

GS108T Smart Switch Hardware Installation Guide

NETGEAR[®]

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Certificate of the Manufacturer/Importer

It is hereby certified that the GS108T Gigabit Smart Switch 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.

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This equipment is in the first category (information equipment to be used in commercial and/or industrial areas) and conforms to the standards set by the Voluntary Control Council for Interference by Data Processing Equipment and Electronic Office Machines that are aimed at preventing radio interference in commercial and/or industrial areas.

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Federal Communications Commission (FCC) Compliance Notice: Radio Frequency Notice

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

This device may not cause harmful interference.

This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A 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 to correct the interference by one or more of the following measures:

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- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

EU Statement of Compliance

The NETGEAR GS108T Gigabit Smart Switch is compliant with the following EU Council Directives: 89/336/EEC and LVD 73/23/EEC. Compliance is verified by testing to the following standards: EN55022 Class A, EN55024 and EN60950-1.

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

Canadian Department of Communications Radio Interference Regulations

This digital apparatus (NETGEAR GS108T Gigabit Smart Switch) does not exceed the Class A limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Règlement sur le brouillage radioélectrique du ministère des Communications

Cet appareil numérique (NETGEAR GS108T Gigabit Smart Switch) respecte les limites de bruits radioélectriques visant les appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada.

Customer Support

For assistance with installing and configuring your NETGEAR system or for questions or problems following installation:

- Check the NETGEAR Web page at <http://www.NETGEAR.com/support>
- Call Technical Support in North America at 1-888-NETGEAR. If you are outside North America, please refer to the phone numbers listed on the Support Information Card that was included with your switch.
- Email Technical Support at support@NETGEAR.com.
- Defective or damaged merchandise can be returned to your point-of-purchase representative.

Internet/World Wide Web

NETGEAR maintains a World Wide Web home page that you can access at the uniform resource locator (URL) <http://www.NETGEAR.com>. A direct connection to the Internet and a Web browser such as Internet Explorer or Netscape are required.

FCC Requirements for Operation in the United States

FCC Information to User

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

FCC Guidelines for Human Exposure

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

FCC Declaration Of Conformity

We, NETGEAR, Inc., 4500 Great America Parkway, Santa Clara, CA 95054, declare under our sole responsibility that the model GS108T: ProSafe™ 24 Port 10/100 Smart Switch with 4 Gigabit Ports and 24 Port PoE complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: a) This device may not cause harmful interference and b) This device must accept any interference received, including interference that may cause undesired operation."

Product and Publication Details

Model Number:	GS108T
Publication Date:	March 2007
Product Family:	Smart Switch
Product Name:	GS108T Gigabit Smart Switch
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Contents

About This Manual

Conventions, Formats, and Scope	vii
How to Use This Manual	viii
How to Print this Manual	viii
Revision History	ix

Chapter 1

Introduction

Overview	1-1
Features	1-2
Package Contents	1-4

Chapter 2

Physical Description

Front and Back Panels	2-1
10/100/1000 Mbps RJ-45 Ports	2-2
LED Descriptions	2-2
Reset Button	2-3
Restore Factory Defaults Button	2-4

Chapter 3

Applications

Desktop Switching	3-1
-------------------------	-----

Chapter 4

Installation

Step 2: Applying Footpads and Wall Mounting	4-2
Step 3: Checking the Installation	4-2
Step 4: Connecting Devices to the Switch	4-2
Step 5: Applying Power	4-3
Step 6: Switching Management Through a Web Browser or Utility Program (Initial Configuration)	4-4

Appendix A
Troubleshooting

Troubleshooting Chart A-1
Additional Troubleshooting Suggestions A-2
Network Adapter Cards A-2
Configuration A-2
Switch Integrity A-2

Appendix B
Technical Specifications

Network Protocol and Standards Compatibility B-1
Management B-1
Interface B-1
LEDs B-2
Performance Specifications B-2
Power Supply B-2
Physical Specifications B-2
Environmental Specifications B-2
Electromagnetic Emissions B-2
Electromagnetic Immunity B-3
Safety B-3

Appendix C
Glossary

About This Manual

The *NETGEAR® GS108T Smart Switch™ Hardware Installation Guide* describes how to install, configure, and troubleshoot the GS108T Gigabit Smart Switch. The information in this manual is intended for readers with intermediate computer and Internet skills.

Conventions, Formats, and Scope

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

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

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

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

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

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

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

	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 GS108T Smart Switch according to these specifications:

Product Version	GS108T Gigabit Smart Switch
Manual Publication Date	March 2007



Note: Product updates are available on the NETGEAR, Inc. website at <http://kbserver.netgear.com/products/GS108T.asp>.

How to Use This Manual

The HTML version of this manual includes the following:

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

How to Print this Manual

To print this manual, choose one of the following options:

- **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.

