Managed Layer 2+ Stackable Switches FSM7226RS and FSM7250RS Hardware Installation Guide

NETGEAR, Inc.
350 E. Plumeria Drive
San Jose, CA 95134 USA

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It is hereby certified that the NETGEAR ProSafe™ 24-Port L2+ Managed Stackable Switch with 2 Gigabit ports FSM7226RS 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 , however, be subject to certain restrictions. Please refer to the notes in the operating instructions.

It is hereby certified that the NETGEAR ProSafe™ 48-Port L2+ Managed Stackable Switch with 2 Gigabit ports FSM7250RS 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 , 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 occur, in which case, the user 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。

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 not cause harmful interference.
- This device must accept any interference received, including interference that 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 may radiate radio frequency energy and, if not installed and used in accordance with the instructions, 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 (NETGEAR ProSafe™ 24-Port L2+ Managed Stackable Switch with 2 Gigabit ports FSM7226RS) 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 (NETGEAR ProSafe™ 48-Port L2+ Managed Stackable Switch with 2 Gigabit ports FSM7250RS) 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 ProSafe™ 24-Port L2+ Managed Stackable Switch with 2 Gigabit ports FSM7226RS) 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 (NETGEAR ProSafe™ 48-Port L2+ Managed Stackable Switch with 2 Gigabit ports FSM7250RS) 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.

EN 55 022 Declaration of Conformance

This is to certify that the NETGEAR ProSafe™ 24-Port L2+ Managed Stackable Switch with 2 Gigabit ports FSM7226RS is shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55024 Class A (CISPR 22).

This is to certify that the NETGEAR ProSafe™ 48-Port L2+ Managed Stackable Switch with 2 Gigabit ports FSM7250RS is shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55024 Class A (CISPR 22).

EN 55 022 and EN 55 024 Statements

This is to certify that the NETGEAR ProSafe™ 24-Port L2+ Managed Stackable Switch with 2 Gigabit ports FSM7226RS is shielded against the generation of radio interference in accordance with the application of Council

Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55 022 Class A (CISPR 22) and EN 55 024.

This is to certify that the NETGEAR ProSafe™ 48-Port L2+ Managed Stackable Switch with 2 Gigabit ports FSM7250RS is shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55 022 Class A (CISPR 22) and EN 55 024.

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

Customer Support

Refer to the Support Information Card that shipped with your ProSafe™ 24-Port L2+ Managed Stackable Switch with 2 Gigabit ports FSM7226RS or ProSafe™ 48-Port L2+ Managed Stackable Switch with 2 Gigabit ports FSM7250RS.

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:	FSM7226RS and FSM7250RS
Publication Date:	October 2008
Product Family:	managed switch
Product Name:	• ProSafe™ 24-Port L2+ Managed Stackable Switch with 2 Gigabit ports FSM7226RS • ProSafe™ 48-Port L2+ Managed Stackable Switch with 2 Gigabit ports FSM7250RS
Home or Business Product:	Business
Language:	English
Publication Part Number:	202-10454-01
Publication Version Number	1.0

Contents

About This Manual

The *NETGEAR® Managed Layer 2+ Stackable Switches FSM7226RS and FSM7250RS Hardware Installation Guide* describes how to install, configure and troubleshoot the managed switches. The information in this manual is intended for readers with intermediate computer and Internet skills.

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

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
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 result in a malfunction or damage to the equipment.

- **Scope**. This manual is written for the Managed Layer 2+ Stackable Fast Ethernet Switch according to these specifications:

Product Version	ProSafe FSM7200RS
Manual Publication Date	October 2008

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.

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    - 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.
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  • Click the print icon in the upper left corner of your browser window.

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Revision History

Part Number	Version Number	Date	Description
202-10454-01	1.0	September 2008	Original publication.

Chapter 1
Introduction

The NETGEAR Layer 2+ 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 L2+ Managed Stackable Switch with 2 Gigabit ports FSM7226RS
- ProSafe™ 48-Port L2+ Managed Stackable Switch with 2 Gigabit ports FSM7250RS

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*.

