Managed Stackable Layer 3 Fast Ethernet Switches Hardware Installation Guide

Models FSM7328S, FSM7328PS, FSM7352S, and FSM7352PS

NETGEAR

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

202-10256-01
May 2007

Trademarks

The Netgear Logo, the Gear Guy, Everybody's connecting, and ProSafe are trademarks or registered trademark of Netgear, Inc. in the United States and other countries. Microsoft, Windows, and the Windows logo are trademarks or registered trademarks of Microsoft Corporation in the United States and other countries. Other brand and product names are trademarks or registered trademarks of their respective holders.

Statement of Conditions

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

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

Certificate of the Manufacturer/Importer

It is hereby certified that the NETGEAR Model FSM7328S Managed Fast Ethernet 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.

It is hereby certified that the NETGEAR Model FSM7328PS Managed Fast Ethernet 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.

It is hereby certified that the NETGEAR Model FSM7352S Managed Fast Ethernet 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.

It is hereby certified that the NETGEAR Model FSM73f2PS Managed Fast Ethernet Switch with PoE 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.

Voluntary Control Council for Interference (VCCI) Statement

This is Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions."

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Publication Version 1.0, May 2007

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:

- Reorient or relocate the receiving antenna.
- 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.

Canadian Department of Communications Radio Interference Regulations

This digital apparatus (ProSafe 24-Port 10/100 LE managed Stackable Switch with 4 Gigabit Ports FSM7328S) 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.

This digital apparatus (ProSafe 24-Port 10/100 LE managed Stackable Switch with 4 Gigabit Ports and PoE FSM7328PS) 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.

This digital apparatus (ProSafe 48-Port 10/100 LE managed Stackable Switch with 4 Gigabit Ports FSM7352S) 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.

This digital apparatus (ProSafe 48-Port 10/100 LE managed Stackable Switch with 4 Gigabit Ports and PoE FSM7352PS) do 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 (ProSafe 24-Port 10/100 LE managed Stackable Switch with 4 Gigabit Ports FSM7328S) 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.

Cet appareil numérique (ProSafe 24-Port 10/100 LE managed Stackable Switch with 4 Gigabit Ports and PoE FSM7328PS) 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.

Cet appareil numérique (ProSafe 48-Port 10/100 LE managed Stackable Switch with 4 Gigabit Ports FSM7352S) 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.

Cet appareil numérique (ProSafe 48-Port 10/100 LE managed Stackable Switch with 4 Gigabit Ports and PoE FSM7352PS) 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

Refer to the Support Information Card that shipped with your Managed Stackable Layer 3 Fast Ethernet Switch.

World Wide Web

NETGEAR maintains a World Wide Web home page that you can access at the universal 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.

Product and Publication Details

Model Number:	FSM7328S, FSM7328PS, FSM7352S, and FSM7352PS
Publication Date:	May 2007
Product Family:	managed switch
Product Name:	Managed Stackable Layer 3 Fast Ethernet Switch
Home or Business Product:	Business
Language:	English
Publication Part Number:	202-10256-01
Publication Version Number	1.0

Contents

Chapter 1
About This Manual

The *FSM7328S,FSM7328PS, FSM7352S, and FSM7352PS Managed Stackable Layer 3 Fast Ethernet Switches Hardware Installation Guide* contains information for set up and management of the NETGEAR FSM7328S, FSM7328PS, FSM7352S, and FSM7352PS switches.

Audience, Conventions, Formats, and Scope

This information is intended for network managers familiar with network management concepts and terminology. This guide uses the following typographical conventions:

Table 1-1. Typographical Conventions

Italics	Emphasis, books, CDs, URL names
Bold	User input

This guide uses the following formats to highlight special messages:

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

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

This manual is written according to these specifications:

Table 1-2. Manual Scope

Product version	• ProSafe 24-Port 10/100 LE managed Stackable Switch with 4 Gigabit Ports FSM7328S • ProSafe 24-Port 10/100 LE managed Stackable Switch with 4 Gigabit Ports and PoE FSM7328PS • ProSafe 48-Port 10/100 LE managed Stackable Switch with 4 Gigabit Ports FSM7352S • ProSafe 48-Port 10/100 LE managed Stackable Switch with 4 Gigabit Ports and PoE FSM7352PS
Manual publication date	May 2007

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

Chapter 2
Introduction

The NETGEAR Layer 3 Managed Stackable Fast Ethernet Switch is a state-of-the-art, high-performance, IEEE-compliant network solution. It includes powerful management features that you can use to eliminate bottlenecks, boost performance, and increase productivity.

This guide describes hardware installation and basic troubleshooting for the following NETGEAR switches:

- ProSafe 24-Port 10/100 LE managed Stackable Switch with 4 Gigabit Ports FSM7328S
- ProSafe 24-Port 10/100 LE managed Stackable Switch with 4 Gigabit Ports and PoE FSM7328PS
- ProSafe 48-Port 10/100 LE managed Stackable Switch with 4 Gigabit Ports FSM7352S
- ProSafe 48-Port 10/100 LE managed Stackable Switch with 4 Gigabit Ports and PoE FSM7352PS

These switches can be free-standing, or rack-mounted in a wiring closet or an equipment room. For information about features for each product, see the NETGEAR website at *http://www.netgear.com*.

FSM7328S Front Panel and LEDs

The following figure shows the front panel of the FSM7328S. The front panel contains LEDs, RJ-45 jacks, SFP module bays, stacking ports, and a console port.

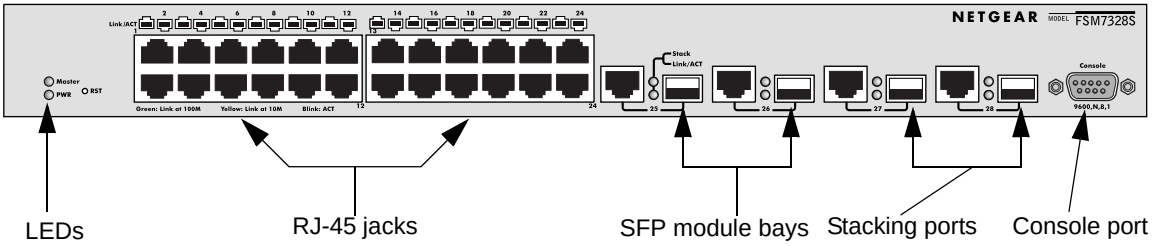

Figure 2-1

The following table shows the LEDs on the front panel of the switch.