- Click the *PDF of This Chapter* link at the top left 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.**

- Click the *Complete PDF Manual* link at the top left 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 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
202-10248-01	1.0	March 2007	Product created

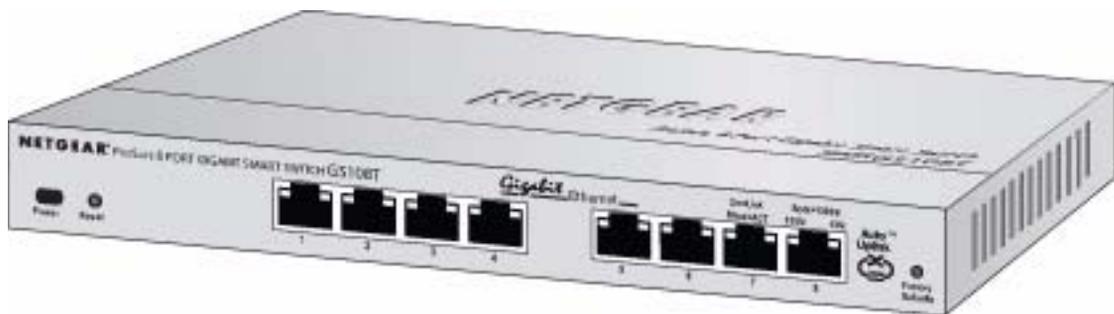
Chapter 1

Introduction

Congratulations on your purchase of the NETGEAR GS108T Gigabit Smart Switch! Your NETGEAR Switch is a state-of-the-art, high-performance, IEEE-compliant network solution designed for users who require a large number of ports and want the power of Gigabit connectivity to eliminate bottlenecks, boost performance, and increase productivity. There are 8 twisted-paired ports on the front panel of the switch which support non-stop 10/100/1000 networks. To simplify installation, the switch is shipped ready for use out of the box.

This chapter serves as the introduction for using your NETGEAR GS108T Gigabit Smart Switch and provides the following information:

- Overview
- Switch Features
- Package contents



Overview

Your NETGEAR GS108T Gigabit Smart Switch provides 8 twisted-pair ports that support 10/100/1000 Megabit link speed. Using these Gigabit slots, you can create high-speed connections to a server or network backbone. For example, you can:

- Connect switches to each other with high-speed links

- Link to high-speed servers
- Provide 10/100/1000 copper connectivity

Your GS108T Gigabit Smart Switch also provides the benefit of administrative management with a complete package of features for the observation, configuration, and control of your network. With a Web-based Graphical User Interface (GUI), the switch's many capabilities can be viewed and used in a simple and intuitive manner. There is also an easy to use switch management utility that runs on a PC. The switch's management features include configuration for port and switch information, VLAN for traffic control, port trunking for increased bandwidth, and Class of Service (CoS) for traffic prioritization. These features, and more, enable you better to understand and control your network.

Your NETGEAR GS108T Gigabit Smart Switch can be free-standing or rack-mounted in a wiring closet or equipment room. It is IEEE-compliant and offers low latency for high-speed networking. It includes 8 auto-sensing 10/100/1000 Ethernet ports. All ports can automatically negotiate to the highest speed. This capability makes the switch ideal for environments that have a mix of Ethernet, Fast Ethernet, and Gigabit Ethernet devices. In addition, all 10/100/1000 Mbps ports operate in half- or full-duplex mode, increasing the maximum bandwidth of each connection to either 20 Mbps, 200 Mbps, or 2000 Mbps, respectively. The maximum segment length is 328 feet (100 meters) over Category 5 unshielded twisted-pair (UTP) cable.

Features

The following list identifies the key features of the NETGEAR GS108T Gigabit Smart Switch.

- Eight 10/100/1000 Mbps auto-sensing Gigabit-Ethernet switching ports
- Reset Button
- Factory Defaults Button
- Administrative switch management
 - IEEE 802.1w Rapid Spanning tree
 - IEEE 802.1x Port Security
 - IEEE 802.1ab LLDP (Link Layer Discovery Protocol)
 - SNMP (Simple Network Management Protocol)
 - IEEE 802.1Q Tag VLAN with up to 8 VIDs ranging in 2 to 4K
 - IEEE 802.1p QoS support, four priority queues per port
 - Port-based VLAN with up to 8 groups; any one port can belong to different VLAN groups
 - IEEE 802.3ad Link Aggregation support

- Embedded HTTP server for Web-based management
- Supports port-setting function, enabling user to enable/disable each port, and set speed, duplex mode and device flow control
- Auto-Discovery support with application program for discovering and managing the smart switches on the network
- Flash upgrade, configuration backup/restore, and factory reset
- Full compatibility with IEEE standards:
 - IEEE 802.3i (10BASE-T)
 - IEEE 802.3u (100BASE-TX)
 - IEEE 802.3z/ab (1000BASE-X, 1000Base-T)
 - IEEE 802.3x (full-duplex flow control)
- Auto-sense and auto-negotiate for all ports
- Auto Uplink™ on all ports for the right connection sense
- Integrated address Look-Up Engine supports 8K absolute MAC addresses
- Full- and half-duplex functions for all 10/100/1000 ports
- Store-and-Forward transmission to remove bad packets from the network
- Active flow control to minimize packet loss/frame drops:
 - Half-duplex back-pressure control
 - Full-duplex IEEE 802.3x pause frame flow control
- LED indicators for port status monitoring:
 - Power LED indicates power on/off status
 - Link/Act LED indicates link status and activity
- Flexible installation:
 - Standalone desktop installation

Package Contents

Figure 1-1 shows the package contents of the NETGEAR GS108T Gigabit Smart Switch.