FSM7226RS Front Panel and LEDs

The following figure shows the front panel of the managed switch. The front panel contains LEDs, a RST (reset) button, RJ-45 jacks, and copper/fiber combo ports.

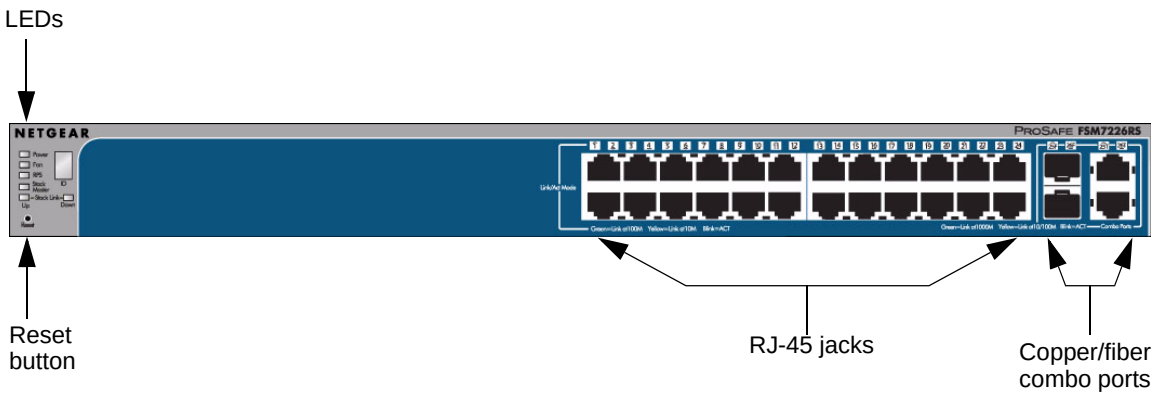

Figure 1-1

FSM7226RS Rear Panel

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

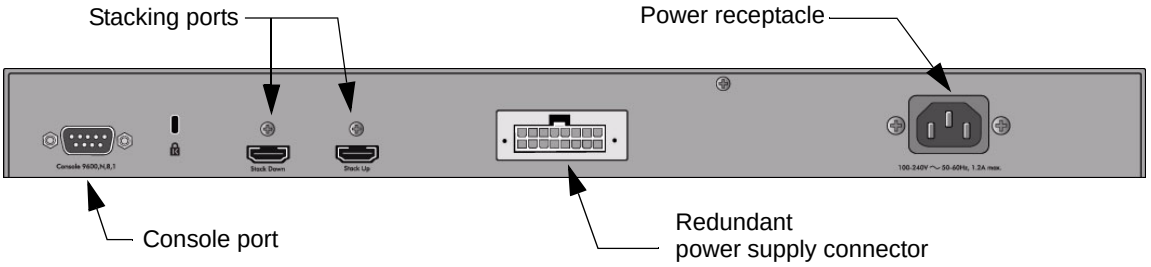

Figure 1-2

FSM7250RS Front Panel and LEDs

The following figure shows the front panel of the managed switch. The front panel contains LEDs, a RST (reset) button, RJ-45 jacks, and copper/fiber combo ports.