Table 2-1. LED Descriptions for FSM7328S

LED	Description
Master	**Green:** This switch is the master of the stack. **Off:** The switch is not the master of the stack.
Power	**Solid green:** Power is supplied, and the switch is operating normally. **Blinking green:** Runtime code load in progress. **Solid yellow:** Power-On Self-Test (POST) in progress. **Blinking yellow:** POST failure or CPU failure. **Off:** Power is disconnected.
Fan	**Solid red:** Fan has failed. **Off:** Fan is present and operating normally.
10/100M ports One LED per port	**Link/ACT/SPD LED** • **Off:** No 10/100 Mbps link is established on the port. • **Solid green:** A valid 100 Mbps link is established on the port. • **Blinking green:** The port is sending or receiving packets at 100 Mbps. • **Solid yellow:** A valid 10 Mbps link is established on the port. • **Blinking yellow:** The port is sending or receiving packets at 10 Mbps.

Table 2-1. LED Descriptions for FSM7328S (continued)

LED	Description
10/100/1000M ports two LEDs per port	**Link/ACT LED** • **Off:** No 10/100/1000 Mbps link is established on the port. • **Solid green:** A valid 1,000 Mbps link is established on the port. • **Solid yellow:** A valid 10/100 Mbps link is established on the port. • **Blinking green:** Packets transmission or reception is occurring on the port at 1,000 Mbps. • **Blinking yellow:** The port is sending or receiving packets at 10/100 Mbps. **Stack LED** • **Green:** Stack port has a valid link connection. • **OFF:** Stack port does not have a valid link connection.
SFP port (1000 Mbps only)	• **Solid green:** Link is up. • **Blinking green:** The port is sending or receiving a packet in link up status . • **Off:** No link is detected .

FSM7328S Rear Panel

The rear panel has a standard AC power receptacle for the supplied power cord.

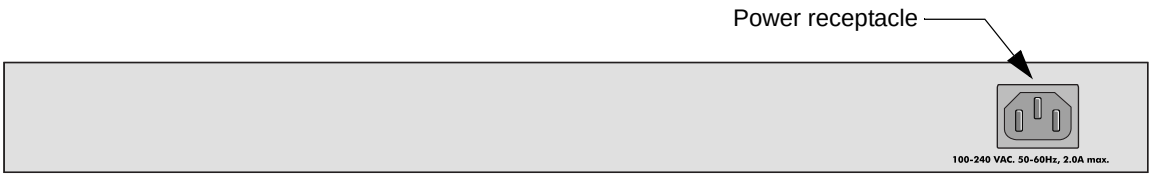

Figure 2-2

FSM7328PS Front Panel and LEDs

The following figure shows the front panel of the FSM7328PS. The front panel contains LEDs, RJ-45 jacks, SFP module bays, and stacking ports.

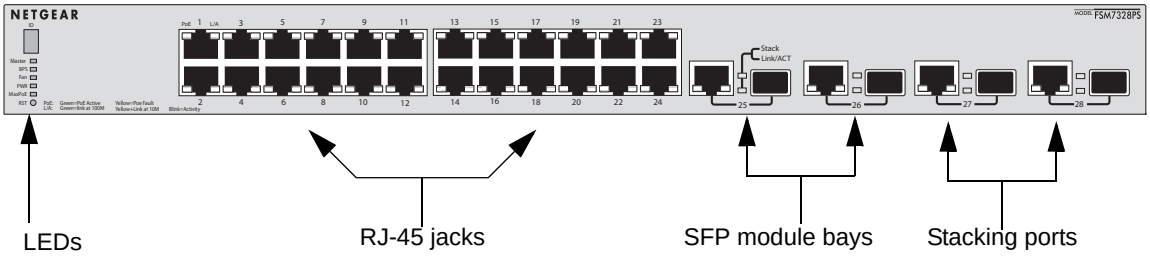

Figure 2-3

The following table shows the LEDs on the front panel of the switch.

Table 2-2. LED Descriptions for FSM7328PS

LED	Description
ID	This is the stack member ID (1–8) that the software assigns to the switch.
Master	**Green:** This switch is the master of the stack. **Off:** The switch is not the master of the stack.
Power	**Solid green:** Power is supplied, and the switch is operating normally. **Blinking green:** Runtime code load in progress. **Solid yellow:** Power-On Self-Test (POST) in progress. **Blinking yellow:** POST failure or CPU failure. **Off:** Power is disconnected.
Fan	**Solid red:** Fan has failed. **Off:** Fan is present and operating normally.
MAX PoE	**Solid yellow:** Less than 15.4 W of PoE power is available. **Blinking yellow:** The MAX PoE LED was active in the previous two minutes. **Off:** There is at least 7 W of PoE power available for another device.
RPS (redundant power supply)	**Solid green:** RPS bank supply PoE power. **Off:** RPS bank is disconnected.

Table 2-2. LED Descriptions for FSM7328PS (continued)

LED	Description
10/100M ports two LEDs per port	**Link/ACT/SPD LED (on the right)** • **Off:** No 10/100 Mbps link is established on the port. • **Solid green:** A valid 100 Mbps link is established on the port. • **Blinking green:** The port is sending or receiving packets at 100 Mbps. • **Solid yellow:** A valid 10 Mbps link is established on the port. • **Blinking yellow:** The port is sending or receiving packets at 10 Mbps. **POE/POE Fault LED: (on the left)** • **Solid Green: A** PoE powered device (PD) is connected and the port is supplying power successfully. • **Solid Yellow:** Indicates one of the following failures resulted in stopping power to that port: – Short circuit on PoE power circuit. – PoE power demand exceeds power available. – PoE current exceeds PD's classification. – Out of proper voltage band (44 ~ 57 VDC). • **Off:** No PoE powered device (PD) is connected.
10/100/1000M ports two LEDs per port	**Link/ACT LED** • **Off:** No 10/100/1000 Mbps link is established on the port. • **Solid green:** A valid 1,000 Mbps link is established on the port. • **Solid yellow:** A valid 10/100 Mbps link is established on the port. • **Blinking green:** Packets transmission or reception is occurring on the port at 1,000 Mbps. • **Blinking yellow:** The port is sending or receiving packets at 10/100 Mbps. **Stack LED** • **Green:** Stack port has a valid link connection. • **OFF:** Stack port does not have a valid link connection.
SFP port (1000 Mbps only) two LEDs per port	**Link/ACT LED** • **Solid green:** Link is up. • **Blinking green:** The port is sending or receiving a packet in link up status . • **Off:** No link is detected . **Stack LED** • **Green:** The stack partner successfully established the link. • **Blinking green:** The switch detects an active link, but the stack partner failed to establish the link. • **Off:** No link, or the switch is in non-stack mode.