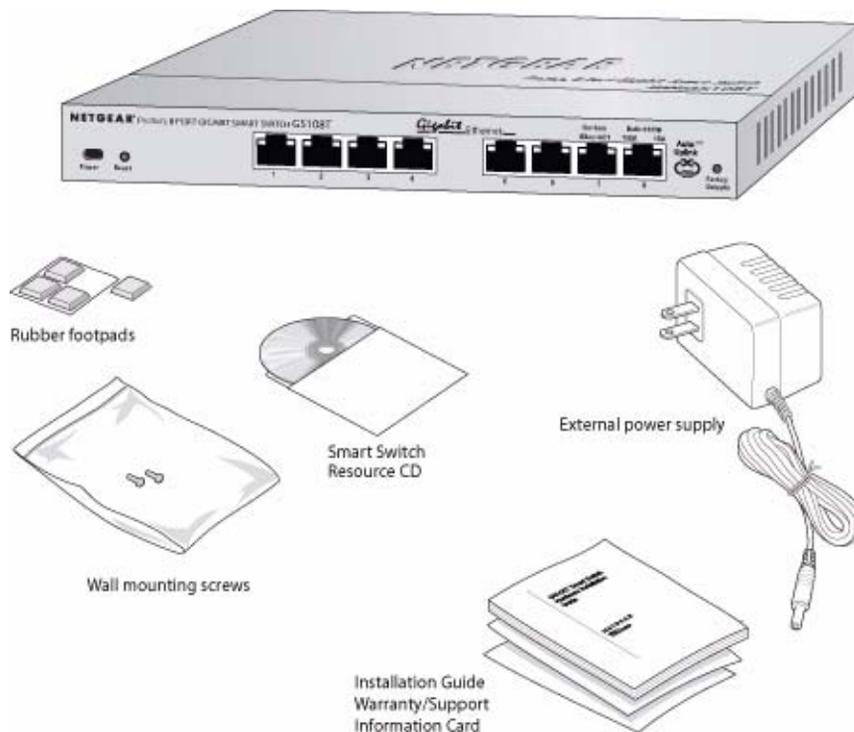


Figure 1-1 Package Contents

Verify that your package contains the following:

- GS108T Gigabit Smart Switch.
- Rubber footpads for tabletop installation.
- External power supply.
- Wall mounting screws (2).
- Installation guide.
-

- Smart Switch Resource CD. This includes the Smart Wizard Discovery Utility and Hardware manual. The CD also provides a link to the Software Admin manual (the *GS108T Smart Switch Software User Manual*).



Tip: You can download the *GS108T Smart Switch Software User Manual* on the NETGEAR documentation Web site at <http://kbserver.netgear.com>.

- Warranty/Support Information Card.

If any item is missing or damaged, contact your point-of-purchase representative immediately.

Chapter 2

Physical Description

This chapter describes the hardware features of the NETGEAR GS108T Gigabit Smart Switch. Topics include:

- Front and back panels
- 10/100/1000 Mbps auto-sensing RJ-45 ports
- LED descriptions
- Reset button
- Factory defaults button

Front and Back Panels

Figure 2-1 and Figure 2-2 show the key components on the front and back panels of the NETGEAR GS108T Gigabit Smart Switch.

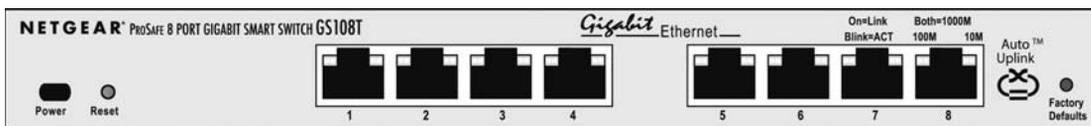


Figure 2-1 GS108T Gigabit Smart Switch—Front Panel



Figure 2-2 GS108T Gigabit Smart Switch—Rear Panel

The front panel contains RJ-45 jacks with LEDs. The rear panel has a DC jack for accommodating the power adapter.

10/100/1000 Mbps RJ-45 Ports

The 8 10/100/1000 Mbps, auto-sensing RJ-45 ports of the GS108T Gigabit Smart Switch are seen in [Figure 2-1](#). When you insert a cable into one of these ports, the switch automatically determines the maximum speed (10 or 100 or 1000 Mbps) and the mode (half- or full-duplex) of the attached device. All ports support only unshielded twisted-pair (UTP) cable with an 8-pin RJ-45 plug connection.

To simplify the procedure for attaching devices, all RJ-45 ports support Auto Uplink. This technology enables you to attach devices to the RJ-45 ports using either straight-through or crossover cables. When you insert a cable into one of these ports, the switch automatically:

- Detects whether the combination of attached device and network cable (normal or crossover) requires a normal connection (such as when connecting the port to a PC) or an uplink connection (such as when connecting the port to a router, switch, or hub).
- Configures the RJ-45 port to enable communications with the attached device without user intervention.

LED Descriptions

The front panel of the NETGEAR GS108T Gigabit Smart Switch comprises LEDs that provide a concise display of link, port speed, and activity. The following table summarizes the function of these LEDs.