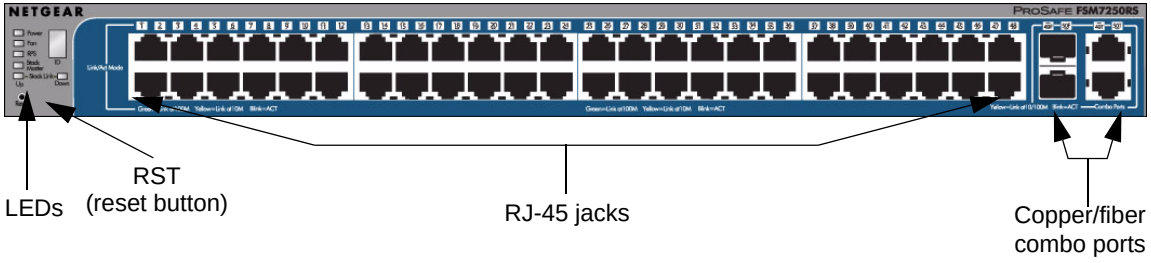

Figure 1-3

FSM7250RS Rear Panel

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

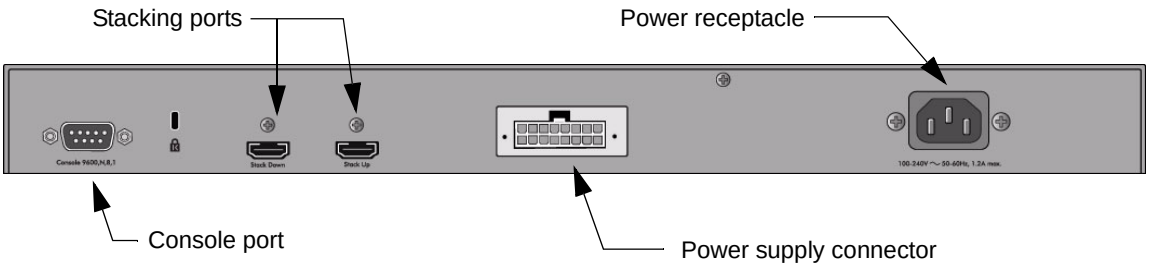

Figure 1-4

Interpreting the LEDs

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

Table 1-1. LED Descriptions

LED	Description
PWR (power)	• **Solid green:** Power is supplied and the switch is working. • **Blinking green**. Power-on self-test (POST) in progress. • **Solid yellow**: System is booting up. • **Blinking yellow:** POST, CPU, or power supply has failed. • **Off:** Power is disconnected.
FAN	• **Yellow:** Fan has failed. • **Green:** Fan operating normally.
RPS (redundant power supply)	• **Solid green:** The redundant power supply is connected (and using internal power). • **Solid yellow:** The switch internal power has failed or been disconnected, but the redundant power supply is providing power to the switch. • **Blinking yellow**: The redundant power supply unit is present, but the power has failed. • **Off:** The redundant power supply is disconnected or not present.
Stack Master	• **Solid Green:** The switch is master of the stack. • **Off:** The switch is not master of the stack.

Table 1-1. LED Descriptions (continued)

LED	Description
Stack ID	**Solid Green:** Display the stack ID.
• RJ45 Port 1-24 for FSM7226RS • RJ45 Port 1-48 for FSM7250RS (One LED per port)	**SPD/Link/ACT LED** • **Off:** No link is established on the port. • **Green:** A valid 100M link is established on the port. • **Blinking:** The port is sending or receiving packets. • **Yellow:** A valid 10 Mbps link is established on the port.
Stack ports (IN and OUT)	• **Off:** Stack port does not have a valid link connection. • **Green:** Stack port has a valid link connection. • **Blinking:** The stack port is sending or receiving packets.
• Copper port 25-26 for FSM7226RS • Copper port 49-50 for FSM7250RS (One LED per port)	**SPD/Link/Act LED** • **Off**:No link is established on the port. • **Green**: A valid 1000M link is established on the port. • **Blinking**:The port is sending or receiving packets. • **Yellow**: A valid 10/100M link is established on the port.
• SFP fiber ports 25-26 for FSM7226RS • SFP fiber ports 49-50 for FSM7250RS (One LED per port)	**SPD/Link/Act LED** • **Off**:No link is established on the port. • **Green**: A valid 1000M link is established on the port. • **Blinking**:The port is sending or receiving packets. • **Yellow**: A valid 100M link is established on the port.

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 could 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, contact your trained service provider.
- Do not push any objects into the openings of your system. Doing so could 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 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 2
Hardware Installation

This chapter explains how to install the hardware for the Managed Stackable Layer 2+ Fast Ethernet Switch models FSM7226RS and FSM7250RS.

