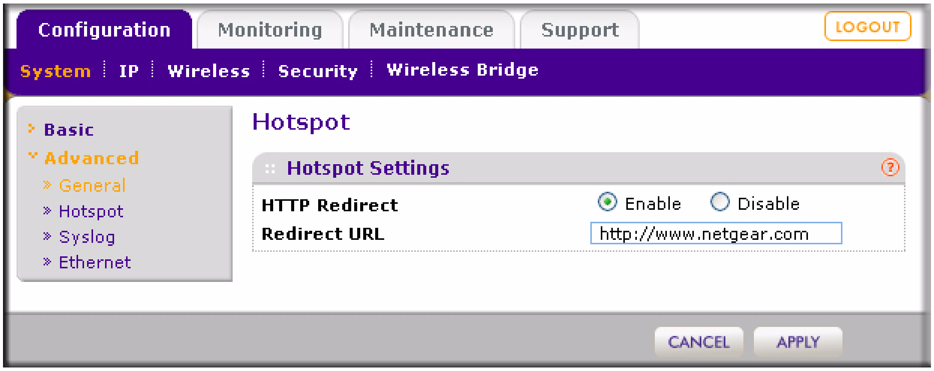
     If you make this selection, you must set the **Speed**. Select one of the following speeds: 10Mbps Half Duplex, 10Mbps Full Duplex, 100Mbps Half Duplex, or 100Mbps Full Duplex.
4. Click **Apply** to save your settings.

Hotspot Settings

If you want the wireless access point to capture and redirect the first HTTP (TCP, port 80) request, use this feature. For example, a hotel might want to direct all wireless connections to its server to start a billing transaction, or an ISP might want to direct wireless connections to a login page.

To configure hotspots:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Configuration** > **System** > **Advanced** > **Hotspots**. The Hotspots settings screen displays (see Figure 5-2 on page 5-3).



Hotspot

Hotspot Settings

HTTP Redirect ● Enable ○ Disable

Redirect URL http://www.netgear.com

Figure 5-2

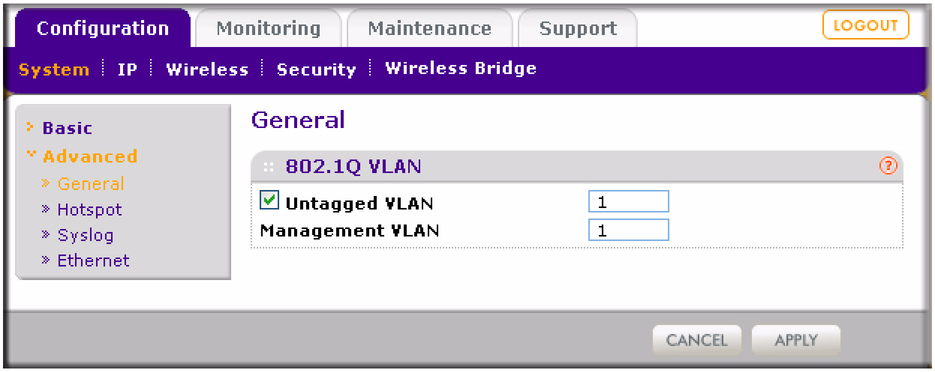
3. Enter the following settings:
   - **HTTP Redirect,**. Select the **Enable** radio button to redirect a HTTP request.
   - **Redirect URL**. Enter the URL to which the HTTP request must be redirected.
4. Click **Apply** to save your settings. The Hotspot feature is now enabled and the first HTTP request will be redirected to the supplied URL.

802.1Q VLAN Settings

The 802.1Q VLAN protocol on the wireless access point logically separates traffic on the same physical network.

To configure VLAN settings:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Configuration** > **System** > **Advanced** > **General**. T802.1Q VLAN settings screen displays (see Figure 5-3 on page 5-4).



General

802.1Q VLAN

☑ Untagged VLAN 1

Management VLAN 1

Figure 5-3

3. Make selections from the following options:

    - **Untagged VLAN**. When checked, this option allows one VLAN to be configured as an “untagged VLAN.” When the wireless access point sends frames associated with the untagged VLAN out the LAN (Ethernet) interface, those frames will be untagged. When the wireless access point receives untagged traffic from the LAN (Ethernet) interface, those frames are assigned to the untagged VLAN.

      When unchecked, the wireless access point tags all outgoing LAN (Ethernet) frames, and only accepts incoming frames that are tagged with known VLAN IDs.

➡	**Note:** The Untagged VLAN checkbox should only be unchecked if the hubs or switches on your LAN support the VLAN (802.1Q) standard. Likewise, the Untagged VLAN value should only be changed if the hubs/switches on your LAN support the VLAN (802.1Q) standard. Changing either of these values will result in a loss of IP connectivity if the hubs and switches on your network have not yet been configured with the corresponding VLANs.

- **Management VLAN.** Management VLANs are used for managing traffic (Telnet, SNMP, and HTTP) to and from the wireless access point.

  Frames belonging to the Management VLAN are not given any 802.1Q header when sent over the trunk. If a port is in a single VLAN, it can be untagged. But if the port needs to be a member of multiple VLANs, it must be tagged.

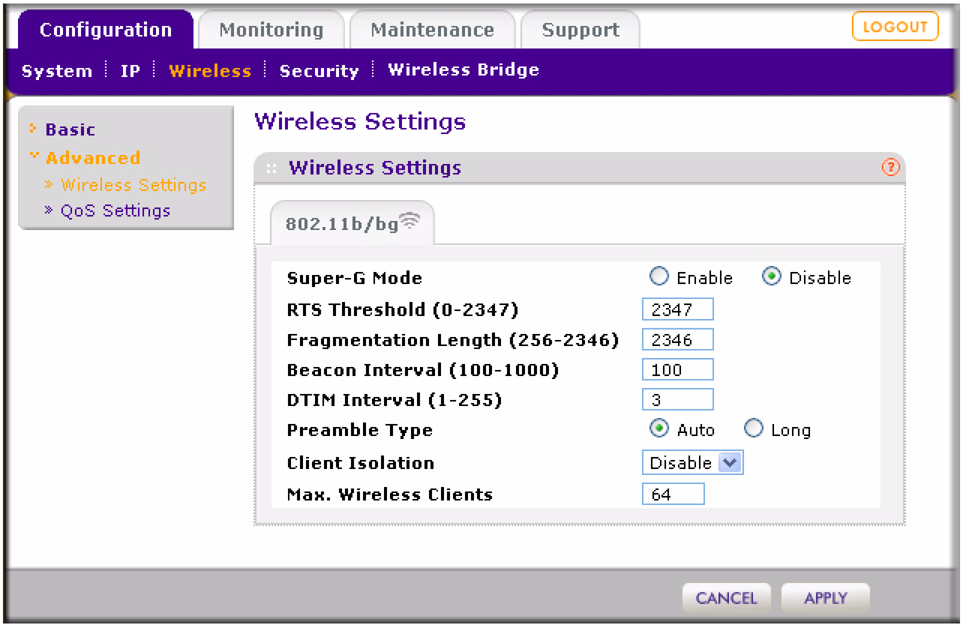
4. Click **Apply** to save your settings.

Configuring Advanced Wireless LAN Settings

The advanced wireless settings normally do not need to be changed. The default advanced wireless LAN settings usually work well. If you want the wireless access point to operate in Super-G mode, use this feature.

To change the wireless access point’s advanced wireless settings:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Configuration** > **Wireless** > **Advanced** > **Wireless Settings**. The Wireless Settings screen displays:



Wireless Settings

Wireless Settings

Super-G Mode	○ Enable ● Disable
RTS Threshold (0-2347)	2347
Fragmentation Length (256-2346)	2346
Beacon Interval (100-1000)	100
DTIM Interval (1-255)	3
Preamble Type	● Auto ○ Long
Client Isolation	Disable
Max. Wireless Clients	64

Figure 5-4

3. Make selections from the following options:
   - **Super-G Mode**. Super-G mode is a proprietary extension to the 802.11g standard, which can double the throughput to 108 Mbps. Only compatible wireless stations can use this mode. To select this mode, select the **Enable** radio button. Super-G mode is disabled by default.

