NETGEAR®

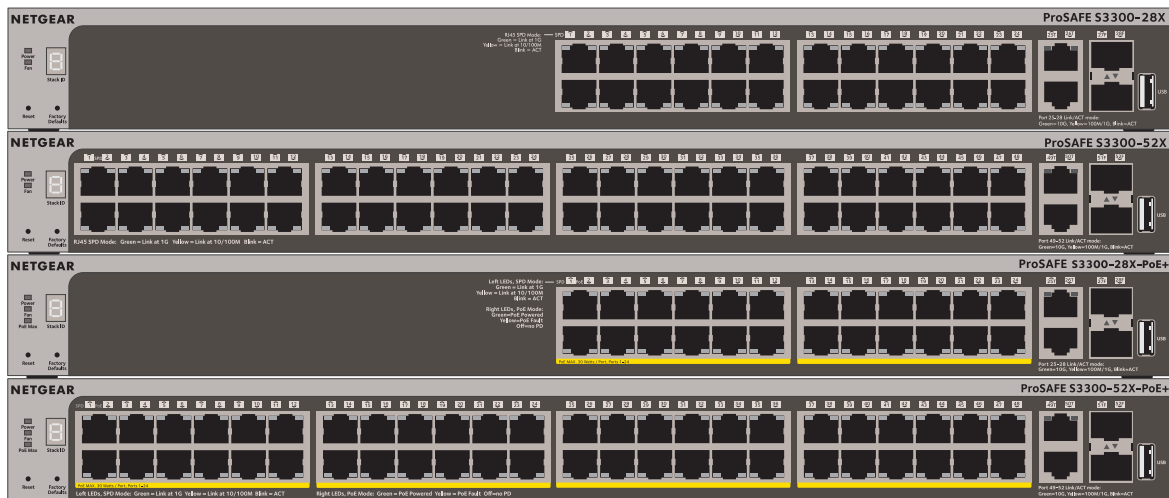# ProSAFE S3300 Smart Switch

Hardware Installation Guide

350 East Plumeria Drive
San Jose, CA 95134
USA

Support

Thank you for selecting NETGEAR products.

After installing your device, locate the serial number on the label of your product and use it to register your product at *https://my.netgear.com*. You must register your product before you can use NETGEAR telephone support. NETGEAR recommends registering your product through the NETGEAR website. For product updates and web support, visit *http://support.netgear.com*.

Phone (US & Canada only): 1-888-NETGEAR.

Phone (Other Countries): Check the list of phone numbers at *http://support.netgear.com/general/contact/default.aspx*.

Compliance

For regulatory compliance information, visit *http://www.netgear.com/about/regulatory*.

See the regulatory compliance document before connecting the power supply.

Trademarks

Revision History

Publication Part Number	Publish Date	Comments
202-11445-01	August 2014	First publication

Contents

Appendix A Troubleshooting

Appendix B Physical and Technical Specifications

Introduction

1

The NETGEAR® ProSAFE® S3300 Smart Switch is a high-performance, IEEE-compliant, stackable switch with either 48 (models S3300-52X and S3300-52X-PoE+) or 24 (models S3300-28X and S3300-28X-PoE+) twisted-pair ports on the front panel to support 10/100/1000 Mbps networks. In addition, the front panel provides two dedicated 10GBASE-T ports and two dedicated SFP+ ports for connections to a server or network backbone. You can configure the dedicated 10GBASE-T and SFP+ ports as stacking links to build a stack system with other S3300 switches. To simplify installation, the smart switch is shipped ready for use out of the box.

This hardware installation guide complements the installation guide that came with your smart switch.

This chapter serves as an introduction to the smart switch and includes the following sections:

- *Hardware Overview*
- *Hardware Features*
- *Stacking*
- *Package Contents*

> **Note:** For more information about the topics that are covered in this manual, visit the support website at *support.netgear.com*.

> **Note:** In this manual, the S3300 Smart Switch is referred to as the *smart switch*.

Hardware Overview

This installation guide is for the following S3300 Smart Switch models:

*   **S3300-52X**. Supports forty eight 10/100/1000 Mbps ports, two dedicated 100M/1G/10GBASE-T ports, and two dedicated 10G/1G SFP+ ports.
*   **S3300-52X-PoE+**. Supports forty eight 10/100/1000 Mbps PoE+ capable ports (IEEE 802.1at), two dedicated 100M/1G/10GBASE-T ports, and two dedicated 10G/1G SFP+ ports.
*   **S3300-28X**. Supports twenty four 10/100/1000 Mbps ports, two dedicated 100M/1G/10GBASE-T ports, and two dedicated 10G/1G SFP+ ports.
*   **S3300-28X-PoE+**. Supports twenty four 10/100/1000 Mbps PoE+ capable ports (IEEE 802.1at), two dedicated 100M/1G/10GBASE-T ports, and two dedicated 10G/1G SFP+ ports.

You can configure the dedicated 10GBASE-T and SFP+ ports on the smart switch either as Ethernet ports or as stacking links.

Using these 10G copper and fiber ports, you can also create high-speed connections to a server or network backbone. For example, you can do the following:

*   Connect switches to each other with high-speed links
*   Link to high-speed servers
*   Provide 10G/1G/100M copper and 10G/1G fiber connectivity
*   Connect up to six switches in a stack to create a high-port-capacity solution with a single point of administration

The smart switch can be freestanding, stacked with other switches, or rack-mounted in a wiring closet or equipment room. It is IEEE compliant and offers low latency for high-speed networking.

All ports can automatically negotiate to the highest speed, which makes the smart switch very suitable for environments with a mix of Ethernet, Fast Ethernet, Gigabit Ethernet, or 10-Gigabit Ethernet devices. The 10/100 Mbps ports can operate in half-duplex or full-duplex mode. The 10G/1G ports always operate in full-duplex mode.

The maximum segment length is 328 feet (100 meters) over Category 5 unshielded twisted-pair (UTP) cable. For 10GBASE-T connections, NETGEAR recommends that you use a Category 6a cable or a cable that is even higher rated.

Hardware Features

The S3300 Smart Switch includes the following key hardware features:

*   Forty eight (S3300-52X and S3300-52X-PoE+) or twenty four (S3300-28X and S3300-28X-PoE+) 10/100/1000 Mbps autosensing Gigabit Ethernet switching ports.
*   Two dedicated 100M/1G/10GBASE-T ports.

- Two dedicated 10G/1G SFP+ ports.
- One USB port to support firmware upgrades from a disk and backups to a storage device.
- Full NETGEAR Smart Switch functionality.
- Full compatibility with IEEE standards:
  - IEEE 802.3i (10BASE-T)
  - IEEE 802.3u (100BASE-TX)
  - IEEE 802.3ab (1000BASE-T)
  - IEEE 802.3an (10GBASE-T)
  - IEEE 802.3z (1000BASE-X)
  - IEEE 802.3 Clause 49 (10GBASE-LR and 10GBASE-SR)
  - IEEE802.aq (10GBASE-LRM)
  - IEEE802.3ae (10GBASE Ethernet)
  - IEEE802.3az (Energy Efficient Ethernet)
  - IEEE 802.3x (Full-duplex flow control)
  - IEEE 802.1at (PoE+)
- AutoSensing and autonegotiating capabilities for all ports.
- Auto Uplink technology is supported on all ports.
- Automatic address learning function to build the packet-forwarding information table. The table contains up to 16K Media Access Control (MAC) addresses.
- Store-and-forward transmission to remove bad packets from the network.
- Full-duplex IEEE 802.3x pause frame flow control.
- Active flow control to minimize packet loss and frame drops.
- Half-duplex backpressure control.
- Per-port status LEDs and system status LEDs.
- Internal open frame power supply.
- Standard NETGEAR chassis (1U high).
- NETGEAR green power-saving features:
  - Energy efficiency mode that fully conforms to the IEEE802.3az standard
  - Per-port automatic change to a lower power mode when the port link is down
- Support for Power over Ethernet (PoE+) on models S3300-52X-PoE+ and S3300-28X-PoE+.
- Support for an RPS4000 external power supply to provide a larger power budget for model S3300-52X-PoE+ or model S3300-28X-PoE+.