Table 2-1. Front Panel LEDs

Label	Color	Activity	Description
100Mbps Link / ACT LED (Left LED)	n/a	Off	No 100Mbps link is established on the port
	Green	On - Solid	A valid 100Mbps link is established on the port
	Green	On - Blinking	Packets transmission or reception is occurring on the port, linked at 100Mbps mode

Table 2-1. Front Panel LEDs (continued)

10Mbps Link / ACT LED (Right LED)	n/a	Off	No 10Mbps link is established on the port
	Green	On - Solid	A valid 10Mbps link is established on the port
	Green	On - Blinking	Packets transmission or reception is occurring on the port, linked at 10Mbps mode
1000Mbps Link / ACT LED (Both LEDs)	n/a	Off	No 1000Mbps link is established on the port
	Green	On - Solid	A valid 1000Mbps link is established on the port
	Green	On - Blinking	Packets transmission or reception is occurring on the port, linked at 1000Mbps mode

Reset Button

The Reset button of the GS108T triggers a hardware reset of the switch. [Figure 2-3](#) shows its location on the front panel. This action is equivalent to switching the unit power off and back on. The last saved configuration is loaded into the switch as it resets. To operate the reset button, insert a device such as a paper clip into the opening to press the recessed button. The front-panel LEDs should extinguish and light again as the switch performs its Power On Self Test (POST).

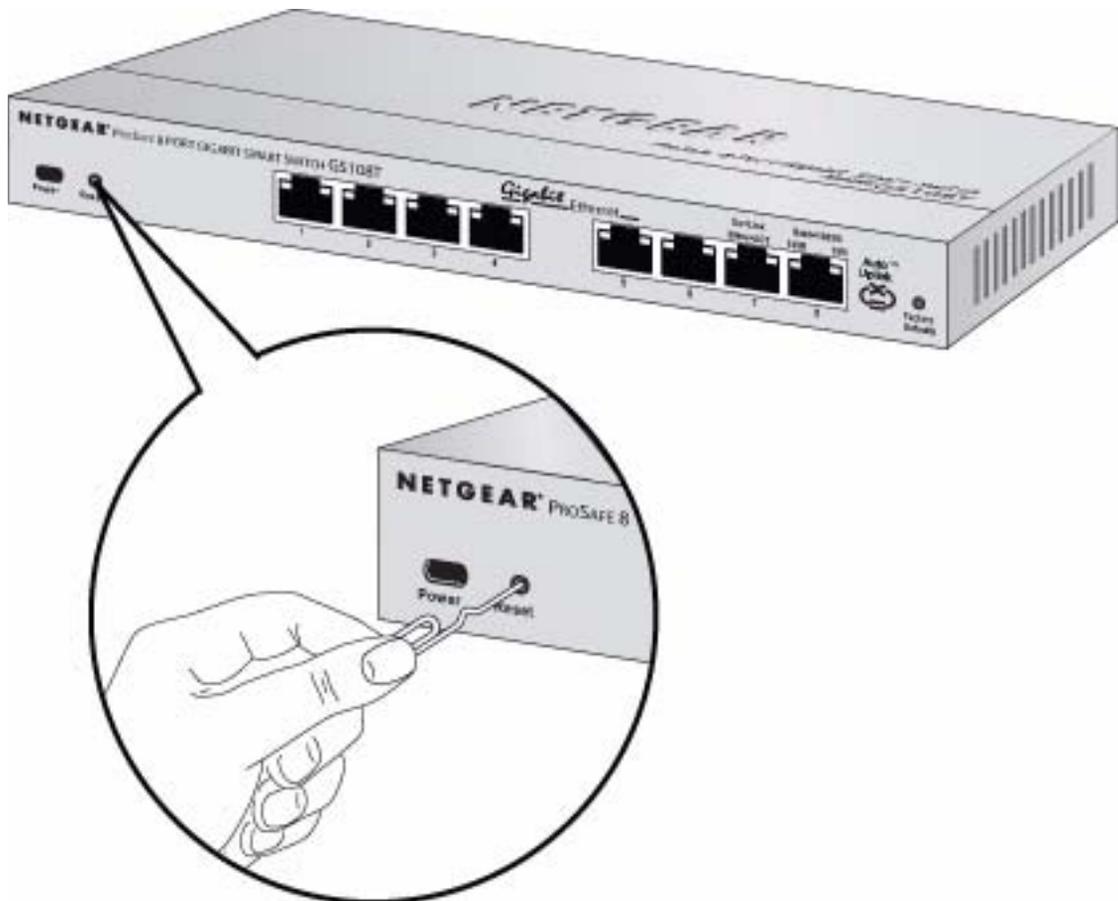


Figure 2-3 Reset Button of the GS108T Gigabit Smart Switch

Restore Factory Defaults Button

The Restore Factory Default button of the GS108T Smart Switch enables you to clear the current settings and return the switch to its factory default configuration. This function clears all settings, including the password, VLAN settings, and port configurations. To perform this operation, insert a device such as a paper clip into the opening to press the recessed button.