- **RTS Threshold**. (Request to Send Threshold.) The packet size that is used to determine if it should use the Carrier Sense Multiple Access with Collision Detection mechanism (CSMA/CD) or the CSMA/CA mechanism for packet transmission. With CSMA/CD, the transmitting station sends the packet as soon as it has waited for the silence period. With CSMA/CA, the transmitting station sends an RTS packet to the receiving station, and waits for the receiving station to send back a Clear to Send (CTS) packet before sending the packet data. The default is 2347.
- **Fragmentation Length**. This is the maximum packet size used for fragmentation. Packets larger than this size will be fragmented. The Fragment Threshold value must be larger than the RTS Threshold value. The default is 2346.
- **Beacon Interval**. The interval time (between 100ms and 1000ms) for each beacon transmission. The default is 100.
- **DTIM Interval**. The Delivery Traffic Indication Message (DTIM) specifies the data beacon rate between 1 and 255. The default is 3.
- **Preamble Type**. Select one of the following radio buttons:
  - **Auto**. A short transmit preamble gives better performance. Auto automatically handles both long and short preambles. The default setting is Auto.
  - **Long**. A long transmit preamble may provide a more reliable connection or slightly longer range.
- **Client Isolation**. If enabled, wireless clients with different SSIDs will not be able to communicate with one another. Client isolation affects only the communication between the clients of different virtual access points (VAPs). From the pull-down menu, select one of the following options:
  - **Disable**. Allows unicast, multicast, and broadcast traffic between all wireless stations.
  - **Enable**. Blocks unicast, multicast, and broadcast traffic between all wireless stations.
- **Max. Wireless Clients**. The maximum number of wireless clients that can associate. The default is 64. If set to zero, any number of clients can connect.

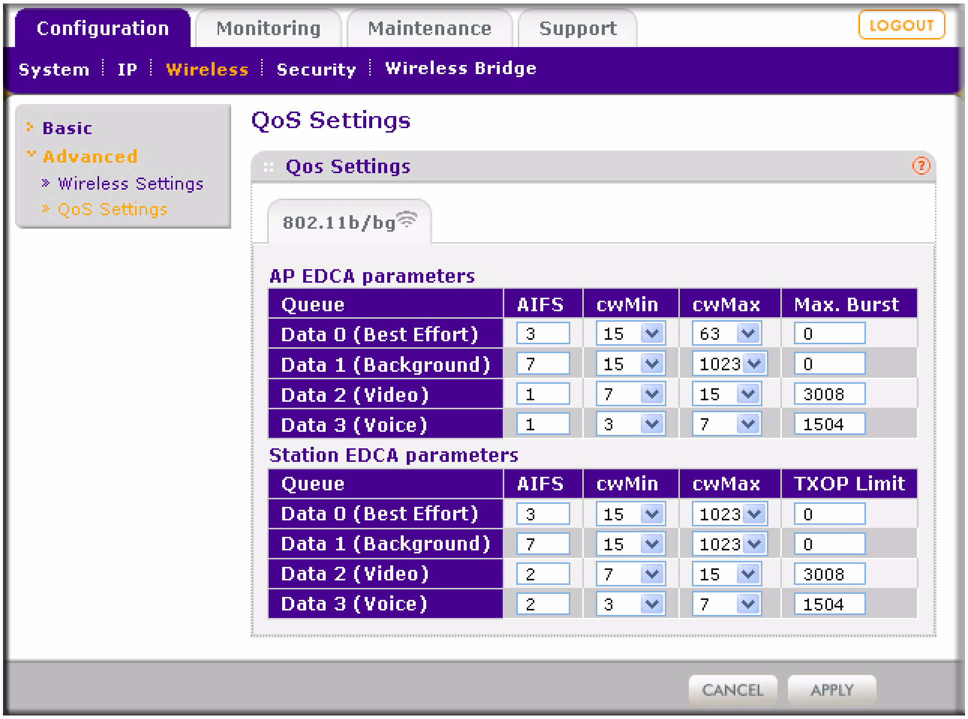
4. Click **Apply** to save your settings.

Configuring Advanced QoS Settings

Wi-Fi Multimedia (WMM) is a subset of the 802.11e standard. WMM allows Quality of Service (QoS) for wireless traffic; depending on the type of data. a range of priorities can be set. Time-dependent information, such as video or audio, has a higher priority than normal traffic. For WMM to function correctly, Wireless clients must also support WMM.

To configure advanced QoS:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. **Select Configuration** > **Wireless** > **Advanced** > **QoS Settings**. The QoS Settings screen displays:



AP EDCA parameters

Queue	AIFS	cwMin	cwMax	Max. Burst
Data 0 (Best Effort)	3	15	63	0
Data 1 (Background)	7	15	1023	0
Data 2 (Video)	1	7	15	3008
Data 3 (Voice)	1	3	7	1504

Station EDCA parameters

Queue	AIFS	cwMin	cwMax	TXOP Limit
Data 0 (Best Effort)	3	15	1023	0
Data 1 (Background)	7	15	1023	0
Data 2 (Video)	2	7	15	3008
Data 3 (Voice)	2	3	7	1504

Figure 5-5

For most networks, the default QoS queue parameter settings work well. QoS provides you with the ability to specify parameters on multiple queues for increased throughput and better performance of differentiated wireless traffic, like Voice-over-IP (VoIP), other types of audio, video, and streaming media, as well as traditional IP data.

3. Configure the QoS options. Table 5-1 describes the settings for the QoS queues.
   - **AP EDCA Parameters.** Specify the Access Point (AP) Enhanced Distributed Channel Access (EDCA) parameters for different types of data transmitted from the wireless access point to the wireless client.

- **Station EDCA Parameters.** Specify the Station EDCA parameters for different types of data transmitted from the wireless client to the wireless access point. If WMM is disabled, you cannot configure Station EDCA parameters (see "Configure Basic QoS Settings" on page 2-11).

4. Click **Apply** to save your settings.

Table 5-1. QoS Queues and Settings

QoS Queue	Description
Data 0 (Best Effort)	Lowest priority queue, high throughput. Bulk data that requires maximum throughput and is not time-sensitive is sent to this queue (FTP data, for example).
Data 1 (Background)	Medium priority queue, medium throughput and delay. Most traditional IP data is sent to this queue.
Data 2 (Video)	High priority queue, minimum delay. Time-sensitive video data is automatically sent to this queue.
Data 3 (Voice)	High priority queue, minimum delay. Time-sensitive data such as VoIP and streaming media are automatically sent to this queue.
AIFS (Arbitration Inter-Frame Space)	Specifies a wait time (in milliseconds) for data frames. Valid values for AIFS are 1 through 255.
cwMin (Minimum Contention Window)	Upper limit (in milliseconds) of a range from which the initial random backoff wait time is determined. Valid values for the "cwmin" are 1, 3, 7, 15, 31, 63, 127, 255, 511, or 1024. The value for cwMin must be lower than the value for cwMax.
cwMax (Maximum Contention Window)	Upper limit (in milliseconds) for the doubling of the random backoff value. Valid values for the "cwmax" are 1, 3, 7, 15, 31, 63, 127, 255, 511, or 1024. The value for cwMax must be higher than the value for cwMin.
Max. Burst Length (AP EDCA parameters only)	Specifies in milliseconds the Maximum Burst Length allowed for packet bursts on the wireless network. A packet burst is a collection of multiple frames transmitted without header information. Valid values for maximum burst length are 0.0 through 999.9.
TXOP Limit (Station EDCA parameters only)	Specifies in milliseconds the Transmission Opportunity (TXOP) for a client station to initiate transmissions on the wireless medium (WM). Decreasing this value increases the priority of the queue. Valid values for the maximum TXOP limit are 0.0 through 999.9.

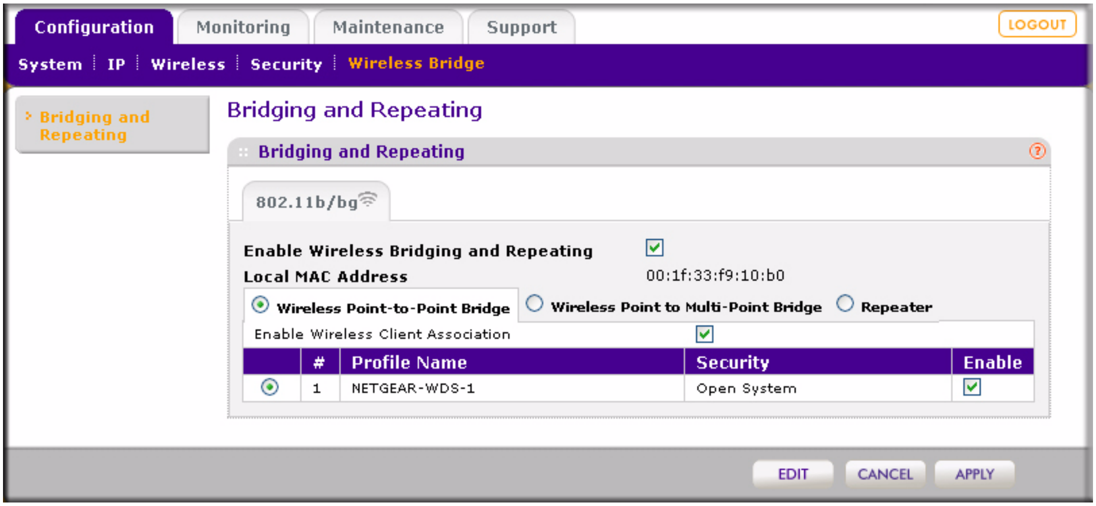
Wireless Bridging and Repeating

The wireless access point lets you build large bridged wireless networks. Examples of wireless bridged configurations are:

- **Point-to-point bridge**. The wireless access point communicates with another bridge-mode wireless access point. See "How to Configure Point-to-Point Bridge Mode" on page 5-10.
- **Multi-point bridge**. The wireless access point is the "master" for a group of bridge-mode wireless access points. Then all traffic is sent to this "master," rather than to the other wireless access points. See "How Configure Point to Multi-Point Bridge Mode" on page 5-11.
- **Repeater**. The wireless access point sends all traffic to the remote AP. See "How to Configure Repeater Mode" on page 5-13.