Stacking

A single switch can control and manage a stack. This switch is referred to as the stack master, or simply, the master. Any other members in the stack are referred to as slaves. All switches in a stack are stack members.

Slaves can download firmware from the master and the master can push firmware to the slaves.

The master runs the fully operational software of a switch. In addition, the master runs the master software of the distributed switching application that configures and manages all slaves. Generally, the master operates the remote slave's low-level drivers through the distributed switching application part that is running in the context of the slave.

During stacking setup, the switches autoselect one switch as the master. All other switches become slaves and are assigned unique stack IDs. One of the slaves is designated as the backup master. The backup master functions as a slave but can become the master if the original master fails. In the default configuration, the master and backup master are assigned unit IDs of 1 and 2, respectively. You can use the web management interface to configure different ID assignments. The master provides a single point of control and management as well as a single interface through which to control and manage the stack.

Switch software is downloaded separately for each stack member. However, all stack members must be running the same software version.

A stack unit can operate in one of the following modes:

- A standalone switch runs as a general switch. The standalone unit does not run the stacking application until it is connected to a stack.
- A master manages the entire stack and is responsible for the entire stack configuration. All protocols run in the context of the master, which updates and synchronizes the backup master.
- A backup master runs as a slave until it must take over from the master. In addition, the backup master continuously monitors the existence and operation of the master. If the master fails, the backup master assumes the role of master through a switchover.
- A slave runs only a slave version of the distributed switching software, which allows the applications running on the master to control and manage the resources of the slave.

A stack can contain a mix of up to six S3300 switches. All S3300 models support stacking.

Package Contents

The following figure shows the package contents of the S3300 Smart Switch. The figure shows model S3300-52X. However, the package contents for the other models are the same.
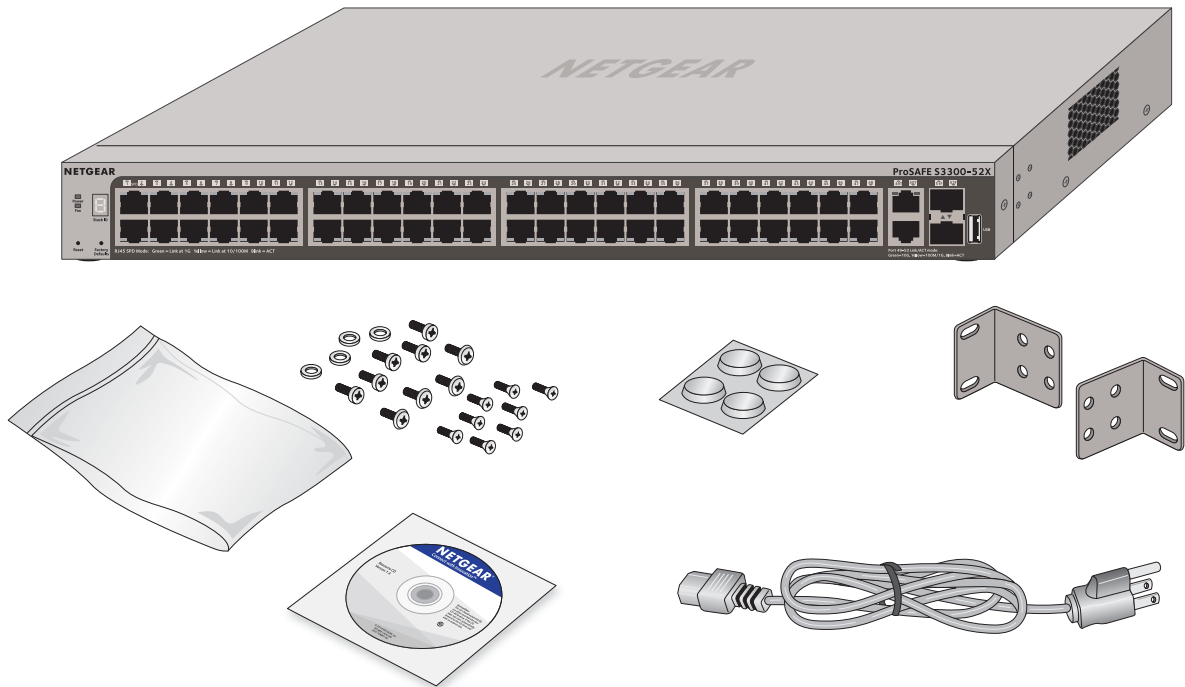
Figure 1. Package contents

Verify that the package contains the following:

- S3300 Smart Switch
- Rubber footpads for tabletop installation
- Rack-mounting kit
- Power cord
- Quick installation guide
- Smart switch resource CD with NETGEAR Smart Control Center and a link to the *S3300 Smart Switch Software Administration Manual*.

If any item is missing or damaged, contact the vendor immediately.

Physical Description

2

This chapter describes the S3300 Smart Switch hardware features.

The chapter includes the following sections:

- *S3300-52X and S3300-52X-PoE+ Description*
- *S3300-28X and S3300-28X-PoE+ Description*
- *Device Hardware Interfaces*

S3300-52X and S3300-52X-PoE+ Description

This section describes the smart switch hardware features for models S3300-52X and S3300-52X-PoE+.

S3300-52X Front Panel and Back Panel Configuration

The S3300-52X and S3300-52X-PoE+ models provide forty eight 10/100/1000 Mbps ports, two dedicated 100M/1G/10GBASE-T ports, and two dedicated 10G/1G Gbps SFP+ ports.

Each port can sense the line speed and negotiate the duplex mode with the link partner automatically. Model S3300-52X-PoE+ supports PoE+ on ports 1 through 48.

The following figures illustrate the front panel of models S3300-52X and S3300-52X-PoE+.
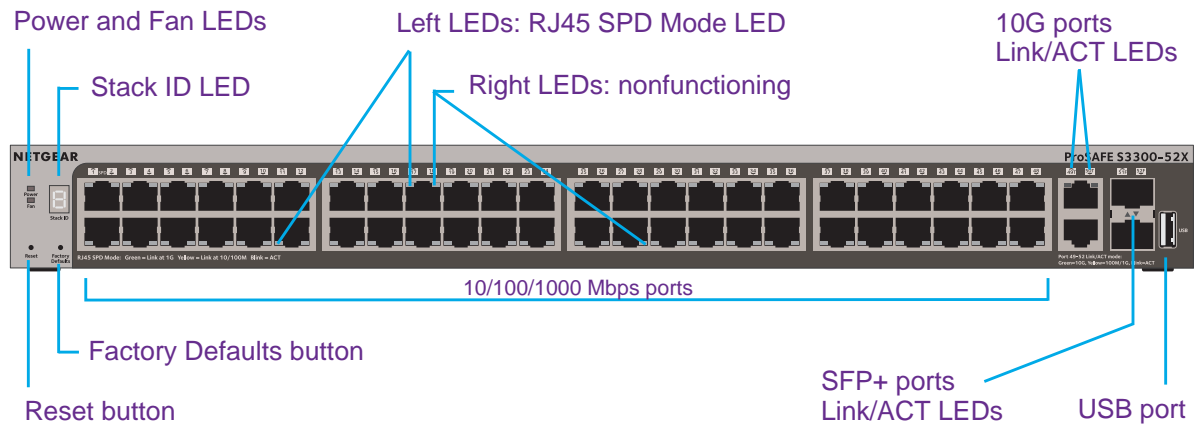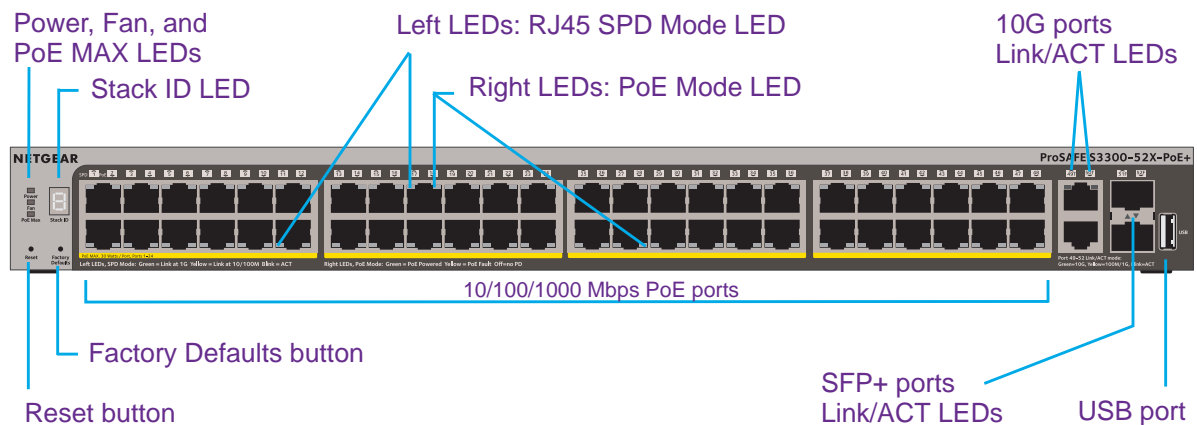