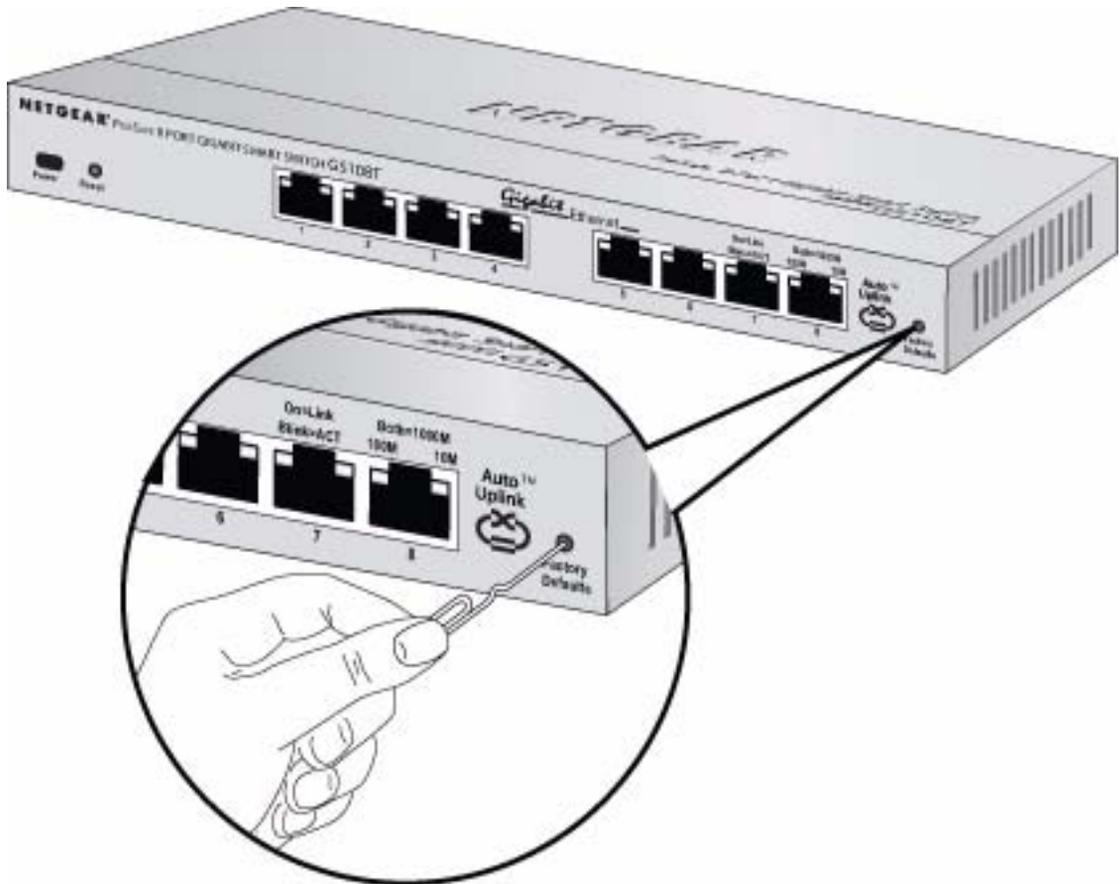


Figure 2-4 Restore Factory Defaults Button of the GS108T Gigabit Smart Switch

Chapter 3

Applications

Your NETGEAR GS108T Gigabit Smart Switch is designed to provide flexibility in configuring your network connections. It can be used as your only network traffic-distribution device or with added 10 Mbps, 100 Mbps, 10/100 Mbps, and 1000 Mbps hubs and switches. This chapter shows how the switch can be used in a network environment.

Desktop Switching

Your NETGEAR GS108T Gigabit Smart Switch can be used as a desktop switch in a small network that gives users 1000 Mbps access to a file server. With full-duplex mode enabled, the switch port connected to the server or PC can provide 2000 Mbps throughput.

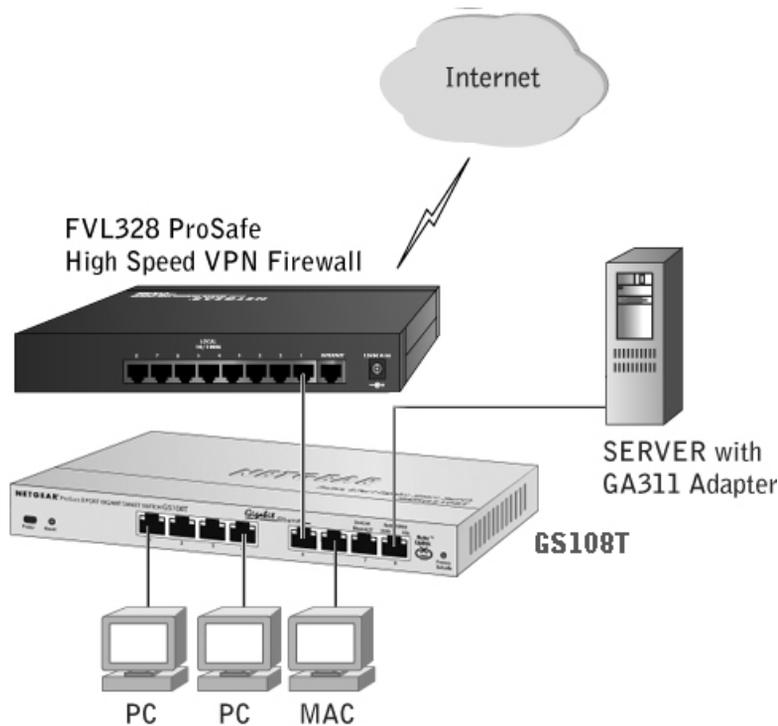


Figure 3-1 Example of Desktop Switching

Chapter 4 Installation

This chapter describes the installation procedures for your NETGEAR GS108T Gigabit Smart Switch. Switch installation involves the following steps:

1. Preparing the site
2. Applying footpads and wall mounting
3. Checking the installation
4. Connecting devices to the switch
5. Applying power
6. Switching management through a Web Browser or Utility Program (initial configuration)

Step 1: Preparing the Site

Before you install your switch, ensure that your operating environment meets the environmental requirements in [Table 4-1](#).