To display the bridging and repeating functions:

1. Log in to the wireless access point at its default LAN address of **http://192.168.0.229** with its default user name of **admin** and default password of **password**, or using whatever password and LAN address you have chosen for the wireless access point.
2. Select **Configuration** > **Wireless Bridge**. The Bridging and Repeating screen displays (see Figure 5-6 on page 5-9).



Bridging and Repeating

Bridging and Repeating

Enable Wireless Bridging and Repeating ☑

Local MAC Address 00:1f:33:f9:10:b0

● Wireless Point-to-Point Bridge ○ Wireless Point to Multi-Point Bridge ○ Repeater

Enable Wireless Client Association ☑

	#	Profile Name	Security	Enable
●	1	NETGEAR-WDS-1	Open System	☑

Figure 5-6

How to Configure Point-to-Point Bridge Mode

In point-to-point (P2P) bridge mode, the wireless access point communicates with another bridge-mode wireless station. Use wireless security to protect this communication. The following figure shows an example in which two wireless access points (APs) function in point-to-point bridge mode.

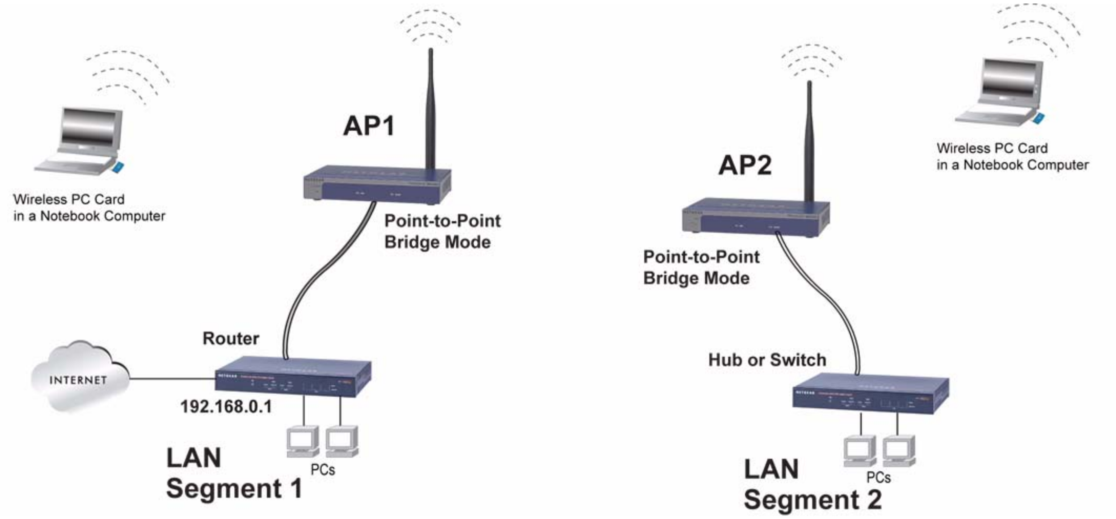


Figure 5-7

To set up a point-to-point bridge configuration.

1. Configure point-to-point bridge mode from the Bridging and Repeating screen of the wireless access point (AP1 on LAN Segment 1 in Figure 5-7 on page 5-10):
   a. Select the **Enable Wireless Bridging and Repeating** check box.
   b. Select the **Wireless Point-to-Point Bridge** radio button.
   c. As an option, you can enable wireless client associations with the wireless access point. Associate the wireless access point with wireless clients from the table with wireless clients by selecting the corresponding check boxes in the Enable column.
   d. Click **Edit** to open the Edit Security Profile screen and enter the MAC address of the corresponding bridge-mode wireless access point (AP2 on LAN Segment 2 in Figure 5-7 on page 5-10) in the Remote MAC Address field.
   e. WEP, WPA-PSK, and WPA2-PSK are supported. NETGEAR recommends that you use WPA2-PSK to protect this communication.
   f. Click **Apply** to save your settings.

2. Configure the other wireless access point (AP2 on LAN Segment 2 in Figure 5-7 on page 5-10) in point-to-point bridge mode.

   AP 1 must have AP 2's MAC address in its Remote MAC Address field and AP 2 must have AP 1's MAC address in its Remote MAC Address field.

3. Configure and verify the following for both wireless access points:
   - Verify the LAN network configuration of the wireless access points. Both must be configured to operate in the same LAN network address range as the LAN devices.
   - Both wireless access points must use the same ESSID, channel, authentication mode, and security settings.

4. Verify connectivity across LAN 1 and LAN 2.

   A computer on either LAN segment should be able to connect to the Internet or share files and printers of any other computers or servers connected to LAN Segment 1 or LAN Segment 2.

How Configure Point to Multi-Point Bridge Mode

Set up a point to multi-point (P2MP) bridge only if the wireless access point (the WG103) is the "master" for a group of bridge-mode wireless access points. Then all traffic is sent to this "master," rather than to the other wireless access points. Up to four profiles can be configured.

The following figure shows an example of a (point to) multi-point bridge mode configuration.

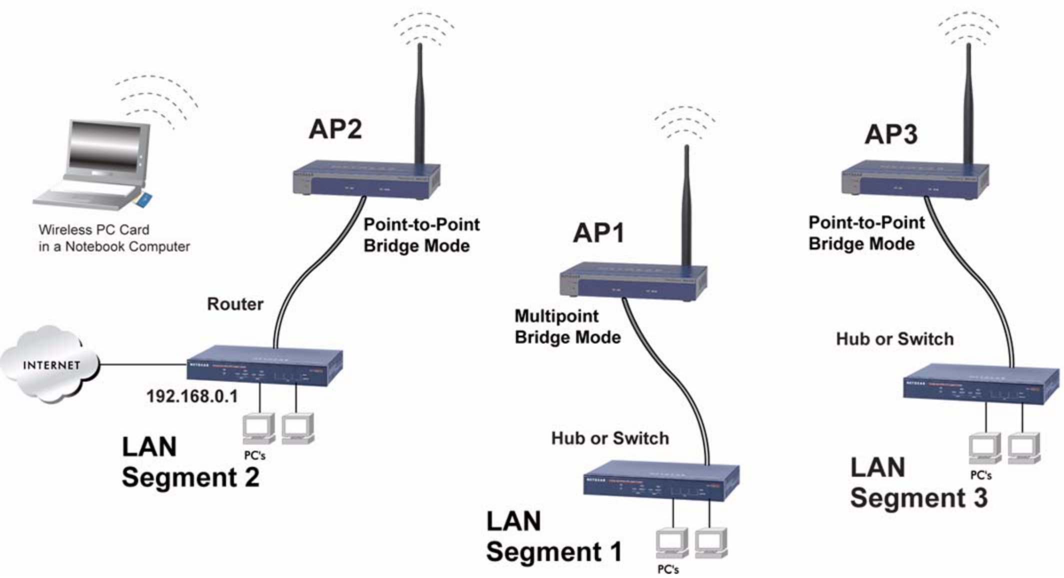


Figure 5-8

To set up the point to multi-point bridge configuration:

1. Configure point-to-point bridge mode from the Bridging and Repeating screen of the wireless access point (AP1 on LAN Segment 1 in Figure 5-8):
   a. Select the **Enable Wireless Bridging and Repeating** check box.
   b. Select the **Wireless Point-to-Multipoint Bridge** radio button.
   c. Click **Edit** to open the Edit Security Profile screen and enter the MAC addresses of the corresponding wireless access point (AP 2 on LAN Segment 2 and AP 3 on LAN Segment 3 in Figure 5-8) in the Remote MAC Address field.
   d. WEP, WPA-PSK, and WPA2-PSK are supported. NETGEAR recommends that you use WPA2-PSK to protect this communication.
   e. Click **Apply** to save your settings.
2. Configure AP 2 on LAN Segment 2 (see Figure 5-8) in point-to-point bridge mode with the remote MAC address of AP 1.
3. Configure AP 3 on LAN Segment 3 (see Figure 5-8 on page 5-11) in point-to-point bridge mode with the remote MAC address of AP 1.
4. Verify the following for all wireless access points:
   - The LAN network configuration of the wireless access points are configured to operate in the same LAN network address range as the LAN devices.
   - Only AP 1 on LAN Segment 1 is configured in point-to-multi-point bridge mode, and all others APs are configured in point-to-point bridge mode.
   - All point-to-point APs must have AP 1’s MAC address in their Remote AP MAC address field.
   - All APs must be on the same LAN. That is, the LAN IP addresses of all APs must be in the same network.
   - If using DHCP, all wireless access points should be set to obtain an IP address automatically (as a DHCP client). For more information, see “Configure Basic IP Settings” on page 2-7.
   - All wireless access points must use the same ESSID, channel, authentication mode, and security settings.
5. Verify connectivity across the LANs:
   - A computer on any LAN segment should be able to connect to the Internet or share files and printers with any other PCs or servers connected to any of the three LAN segments.

- Wireless stations will not be able to connect to any wireless access points in this configuration (see Figure 5-8 on page 5-11). If you require wireless stations to access any LAN segment, you can use additional wireless access points configured in regular access point mode to any LAN segment.

➡	**Note:** You can extend this multi-point bridging configuration by adding additional wireless access points that are configured in point-to-point mode for each additional LAN segment. Furthermore, you can extend the range of the wireless network with NETGEAR wireless antenna accessories.

How to Configure Repeater Mode

Select this option to enable the wireless access point to operate as a repeater only without communication with other wireless clients. All traffic is sent to the remote or “downstream” wireless access point. Up to four profiles can be configured.

The following figure shows an example of a repeater mode configuration.

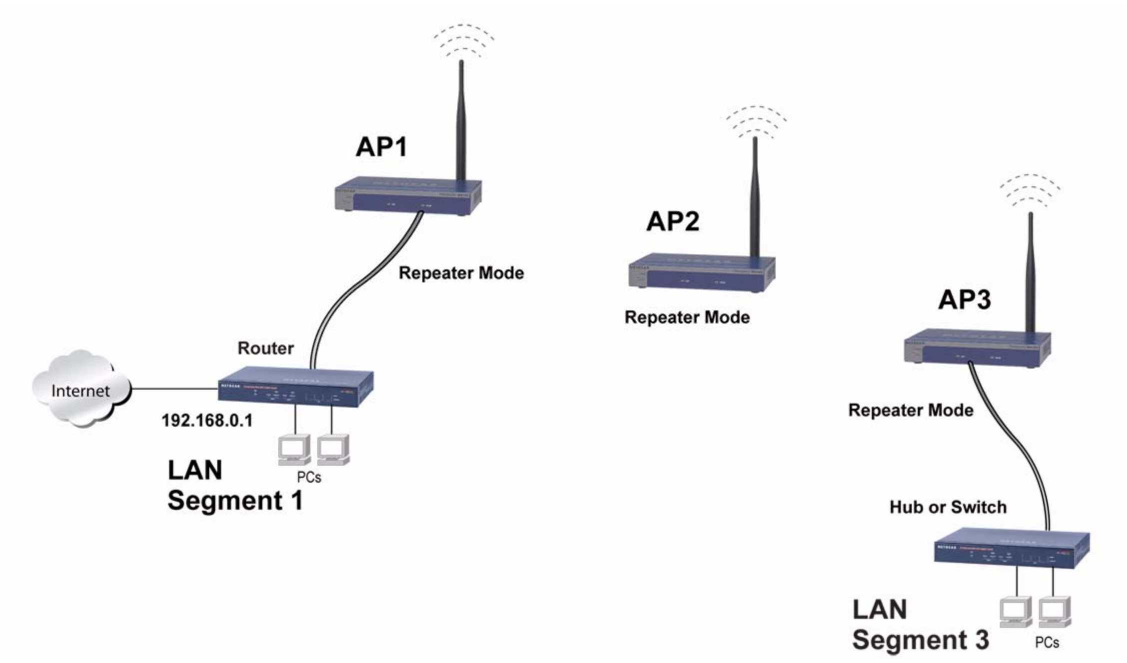


Figure 5-9

To configure a LAN segment using the wireless access point in repeater mode:

1. Configure repeater mode from the Bridging and Repeating screen of the wireless access point (AP 1 on LAN Segment 1 in Figure 5-9):
   a. Select the **Enable Wireless Bridging and Repeating** check box.
   b. Select the **Repeater** radio button.
   c. Click **Edit** to open the Edit Security Profile screen and enter the MAC addresses of the “downstream” wireless access point (AP 2 in Figure 5-9) in the Remote MAC Address field.
   d. WEP, WPA-PSK, and WPA2-PSK are supported. NETGEAR recommends that you use WPA2-PSK to protect this communication.
   e. Click **Apply** to save your settings.
2. Configure AP 2 in repeater mode with the MAC address of the “upstream” wireless access point (AP 1).
3. Verify the following for all wireless access points:
   - The LAN network configuration of the wireless access points are configured to operate in the same LAN network address range as the LAN devices.
   - All APs must be on the same LAN. That is, the LAN IP addresses of all APs must be in the same network.
   - If using DHCP, all wireless access points should be set to obtain an IP address automatically (as a DHCP client). For more information, see “Configure Basic IP Settings” on page 2-7.
   - All wireless access points must use the same ESSID, channel, authentication mode, and security settings.
4. Verify connectivity across the LAN.

Note: Wireless stations will not be able to connect to any wireless access point that functions in repeater mode.

Note: You can extend the repeating functionality by adding up to two more wireless access points that are configured in repeater mode. However, since repeaters communicate in half-duplex mode, the bandwidth decreases as you add repeaters to the network. Also, you can extend the range of the wireless network with NETGEAR wireless antenna accessories.

Chapter 6
Troubleshooting

This chapter provides information about troubleshooting your WG103 ProSafe 802.11g Wireless Access Point. After each problem description, instructions are given to help you diagnose and solve the problem. For the common problems listed, go to the section indicated.

- Is the wireless access point on?

  Go to "Basic Functioning" on this page.

- Have I connected the wireless access point correctly?

  Go to "Basic Functioning" on this page.

- I cannot access the Internet or the LAN.

  Go to "You Cannot Access the Internet or the LAN from a Wireless-Capable Computer" on page 6-3.

- I cannot access the wireless access point from a browser.

  Go to "You Cannot Configure the Wireless Access Point from a Browser" on page 6-4.

- A time-out occurs.

  Go to "When You Enter a URL or IP Address a Time-out Error Occurs" on page 6-5.

- I cannot remember the wireless access point's configuration password.

  Go to "Changing the Administrator Password" on page 4-15.

- I want to clear the configuration and start over again.

  Go to "Using the Reset Button to Restore Factory Default Settings" on page 6-5.

Basic Functioning

After you turn on power to the wireless access point, the following sequence of events should occur:

- The power LED (PWR) should be lit.
- The test LED (TEST) should blink.

- The LAN LED (LAN) should be lit (amber for a 10 Mbps connection and green for a 100 Mbps connection).

If any of these conditions do not occur, see to the appropriate following section.

No LEDs are Lit on the Wireless Access Point

It takes a few seconds for the power LED (PWR) to light up. Wait a minute and check the power LED status on the wireless access point. If the wireless access point has no power:

- Make sure the power cord is connected to the access point and plugged in to a working power outlet or power strip. If it is plugged directly into the wall, verify that it is not a switched outlet.
- Make sure you are using the correct NETGEAR power adapter supplied with your wireless access point.

The LAN LED is Not Lit

There is a hardware connection problem. Check these items:

- Make sure the cable connectors are securely plugged in at the wireless access point and the network device (hub, switch, or router). A switch, hub, or router must be installed between the wireless access point and the Ethernet LAN or broadband modem.
- Make sure the connected device is turned on.
- Be sure the correct cable is used. Use a standard Category 5 Ethernet patch cable. If the network device has Auto Uplink™ (MDI/MDIX) ports, you can use either a crossover cable or a normal patch cable.

The Wireless LAN Activity LED Does Not Light Up

The wireless access point’s antennae are not working.