Figure 2. Front panel model S3300-52X

Figure 3. Front panel model S3300-52X-PoE+

The front panel provides the following components:

- Forty eight RJ-45 connectors for 10/100/1000 Mbps autosensing Gigabit Ethernet switching ports
- Two 100M/1G/10GBASE-T copper ports (49–50) that you can also use for stacking
- Two 10G/1G SFP+ fiber ports (51–52) that you can also use for stacking
- One USB 2.0 port that supports FAT32 and VFAT file systems
- **Rese**t button to restart the device
- Recessed **Factory Defaults** button to restore the device back to the factory defaults
- Link, Speed, and Activity LEDs for each port and for the PoE model, PoE LEDs for ports 1–48
- Power, Fan, and Stack ID LEDs; for model S3300-52X-PoE+ only, PoE Max LED

The following figures illustrate the back panel of models S3300-52X and S3300-52X-PoE+:

Console port   Kensington lock   AC input connector

Figure 4. Back panel model S3300-52X

Console port   RPS slot   Kensington lock   AC input connector

Figure 5. Back panel model S3300-52X-PoE+

From left to right, the back panel provides the following components:

- Serial console port that is configured for 115200, N, 8, 1. The serial port is for debugging purposes by NETGEAR support. (The port requires a special adapter.)
- Slot for an optional redundant power supply (RPS, model S3300-52X-PoE+ only).
- Kensington lock.
- AC power input connector.

LED Designations

This section describes the LED designations of models S3300-52X and S3300-52X-PoE+.

Port LEDs

The following table describes the RJ-45 and SFP+ port LED designations.

Table 1. Port LEDs models S3300-52X and S3300-52X-PoE+

LED	Designation
Both Models	
Left LED RJ45 SPD Mode LED (Link, Speed, Activity) for copper ports 1 to 48	• **Off**. No link is established. • **Solid green**. A valid 1000 Mbps link is established. • **Blinking green**. The port is transmitting or receiving packets at 1000 Mbps. • **Solid yellow**. A valid 10/100 Mbps link is established. • **Blinking yellow**. The port is transmitting or receiving packets at 10/100 Mbps.
Link/ACT Mode LED for 10G copper ports 49 and 50	• **Off**. No link is established on the copper port. • **Solid green**. The copper port established a valid 10 Gbps link. • **Blinking green**. The copper port is transmitting or receiving packets at 10 Gbps. • **Solid yellow**. The copper port established a valid 1 Gbps or 100 Mbps link. • **Blinking yellow**. The copper port is transmitting or receiving packets at 1 Gbps or 100 Mbps.
Link/ACT Mode LED for SFP+ fiber ports 51 and 52	• **Off**. No SFP+ module link is established on the fiber port. • **Solid green**. The fiber port established a valid 10 Gbps link. • **Blinking green**. The fiber port is transmitting or receiving packets at 10 Gbps. • **Solid yellow**. The fiber port established a valid 1 Gbps link. • **Blinking yellow**. The fiber port is transmitting or receiving packets at 1 Gbps.
PoE Model Only	
Right LED PoE Mode LED for copper ports 1 to 48	• **Off**. PoE mode is off. • **Solid green**. PoE mode is on. • **Solid yellow**. A PoE fault occurred. **Note:** For the non-PoE model, the right LAN LED is nonfunctioning by design.

System LEDs

The following table describes the system LED designations.

Table 2. System LEDs models S3300-52X and S3300-52X-PoE+

LED	Designation
Power LED	• **Off**. Power is not supplied to the smart switch. • **Solid green**. The smart switch is powered on and operating normally. • **Solid yellow**. The smart switch is booting.
Fan LED	• **Off**. The fan is operating normally. • **Solid yellow**. The fan failed.
Stack ID LED	The Stack ID LED consists of two components, the Segment LED and the Dot LED. The Segment LED contains seven segments to display the stack unit number of the smart switch. The Dot LED is located at the bottom right of the Stack ID LED and provides information about whether the smart switch is the master in the stack. • **Segment LED solid green and Dot LED solid green**. This LED status indicates *one* of the following situations: - The smart switch is a standalone switch and is not a member of a stack. The Segment LED displays the unit number. - The smart switch is a member of a stack and is the master of the stack. The Segment LED displays the stack unit number. • **Segment LED solid green and Dot LED off**. The smart switch is a member of a stack but is not the master of the stack. The Segment LED displays the stack unit number.
PoE Model Only	
PoE Max LED	• **Off**. More than 7 watts (W) of PoE power is available for another powered device (PD). • **Solid yellow**. Less than 7 watts (W) of PoE power is available for another PD. • **Blinking yellow**. The attached PD was active in the past two minutes.

S3300-28X and S3300-28X-PoE+ Description

This section describes the smart switch hardware features for models S3300-28X and S3300-28X-PoE+.

S3300-28X Front Panel and Back Panel Configuration

The S3300-28X and S3300-28X-PoE+ models provide twenty four 10/100/1000 Mbps ports, two dedicated 100M/1G/10GBASE-T, and two dedicated 10G/1G SFP+ ports.

Each port can sense the line speed and negotiate the duplex mode with the link partner automatically. Model S3300-28X-PoE+ supports PoE+ on ports 1 through 24.

The following figures illustrate the front panel of models S3300-28X and S3300-28X-PoE+.
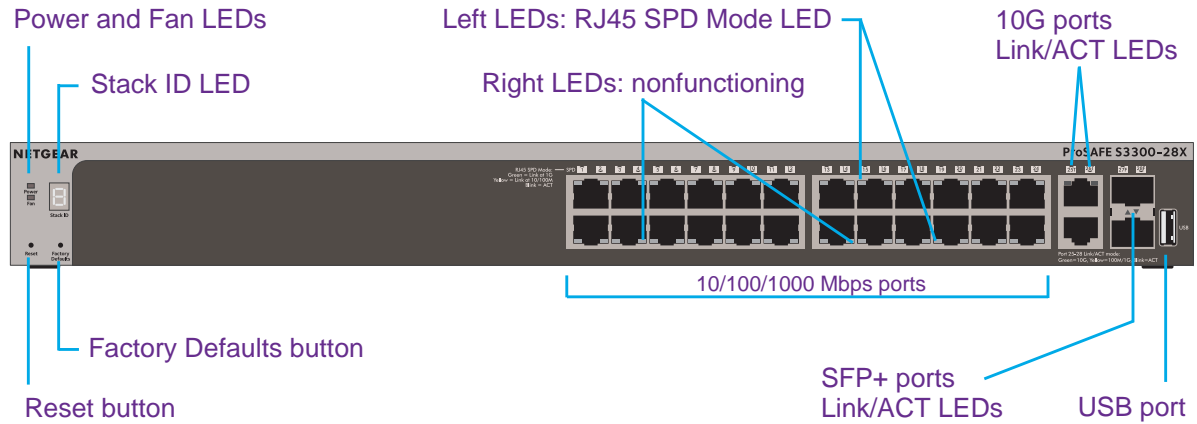