Table 4-1. Site Requirements

Characteristics	Requirements
Mounting	
Installations	Desktop: provide a flat table or shelf surface
	Wall-mount: select a location (see "Access"). You also need the mounting screws supplied with your switch.
Access	Locate the switch in a position that lets you access the front panel RJ-45 ports, view the front panel LEDs, and access power connector.
Power source	Provide a power adapter (included) ^a . Ensure that the AC outlet is not controlled by a wall switch, which can accidentally turn off power to the outlet and the switch.

a. Power specifications for the switch are shown in [Appendix B, "Technical Specifications"](#)

Step 2: Applying Footpads and Wall Mounting

1. Attach one rubber foot pad into each of the four concave depressions on the base of the switch. (The switch ships with four self-adhesive rubber footpads.)



Note: These footpads cushion the switch against shock and vibration. They also provide for ventilation space between stacked switches.

2. To mount the switch on a wall (optional), install the two provided screws in positions that correspond to the slots on the bottom side of the GS108T, then mount the switch.

Step 3: Checking the Installation

Before you apply power, inspect the equipment thoroughly to:

- Verify that all cables are installed correctly.
- Check that cables are not damaged and that cable routing does not interfere with equipment to create a safety hazard.
- Ensure that all equipment is mounted properly and securely.

Step 4: Connecting Devices to the Switch

The following procedure describes how to connect devices to the switch's RJ-45 ports. Your NETGEAR GS108T Gigabit Smart Switch contains Auto Uplink technology, which enables you to attach devices using either straight-through or crossover cables.

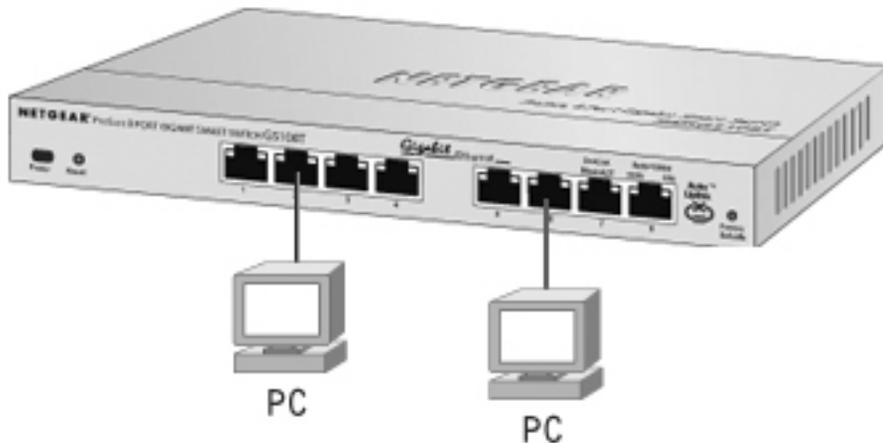


Figure 4-1 Connecting Devices to the Switch

Connect each device to an RJ-45 network port on the switch's front panel (see [Figure 4-1](#)) using a Category 5 (Cat5) unshielded twisted-pair (UTP) cable with RJ-45 connectors.



Note: Ethernet specifications limit the cable length between the switch and the attached device to 100 m (328 ft.).

Step 5: Applying Power

Because the NETGEAR GS108T Gigabit Smart Switch has no ON/OFF switch, AC power must be controlled by means of the power adapter. Select an appropriate unswitched, grounded AC facility outlet so as to avoid any future inadvertent power interruptions. Use the following procedure to apply AC power:

1. Connect the female end of the supplied IEC AC power adapter cable to the power receptacle on the back of the switch.
2. Connect the AC power adapter cable to the DC jack.

When you apply power, the green Power LED on the switch front panel illuminates.



Note: If the Power LED does not light, check that the power cable is installed correctly and that the AC power supply is present. If this does not resolve the problem, refer to [Appendix A, “Troubleshooting”](#).

Step 6: Switching Management Through a Web Browser or Utility Program (Initial Configuration)

Your NETGEAR GS108T Gigabit Smart Switch has embedded management software for viewing, changing, and monitoring its activity and configuration. You need not use this management software for it to function as a simple switch. However, the management software enables you to set up advanced features such as VLANs and Trunking and also enables you to configure the switch for improved efficiency and performance. As a result, you can improve the overall performance of your network.

After you power-up the switch for the first time, you can configure it using a Web browser or a utility program called Smartwizard Discovery. For more information about managing the switch, see the User Manual on the Smart Switch Resource CD.

Appendix A

Troubleshooting

This chapter provides information about troubleshooting the NETGEAR GS108T Gigabit Smart Switch. Information is supplied as:

- A Troubleshooting chart
- Additional troubleshooting suggestions

Troubleshooting Chart

Table A-1 lists symptoms, causes, and solutions of possible problems.