- If the Wireless LAN (WLAN) activity LED stays off, disconnect the adapter from its power source and then plug it in again.
- Make sure the antennas are tightly connected to the wireless access point.
- Contact NETGEAR if the WLAN light remains off while the wireless access point is transmitting or receiving data.

The Test LED Remains Amber

There is a system fault or a firmware upgrade failure.

- Reload or upgrade the firmware (see "Upgrading the Wireless Access Point Firmware" on page 4-5).
- Contact NETGEAR if the Test LED remains amber after you have upgraded the firmware.

You Cannot Access the Internet or the LAN from a Wireless-Capable Computer

There is a configuration problem. Check the following:

- You may not have restarted the computer with the wireless adapter to allow TCP/IP changes take effect. Restart the computer.
- The computer with the wireless adapter may not have the correct TCP/IP settings to communicate with the network. Restart the computer and check that TCP/IP is set up properly for that network. The usual setting for Windows the Network Properties is set to "Obtain an IP address automatically."
- The wireless access point's default values may not work with your network. Check the wireless access point default configuration against the configuration of other devices in your network.
- Make sure that the SSID, network authentication, and data encryption settings of the computer with the wireless adapter are same as those of the wireless access point.
- Ping the IP address of the wireless access point to verify that there is a wireless connection between the computer with the wireless adapter and the wireless access point. If the ping fails, check the network configuration.
- Ping the default gateway to verify that there is a path from the computer with the wireless adapter to the default gateway. If the ping fails, check the network configuration or call the Internet service provider (ISP).

You Cannot Configure the Wireless Access Point from a Browser

Check the following:

- The wireless access point is properly installed, LAN connections are OK, and it is powered on. Check that the LAN port LED is on (amber indicating a 10 Mbps Ethernet connection or green indicating a 100 Mbps Ethernet connection) to verify that the Ethernet connection is OK.
- If you are using the NetBIOS name of the wireless access point to connect, ensure that your computer and the wireless access point are on the same network segment or that there is a WINS server on your network.
- If your computer uses a fixed (static) IP address, ensure that it is using an IP address in the range of the wireless access point. The wireless access point default IP address is 192.168.0.229 and the default subnet mask is 255.255.255.0. The wireless access point default setting is for a static IP address. If the network where you are connecting it is using DHCP, configure it accordingly (see “Configure Basic IP Settings” on page 2-7).
- Make sure that your browser has Java, JavaScript, or ActiveX enabled. If you are using Internet Explorer, click Refresh to be sure that the Java applet is loaded.
- Try quitting the browser and launching it again.
- Make sure that you are using the correct login information. The factory default login name is **admin**, and the password is **password**. Make sure that Caps Lock is off when entering this information.

If the wireless access point does not save changes you have made in the Web configuration interface, check the following:

- When entering configuration settings, be sure to click the **Apply** button before moving to another screen or tab, or your changes are lost.
- Click the Refresh or Reload button in the Web browser. The changes might have occurred, but the Web browser might be caching the old configuration.

When You Enter a URL or IP Address a Time-out Error Occurs

A number of things could be causing this. Try the following troubleshooting steps.

- Check whether other computers on the LAN work. If they do, ensure that your computer's TCP/IP settings are correct. If you use a fixed (static) IP address, check the subnet mask, default gateway, DNS, and IP addresses. (see "Configure Basic IP Settings" on page 2-7).
- If the computers are configured correctly, but still not working, ensure that the wireless access point is connected and turned on. Connect to it and check its settings. If you cannot connect to the wireless access point, check the LAN and power connections.
- If the wireless access point is configured correctly, check your Internet connection (for example, your cable modem) to make sure that it is working correctly.

Using the Reset Button to Restore Factory Default Settings

The Reset button (see "Rear Panel" on page 1-6) has two functions:

- **Reboot**. When pressed and released, the wireless access point reboots (restarts).
- **Reset to Factory Defaults**. When pressed and held down, it clears all data and restores all settings to the factory default values.

To clear all data and restore the factory default values:

1. Press the Reset button until the LEDs blink twice, usually more than five seconds.
2. Release the Reset button. The factory default configuration has now been restored, and the wireless access point is ready for use.

Appendix A
Technical Specifications

This appendix provides technical specifications and factory default settings for the WG103 ProSafe 802.11g Wireless Access Point.

General Specifications

Specification	Description
Network Management	• Web-based configuration and status monitoring • Remote console using the CLI • SNMP support.
Maximum Clients	Limited by the amount of wireless network traffic generated by each node; typically 15 to 20 nodes.
Status LEDs	Power/Ethernet LAN/Wireless LAN/Test
Power Adapter	12V DC, 1 A
Electromagnetic Compliance	FCC Part 15 Class B, CE, C-TICK
Physical Specifications	Dimensions (length x width x height): 158 mm x 101 mm x 29 mm [6.22 in. x 3.98 in. x 1.14 in.]
	Weight: 402.5 g [0.89 lbs]
Environmental Specifications	Operating temperature: 0 to 45° C Operating humidity: 10-90%, non-condensing
Data Encoding	802.11b: 1 and 2 Mbps, Direct Sequence Spread Spectrum (DSSS) 802.11b: 5.5 and 11 Mbps, Complementary Code Keying (CCK) 802.11g: All rates, Orthogonal Frequency Division Multiplexing (OFDM)
Maximum Computers Per Wireless Network	Limited by the amount of wireless network traffic generated by each node. Typically 30-70 nodes.
802.11b and g Radio Data Rate	1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54, and 108 Mbps (Auto-rate capable)
802.11b and g Operating Frequencies and Channels	2.412 ~ 2.462 GHz (North America), Channels 1-11 2.412 ~ 2.472 GHz (Europe including France and Spain, and Japan), Channels 1-13
Antenna	One (1) external 5 dBi 2.4 GHz detachable antenna
802.11 Security	40-bits (also called 64-bits), 128, and 152-bits WEP data encryption; WPA and WPA2

Default Factory Settings

When you first receive your wireless access point, the default factory settings are set as shown below. You can restore these defaults with the Reset button on the rear panel (see "Rear Panel" on page 1-6).

Feature	Factory Default Settings
User Name (case sensitive)	admin
Password (case sensitive)	password
Operating Mode	Access Point
Access Point Name	netgearxxxxx8 where xxxxx are the last five digits of the wireless access point's MAC address
Built-in DHCP client	DHCP client disabled, it uses the default IP address
IP Configuration	IP Address: 192.168.0.229 Subnet Mask: 255.255.255.0 Gateway: 0.0.0.0
Network Name (SSID)	NETGEAR
Broadcast Network Name (SSID)	Enabled
Super-G Mode	Disabled
WEP/WPA	Disabled
MAC Access Control	Disabled
Restricting connectivity based on MAC Access Control List	Disabled
Time Zone	USA-Pacific
SNMP	Disabled
VLAN (802.1Q)	Disabled
WMM Support	Enabled
WMM Power Save	Enabled

Appendix B
Related Documents

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

Document	Link
ITCP/IP Networking Basics	*http://documentation.netgear.com/reference/enu/tcpip/index.htm*
Wireless Networking Basics	*http://documentation.netgear.com/reference/enu/wireless/index.htm*
Preparing Your Network	*http://documentation.netgear.com/reference/enu/wsdhcp/index.htm*
Virtual Private Networking Basics	*http://documentation.netgear.com/reference/enu/vpn/index.htm*
Glossary	*http://documentation.netgear.com/reference/enu/glossary/index.htm*

Appendix C
Command Line Reference

The WG103 ProSafe 802.11g Wireless Access Point (AP) can be configured either through the command line interface (CLI), a Web browser, or a MIB browser. The CLI allows viewing and modification of the configuration from a terminal or PC through a telnet connection.