FSM7328PS Rear Panel

The rear panel has a Console port, redundant power supply (RPS) connector, and a standard AC power receptacle for the supplied power cord.

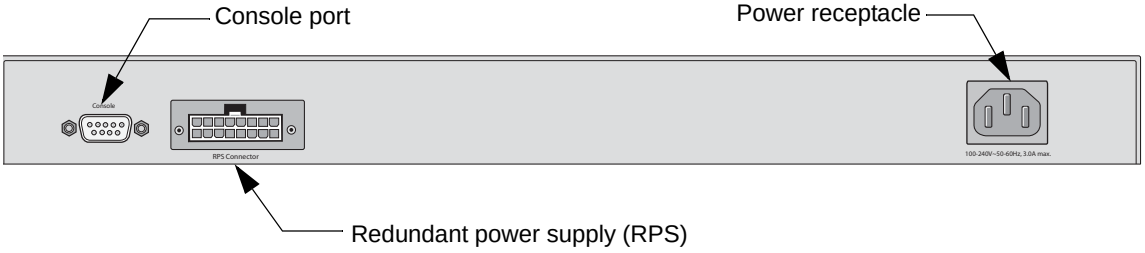

Figure 2-4

FSM7352S Front Panel and LEDs

The following figure shows the front panel of the FSM7352S. The front panel contains LEDs, RJ-45 jacks, SFP module bays, and stacking ports.

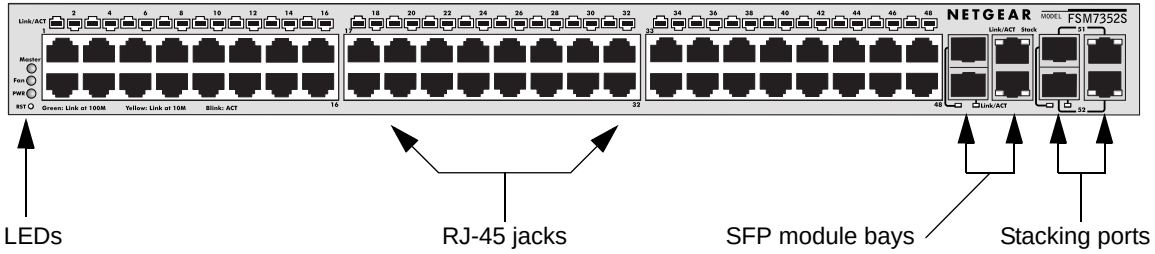

Figure 2-5

The following table shows the FSM7352S LEDs on the front of the switch.

Table 2-3. FSM7352S LED Description

LED	Description
Master	**Green on:** The switch is the master of the stack. **Yellow on:** The switch is not the master of the stack. **Off:** The switch is not part of a stack.
Fan	**Solid red:** Fan has failed. **Off:** Fan is present and operating normally.

Table 2-3. FSM7352S LED Description (continued)

Power	**Solid green:** Power is supplied, and the switch is operating normally. **Blinking green:** Runtime code load in progress. **Solid yellow:** Power-On Self-Test (POST) in progress. **Blinking yellow:** POST failure or CPU failure. **Off:** Power is disconnected.
10/100M ports One LED per port	**Link/ACT/SPD LED** • **Off:** No 10/100 Mbps link is established on the port. • **Solid green:** A valid 100 Mbps link is established on the port. • **Blinking green:** The port is sending or receiving packets at 100Mbps. • **Solid yellow:** A valid 10 Mbps link is established on the port. • **Blinking yellow:** The port is sending or receiving packets at 10 Mbps.
10/100/1000M ports Three LEDs per port	**Link/ACT LED** • **Off:** No 10/100/1000 Mbps link is established on the port. • **Solid green:** A valid 1,000 Mbps link is established on the port. • **Solid yellow:** A valid 10/100 Mbps link is established on the port. • **Blinking green:** The port is sending or receiving packets at 1,000 Mbps. • **Blinking yellow:** The port is sending or receiving packets at 10/100 Mbps. **Stack LED** • **Green:** Stack port has a valid link connection. • **Off:** Stack port does not have a valid link connection.
SFP Port (1,000 Mbps only)	• **Solid green:** Link is up. • **Blinking green:** The port is sending or receiving packets in link up status. • **Off:** No link is detected.

FSM7352S Rear Panel

The rear panel has a console port and a standard AC power receptacle for the supplied power cord.

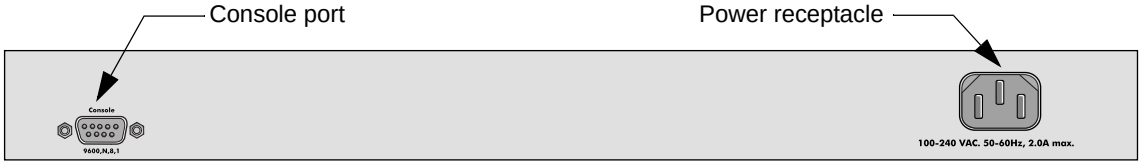

Figure 2-6

FSM7352PS Front Panel and LEDs

The following figure shows the front panel of the FSM7352PS. The front panel contains LEDs, RJ-45 jacks, SFP module bays, and stacking ports. The console port is on the rear panel.

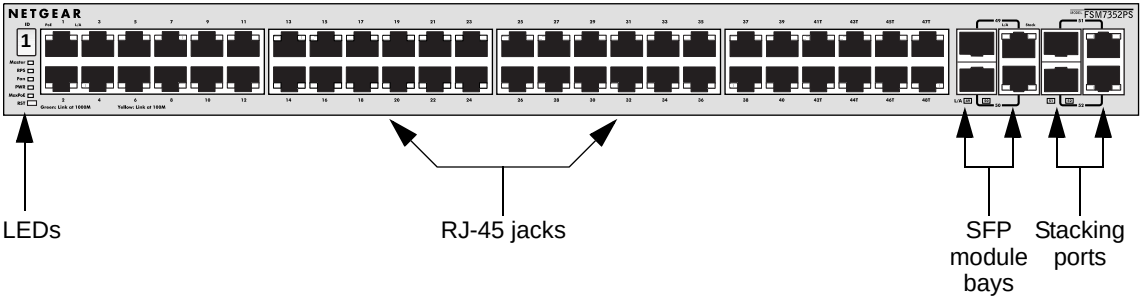

Figure 2-7

The following table describes the FSM7352PS LEDs on the front of the switch.