Table A-1. Troubleshooting Chart

Symptom	Cause	Solution
Power LED is off	No power is received	Check the power cord connections for the switch at the switch and the connected device Make sure all cables used are correct and comply with Ethernet specifications.
Link/ACT LED is off	Port connection is not working	Check the crimp on the connectors and make sure that the plug is properly inserted and locked into the port at both the switch and the connecting device. Make sure all cables used are correct and comply with Ethernet specifications. See Appendix D. Check for a defective adapter card, cable, or port by testing them in an alternate environment where all products are functioning.
File transfer is slow or performance degradation is a problem	Half- or full-duplex setting on the switch and the connected device are not the same	Make sure the attached device is set to auto negotiate.

Table A-1. Troubleshooting Chart (continued)

Symptom	Cause	Solution
A segment or device is not recognized as part of the network	One or more devices are not properly connected, or cabling does not meet Ethernet guidelines	Verify that the cabling is correct. Be sure all connectors are securely positioned in the required ports. Equipment may have been accidentally disconnected
Link/ACT LED is flashing continuously on all connected ports and the network is disabled	A network loop (redundant path) has been created	Break the loop by ensuring that there is only one path from any networked device to any other networked device

Additional Troubleshooting Suggestions

If the suggestions in [Table A-1](#) do not resolve your problem, refer to the troubleshooting suggestions in this section.

Network Adapter Cards

Ensure that the network adapter cards installed in the PCs are in working condition and their most recent software drivers have been installed.

Configuration

If problems occur after altering the network configuration, restore the original connections and attempt to isolate the problem by implementing the most-recent changes, one step at a time. Make sure that cable distances, repeater limits, and other physical aspects of the installation do not exceed the Ethernet specification limitations.

Switch Integrity

If required, verify the integrity of the switch by resetting it. To do this, use the Reset button (see [Chapter 2, “Physical Description”](#)) or remove AC power from the switch and then reapply it. If the problem persists, contact NETGEAR technical support. In North America, call 1-888-NETGEAR. If you are outside of North America, please refer to the support information card included with your product.

Appendix B

Technical Specifications

This appendix provides technical specifications for the NETGEAR GS108T Gigabit Smart Switch.

Network Protocol and Standards Compatibility

IEEE 802.3 10BASE-T

IEEE 802.3u 100BASE-TX

IEEE 802.3ab 1000BASE-T

IEEE 802.3z 1000Base-X

IEEE 802.3x flow control

Management

IEEE 802.1w Rapid Spanning tree

IEEE 802.1x Port Security

IEEE 802.1ab LLDP (Link Layer Discovery Protocol)

SNMP (Simple Network Management Protocol)

IEEE 802.1Q Static VLAN (Up to 256)

Port-based VLAN (Up to 8)

IEEE 802.1p Class of Service (CoS)

Port-based QoS (Port default priority; options: High/Normal/Low/Lowest)

Port Trunking - Manual as per IEEE802.3ad Link Aggregation

Port Monitoring

Interface

8 RJ-45 connectors for 10BASE-T, 100BASE-TX, and 1000BASE-T (Auto Uplink on all ports)

LEDs

Per port (Gigabit): Speed/Link/Act

Per device: Power

Performance Specifications

Forwarding modes: Store-and-forward

Bandwidth: 16 Gbps

Network latency: Less than 20 microseconds for 64-byte frames in store-and-forward mode for 100 Mbps to 100 Mbps transmission

Buffer memory: 128 KB embedded memory per unit

Address database size: 8,000 media access control (MAC) addresses per system

Mean Time Between Failure (MTBF): 108,016 hours (~12 years)

Power Supply

Power Consumption: 12 W maximum

100–240VAC/50–60 Hz universal input

Physical Specifications

Dimensions (H x W x D): 25.9 mm (1.02") x 235.5 mm (9.27") x 440 x 100.8 mm (3.97")

Weight: 0.69 kg (1.52 lbs)

Environmental Specifications

Operating temperature: 0 to 50°C (32 to 122°F)

Storage temperature: -20 to 70°C (28 to 158°F)