Command Set

```
KEYWORD                                DESCRIPTION
-------------------------------------- ----------------------
|-backup-configuration                 --backup configuration
|-config>                              --configuration setting
| |-apname                             --access point name
| |-country                            --country/region
| |-dhcp>                              --DHCP server
| | |-dns-server                       --DNS server
| | |-gateway                          --default gateway
| | |-ip-address                       --IP range
| | |-lease-time                       --lease time
| | |-status                           --status
| | |-subnet-mask                      --subnet mask
| | |-wins-server                      --WINS server
| |
| |-http-redirect                      --enable HTTP redirection
| |-http-redirect-url                  --HTTP redirection URL
| |-interface>                         --select wireless lan interface
| | |-wlan>                            --wireless LAN interface setting
| | | |-2.4GHz>                        --2.4 GHz wireless LAN interface setting
| | | | |-aggregation-length           --aggregated packet size
| | | | |-ampdu                        --aggregated MAC Protocol Data Unit
| | | | |-beacon-interval              --wireless beacon period in TU(1024 us)
| | | | |-channel                      --wireless channel (depends on country
| | | | |                                 and wireless mode)
| | | | |-channelwidth                 --wireless channel width
| | | | |-dtim-interval                --wireless DTIM period in beacon interval
| | | | |-extension-protection-spacing --wireless extension protection spacing
| | | | |-fragmentation-length         --wireless fragmentation threshold(even
| | | | |                                 only)
| | | | |-guardinterval                --interval (from interference from other
| | | | |                                 transmissions)
| | | | |-knownap-add                  --add known access point
| | | | |-knownap-del                  --delete known access point
| | | | |-macacl-add                   --add wireless access control (ACL)
| | | | |-macacl-database              --delete wireless access control (ACL)
| | | | |                                 database
| | | | |-macacl-del                   --delete wireless access control (ACL)
| | | | |-mcsrate                      --transmit data rate
| | | | |-mode                         --enable wireless access control (ACL)
| | | | |-operation-mode               --wireless operation mode
| | | | |-power                        --wireless transmit power
| | | | |-preamble                     --wireless preamble (only effect on
| | | | |                                 802.11b rates)
| | | | |-radio                        --enable wireless radio
| | | | |-rate                         --wireless transmission date rate
| | | | |-rifs-transmission            --enable successive frame transmission at
| | | | |                                 different transmit powers
| | | | |-rogue-ap-detection           --enable rogue access point detection
| | | | |-rts-threshold                --wireless RTS/CTS threshold
| | | | |-security-profile>            --create security profile
| | | | | |-1>                         --1st security profile
| | | | | | |-authentication           --authentication type
| | | | | | |-encryption               --data encryption
| | | | | | |-hide-network-name        --hide network name
| | | | | | |-key1                     --wireless wep key 1
| | | | | | |-key2                     --wireless wep key 2
| | | | | | |-key3                     --wireless wep key 3
| | | | | | |-key4                     --wireless wep key 4
| | | | | | |-keyno                    --key number
| | | | | | |-name                     --profile name
| | | | | | |-presharedkey             --pre-shared key
| | | | | | |-security-separation      --disable associated wireless client
| | | | | | |                             communication
| | | | | | |-ssid                     --network name (1-32 chars)
| | | | | | |-status                   --profile status
| | | | | | |-vlan-id                  --VLAN id
| | | | | | |-wep-pass-phrase          --wireless wep passphrase key
| | | | | | |-wepkeytype               --wireless wep key type
| | | | | |
| | | | | |-2>                         --2nd security profile
| | | | | | |-authentication           --authentication type
| | | | | | |-encryption               --data encryption
| | | | | | |-hide-network-name        --hide network name
| | | | | |  -key1                     --wireless wep key 1
| | | | | | |-key2                     --wireless wep key 2
| | | | | | |-key3                     --wireless wep key 3
| | | | | | |-key4                     --wireless wep key 4
| | | | | | |-keyno                    --key number
| | | | | | |-name                    --profile name
| | | | | | |-presharedkey            --pre-shared key
| | | | | | |-security-separation     --disable associated wireless client
| | | | | | |                            communication
| | | | | | |-ssid                    --network name (1-32 chars)
| | | | | | |-status                  --profile status
| | | | | | |-vlan-id                 --VLAN id
| | | | | | |-wep-pass-phrase         --wireless wep passphrase key
| | | | | | |-wepkeytype              --wireless wep key type
| | | | | |
| | | | | |-3>                        --3rd security profile
| | | | | | |-authentication          --authentication type
| | | | | | |-encryption              --data encryption
| | | | | | |-hide-network-name       --hide network name
| | | | | | |-key1                    --wireless wep key 1
| | | | | | |-key2                    --wireless wep key 2
| | | | | | |-key3                    --wireless wep key 3
| | | | | | |-key4                    --wireless wep key 4
| | | | | | |-keyno                   --key number
| | | | | | |-name                    --profile name
| | | | | | |-presharedkey            --pre-shared key
| | | | | | |-security-separation     --disable associated wireless client
| | | | | | |                            communication
| | | | | | |-ssid                    --network name (1-32 chars)
| | | | | | |-status                  --profile status
| | | | | | |-vlan-id                 --VLAN id
| | | | | | |-wep-pass-phrase         --wireless wep passphrase key
| | | | | | |-wepkeytype              --wireless wep key type
| | | | | |
| | | | | |-4>                        --4th security profile
| | | | | | |-authentication          --authentication type
| | | | | | |-encryption              --data encryption
| | | | | | |-hide-network-name       --hide network name
| | | | | | |-key1                    --wireless wep key 1
| | | | | | |-key2                    --wireless wep key 2
| | | | | | |-key3                    --wireless wep key 3
| | | | | | |-key4                    --wireless wep key 4
| | | | | | |-keyno                   --key number
| | | | | | |-name                    --profile name
| | | | | | |-presharedkey            --pre-shared key
| | | | | | |-security-separation     --disable associated wireless client
| | | | | | |                            communication
| | | | | | |-ssid                    --network name (1-32 chars)
| | | | | | |-status                  --profile status
| | | | | | |-vlan-id                 --VLAN id
| | | | | | |-wep-pass-phrase         --wireless wep passphrase key
| | | | | | |-wepkeytype              --wireless wep key type
| | | | | |
| | | | | |-5>                         --5th security profile
| | | | | | |-authentication           --authentication type
| | | | | | |-encryption               --data encryption
| | | | | | |-hide-network-name        --hide network name
| | | | | | |-key1                     --wireless wep key 1
| | | | | | |-key2                     --wireless wep key 2
| | | | | | |-key3                     --wireless wep key 3
| | | | | | |-key4                     --wireless wep key 4
| | | | | | |-keyno                    --key number
| | | | | | |-name                     --profile name
| | | | | | |-presharedkey             --pre-shared key
| | | | | | |-security-separation      --disable associated wireless client
| | | | | | |                             communication
| | | | | | |-ssid                     --network name (1-32 chars)
| | | | | | |-status                   --profile status
| | | | | | |-vlan-id                  --VLAN id
| | | | | | |-wep-pass-phrase          --wireless wep passphrase key
| | | | | | |-wepkeytype               --wireless wep key type
| | | | | |
| | | | | |-6>                         --6th security profile
| | | | | | |-authentication           --authentication type
| | | | | | |-encryption               --data encryption
| | | | | | |-hide-network-name        --hide network name
| | | | | | |-key1                     --wireless wep key 1
| | | | | | |-key2                     --wireless wep key 2
| | | | | | |-key3                     --wireless wep key 3
| | | | | | |-key4                     --wireless wep key 4
| | | | | | |-keyno                    --key number
| | | | | | |-name                     --profile name
| | | | | | |-presharedkey             --pre-shared key
| | | | | | |-security-separation      --disable associated wireless client
| | | | | | |                             communication
| | | | | | |-ssid                     --network name (1-32 chars)
| | | | | | |-status                   --profile status
| | | | | | |-vlan-id                  --VLAN id
| | | | | | |-wep-pass-phrase          --wireless wep passphrase key
| | | | | | |-wepkeytype               --wireless wep key type
| | | | | |
| | | | | |-7>                         --7th security profile
| | | | | | |-authentication           --authentication type
| | | | | | |-encryption               --data encryption
| | | | | | |-hide-network-name        --hide network name
| | | | | | |-key1                     --wireless wep key 1
| | | | | | |-key2                     --wireless wep key 2
| | | | | | |-key3                     --wireless wep key 3
| | | | | | |-key4                     --wireless wep key 4
| | | | | | |-keyno                    --key number
| | | | | | |-name                     --profile name
| | | | | | |-presharedkey              --pre-shared key
| | | | | | |-security-separation       --disable associated wireless client
| | | | | | |                              communication
| | | | | | |-ssid                      --network name (1-32 chars)
| | | | | | |-status                    --profile status