Package Contents

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

- Managed Stackable Layer 2+ Fast Ethernet Switch with preinstalled software
- Power adapter cord
- Rubber footpads for tabletop installation
- Rubber caps for the SFP sockets
- Rack-mounting kit
- Stack cable
- 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 7200RS Series Layer-2 Stackable Switches*, the *NETGEAR 7000 Series Managed Switch Administration Guide, the NETGEAR Installation Guide for the 7000 Series Stackable Managed Switch*, and this *Hardware Installation Guide*
- Warranty and Support Card
- ProSafe NMS100 Network Management System 30-day trial CD-ROM

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 “Selecting a Location” on page 2-3.
3. Remove all packing material.
4. Make sure that all items are present. See “Package Contents” on page 2-1.

	**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 following sequence, as presented in this chapter:

1. Select a location. See "Selecting a Location" on page 2-3.
2. Install the switch. See "Installing the Switch" on page 2-4.
3. Check the installation. See "Checking the Installation" on page 2-5
4. Apply power and check the LEDs. See "Connecting to Power and Checking the LEDs" on page 2-5.

Selecting 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 greatly affect its performance. Before installing the switch or switches, make sure that the chosen installation location meets the following site requirements.

Table 2-1. 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, and the rack-mounting kit supplied with your switch.
Access	Put 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 are shown in Appendix A, "Default Factory Settings and Technical Specifications. Be sure that the AC outlet is not controlled by a wall switch, which could 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 0º to 55ºC (32º and 131ºF). 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 will install the switch.

Table 2-1. Site Requirements for Switch Location (continued)

Requirements	
Cabling	Route the cable to avoid sources of electrical noise such as radio transmitters, broadcast amplifiers, power lines, and fluorescent lighting fixtures.

Installing 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 need the 19-inch rack-mounting 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.

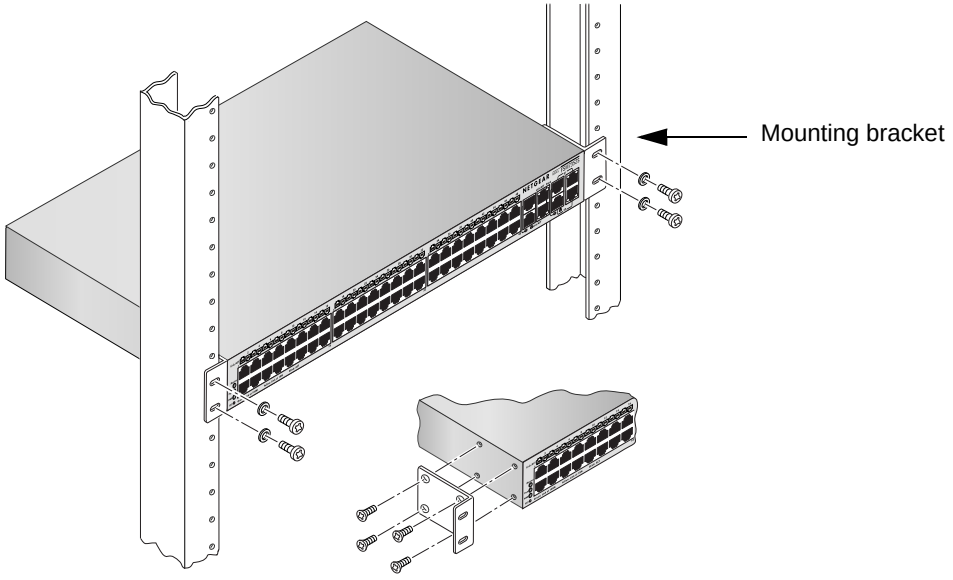

Figure 2-1

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 to the rack.
5. Tighten the screws with a No. 2 Phillips screwdriver to secure the switch in the rack.

Checking 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.

Connecting to Power and Checking 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).
   - If the switch passes the test, the LED turns green. 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 3, “Troubleshooting.

SFP Modules

The module bay accommodates a standard SFP module with an LC connector that is compatible with the IEEE 802.3z 1000BASE-X standard. SFP modules are sold separately.