Figure 6. Front panel model S3300-28X
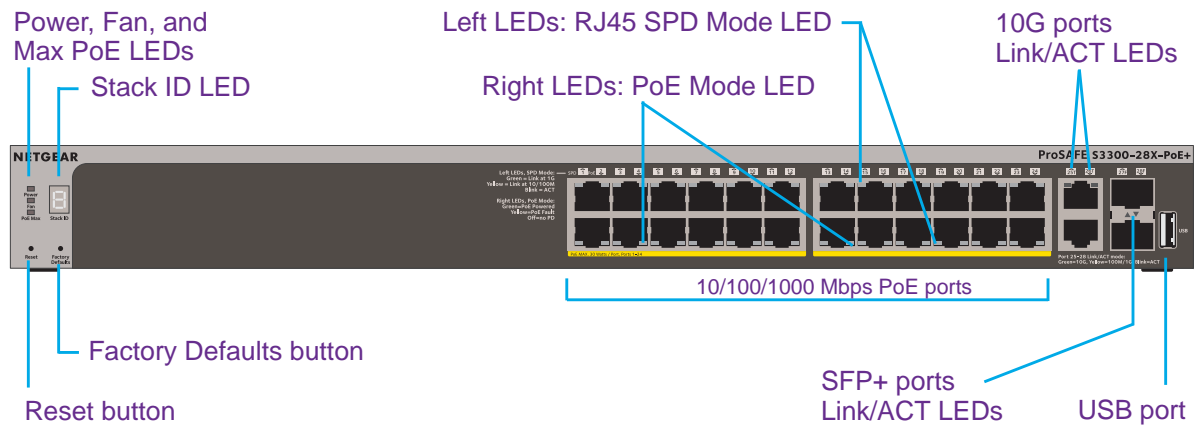
Figure 7. Front panel model S3300-28X-PoE+

The front panel provides the following components:

- Twenty four RJ-45 connectors for 10/100/1000 Mbps autosensing Gigabit Ethernet switching ports
- Two 100M/1G/10GBASE-T copper ports (25–26) that you can also use for stacking
- Two 10G/1G SFP+ fiber ports (27–28) that you can also use for stacking
- One USB 2.0 port that supports FAT32 and VFAT file systems
- **Reset** button to restart the device
- Recessed **Factory Defaults** button to restore the device back to the factory defaults
- Link, Speed, and Activity LEDs for each port and for the PoE model, PoE LEDs for ports 1–24
- Power, Fan, and Stack ID LEDs; for model S3300-28X-PoE+ only, PoE Max LED

The following figures illustrate the back panel of models S3300-28X and S3300-28X-PoE+.

Console port   Kensington lock   AC input connector
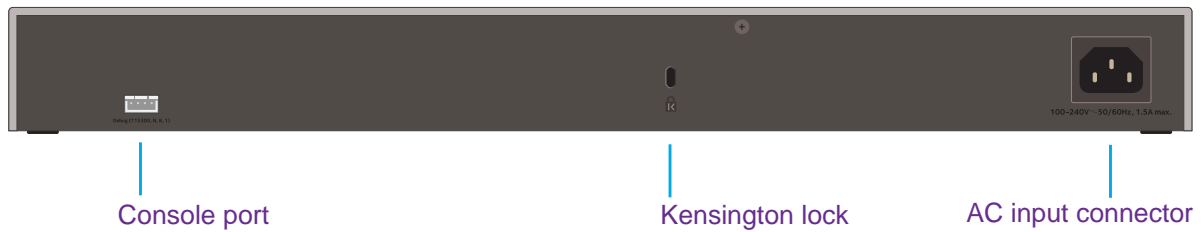
Figure 8. Back panel model S3300-28X

Console port   RPS slot   Kensington lock   AC input connector

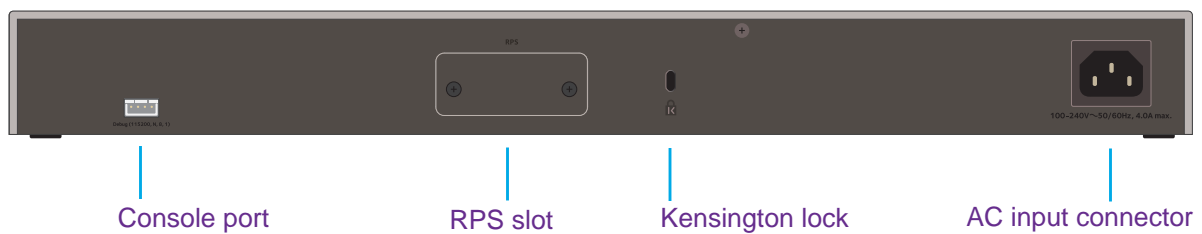**Figure 9. Back panel model S3300-28X-PoE+**

From left to right, the back panel provides the following components:

• Serial console port that is configured for 115200, N, 8, 1. The serial port is for debugging purposes by NETGEAR support. (The port requires a special adapter.)

• Slot for an optional redundant power supply (RPS, model S3300-28X-PoE+ only).

• Kensington lock.

• AC power input connector.

LED Designations

This section describes the LED designations of models S3300-28X and S3300-28X-PoE+.

Port LEDs

The following table describes the RJ-45 and SFP+ port LED designations.

Table 3. Port LEDs models S3300-28X and S3300-28X-PoE+

LED	Designation
Both Models	
Left LED RJ45 SPD Mode LED (Link, Speed, Activity) for copper ports 1 to 24	• **Off**. No link is established. • **Solid green**. A valid 1000 Mbps link is established. • **Blinking green**. The port is transmitting or receiving packets at 1000 Mbps. • **Solid yellow**. A valid 10/100 Mbps link is established. • **Blinking yellow**. The port is transmitting or receiving packets at 10/100 Mbps.
Link/ACT Mode LED for 10G copper ports 26 and 26	• **Off**. No link is established on the copper port. • **Solid green**. The copper port established a valid 10 Gbps link. • **Blinking green**. The copper port is transmitting or receiving packets at 10 Gbps. • **Solid yellow**. The copper port established a valid 1 Gbps or 100 Mbps link. • **Blinking yellow**. The copper port is transmitting or receiving packets at 1 Gbps or 100 Mbps.
Link/ACT Mode LED for SFP+ fiber ports 27 and 28	• **Off**. No SFP+ module link is established on the fiber port. • **Solid green**. The fiber port established a valid 10 Gbps link. • **Blinking green**. The fiber port is transmitting or receiving packets at 10 Gbps. • **Solid yellow**. The fiber port established a valid 1 Gbps link. • **Blinking yellow**. The fiber port is transmitting or receiving packets at 1 Gbps.
PoE Model Only	
Right LED PoE Mode LED for copper ports 1 to 24	• **Off**. PoE mode is off. • **Solid green**. PoE mode is on. • **Solid yellow**. A PoE fault occurred. **Note:** For the non-PoE model, the right LAN LED is non-functioning by design.

System LEDs

The following table describes the system LED designations.

Table 4. System LEDs models S3300-28X and S3300-28X-PoE+

LED	Designation
Power LED	• **Off**. Power is not supplied to the smart switch. • **Solid green**. The smart switch is powered on and operating normally. • **Solid yellow**. The smart switch is booting.
Fan LED	• **Off**. The fan is operating normally. • **Solid yellow**. The fan failed.

Stack ID LED	The Stack ID LED consists of two components, the Segment LED and the Dot LED. The Segment LED contains seven segments to display the stack unit number of the smart switch. The Dot LED is located at the bottom right of the Stack ID LED and provides information about whether the smart switch is the master in the stack.
	• **Segment LED solid green and Dot LED solid green**. This LED status indicates *one* of the following situations:
	  - The smart switch is a standalone switch and is not a member of a stack. The Segment LED displays the unit number.
	  - The smart switch is a member of a stack and is the master of the stack. The Segment LED displays the stack unit number.
	• **Segment LED solid green and Dot LED off**. The smart switch is a member of a stack but is not the master of the stack. The Segment LED displays the stack unit number.

PoE Model Only	
PoE Max LED	• **Off**. More than 7 watts (W) of PoE power is available for another powered device (PD). • **Solid yellow**. Less than 7 watts (W) of PoE power is available for another PD. • **Blinking yellow**. The attached PD was active in the past two minutes.

Device Hardware Interfaces

This section describes the hardware interfaces of the S3300 models.