Table 2-4. FSM7352S LED Description

LED	Description
ID	This is the stack member ID (1–8) that the software assigns to the switch.
Master	**Green on:** This switch is the master of the stack. **Off:** The switch is not part of a stack.
Fan	**Solid red:** Fan has failed. **Off:** Fan is present and operating normally.
Power	**Solid green:** Power is supplied, and the switch is operating normally. **Solid yellow:** Power-On Self-Test (POST) is in progress. **Blinking yellow:** POST failure or CPU failure. **Off:** Power is disconnected.
MAX PoE	**Solid yellow:** Less than 15.4 W of PoE power is available. **Blinking yellow:** The MAX PoE LED was active in the previous two minutes. **Off:** There is at least 7 W of PoE power available for another device.
RPS (redundant power supply)	**Solid green:** RPS bank supply PoE power. **Off:** RPS bank is disconnected.

Table 2-4. FSM7352S LED Description (continued)

10/100M Ports
One LED per port
	Right LED shows Link, Activity, and Speed
	• **Off:** No 10/100 Mbps link is established on the port.
	• **Solid green:** A valid 100Mbps link is established on the port.
	• **Blinking green:** The port is sending or receiving packets at 100 Mbps.
	• **Solid yellow:** A valid 10 Mbps link is established on the port.
	• **Blinking yellow:** The port is sending or receiving packets at 10 Mbps.
	Left LED shows PoE, and PoE fault
	• **Solid green:** The PoE-powered device is connected, and the port is supplying power successfully.
	• **Solid yellow:** One of the following failures resulted in stopping power to the port:
	  • Short circuit on PoE power circuit.
	  • PoE power demand exceeds power available.
	  • PoE current exceeds classification for PoE powered device.
	  • Out of proper voltage band (44–57 VDC).
	• **Off:** No PoE-powered device connected.

10/100/1000M ports Three LEDs per port	**Copper Link, and Activity LED** • **Off:** No 10/100/1000 Mbps link is established on the port. • **Solid green:** A valid 1,000 Mbps link is established on the port. • **Solid yellow:** A valid 10/100 Mbps link is established on the port. • **Blinking green:** The port is sending or receiving packets at 1000Mbps. • **Blinking yellow:** The port is sending or receiving packets at 10/100Mbps. **SFP Link/ACT LED** • **Off:** No 1,000 Mbps link is established on the port. • **Solid green:** A valid 1,000 Mbps link is established on the port. • **Blinking green:** The port is sending or receiving packets at 1,000 Mbps. **Stack LED** • **Green:** The stack partner successfully established the link. • **Blinking green:** The switch detects an active link, but the stack partner failed to establish the link. • **Off:** No link, or the switch is in non-stack mode.

FSM7352PS Rear Panel

The rear panel has a console port, a redundant power supply connector, and a standard AC power receptacle for the supplied power cord.

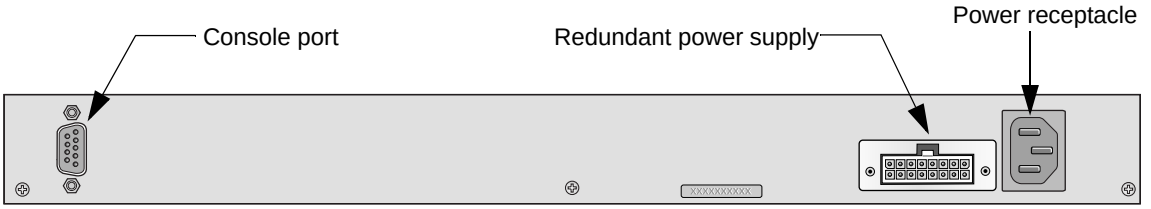

Figure 2-8

Safety Instructions

Use the following safety guidelines to ensure your own personal safety and to help protect your system from potential damage.

To reduce the risk of bodily injury, electrical shock, fire, and damage to the equipment, observe the following precautions.

- Observe and follow service markings.
  - Do not service any product except as explained in your system documentation.
  - Opening or removing covers that are marked with the triangular symbol with a lightning bolt may expose you to electrical shock. Only a trained service technician should service components inside these compartments.
- If any of the following conditions occur, unplug the product from the electrical outlet and replace the part or contact your trained service provider:
  - The power cable, extension cable, or plug is damaged.
  - An object has fallen into the product.
  - The product has been exposed to water.
  - The product has been dropped or damaged.
  - The product does not operate correctly when you follow the operating instructions.

- Keep your system away from radiators and heat sources. Also, do not block cooling vents.
- Do not spill food or liquids on your system components, and never operate the product in a wet environment. If the system gets wet, see the appropriate section in your troubleshooting guide or contact your trained service provider.
- Do not push any objects into the openings of your system. Doing so can cause fire or electric shock by shorting out interior components.
- Use the product only with approved equipment.
- Allow the product to cool before removing covers or touching internal components.
- Operate the product only from the type of external power source indicated on the electrical ratings label. If you are not sure of the type of power source required, consult your service provider or local power company.
- To help avoid damaging your system, be sure that the voltage selection switch (if provided) on the power supply is set to match the power available at your location:
  - 115 volts (V), 60 hertz (Hz) in most of North and South America and in some Far Eastern countries such as South Korea and Taiwan
  - 100 V, 50 Hz in eastern Japan and 100 V, 60 Hz in western Japan
  - 230 V, 50 Hz in most of Europe, the Middle East, and the Far East
- Also, be sure that attached devices are electrically rated to operate with the power available in your location.
- Use only approved power cables. If you have not been provided with a power cable for your system or for any AC powered option intended for your system, purchase a power cable that is approved for use in your country. The power cable must be rated for the product and for the voltage and current marked on the product's electrical ratings label. The voltage and current rating of the cable should be greater than the ratings marked on the product.
- To help prevent electric shock, plug the system and peripheral power cables into properly grounded electrical outlets.
- The peripheral power cables are equipped with three-prong plugs to help ensure proper grounding. Do not use adapter plugs or remove the grounding prong from a cable. If you must use an extension cable, use a three-wire cable with properly grounded plugs.