To install an SFP module insert the SFP module into the module bay. Press firmly to ensure that the module seats into the connector.

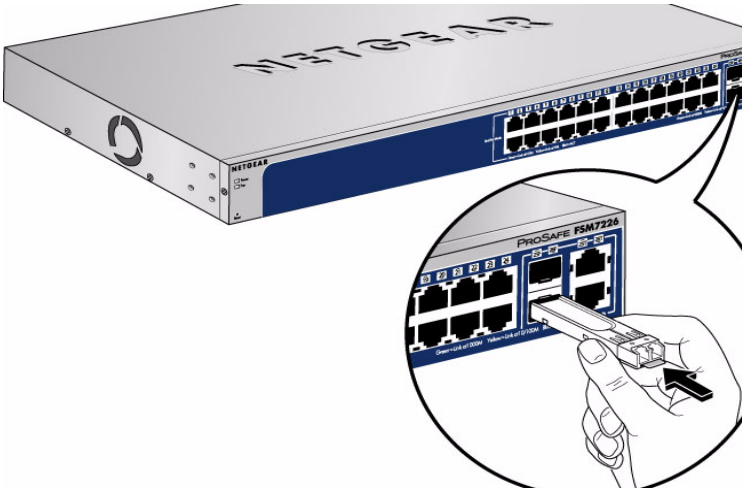

Figure 2-2

Connecting a Redundant Power Supply

Each switch has a redundant power supply (RPS) connector at the rear of the switch next to the power receptacle.

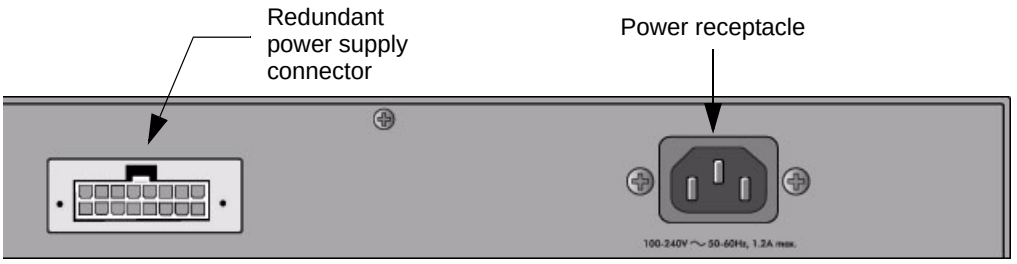

Figure 2-3

You can connect an external DC-to-DC power supply unit to the switch to provide redundant power in case the primary power supply fails. To connect a redundant power supply (RPS) unit to the switch, first turn off the switch. When the power is off, you can remove the cover plate and connect the RPS unit to the switch. After all connections are completed, apply power to the switch.

If you would like to purchase a RPS unit that is compatible with this switch, go to the NETGEAR product support website *http://www.kbserver.com*. Select your product in the Product Support section of the screen. When the product support screen displays, look for the Certified RPS Power Supplier link.

Stacking

You can connect up to eight switches to form a stack with a single management IP address. The switches automatically select a master unit. Once the master is selected, you can use its console to manage all the switches in the stack.

Two stacking port can be used for stacking, while the remaining two I/O module bays can be used for 10-Gigabit Ethernet uplinks.

To set up a stack:

1. Connect the provided stacking cable from one switch's IN stacking port to another switch's OUT stacking port.

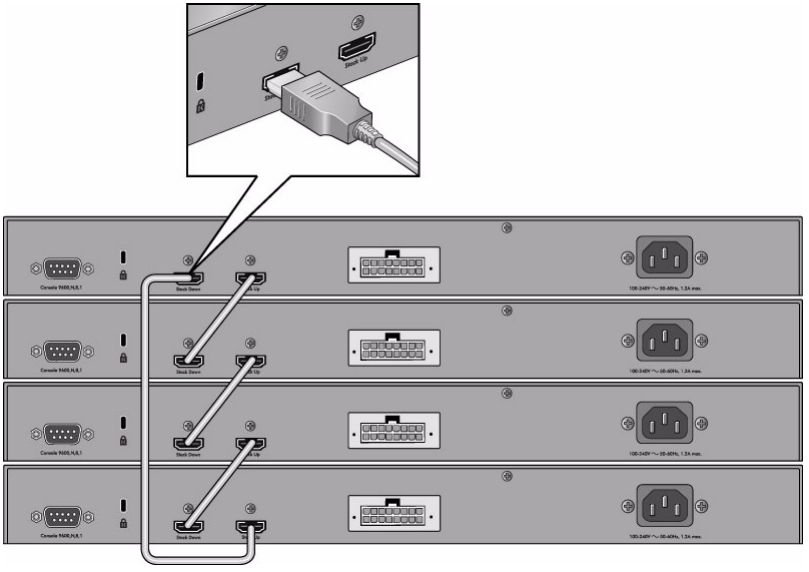

Figure 2-4

3. Connect each switch to the next in a cascade to build the backplane of the stack. Finally, connect the last switch in the stack to the first switch, to close the ring and provide redundancy and resiliency to the stack.

   The switches automatically select the master switch in the stack.

4. To use the console and Command Line Interface (CLI), use a serial cable to connect the console to the master switch. This single console connection lets you manage all the switches in the stack.

For information about working with the CLI, see the *Command Line Interface Reference for the ProSafe 7200RS Series Layer-2 Stackable Switches* on the *Resource CD* that shipped with your product.

Connecting Equipment to the Switch

You can connect devices, a Gigabit Ethernet module, and/or 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).

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” on page 2-7.

To use a console you need the following items:

- VT100/ANSI terminal, or a Windows PC, Apple Macintosh PC, 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 on the rear of the switch.

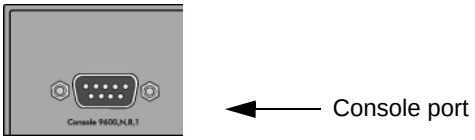

Figure 2-5

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:

- *Command Line Interface Reference for the ProSafe 7200RS Series Layer-2 Stackable Switches:* Gives detailed examples of how to use the CLI, and is located on the *Resource CD*.
- *NETGEAR 7000 Series Managed Switch Administration Guide*: Describes configuration tasks, and is located on the *Resource CD*.

Chapter 3
Troubleshooting

Troubleshooting Chart

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

Table 3-1. Troubleshooting

Problem	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 that 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. • 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
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 have been accidentally disconnected.
ACT LED flashes 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 3-1 on page 3-1 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.
- **Auto-Negotiation**
  The copper 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 fiber gigabit ports negotiate speed, duplex mode, and flow control, provided that the attached device supports auto-negotiation.

Appendix A
Default Factory Settings and Technical Specifications

Default Configuration Settings

This section provides the default settings for the FSM7226RS and FSM7250RS switches.

Table A-1. Default Configuration Settings

Features	Default Setting
Port speed	Auto-negotiation
Port duplex	Auto-negotiation
Flow control (half duplex)	Enabled
Flow control (full duplex)	Disabled
Broadcast storm control	Enabled
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

Table A-1. Default Configuration Settings (continued)

Features	Default Setting
ACL	Disabled
GVRP	Disabled
GMRP	Disabled
IP routing	Disabled
MAC address aging	300 seconds
SNMP community	public (read-only access), private (read/write access)
DHCP Server	Disabled
VLAN Ingress filtering	Enabled
IP multicast filtering	Disabled

Technical Specifications

This section provides technical specifications for the switches.