Operating humidity: 90% maximum relative humidity, non-condensing

Storage humidity: 95% maximum relative humidity, non-condensing

Operating altitude: 3,000 m (10,000 ft.) maximum

Storage altitude: 3,000 m (10,000 ft.) maximum

Electromagnetic Emissions

CE mark, commercial

FCC Part 15 Class A

VCCI Class A

C-Tick

Electromagnetic Immunity

EN 55022 (CISPR 22), Class A

Safety

CE mark, commercial

Appendix C

Glossary

Table C-1. Glossary

10BASE-T	The IEEE specification for 10 Mbps Ethernet over Category 3, 4, or 5 twisted-pair cable.
100BASE-FX	The IEEE specification for 100 Mbps Fast Ethernet over fiber-optic cable.
100BASE-TX	The IEEE specification for 100 Mbps Fast Ethernet over Category 5 twisted-pair cable.
1000BASE-SX	The IEEE specification for 1000 Mbps Gigabit Ethernet over fiber-optic cable.
1000BASE-T	The IEEE specification for 1000 Mbps Gigabit Ethernet over Category 5 twisted-pair cable.
Auto-negotiation	A feature that allows twisted-pair ports to advertise their capabilities for speed, duplex mode and flow control. When connected to a port that also supports auto-negotiation, the link can automatically configure itself to the optimum setup.
Auto Uplink™	A feature that allows twisted-pair ports to sense if a normal (MDI-X) or uplink (MDI) connection is necessary and make the right link. It adjusts for straight-through or crossover cables.
Backbone	The part of a network used as a primary path for transporting traffic between network segments.
Bandwidth	The information capacity, measured in bits per second that a channel could transmit. Bandwidth examples include 10 Mbps for Ethernet, 100 Mbps for Fast Ethernet, and 1000 Mbps (1 Gbps) for Gigabit Ethernet.
Baud	The signaling rate of a line, that is, the number of transitions (voltage or frequency changes) made per second. Also known as line speed.
Class of Service	A term to describe treating different types of traffic with different levels of service priority. Higher priority traffic gets faster treatment during times of switch congestion
Collision	A term used to describe two colliding packets in an Ethernet network. Collisions are a part of normal Ethernet operation, but a sudden prolonged increase in the number of collisions can indicate a problem with a device, particularly if it is not accompanied by a general increase in traffic.
Endstation	A computer, printer, or server that is connected to a network.

Table C-1. Glossary

Ethernet	A LAN specification developed jointly by Xerox, Intel and Digital Equipment Corporation. Ethernet networks transmit packets at a rate of 10 Mbps.
Fast Ethernet	An Ethernet system that is designed to operate at 100 Mbps.
Gigabit Ethernet	An Ethernet system that is designed to operate at 1000 Mbps (1 Gbps).
Fault isolation	A technique for identifying and alerting administrators about connections (such as those associated with switch ports) that are experiencing congestion or failure, or exceeding an administrator-defined threshold.
Forwarding	The process of sending a packet toward its destination using a networking device.
Filtering	The process of screening a packet for certain characteristics, such as source address, destination address, or protocol. Filtering is used to determine whether traffic is to be forwarded, and can also prevent unauthorized access to a network or network devices.
Flow control	A congestion- control mechanism. Congestion is caused by devices sending traffic to already overloaded port on a switch. Flow control prevents packet loss and temporarily inhibits devices from generating more traffic until the period of congestion ends.
Full-duplex	A system that allows packets to be transmitted and received at the same time and, in effect, doubles the potential throughput of a link.
Half-duplex	A system that allows packets to transmitted and received, but not at the same time. Contrast with full duplex.
IEEE	Institute of Electrical and Electronics Engineers. This American organization was founded in 1963 and sets standards for computers and communications.
IETF	Internet Engineering Task Force. An organization responsible for providing engineering solutions for TCP/IP networks. In the network management area, this group is responsible for the development of the SNMP protocol.
IP	Internet Protocol. IP is a layer 3 network protocol that is the standard for sending data through a network. IP is part of the TCP/IP set of protocols that describe the routing of packets to addressed devices.
IP address	Internet Protocol address. A unique identifier for a device attached to a network using TCP/IP. The address is written as four octets separated with periods (full-stops), and is made up of a network section, an optional subnet section and a host section.
LAN	Local Area Network. A network of endstations (such as PCs, printers, servers) and network devices (hubs and switches) that cover a relatively small geographic area (usually not larger than a floor or building).

Table C-1. Glossary

Loop	An event that occurs when two network devices are connected by more than one path, thereby causing packets to repeatedly cycle around the network and not reach their destination.
MAC	Media Access Control. A protocol specified by the IEEE for determining which devices have access to a network at any one time.
MAC address	Media Access Control address; also called hardware or physical address. Most devices that connect to a LAN have a MAC address assigned to them, as they are used to identify other devices in a network.
Port monitoring	The ability to monitor the traffic passing through a port on a device to analyze network characteristics and perform troubleshooting.
Port speed	The speed that a port on a device uses to communicate with another device or the network.
Port trunking	The ability to combine multiple ports on a device to create a single, high-bandwidth connection.
Protocol	A set of rules for communication between devices on a network.
Quality of Service	A term to describe delay, throughput, bandwidth, and other factors that measure the service quality provided to a user.
Segment	A section of a LAN that is connected to the rest of the network using a switch, bridge, or repeater.
SNMP	Simple Network Management Protocol. An IETF standard protocol for managing devices on a TCP/IP network.
Switch	A device that interconnects several LANs to form a single logical LAN that comprises of several LAN segments. Switches are similar to bridges, in that they connect LANs of a different type; however they connect more LANs than a bridge and are generally more sophisticated.
TCP/IP	Transmission Control Protocol/Internet Protocol. This is the name for two of the most well-known protocols developed for the interconnection of networks. Originally a UNIX standard, TCP/IP is now supported on almost all platforms, and is the protocol of the Internet. TCP relates to the content of the data traveling through a network — ensuring that the information sent arrives in one piece when it reaches its destination. IP relates to the address of the endstation to which data is being sent, as well as the address of the destination network.
Traffic prioritization	Giving time-critical data traffic a higher quality of service over other, non-critical data traffic.
VLAN	Virtual LAN. A logical association that allows users to communicate as if they were physically connected to a single LAN, independent of the actual physical configuration of the network.