- Observe extension cable and power strip ratings. Make sure that the total ampere rating of all products plugged into the extension cable or power strip does not exceed 80 percent of the ampere ratings limit for the extension cable or power strip.
- To help protect your system from sudden, transient increases and decreases in electrical power, use a surge suppressor, line conditioner, or uninterruptible power supply (UPS).
- Position system cables and power cables carefully; route cables so that they cannot be stepped on or tripped over. Be sure that nothing rests on any cables.
- Do not modify power cables or plugs. Consult a licensed electrician or your power company for site modifications.
- Always follow your local and national wiring rules.
- Move products with care; ensure that all casters and stabilizers are firmly connected to the system. Avoid sudden stops and uneven surfaces.

Chapter 3
Hardware Installation

This chapter explains how to install the hardware for the Managed Stackable Layer 3 Fast Ethernet Switch models FSM7328S ,FSM7328PS, FSM7352S, and FSM7352PS.

Package Contents

Each switch is packed and shipped separately. The package contains the following items:

- Managed Stackable Layer 3 Fast Ethernet Switch with preinstalled software
- Power adapter cord
- Rack-mounting kit
- Null-modem serial cable (RS-232) with 9-pin connectors
- Resource CD: The CD contains
  - Configuration software
  - Documentation including the *Command Line Interface Reference for the ProSafe 7300S Series Layer-3 Stackable Switches*, the *Administration Manual for the ProSafe 7300S Series Layer-3 Stackable Switches*, the Quick Install Guide, and this Hardware Installation Guide
- Warranty and Support Card
- Quick Install Guide

Protecting Against Electrostatic Discharge

Warning: Static electricity can harm delicate components inside your system. To prevent static damage, discharge static electricity from your body before you touch any of the electronic components, such as the microprocessor. You can do so by periodically touching an unpainted metal surface on the switch.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

1. When unpacking a static-sensitive component from its shipping carton, leave it in the antistatic package until you are ready to install it. Just before unwrapping the antistatic package, discharge static electricity from your body.
2. Before moving a sensitive component, place it in an antistatic container or package.
3. Handle all sensitive components in a static-safe area. If possible, use antistatic floor pads, workbench pads, and an antistatic grounding strap.

Unpacking the Hardware

Check the contents of the boxes to make sure that all items are present before beginning the installation.

1. Place the container on a clean flat surface and cut all straps securing the container.
2. Unpack the hardware from the boxes.

   Carefully remove the hardware and place it on a secure and clean surface. See “Select a Location” on page 3-4.
3. Remove all packing material.

4. Make sure that all items are present. See “Package Contents” on page 3-1.

	**Note:** If any item is found missing or damaged, contact your local NETGEAR reseller for replacement.

5. Inspect the products and accessories for damage. Report any damage immediately.

Installation

Install the equipment in the sequence presented in this chapter:

1. Select a Location.
   See “Select a Location” on page 3-4.
2. Install the Switch.
   See “Install the Switch” on page 3-5.
3. Check the installation.
   See “Check the Installation” on page 3-6
4. Apply power and check the LEDs.
   See “Connect to Power and Check the LEDs” on page 3-6.

Select a Location

The switch can be mounted in a standard 19-inch (48.26-centimeter) rack, wall-mounted, or left freestanding (placed on a tabletop).

The site where you install the switch may greatly affect its performance. Before installing the switch or switches, make sure that the chosen installation location meets the following site requirements.

Table 3-1. Site Requirements for Switch Location

Requirements	
Mounting	• Desktop installations: Provide a flat table or shelf surface. • Rack-mount installations: Use a 19-inch (48.3-centimeter) EIA standard equipment rack that is grounded and physically secure. You need the rack-mount kit 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 the rear-panel power connector.
Power source	Provide a power source within 6 feet (1.8 meters) of the installation location. Power specifications for the switch is shown in Appendix A, “Technical Specifications”. Be sure that the AC outlet is not controlled by a wall switch, which can accidentally turn off power to the outlet and the switch.
Environment	Install the switch in a site free from strong electromagnetic field generators (such as motors), vibration, dust, and direct exposure to sunlight.
Temperature	The ambient switch operating temperature range is 32º to 104ºF (0º to 40ºC). Keep the switch away from heat sources such as direct sunlight, warm air exhausts, hot-air vents, and heaters.
Operating humidity	Install the switch in a dry area with a maximum relative humidity of 90%, noncondensing.
Ventilation	Do not restrict airflow by covering or obstructing air inlets on the sides of the switch. Keep at least 2 inches (5.08 centimeters) free on all sides for cooling. Be sure that there is adequate airflow in the room or wiring closet where you intend to install the switch.
Cabling	Route the cable to avoid sources of electrical noise such as radio transmitters, broadcast amplifiers, power lines, and fluorescent lighting fixtures.

Install the Switch

You can install the switch on a flat surface or in a standard 19-inch rack.

Installing the Switch on a Flat Surface

The switch ships with four self-adhesive rubber footpads. Stick one rubber footpad on each of the four concave spaces on the bottom of the switch. The rubber footpads cushion the switch against shock and vibrations.

Installing the Switch in a Rack

To install the switch in a rack, you will need the 19-inch rack-mount kit supplied with your switch.

1. Attach the supplied mounting brackets to the side of the switch.
2. Use the provided Phillips head screws to fasten the brackets to the sides of the switch.

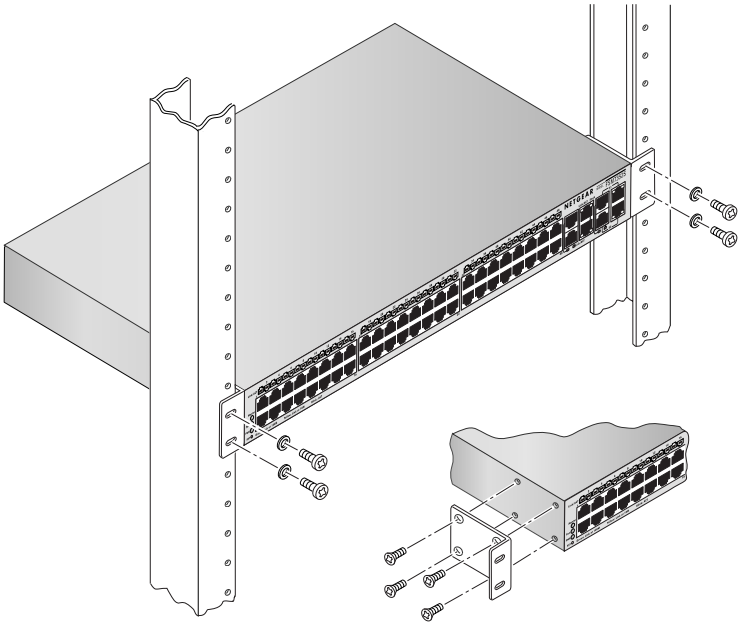

Figure 3-1

3. Tighten the screws with a No. 1 Phillips screwdriver to secure each bracket.

4. Align the bracket and rack holes. Use two pan-head screws with nylon washers to fasten each bracket and to the rack.
5. Tighten the screws with a No. 2 Phillips screwdriver to secure the switch in the rack.