Table A-2. Technical Specifications

Feature	FSM7226RS	FSM7250RS
IEEE Network Protocol and Standards compatibility	802.3 10BASE-T 802.3u 100BASE-TX 802.3z 1000BASE-SX 802.3z 1000BASE-LX 802.3ab 1000BASE-T 802.3x flow control	

Table A-2. Technical Specifications (continued)

Feature	FSM7226RS	FSM7250RS
Switch management	• Port mirroring support • SNMP v1, v2c, v3 • RFC1757 RMON 1 groups 1, 2, 3, and 9 • RFC1213 MIB II • RFC1643 Ethernet Interface MIB • RFC1493 bridge MIB • RFC2131 DHCP client (and BootP) • RFC2138 RADIUS client • Broadcast storm control • Telnet sessions for management CPU (5) • Ping support • ARP support • Private enterprise MIB • Configuration file upload, download (TFTP) • Runtime image download (TFTP) • Command Line Interface • Web-based graphic user interface • Simple Network Time Protocol (SNTP) • Syslog • SSLv3/TLSv1.0 Web security • Secured Shell (SSHv1, v2)	
Layer 2 Services	• 802.1Q Static VLAN (Up to 512k) • 802.1p Class of Service (CoS) • 802.1D Spanning Tree Protocol (STP) • 802.1w Rapid Spanning Tree Protocol (RSTP) • 802.1s Multiple Spanning Tree Protocol (MSTP) • 802.3ad Link Aggregation (LACP) • IGMP v1, v2, v3 Snooping support	
Layer 3 Services	• Static routing • ACL • DiffServ QOS • DHCP, BOOTP Relay • DHCP server • UDP Relay • ARP • IGMP querier	

Table A-2. Technical Specifications (continued)

Feature	FSM7226RS	FSM7250RS
Interface (Auto Uplink on all RJ-45 ports)	• 24 RJ-45 connectors for 10BASE-T, 100BASE-TX • 2 gigabit interface converter (SFP) slots for SFP modules • two 2.5-Gigabit HDMI interfaces for stacking connectivity • RS-232 console port	• 48 RJ-45 connectors for 10BASE-T, 100BASE-TX • 2 gigabit interface converter (SFP) slots for SFP modules • two 2.5-Gigabit HDMI interfaces for stacking connectivity • RS-232 console port
Bandwidth	18.8 Gbps	23.6 Gbps
Address database size	16K MAC addresses per system	
10/100/1000 buffer memory	Max support 1MB buffer memory	Max support 2MB buffer memory
Mean time between failure (MTBF)	• 562,110 hours (~ 64 years)	• 385,102 hours (~ 44 years)
Performance	• Forwarding modes: Store-and-forward • Network latency: Less than 10 microseconds for 64-byte frames in store-and-forward mode for 1000 Mbps to 1000 Mbps transmission • Addressing: 48-bit MAC address • Acoustic noise: (ANSI-S10.12): 36.6 dB • Heat dissipation: 51.15 Btu/hr.	• Forwarding modes: Store-and-forward • Network latency: Less than 10 microseconds for 64-byte frames in store-and-forward mode for 1000 Mbps to 1000 Mbps transmission • Addressing: 48-bit MAC address • Acoustic noise: (ANSI-S10.12): 38.3 dB • Heat dissipation: 111.92Btu/hr.
Power consumption	15 W maximum 100-240VAC, 50–60 Hz universal input	32.8 W maximum 100-240VAC, 50–60 Hz universal input
Dimensions (W x D x H)	17.3 x 8.1 x 1.7 inch (W x D x H) (440 x 205 x 43 mm)	17.3 x 10.1 x 1.7 inch (W x D x H) (440 x 257 x 43 mm)
Environment	**Operating:** • temperature: 23° to 122°F (–5° to 50°C) • humidity: 90% maximum relative humidity, noncondensing • altitude: 10,000 ft. (3,000 m) maximum **Storage:** • temperature: – 4° to 158°F (–20° to 70°C) • humidity: 95% maximum relative humidity, noncondensing • altitude: 10,000 ft. (3,000 m) maximum	

Table A-2. Technical Specifications (continued)

Feature	FSM7226RS	FSM7250RS
Electromagnetic emissions and immunity	• CE mark, commercial • FCC Part 15 Class A VCCI • Class A EN 55022 (CISPR 22) Class A • 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	