| | | | | | |-vlan-id                   --VLAN id
| | | | | | |-wep-pass-phrase           --wireless wep passphrase key
| | | | | | |-wepkeytype                --wireless wep key type
| | | | | |
| | | | | |-8>                          --8th security profile
| | | | | | |-authentication            --authentication type
| | | | | | |-encryption                --data encryption
| | | | | | |-hide-network-name         --hide network name
| | | | | | |-key1                      --wireless wep key 1
| | | | | | |-key2                      --wireless wep key 2
| | | | | | |-key3                      --wireless wep key 3
| | | | | | |-key4                      --wireless wep key 4
| | | | | | |-keyno                     --key number
| | | | | | |-name                      --profile name
| | | | | | |-presharedkey              --pre-shared key
| | | | | | |-security-separation       --disable associated wireless client
| | | | | | |                              communication
| | | | | | |-ssid                      --network name (1-32 chars)
| | | | | | |-status                    --profile status
| | | | | | |-vlan-id                   --VLAN id
| | | | | | |-wep-pass-phrase           --wireless wep passphrase key
| | | | | | |-wepkeytype                --wireless wep key type
| | | | | |
| | | | |
| | | | |-wireless-bridge>            --wireless bridge setting
| | | | | |-security-profile>         --create security profile
| | | | | | |-1>                      --1st security profile
| | | | | | | |-authentication        --authentication type
| | | | | | | |-encryption            --data encryption
| | | | | | | |-name                  --profile name
| | | | | | | |-presharedkey          --preshared key
| | | | | | | |-remote-mac            --remote MAC
| | | | | | | |-status                --profile status
| | | | | | | |-wep-pass-phrase       --wireless wep passphrase key
| | | | | | | |-wepkey                --wireless wep key
| | | | | | | |-wepkeytype            --wireless wep key type
| | | | | | |
| | | | | | |-2>                      --2nd security profile
| | | | | | | |-authentication        --authentication type
| | | | | | | |-encryption            --data encryption
| | | | | | | |-name                  --profile name
| | | | | | | |-presharedkey          --preshared key
| | | | | | | |-remote-mac            --remote MAC
| | | | | | | |-status                --profile status
| | | | | | | |-wep-pass-phrase       --wireless wep passphrase key
| | | | | | | |-wepkey                --wireless wep key
| | | | | | | |-wepkeytype            --wireless wep key type
| | | | | | |
| | | | | | |-3>                      --3rd security profile
| | | | | | | |-authentication        --authentication type
| | | | | | | |-encryption            --data encryption
| | | | | | | |-name                  --profile name
| | | | | | | |-presharedkey          --preshared key
| | | | | | | |-remote-mac            --remote MAC
| | | | | | | |-status                --profile status
| | | | | | | |-wep-pass-phrase       --wireless wep passphrase key
| | | | | | | |-wepkey                --wireless wep key
| | | | | | | |-wepkeytype            --wireless wep key type
| | | | | | |
| | | | | | |-4>                      --4th security profile
| | | | | | | |-authentication        --authentication type
| | | | | | | |-encryption            --data encryption
| | | | | | | |-name                  --profile name
| | | | | | | |-presharedkey          --preshared key
| | | | | | | |-remote-mac            --remote MAC
| | | | | | | |-status                --profile status
| | | | | | | |-wep-pass-phrase       --wireless wep passphrase key
| | | | | | | |-wepkey                --wireless wep key
| | | | | | | |-wepkeytype            --wireless wep key type
| | | | | | |
| | | | | |
| | | | |
| | | | |-wmm>                        --wmm settings
| | | | | |-ap-data0-best-effort      --access point best effort voice data
| | | | | |-ap-data1-background       --access point low-priority data
| | | | | |-ap-data2-video            --access point video data
| | | | | |-ap-data3-voice            --access point voice data
| | | | | |-station-data0-best-effort --station best effort voice data
| | | | | |-station-data1-background  --station low-priority data
| | | | | |-station-data2-video       --station video data
| | | | | |-station-data3-voice       --station voice data
| | | | | |-support                  --support
| | | | |
| | | |
| | | |-5GHz>                         --5 GHz wireless LAN interface setting
| | | | |-aggregation-length          --aggregated packet size
| | | | |-ampdu                       --aggregated MAC Protocol Data Unit
| | | | |-beacon-interval             --wireless beacon period in TU(1024 us)
| | | | |-channel                     --wireless channel (depends on country
| | | | |                                and wireless mode)
| | | | |-channelwidth                --wireless channel width
| | | | |-dtim-interval                --wireless DTIM period in beacon interval
| | | | |-extension-protection-spacing --wireless extension protection spacing
| | | | |-fragmentation-length         --wireless fragmentation threshold(even
| | | | |                                 only)
| | | | |-guardinterval                --interval (from interference from other
| | | | |                                 transmissions)
| | | | |-knownap-add                  --add known access point
| | | | |-knownap-del                  --delete known access point
| | | | |-macacl>                      --modify wireless access control (ACL)
| | | | | |-add                        --add wireless access control (ACL)
| | | | | |-del                        --delete wireless access control (ACL)
| | | | |
| | | | |-macacl-add                   --add wireless access control (ACL)
| | | | |-macacl-database              --delete wireless access control (ACL)
| | | | |                                 database
| | | | |-macacl-del                   --delete wireless access control (ACL)
| | | | |-mcsrate                      --transmit data rate
| | | | |-mode                         --enable wireless access control (ACL)
| | | | |-operation-mode               --wireless operation mode
| | | | |-power                        --wireless transmit power
| | | | |-radio                        --enable wireless radio
| | | | |-rate                         --wireless transmission date rate
| | | | |-rifs-transmission            --enable successive frame transmission at
| | | | |                                 different transmit powers
| | | | |-rogue-ap-detection           --enable rogue access point detection
| | | | |-rts-threshold                --wireless RTS/CTS threshold
| | | | |-security-profile>            --create security profile
| | | | | |-1>                         --1st security profile
| | | | | | |-authentication           --authentication type
| | | | | | |-encryption               --data encryption
| | | | | | |-hide-network-name        --hide network name
| | | | | | |-key1                     --wireless wep key 1
| | | | | | |-key2                     --wireless wep key 2
| | | | | | |-key3                     --wireless wep key 3
| | | | | | |-key4                     --wireless wep key 4
| | | | | | |-keyno                    --key number
| | | | | | |-name                     --profile name
| | | | | | |-presharedkey             --pre-shared key
| | | | | | |-security-separation      --disable associated wireless client
| | | | | | |                             communication
| | | | | | |-ssid                     --network name (1-32 chars)
| | | | | | |-status                   --profile status
| | | | | | |-vlan-id                  --VLAN id
| | | | | | |-wep-pass-phrase          --wireless wep passphrase key
| | | | | | |-wepkeytype               --wireless wep key type
| | | | | |
| | | | | |-2>                         --2nd security profile
| | | | | | |-authentication           --authentication type
| | | | | | |-encryption               --data encryption
| | | | | | |-hide-network-name        --hide network name
| | | | | | |-key1                     --wireless wep key 1
| | | | | | |-key2                     --wireless wep key 2
| | | | | | |-key3                     --wireless wep key 3
| | | | | | |-key4                     --wireless wep key 4
| | | | | | |-keyno                    --key number
| | | | | | |-name                     --profile name
| | | | | | |-presharedkey             --pre-shared key
| | | | | | |-security-separation      --disable associated wireless client
| | | | | | |                             communication
| | | | | | |-ssid                     --network name (1-32 chars)
| | | | | | |-status                   --profile status
| | | | | | |-vlan-id                  --VLAN id
| | | | | | |-wep-pass-phrase          --wireless wep passphrase key
| | | | | | |-wepkeytype               --wireless wep key type
| | | | | |
| | | | | |-3>                         --3rd security profile
| | | | | | |-authentication           --authentication type
| | | | | | |-encryption               --data encryption
| | | | | | |-hide-network-name        --hide network name
| | | | | | |-key1                     --wireless wep key 1
| | | | | | |-key2                     --wireless wep key 2
| | | | | | |-key3                     --wireless wep key 3
| | | | | | |-key4                     --wireless wep key 4
| | | | | | |-keyno                    --key number
| | | | | | |-name                     --profile name
| | | | | | |-presharedkey             --pre-shared key
| | | | | | |-security-separation      --disable associated wireless client
| | | | | | |                             communication
| | | | | | |-ssid                     --network name (1-32 chars)
| | | | | | |-status                   --profile status
| | | | | | |-vlan-id                  --VLAN id
| | | | | | |-wep-pass-phrase          --wireless wep passphrase key
| | | | | | |-wepkeytype               --wireless wep key type
| | | | | |
| | | | | |-4>                         --4th security profile
| | | | | | |-authentication           --authentication type
| | | | | | |-encryption               --data encryption
| | | | | | |-hide-network-name        --hide network name
| | | | | | |-key1                     --wireless wep key 1
| | | | | | |-key2                     --wireless wep key 2
| | | | | | |-key3                     --wireless wep key 3
| | | | | | |-key4                     --wireless wep key 4
| | | | | | |-keyno                    --key number
| | | | | | |-name                     --profile name