Check the Installation

Before you apply power, perform the following checks:

1. Inspect the equipment thoroughly.
2. Verify that all cables are installed correctly.
3. Check cable routing to ensure that cables are not damaged and will not create a safety hazard.
4. Be sure that all equipment is mounted properly and securely.

Connect to Power and Check the LEDs

The switch does not have an ON/OFF switch. The only way to apply or remove power is to connect or disconnect the power cord. Before you connect the power cord, select an AC outlet that is not controlled by a wall switch (which can turn off power to the switch).

After you select an appropriate outlet, follow these steps to apply AC power.

1. Connect one end of the AC power adapter cable to the rear of the switch, and the other end to a grounded three-pronged AC outlet.
2. Check the Power LED on the front panel of the switch. The LED should light up in the following sequence:
   - The LED turns yellow as the switch runs a Power-On Self-Test (POST).
   - The switch passes the test, the LED turns green, and the switch is working and ready to pass data.
   - If the POST fails, the Power LED blinks yellow.

   If the Power LED does not light up, check that the power cable is plugged in correctly and that the power source is good. For help with troubleshooting, see Chapter 4, “Troubleshooting”.

Stacking Switches

Up to eight switches can be stacked. The last two ports on the right side of the front panel of each switch are preconfigured for stacking. These are ports 27 and 28 for the FSM7328S and FSM7328PS, and ports 51 and 52 for the FSM7352S and FSM7352PS.

	Note: You can connect and establish a link with non-stacking interfaces, but no traffic will pass across the interface.

To set up a stack:

1. Connect the switches using a standard Category 5 Ethernet cable on the stacking ports, as shown:

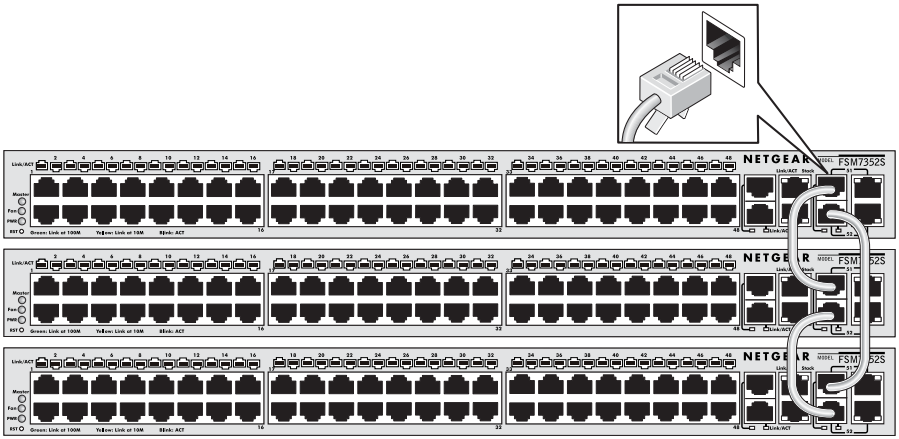

Figure 3-2

2. The switches automatically select the master switch in the stack.
3. To use the console and Command Line Interface (CLI), connect the console to the master switch. This single console connection enables you to manage all of the switches in the stack.

For information about working with the CLI, see the *Command Line Interface Reference for the ProSafe 7300S Series Layer-3 Stackable Switches* on the Resource CD that shipped with your product.

Connecting a Redundant Power Supply

The FSM7328PS and FSM7352PS switches have a redundant power supply connector in the back.

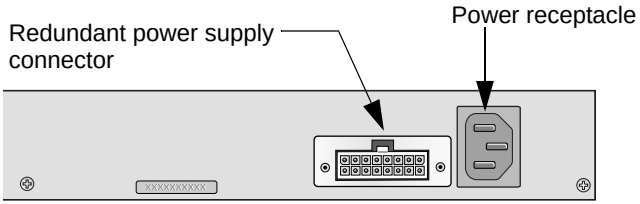

Figure 3-3

The location of the Redundant power supply connector on your switch may differ from the illustration.

You can connect a DC-to-DC power supply to the switch in case the primary power supply fails. To connect a redundant power supply to the switch, first turn off the switch. Then connect the redundant power supply to the switch. Once all connections are completed, apply power to the switch.

Connecting Equipment to the Switch

You can connect devices, an SPF Gigabit Ethernet module, and a console to the switch.

RJ-45 Ports

The switch uses Auto Uplink technology, which enables you to attach devices using either straight-through or crossover cables. Use a Category 5 (Cat5) unshielded twisted-pair (UTP) cable terminated with an RJ-45 connector.

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

Gigabit Module Bay

You can install an SFP Gigabit Ethernet module in the gigabit module bays. SFP modules are sold separately.

Four ports on the switch can be used for either STP (RJ-45) or SFP (fiber) cable. However, both port types cannot be used at the same time. The switch selects the first connected interface. If both connectors are plugged, the SFP interface operates normally and disables the copper interface.

The SFP bay accommodates a standard SFP module with an LC connector that is compatible with the IEEE 802.3z 1000BASE-SX standard.

To install an SFP module:

1. Insert the SFP module into the SFP module bay. Press firmly to ensure that the module seats into the connector.
2. To install additional modules, repeat step 1.

Connecting a Console to the Switch

After you install the switch and apply power, you can connect to it with a terminal or workstation. You can use the Command Line Interface (CLI) to identify the IP address. If you are stacking switches, see “Stacking Switches ” on page 3-7.