RJ–45 Ports

The RJ-45 ports are autosensing ports. When you insert a cable into an RJ-45 port, the smart switch automatically ascertains the maximum speed (10 Mbps, 100 Mbps, 1 Gbps, or 10 Gbps) and duplex mode (half-duplex or full-duplex) of the attached device. All ports support only an unshielded twisted-pair (UTP) cable terminated with an 8-pin RJ-45 plug.

To simplify the procedure for attaching devices, all RJ-45 ports support Auto Uplink technology. This technology allows attaching devices to the RJ-45 ports with either straight-through or crossover cables.

When you insert a cable into the smart switch's RJ-45 port, the smart switch automatically performs the following actions:

- Senses whether the cable is a straight-through or crossover cable.
- Determines whether the link to the attached device requires a normal connection (such as when you are connecting the port to a computer) or an uplink connection (such as when you are connecting the port to a router, switch, or hub).
- Automatically configures the RJ-45 port to enable communications with the attached device. The Auto Uplink technology compensates for setting uplink connections while eliminating concern about whether to use crossover or straight-through cables when you attach devices.

10GBASE-T Ports

To enable high-speed copper and long distance connections on the smart switch, two RJ-45 10GBASE-T copper ports (the two ports to the left of the SFP+ ports on the front panel) support speeds of up to 10 Gbps.

You can also use the 10GBASE-T ports to connect the smart switch to a stack.

SFP+ Ports

To enable high-speed fiber and long distance connections on the smart switch, two SFP+ fiber ports (the rightmost two ports on the front panel) accommodate standard 10G and 1G SFP+ transceiver modules, which are sold separately.

You can also use the SFP+ ports to connect the smart switch to a stack.

Reset Button

The smart switch provides a **Reset** button on the front panel to allow you to manually reboot the smart switch. This action is equivalent to powering the unit off and back on. The last saved configuration is loaded into the smart switch as it resets.

➢ **To reset the smart switch using the Reset button:**

1. Insert a device such as a straightened paper clip into the opening.
2. Press the recessed **Reset** button for a short time (less than two seconds).

   The front panel LEDs turn off and light again when the smart switch performs its power-on self-test (POST).

Factory Defaults Button

The smart switch provides a **Factory Defaults** button on the front panel so that you can remove the current configuration and return the device to its factory settings. When you press the **Factory Defaults** button, all custom settings including the password, VLAN settings, and port configurations are returned to default values.

➢ **To reset the smart switch to factory default settings using the Factory Defaults button:**

1. Insert a device such as a straightened paper clip into the opening.

2. Press the recessed **Factory Defaults** button for about eight seconds.

Note: A smart switch that is a member of a stack retains its stacking configuration.

USB Port

The smart switch provides one USB 2.0 port to upgrade firmware from a disk, back up the configuration to a storage device, and allow for the collection of a memory dump for debugging purposes.

A device that you attach to the USB port must comply with the following requirements:

- The USB device must support USB 2.0.

- The USB device must support the FAT32 or VFAT file type. The NTFS file type is not supported.

Because of hardware limitations, the write and read speed to and from a USB device is about 1 Mbps.

Note: In a stack, only the smart switch that functions as the master can detect and manage an attached USB device.

PoE Ports

The PoE power budgets for model S3300-52X-PoE+ and model S3300-28X-PoE+ differ.

Model S3300-52X-PoE+

Model S3300-52X-PoE+ supports PoE+ on ports 1 through 48. The total power budget depends on the power supply configuration:

- 390W with the internal power supply only

- 1440W with either the redundant power supply (RPS) only or with both the internal power supply and the RPS

Model S3300-28X-PoE+

Model S3300-28X-PoE+ supports PoE+ on ports 1 through 24. The total power budget depends on the power supply configuration:

- 195W with the internal power supply only

- 720W with either the redundant power supply (RPS) only or with both the internal power supply and the RPS

Desktop and Backbone Switching 3

The S3300 Smart Switch is designed to provide flexibility in configuring your network connections. You can use the smart switch as your only network traffic distribution device or with 10 Mbps, 100 Mbps, 1000 Mbps, and 10 Gbps hubs and switches.

The chapter includes the following sections:

- *Desktop Switching*
- *Backbone Switching*

Desktop Switching

You can use the smart switch as a desktop switch to build a small network that allows users 1000 Mbps access to, for example, a file server. With full duplex enabled, the smart switch port connected to the server or computer can provide 2000 Mbps throughput. If you use a 10 Gbps module to connect the smart switch to the file server in full-duplex operation, the server can provide up to 20 Gbps throughput.

The following figure shows model S3300-28X-PoE+. However, you can use any of the other S3300 models for desktop switching.
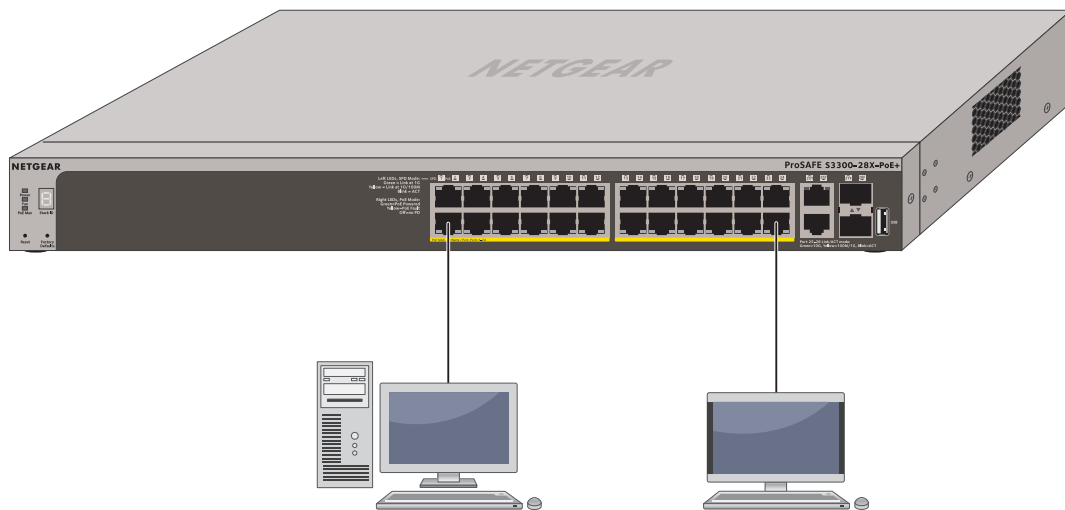

Figure 10. Desktop switching

Backbone Switching

You can use the smart switch as a backbone switch in a small network that gives users high-speed access to servers and other network devices.