| | | | | | |-presharedkey             --pre-shared key
| | | | | | |-security-separation      --disable associated wireless client
| | | | | | |                             communication
| | | | | | |-ssid                     --network name (1-32 chars)
| | | | | | |-status                   --profile status
| | | | | | |-vlan-id                  --VLAN id
| | | | | | |-wep-pass-phrase          --wireless wep passphrase key
| | | | | | |-wepkeytype               --wireless wep key type
| | | | | |
| | | | | |-5>                         --5th security profile
| | | | | | |-authentication           --authentication type
| | | | | | |-encryption               --data encryption
| | | | | | |-hide-network-name        --hide network name
| | | | | | |-key1                     --wireless wep key 1
| | | | | | |-key2                     --wireless wep key 2
| | | | | | |-key3                     --wireless wep key 3
| | | | | | |-key4                     --wireless wep key 4
| | | | | | |-keyno                    --key number
| | | | | | |-name                     --profile name
| | | | | | |-presharedkey             --pre-shared key
| | | | | | |-security-separation      --disable associated wireless client
| | | | | | |                             communication
| | | | | | |-ssid                     --network name (1-32 chars)
| | | | | | |-status                   --profile status
| | | | | | |-vlan-id                  --VLAN id
| | | | | | |-wep-pass-phrase          --wireless wep passphrase key
| | | | | | |-wepkeytype               --wireless wep key type
| | | | | |
| | | | | |-6>                         --6th security profile
| | | | | | |-authentication           --authentication type
| | | | | | |-encryption               --data encryption
| | | | | | |-hide-network-name        --hide network name
| | | | | | |-key1                     --wireless wep key 1
| | | | | | |-key2                     --wireless wep key 2
| | | | | | |-key3                     --wireless wep key 3
| | | | | | |-key4                     --wireless wep key 4
| | | | | | |-keyno                    --key number
| | | | | | |-name                     --profile name
| | | | | | |-presharedkey             --pre-shared key
| | | | | | |-security-separation      --disable associated wireless client
| | | | | | |                              communication
| | | | | | |-ssid                     --network name (1-32 chars)
| | | | | | |-status                   --profile status
| | | | | | |-vlan-id                  --VLAN id
| | | | | | |-wep-pass-phrase          --wireless wep passphrase key
| | | | | | |-wepkeytype               --wireless wep key type
| | | | | |
| | | | | |-7>                         --7th security profile
| | | | | | |-authentication           --authentication type
| | | | | | |-encryption               --data encryption
| | | | | | |-hide-network-name        --hide network name
| | | | | | |-key1                     --wireless wep key 1
| | | | | | |-key2                     --wireless wep key 2
| | | | | | |-key3                     --wireless wep key 3
| | | | | | |-key4                     --wireless wep key 4
| | | | | | |-keyno                    --key number
| | | | | | |-name                     --profile name
| | | | | | |-presharedkey             --pre-shared key
| | | | | | |-security-separation      --disable associated wireless client
| | | | | | |                             communication
| | | | | | |-ssid                     --network name (1-32 chars)
| | | | | | |-status                   --profile status
| | | | | | |-vlan-id                  --VLAN id
| | | | | | |-wep-pass-phrase          --wireless wep passphrase key
| | | | | | |-wepkeytype               --wireless wep key type
| | | | | |
| | | | | |-8>                         --8th security profile
| | | | | | |-authentication           --authentication type
| | | | | | |-encryption               --data encryption
| | | | | | |-hide-network-name        --hide network name
| | | | | | |-key1                     --wireless wep key 1
| | | | | | |-key2                     --wireless wep key 2
| | | | | | |-key3                     --wireless wep key 3
| | | | | | |-key4                     --wireless wep key 4
| | | | | | |-keyno                    --key number
| | | | | | |-name                     --profile name
| | | | | | |-presharedkey             --pre-shared key
| | | | | | |-security-separation      --disable associated wireless client
| | | | | | |                             communication
| | | | | | |-ssid                     --network name (1-32 chars)
| | | | | | |-status                   --profile status
| | | | | | |-vlan-id                  --VLAN id
| | | | | | |-wep-pass-phrase          --wireless wep passphrase key
| | | | | | |-wepkeytype               --wireless wep key type
| | | | | |
| | | | |
| | | | |-wireless-bridge>           --wireless bridge setting
| | | | | |-security-profile>        --create security profile
| | | | | | |-1>                       --1st security profile
| | | | | | | |-authentication         --authentication type
| | | | | | | |-encryption             --data encryption
| | | | | | | |-name                   --profile name
| | | | | | | |-presharedkey           --preshared key
| | | | | | | |-remote-mac             --remote MAC
| | | | | | | |-status                 --profile status
| | | | | | | |-wep-pass-phrase        --wireless wep passphrase key
| | | | | | | |-wepkey                 --wireless wep key
| | | | | | | |-wepkeytype             --wireless wep key type
| | | | | | |
| | | | | | |-2>                       --2nd security profile
| | | | | | | |-authentication         --authentication type
| | | | | | | |-encryption             --data encryption
| | | | | | | |-name                   --profile name
| | | | | | | |-presharedkey           --preshared key
| | | | | | | |-remote-mac             --remote MAC
| | | | | | | |-status                 --profile status
| | | | | | | |-wep-pass-phrase        --wireless wep passphrase key
| | | | | | | |-wepkey                 --wireless wep key
| | | | | | | |-wepkeytype             --wireless wep key type
| | | | | | |
| | | | | | |-3>                       --3rd security profile
| | | | | | | |-authentication         --authentication type
| | | | | | | |-encryption             --data encryption
| | | | | | | |-name                   --profile name
| | | | | | | |-presharedkey           --preshared key
| | | | | | | |-remote-mac             --remote MAC
| | | | | | | |-status                 --profile status
| | | | | | | |-wep-pass-phrase        --wireless wep passphrase key
| | | | | | | |-wepkey                 --wireless wep key
| | | | | | | |-wepkeytype             --wireless wep key type
| | | | | | |
| | | | | | |-4>                       --4th security profile
| | | | | | | |-authentication         --authentication type
| | | | | | | |-encryption             --data encryption
| | | | | | | |-name                   --profile name
| | | | | | | |-presharedkey           --preshared key
| | | | | | | |-remote-mac             --remote MAC
| | | | | | | |-status                 --profile status
| | | | | | | |-wep-pass-phrase        --wireless wep passphrase key
| | | | | | | |-wepkey                 --wireless wep key
| | | | | | | |-wepkeytype             --wireless wep key type
| | | | | | |
| | | | | |
| | | | |
| | | | |-wmm>                         --wmm settings
| | | | | |-ap-data0-best-effort       --access point best effort voice data
| | | | | |-ap-data1-background        --access point low-priority data
| | | | | |-ap-data2-video             --access point video data
| | | | | |-ap-data3-voice             --access point voice data
| | | | | |-station-data0-best-effort  --station best effort voice data
| | | | | |-station-data1-background   --station low-priority data
| | | | | |-station-data2-video        --station video data
| | | | | |-station-data3-voice        --station voice data
| | | | | |-support                    --???
| | | | |
| | | |
| | |
| |
| |-ip>                                --set host IP
| | |-address                          --host IP address
| | |-default-gateway                  --IP address of default gateway
| | |-dhcp-client                      --enable dhcp client
| | |-dns-server                       --IP address of DNS server
| |
| |-log>                               --syslog setting
| | |-syslog                           --enable syslog client
| | |-syslog-server-ip                 --syslog server IP address
| | |-syslog-server-port               --syslog server port number
| |
| |-radius>
| | |-accounting-server-primary                    --primary accounting server
| | |-accounting-server-primary-port               --primary accounting server
| | |                                                 port
| | |-accounting-server-primary-sharedsecret       --primary accounting server
| | |                                                 shared secret
| | |-accounting-server-secondary                  --secondary accounting server
| | |-accounting-server-secondary-port             --secondary accounting server
| | |                                                 port
| | |-accounting-server-secondary-sharedsecret     --secondary accounting server
| | |                                                 shared secret
| | |-authentication-server-primary                --primary authentication
| | |                                                 server
| | |-authentication-server-primary-port           --primary system accounting
| | |                                                 server shared secret
| | |-authentication-server-primary-sharedsecret -  -primary authentication
| | |                                                 server shared secret
| | |-authentication-server-secondary              --secondary authentication
| | |                                                 server
| | |-authentication-server-secondary-port         --secondary authentication
| | |                                                 server port
| | |-authentication-server-secondary-sharedsecret --secondary authentication
| | |                                                 server shared secret
| |
| |-remote>                            --enable remote access via SSH
| | |-ssh-port                         --SSH port
| | |-sshd                             --SSH daemon
| | |-telnet                           --enable remote access via Telnet
| |
| |-snmp>                              --SNMP setting
| | |-description                      --SNMP system description
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