To use a console ,you need:

- VT100/ANSI terminal; or a Windows PC, Apple Macintosh, or UNIX workstation.
- Null-modem cable with 9-pin connectors on each end (shipped with the product)

To connect a console to the switch:

1. Connect the null-modem cable to the console port of the switch.

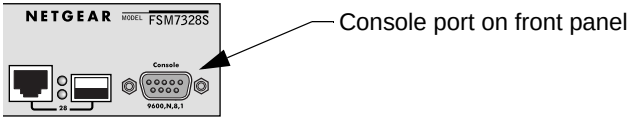

Figure 3-4

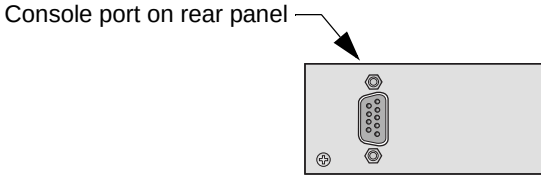

Figure 3-5

2. Connect the other end of the cable to a workstation or terminal.
3. If you attached a workstation, start a terminal-emulation program.
    - Microsoft Windows users can use HyperTerminal, which comes with the Windows operating systems.
    - Macintosh users can use ZTerm.
    - UNIX users can use a terminal emulator such as TIP.
4. Configure the terminal-emulation program to use the following settings:
    - Baud rate: 9,600 bps
    - Data bits: 8
    - Parity: none
    - Stop bit: 1
    - Flow control: none

After you connect a console to the switch, you will need to configure the switch. The following documents are provided for this purpose:

- Quick Install Guide: Explains basic set up and configuration (provided as both a print document and in PDF format on the Resource CD)
- *Command Line Interface Reference for the ProSafe 7300S Series Layer-3 Stackable Switches:* Gives detailed examples of how to use the CLI, and is located on the Resource CD.
- *Administration Manual for the ProSafe 7300S Series Layer-3 Stackable Switches*: Describes configuration tasks, and is located on the Resource CD.

Chapter 4
Troubleshooting

Troubleshooting Chart

The following table lists symptoms, causes, and solutions of possible problems.

Table 4-1. Troubleshooting

Problem	Cause	Solution
Power LED is off.	No power is received	Check the power cord connection for the switch at the switch and at the connecting device. Make sure all cables used are correct and comply with Ethernet specifications.
Link LED is off or intermittent.	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 that all cables used are correct and comply with Ethernet specifications. See Appendix A, “Technical Specifications”. Check for a defective adapter card, cable, or port by testing it 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 that the attached device is set to auto-negotiate. Check the system message log.

Table 4-1. Troubleshooting (continued)

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 that all connectors are securely positioned in the required ports. Equipment may have been accidentally disconnected.
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 4-1 do not resolve your problem, refer to the troubleshooting suggestions in this section.

Network Adapter Cards

Make sure that the network adapter cards installed in the PCs are in working condition and the software driver has been installed.

Configuration

If problems occur after you change the network configuration, restore the original connections. Then find the problem by making the 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 limitations.

Switch Integrity

You can verify the integrity of the switch by resetting the switch. To reset the switch, use the Tools> Reset command or remove AC power from the switch and then reapply AC power. If the problem continues, contact NETGEAR technical support. See the Support Information Card that shipped with your product.

Auto-Negotiation

The 10/100/1000 Mbps ports negotiate the correct duplex mode and speed if the device at the other end of the link supports auto-negotiation. If the device does not support auto-negotiation, the switch only determines the speed correctly and the duplex mode defaults to half-duplex.

The gigabit port on the gigabit module negotiates speed, duplex mode, and flow control, provided that the attached device supports auto-negotiation.

Appendix A
Technical Specifications

This appendix provides technical specifications for the switches.

Table A-1. Technical Specifications for the FSM7328S and FSM7328PS Switches

Feature	FSM7328S	FSM7328PS
IEEE Network Protocol and Standards compatibility	• 802.3 10BASE-T • 802.3u 100BASE-TX • 802.3z 1000BASE-SX • 802.3ab 1000BASE-T • 802.3x flow control	• 802.3 10BASE-T • 802.3u 100BASE-TX • 802.3z 1000BASE-SX • 802.3ab 1000BASE-T • 802.3x flow control • 802.3af Power over Ethernet
Interface (Auto Uplink on all RJ-45 ports)	• 24 RJ-45 connectors for 10BASE-T and 100BASE-TX • 4 RJ-45 connectors for 10BASE-T, 100BASE-TX, and 1000BASE-T • 4 Gigabit Interface Converter (SFP) slots for SFP modules • RS-232 console port	• 24 RJ-45 connectors for 10BASE-T and 100BASE-TX • 4 RJ-45 connectors for 10BASE-T, 100BASE-TX, and 1000BASE-T • 4 Gigabit Interface Converter (SFP) slots for SFP modules • RS-232 console port
Performance	• Forwarding modes: store-and-forward • Bandwidth: 12.8 Gbps • Network latency: Less than 80 microseconds for 64-byte frames in store-and-forward mode for 10 Mbps to 100 Mbps transmission	• Forwarding modes: store-and-forward • Bandwidth: 12.8 Gbps • Network latency: Less than 80 microseconds for 64-byte frames in store-and-forward mode for 10 Mbps to 100 Mbps transmission
Ports (Auto Uplink and auto-sensing)	• 24 10/100 Mbps ports • 4 10/100/1000 Mbps Fast Ethernet TP ports • 4 gigabit ports to stack up to 8 switches • Full- and half-duplex functions	• 24 10/100 Mbps ports • 4 10/100/100 Mbps Fast Ethernet TP ports • 4 gigabit ports to stack up to 8 switches • Full- and half-duplex functions • Power over Ethernet (PoE) support on all 24 10/100 Mbps ports based on IEE 802.3af standard • IEEE 802.3af power budget: Full power for up to 12 ports, 8 W per port for 24 ports