The following figure shows a variety of S3300 models. You can use any of the S3300 models for backbone switching.
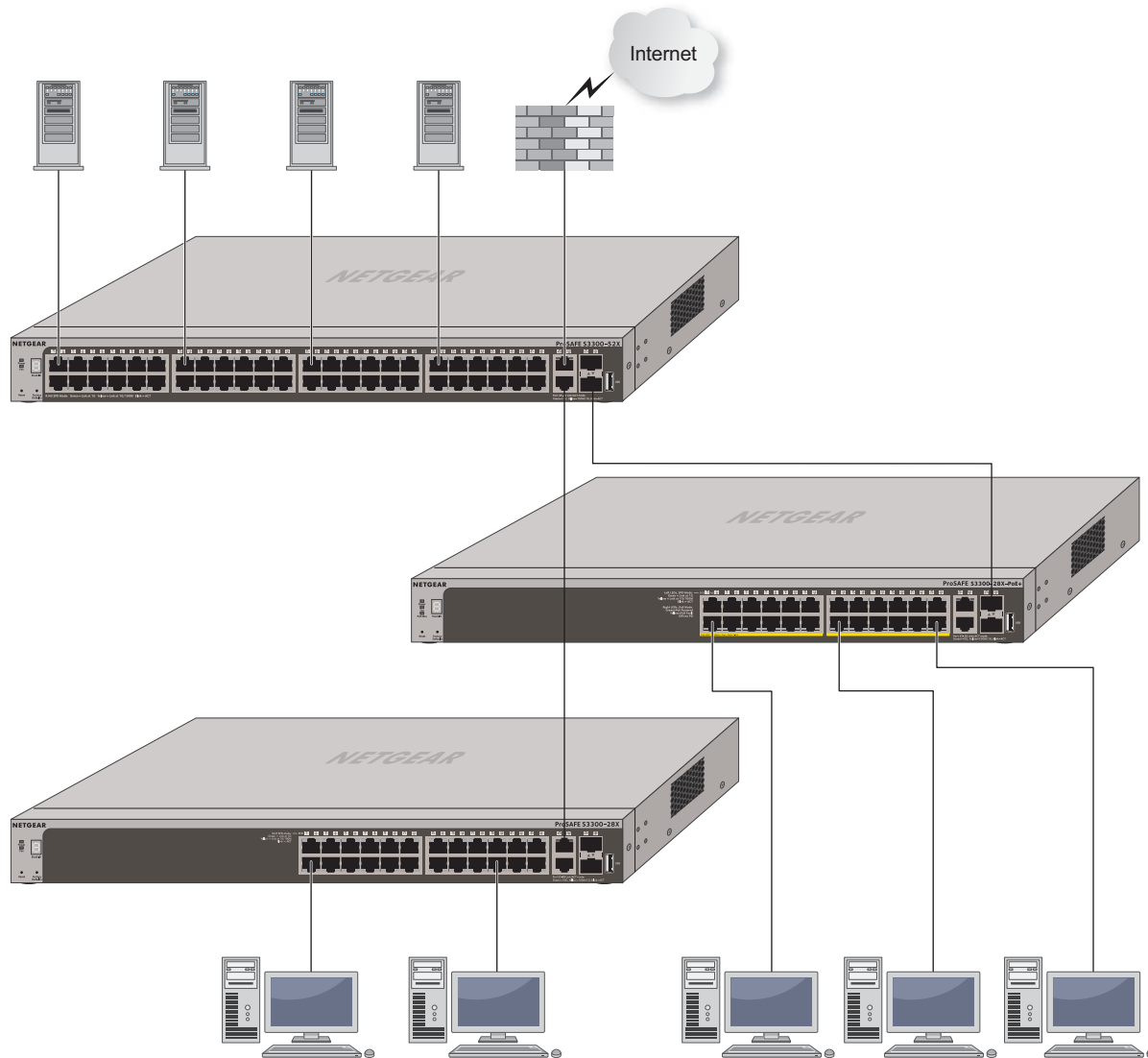

Figure 11. Backbone switching

Installation

4

This chapter describes the installation procedures for the S3300 Smart Switch. Switch installation involves the steps described in the following sections:

Step 1: Prepare the Site

Step 2: Install the Switch

Step 3: Check the Installation

Step 4: Connect Devices to the Switch

Step 5: Install an SFP Transceiver Module

Step 6: Install the Smart Switch as a Stack Master or Stack Slave

Step 7: Apply AC Power

Step 8: Install the RPS and Apply RPS DC Power

Step 9: Manage the Switch Through a Web Browser or the Smart Control Center Utility

Step 1: Prepare the Site

Before you install the smart switch, ensure that the operating environment meets the site requirements that are listed in the following table.

Table 5. Site requirements

Characteristics	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 also need the rack-mount kit that is supplied with the smart switch.
Access	Locate the smart switch in a position that allows you to access the front panel RJ-45 ports, view the front panel LEDs, and access the power connector on the back panel.
Power source	Use the AC power cord that is supplied with the smart switch. For information about power specifications, see *Appendix B, Physical and Technical Specifications*. Ensure that the AC outlet is not controlled by a wall switch, which can accidentally turn off power to the outlet and the smart switch.
Environmental	• **Temperature**. Install the smart switch in a dry area with an ambient temperature between 0ºC and 50ºC (32ºF and 122ºF). Keep the smart switch away from heat sources such as direct sunlight, warm-air exhausts, hot-air vents, and heaters. • **Operating humidity**. The maximum relative humidity of the installation location must not exceed 90%, noncondensing. • **Ventilation**. Do not restrict airflow by covering or obstructing air inlets on the sides of the smart switch. Keep at least 2 inches (5.08 centimeters) free on all sides for cooling. The room or wiring closet in which you install the smart switch must provide adequate airflow. • **Operating conditions**. Keep the smart switch at least 6 feet (1.83 meters) away from the nearest source of electromagnetic noise, such as a photocopy machine.

Step 2: Install the Switch

You can install the smart switch on a flat surface or mount it in a standard network equipment rack.

Install the Switch on a Flat Surface

The smart switch ships with four self-adhesive rubber footpads.

➢ **To install the smart switch on a flat surface:**

Stick one rubber footpad on each of the four concave spaces on the bottom of the smart switch.

The rubber footpads cushion the smart switch against shock and vibrations. They also provide ventilation space between stacked switches.

Install the Switch in a Rack

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

➢ **To install the smart switch in a rack:**

1. Attach the supplied mounting brackets to the side of the smart switch.
2. Insert the screws provided in the rack-mount kit through each bracket and into the bracket mounting holes in the smart switch.
3. Tighten the screws with a No. 1 Phillips screwdriver to secure each bracket.
4. Align the mounting holes in the brackets with the holes in the rack, and insert two pan-head screws with nylon washers through each bracket and into the rack.
5. Tighten the screws with a No. 2 Phillips screwdriver to secure mounting brackets to the rack.

The following figure shows model S3300-52X-PoE+. However, you install the other S3300 models in the same manner.
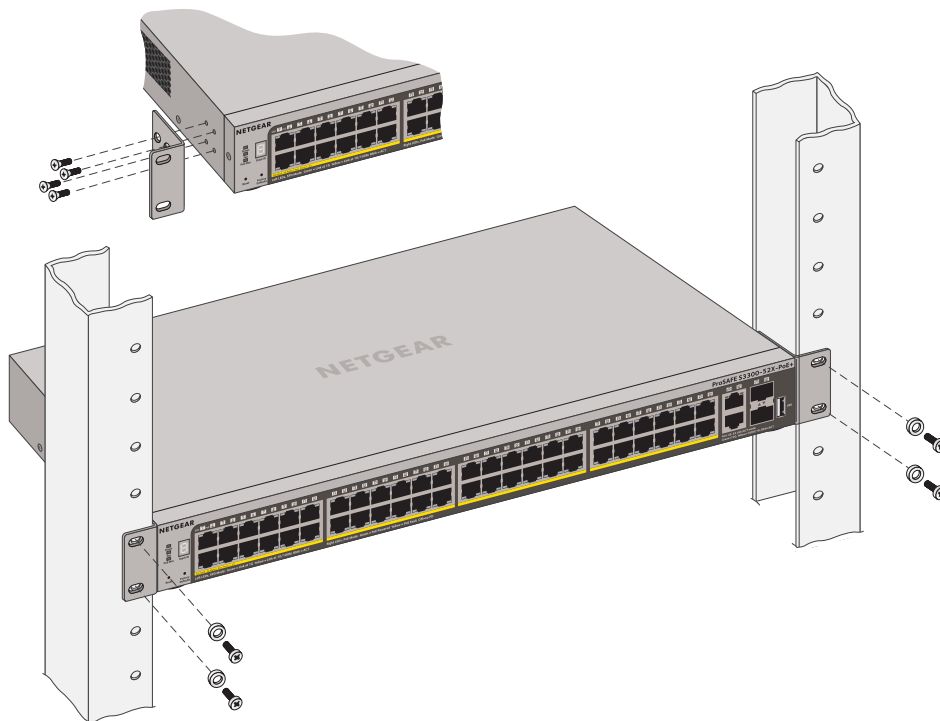
Step 3: Check the Installation

Before you apply power to the smart switch, perform the steps that are described in this section.

➤ **To check the installation:**

1. Inspect the equipment thoroughly.
2. Verify that all cables are installed correctly.
3. Check cable routing to make sure that cables are not damaged or creating a safety hazard.
4. Ensure that all equipment is mounted properly and securely.

Step 4: Connect Devices to the Switch

The following procedure describes how to connect computers to the smart switch's RJ-45 ports. The smart switch supports Auto Uplink technology, which allows you attach devices using either straight-through or crossover cables.

The following figure shows model S3300-28X-PoE+. However, the other S3300 models are connected in the same manner.
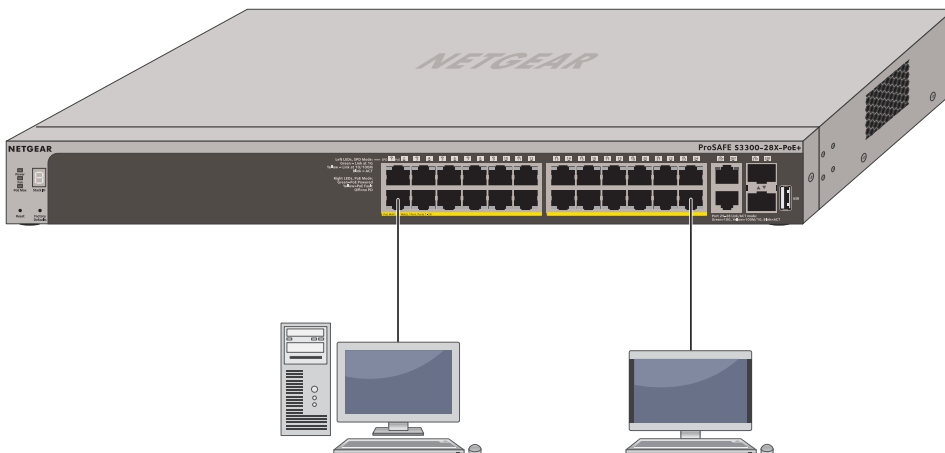

Figure 12. Connecting devices to the smart switch

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

➤ **To connect devices to the smart switch:**

Using a Category 5 (Cat 5) unshielded twisted-pair (UTP) cable terminated with an RJ-45 connector, connect each computer to an RJ-45 network port on the smart switch front panel.

> **Note:** For 10GBASE-T connections, and in particular for connections over 30 meters (about 100 feet), NETGEAR recommends that you use a Category 6a cable or a cable that is even higher rated.

Step 5: Install an SFP Transceiver Module

The following procedure describes how to install an optional SFP transceiver module into one of the SFP ports of the smart switch.

> **Note:** Contact your NETGEAR sales office to buy these modules. If you do not want to install an SFP module, skip this procedure.

➢ **To install an SFP transceiver module:**

1. Insert the transceiver into the SFP port.
2. Press firmly on the flange of the module to seat it securely into the connector.

   You can install up to two additional 10 Gbps or 1 Gbps modules using this procedure.

The following figure shows model S3300-52X-PoE+. However, you install SFP transceiver modules in the other S3300 models in the same manner.
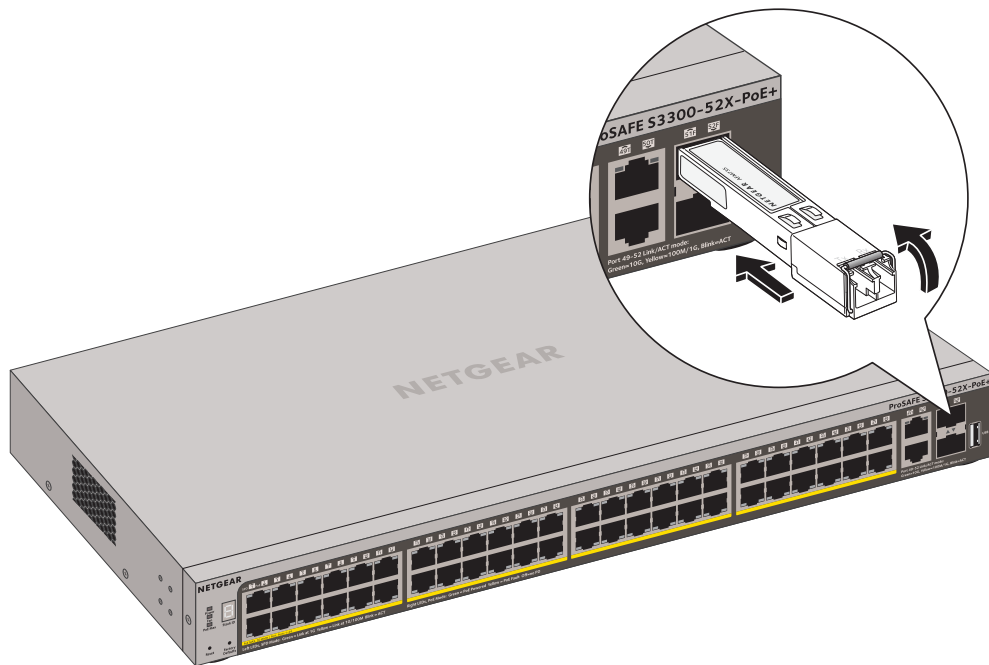

Figure 13. Installing an SFP transceiver module

Step 6: Install the Smart Switch as a Stack Master or Stack Slave

The smart switch can function as a master, backup master, or slave in a stack. (For more information about stacking, see *Stacking* on page 8.)

A backup master runs as a slave. In addition, it continuously monitors the existence and operation of the master. If the master fails, the backup master assumes the role of the master through a switchover. In the default configuration, the master and backup master are assigned unit ID 1 and 2, respectively. However, you can use the web management interface to assign different unit IDs. The goal for switchover time is less than 30 seconds.

If a stacking cable fails or a stack member is extracted in a chain topology, slaves could be disconnected from the stack (which puts them in an ambiguous state), causing all their ports to enter the down state.

Each stack member can work in one of two modes: slave mode or master mode. The operational mode is determined at software boot time and can be changed only by a unit reset. The Segment Stack ID LED remains lit in both modes.

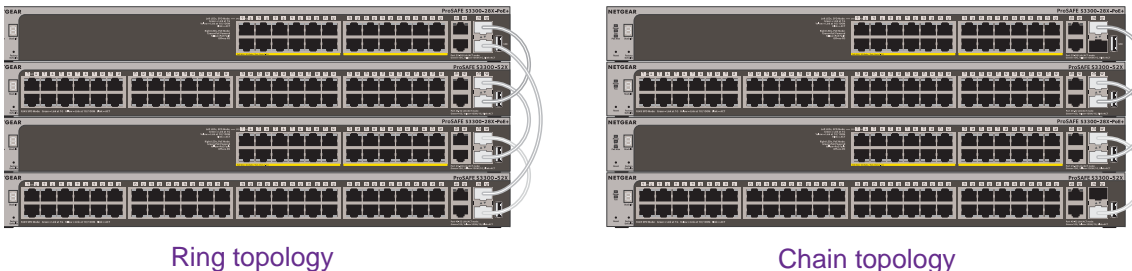The smart switch supports two stacking topologies: ring topology and chain topology.

Ring topology   Chain topology

Figure 14. Stacking topologies

The smart switch is a plug-and-play device in terms of setting up a stacking configuration. Before powering up the smart switch, connect the devices into the required stacking topology. Then power up the smart switch and the other devices. By default, the smart switch is configured to allow the master and slave designations to be determined through automatic discovery. After the smart switch boots and is operational, you can use the web management interface to configure the stack to select a particular switch as master.

For more information about stacking, see the *S3300 Smart Switch Software Administration Manual*. The resource CD includes a link to this document.

Step 7: Apply AC Power

The smart switch does not provide an on/off switch. The power cord connection controls the power.

Before connecting the power cord, select an AC outlet that is not controlled by a wall switch, which can turn off power to the smart switch.

➢ **To apply AC power:**

1. Connect the end of the power cord to the power receptacle on the back of the smart switch.

2. Plug the AC power cord into a power source such as a wall socket or power strip.

When you apply power, the Power LED on the smart switch's front panel lights.

If the Power LED does not light, check that the power cord is plugged in correctly and that the power source is good. If the problem remains, see *Appendix A, Troubleshooting*.

Step 8: Install the RPS and Apply RPS DC Power

This step is optional for models S3300-52X-PoE+ and S3300-28X-PoE+ only. These models support an optional external redundant power supply (RPS).

➢ **To install the RPS and apply RPS DC power:**

1. Loosen the screws of the RPS cover plate and remove the cover plate.

   The RPS receptacle is exposed.