Table A-1. Technical Specifications for the FSM7328S and FSM7328PS Switches

Feature (continued)	**FSM7328S**	**FSM7328PS**
Addressing	• 16,384 media access control (MAC) addresses per system • 48-bit MAC address	
10/100/1000 buffer memory	8-MB embedded memory for 24 ports	
Acoustic noise (ANSI-S10.12)	56.07 dB	38.6 dB
Heat dissipation	18.99 Btu/hr	979.57 Btu/hr
Mean time between failure (MTBF)	125,503 hours (~ 14.3 years)	210,685 hours (~ 24 years)
Power consumption	• 54 W maximum • 100–240 VAC, 50–60 Hz universal input	• 286.93 W maximum • 100–240 VAC, 50–60 Hz universal input
Dimensions (W x D x H)	17.3 x 8.1 x 1.6 inch (440 x 205 x 43 mm)	17.3 x 8.1 x 1.6 inch (440 x 205 x 43 mm)
Environment	Temperature • Operating: 32° to 122°F (0° to 50°C) • Storage: –4° to 158°F (–20° to 70°C) Humidity • Operating: 90% maximum relative humidity, noncondensing • Storage: 95% maximum relative humidity, noncondensing Altitude • Operating: 10,000 ft (3,000 m) maximum • Storage: 10,000 ft (3,000 m) maximum	
Electromagnetic emissions and immunity	CE mark, commercial FCC Part 15 Class A VCCI Class A EN 55022 (CISPR 22), Class A C-Tick EN 50082-1 EN 55024	
Safety	CE mark, commercial CSA certified (CSA 22.2 #950) UL listed (UL 1950)/cUL IEC950/EN60950	

Table A-2. Technical Specifications for the FSM7352S and FSM7352PS Switches

Feature	FSM7352S	FSM7352PS
IEEE Network Protocol and Standards compatibility	• 802.3 10BASE-T • 802.3u 100BASE-TX • 802.3z 1000BASE-SX • 802.3ab 1000BASE-T • 802.3x flow control	• 802.3 10BASE-T • 802.3u 100BASE-TX • 802.3z 1000BASE-SX • 802.3ab 1000BASE-T • 802.3x flow control • 802.3af Power over Ethernet
Interface (Auto Uplink on all RJ-45 ports)	• 48 RJ-45 connectors for 10BASE-T and 100BASE-TX • 4 RJ-45 connectors for 10BASE-T, 100BASE-TX, and 1000BASE-T • 4 Gigabit Interface Converter (SFP) slots for SFP modules • RS-232 console port	• 48 RJ-45 connectors for 10BASE-T and 100BASE-TX • 4 RJ-45 connectors for 10BASE-T, 100BASE-TX, and 1000BASE-T • 4 Gigabit Interface Converter (SFP) slots for SFP modules • RS-232 console port
Performance	• Forwarding modes: store-and-forward • Bandwidth: 17.6 Gbps • Network latency: Less than 80 microseconds for 64-byte frames in store-and-forward mode for 10 Mbps to 100 Mbps transmission	• Forwarding modes: store-and-forward • Bandwidth: 17.6 Gbps • Network latency: Less than 80 microseconds for 64-byte frames in store-and-forward mode for 10 Mbps to 100 Mbps transmission
Ports (Auto Uplink and auto-sensing)	• 48 10/100 Mbps ports • 4 10/100/100 Mbps Ethernet TP ports • 4 gigabit ports to stack up to 8 switches • Full- and half-duplex functions	• 48 10/100 Mbps ports • 4 10/100/100 Mbps Fast Ethernet TP ports • 4 gigabit ports to stack up to 8 switches • Full- and half-duplex functions • Power over Ethernet (PoE) support on all 48 10/100 Mbps ports based on IEE 802.3af standard • IEEE 802.3af power budget: Full power for up to 24 ports, 7 W per port for 48 ports
Addressing	• 16,384 media access control (MAC) addresses per system • 48-bit MAC address	
10/100/1000 buffer memory	32-MB embedded memory for 52 ports	32-MB embedded memory for 52 ports
Acoustic noise (ANSI-S10.12)	56.07 dB	<52 dB
Heat dissipation	18.99 Btu/hr	

Table A-2. Technical Specifications for the FSM7352S and FSM7352PS Switches

Feature (continued)	**FSM7352S**	**FSM7352PS**
Mean time between failure (MTBF)	117,747 hours (~ 13.4 years)	138266 hours (~ 15.8 years)
Power consumption	• 80 W maximum • 100–240 VAC, 50–60 Hz universal input	• 470 W maximum • 100–240 VAC, 50–60 Hz universal input • Power over Ethernet budget: 400 W
Dimensions (W x D x H)	17.3 x 10.1 x 1.6 inch (440 x 257 x 43 mm)	17.3 x 15.2 x 1.6 inch (440 x 385 x 43 mm)
Environment	Temperature • Operating: 32° to 104°F (0° to 40°C) • Storage: –4° to 158°F (–20° to 70°C) Humidity • Operating: 90% maximum relative humidity, noncondensing • Storage: 95% maximum relative humidity, noncondensing Altitude • Operating: 10,000 ft (3,000 m) maximum • Storage: 10,000 ft (3,000 m) maximum	
Electromagnetic emissions and immunity	CE mark, commercial FCC Part 15 Class A VCCI Class A EN 55022 (CISPR 22), Class A C-Tick EN 50082-1 EN 55024	
Safety	CE mark, commercial CSA certified (CSA 22.2 #950) UL listed (UL 1950)/cUL IEC950/EN60950	

Appendix B
Default Configuration Settings

This appendix provides the default settings for the NETGEAR Model FSM7328S, FSM7328PS, FSM7352S, and FSM7352PS switches.

Table B-1. Default Configuration Settings

Features	Default Setting
Port speed	Auto-negotiation
Port duplex	Auto-negotiation
Flow control (full duplex)	Disabled
Broadcast storm control	Disabled
Gigabit port type	Auto detect
Management IP configuration	DHCP
Password protection	Disabled
User name	Admin
Password	(none)
Web access	Enabled
Java mode	Enabled
VLAN	All ports belong to default VLAN (VLAN 1) as untagged ports
IP multicast filtering	Disabled
Spanning Tree Protocol	Enabled (IEEE 802.1s)
Admin edge port	Enabled
Link aggregation	Disabled
Port mirroring	Disabled
Traffic prioritization	Disabled
ACL	Disabled
GVRP	Disabled
GMRP	Disabled
IP routing	Disabled

Table B-1. Default Configuration Settings (continued)

Features	Default Setting
RIP	Disabled
MAC address aging	300 seconds
OSPF	• FSM7328S and FSM7352S: Not supported • FSM7328PS and FSM7352PS: Disabled
SNMP community	Public read only
Stacking mode	• FSM7328S and FSM7328PS: Enabled on port 27 and 28, and disabled on all other ports • FSM7352S and FSM7352PS: Enabled on ports 51 and 52, and disabled on all other ports
Power over Ethernet	Enabled for FSM7328PS and FSM7352PS
DHCP server	Disabled

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

202-10256-01

May 2007