2. Plug in the RPS connector.

3. Plug the AC power cord of the RPS into a power source such as a wall socket or power strip.

Step 9: Manage the Switch Through a Web Browser or the Smart Control Center Utility

The smart switch contains software for viewing, changing, and monitoring the way it works. This management software is not required for the smart switch to work. You can use the ports without using the management software. However, the management software enables the setup of VLAN and trunking features and also improves the efficiency of the smart switch, which results in the improvement of its overall performance as well as the performance of the network.

After you power up the smart switch for the first time, you can configure the smart switch using a web browser or a program called Smart Control Center. For more information about managing the smart switch, see the *S3300 Smart Switch Software Administration Manual*. The resource CD includes a link to this document.

Note: The smart switch is configured with a default IP address of 192.168.0.239 and a subnet mask of 255.255.255.0.

A. Troubleshooting

A

This appendix provides information about troubleshooting the S3300 Smart Switch.

The appendix includes the following sections:

- *Troubleshooting Chart*
- *Additional Troubleshooting Suggestions*

Troubleshooting Chart

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

Table 6. Troubleshooting chart

Symptom	Cause	Solution
Power LED is off.	No power is received.	• Check the power cord connections at the smart switch and the power source. • Ensure that all cables are used correctly and comply with the Ethernet specifications.
Combined Link, Speed, Activity LED is off when the port is connected to a device.	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 smart switch and the connecting device. • Ensure that all cables are used correctly and comply with the Ethernet specifications. • Check for a defective port, cable, or module by testing them in an alternate environment where all products are functioning.
File transfer is slow or performance is degraded.	Half-duplex or full-duplex setting on the smart switch and the connected device are not the same.	Make sure that the attached device is configured to autonegotiate.
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. • Ensure that all connectors are securely positioned in the required ports. It is possible that equipment was accidentally disconnected.
Combined Link, Speed, Activity LED is blinking continuously on all connected ports and the network is disabled.	A network loop (redundant path) was created.	Break the loop by ensuring that only one path exists from any networked device to any other networked device. After you connect to the smart switch web management interface, you can configure the Spanning Tree Protocol (STP) to prevent network loops.
A unit is linked to a stack but does not join the stack.	The stacking ports of the new unit are configured differently from the stack, or the unit is configured as a standalone unit.	Remove the unit from the stack. Use the web management interface to configure the unit as a stackable unit, with combo links used as the stacking ports.

Additional Troubleshooting Suggestions

If the suggestions in the troubleshooting chart do not resolve the problem, see the following troubleshooting suggestions:

- **Network Adapter Cards**. Ensure that the network adapter cards installed in the computers are in working condition and the software driver was installed.

- **Configuration**. If problems occur after you alter the network configuration, restore the original connections and determine the problem by implementing the new changes, one step at a time. Ensure that cable distances, repeater limits, and other physical aspects of the installation do not exceed the Ethernet limitations.

- **Switch Integrity**. If necessary, verify the integrity of the smart switch by resetting it. To reset the smart switch, disconnect the AC power from the smart switch and then reconnect the AC power. If the problem continues, contact NETGEAR technical support:

    - Phone (US & Canada only): 1-888-NETGEAR.

    - Phone (other countries): Check the list of phone numbers at
      http://support.netgear.com/general/contact/default.aspx.

- **Autonegotiation**. The RJ-45 ports negotiate the correct duplex mode, speed, and flow control if the device at the other end of the link supports autonegotiation. If the device does not support autonegotiation, the smart switch determines only the speed correctly, and the duplex mode defaults to half-duplex.

    The Gigabit Ethernet ports negotiate speed, duplex mode, and flow control if the attached device supports autonegotiation.

Physical and Technical Specifications

B

This appendix provides the physical and technical specifications for the S3300 Smart Switch.

Table 7. Physical and technical specifications

Feature	Description
Network protocols and supported standards	• IEEE 802.3i (10BASE-T) • IEEE 802.3u (100BASE-TX) • IEEE 802.3ab (1000BASE-T) • IEEE 802.3an (10GBASE-T) • IEEE 802.3z (1000BASE-X) • IEEE 802.3 Clause 49 (10GBASE-LR and 10GBASE-SR) • IEEE802.aq (10GBASE-LRM) • IEEE802.3ae (10GBASE Ethernet) • IEEE802.3az (Energy Efficient Ethernet) • IEEE 802.3x (Full-duplex flow control) • IEEE 802.1at (PoE+)
Interfaces	• S3300-52X and S3300-52X-PoE+: forty eight 10/100/1000 Mbps ports • S3300-28X and S3300-28X-PoE+: twenty four 10/100/1000 Mbps ports • Two 100M/1G/10GBASE-T ports • Two 10G/1G SFP+ ports • One USB port
LEDs	• Combined Link, Speed, Activity LED for each port • PoE LED for each PoE port (S3300-52X-PoE+ and S3300-28X-PoE+) • Power, Fan, and Stack ID system LEDs • PoE Max system LED (S3300-52X-PoE+ and S3300-28X-PoE+)
Memory	• SRAM size and type: 256 MB DDR3 SDRAM • Flash memory size: 64 MB SPI Flash

Table 7. Physical and technical specifications (continued)

Feature	Description

Performance and capacity	• Forwarding mode: Store and Forward
	• Stacking for up to six switches
	• Bandwidth:
	  - S3300-52X/S3300-52X-PoE+ models: 176 Gbps
	  - S3300-28X/S3300-28X-PoE+ models: 128 Gbps
	• Address database size: 16K Media Access Control (MAC) addresses
	• Mean Time Between Failure (MTBF) at 25°C:
	  - S3300-52X: 279,970 hours
	  - S3300-52X-PoE+: 216,809 hours
	  - S3300-28X: 278,559 hours
	  - S3300-28X-PoE+: 147,965 hours

AC power supply	• Universal power input: 100–240 VAC, 50–60 Hz
	• Current:
	  - S3300-52X: 2A
	  - S3300-52X-PoE+: 10A
	  - S3300-28X: 1.5A
	  - S3300-28X-PoE+: 4A

Redundant power supply	• S3300-52X-PoE+: DC11V, 13.5A maximum; DC56V, 28.2A maximum • S3300-28X-PoE+: DC11V, 6.5A maximum; DC56V, 14.1A maximum

PoE power budget	• S3300-52X-PoE+:
	  - 390W with internal power supply only
	  - 1440W with external RPS only
	  - 1440W with both internal power supply and external RPS
	• S3300-28X-PoE+:
	  - 195W with internal power supply only
	  - 720W with external RPS only
	  - 720W with both internal power supply and external RPS

Physical specifications	• S3300-52X
	  - Dimensions (H x W x D): 43 x 440 x 257 mm (1.7 x 17.3 x 10.1 in.)
	  - Weight: 3.66 kg (8.0 lb)
	• S3300-52X-PoE+
	  - Dimensions (H x W x D): 43 x 440 x 345 mm ((1.7 x 17.3 x 13.6 in.)
	  - Weight: 5.54 kg (12.2 lb)
	• S3300-28X
	  - Dimensions (H x W x D): 43 x 440 x 257 mm (1.7 x 17.3 x 10.1 in.)
	  - Weight: 3.14 kg (6.9 lb)
	• S3300-28X-PoE+
	  - Dimensions (H x W x D): 43 x 440 x 257 mm (1.7 x 17.3 x 10.1 in.)
	  - Weight: 3.77 kg (8.3 lb)

Table 7. Physical and technical specifications (continued)

Feature	Description
Environmental specifications	• Operating temperature: 0 to 50°C (32 to 122°F) • Storage temperature: –20 to 70°C (28 to 158°F) • Operating humidity: 10–90% maximum relative humidity, noncondensing • Storage humidity: 5–95% maximum relative humidity, noncondensing
Electromagnetic emissions	• CE mark, commercial • FCC Part 15 Class A • VCCI Class A • CISPR 22 Class A (Australia) • CCC • KCC • CAN ICES-3(A)/NMB-3(A) • EN 55022 Class A • BSMI 13438
Electromagnetic immunity	EN 55024, Class A
Safety certifications	• UL/cUL/CE EN 60950-1 • CB • CCC • BSMI 14336 • CU (Russia) • SAI (Australia/NZ)