



# ProSAFE 24-Port Gigabit Smart Managed Switch with PoE+ and 2 SFP Ports

## Hardware Installation Guide

**Model GS724TPv2**

April 2017  
202-11766-01

350 E. Plumeria Drive  
San Jose, CA 95134  
USA

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See the regulatory compliance document before connecting the power supply.

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# Contents

## Chapter 1 Introduction

Overview.....	5
Features.....	5
Safety Instructions and Warnings.....	7

## Chapter 2 Hardware Overview

Front Panel.....	10
Back Panel.....	11
LEDs.....	11
Switch Hardware Interfaces.....	12
RJ-45 Ports for 10/100/1000BASE-T Ethernet Connectivity.....	12
SFP Ports for Fiber Connectivity.....	13
Reset Button.....	13
Factory Defaults Button.....	13

## Chapter 3 Installation

Step 1: Prepare the site.....	15
Step 2: Protect Against Electrostatic Discharge.....	16
Step 3: Unpack the Switch.....	16
Step 4: Mount or Place the Switch.....	17
Mount the Switch in a Rack.....	17
Place the Switch on a Flat Surface.....	18
Optional Step 5: Install SFP Transceiver Modules.....	18
Step 6: Attach Devices.....	19
Step 7: Check the Installation.....	19
Step 8: Apply AC Power and Check the LEDs.....	20
Step 9: Manage the Switch.....	20

## Chapter 4 Applications

PoE Applications.....	22
PoE Overview.....	22
Connect PoE Equipment in a Business Environment.....	22
Connect PoE Equipment for Surveillance and Security.....	23
Desktop Switching.....	24

## Chapter 5 Troubleshooting

Troubleshooting Chart.....	26
PoE Troubleshooting Suggestions.....	27
Additional Troubleshooting Suggestions.....	27

This hardware installation guide is for the NETGEAR ProSAFE® 24-Port Gigabit Smart Managed Switch with PoE+ and 2 SFP Ports, Model GS724TPv2.

The switch provides twenty-four 1-Gigabit RJ-45 copper PoE+ ports with two dedicated SFP fiber ports. Power over Ethernet (PoE) lets you provide power to PoE-capable devices such as WiFi access points, VoIP phones, and IP security cameras so that you do not need to use power supplies for those devices. The switch can supply up to 30W PoE+ (IEEE 802.3at) to each port, with a maximum PoE power budget of 190W across all active PoE+ ports.

This hardware installation guide complements the installation guide that came with your switch. The resource CD that came with your switch includes software and additional documentation and support resources.

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

- *Overview* on page 5
- *Features* on page 5
- *Safety Instructions and Warnings* on page 7

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**Note** For more information about the topics that are covered in this manual, visit the support website at [support.netgear.com](http://support.netgear.com).

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**Note** For technical specifications, see the data sheet at [netgear.com/business/products/switches/managed](http://netgear.com/business/products/switches/managed). For switch documentation, see the resource CD in the product package or visit [downloadcenter.netgear.com](http://downloadcenter.netgear.com).

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## Overview

The switch provides twenty-four 10/100/1000BASE-T RJ-45 copper ports that support nonstop 10/100/1000M Layer 2 and Layer 3 networks. All RJ-45 ports support PoE+. Two additional ports can accept small form-factor pluggable (SFP) gigabit interface converters (GBICs) for 1G fiber connectivity.

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**Note** For information about application samples, see *Applications* on page 21.

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The switch provides administrative management options that let you configure, monitor, and control the network. Using the web browser–based management interface, you can configure the switch and the network, including the ports, the management VLAN, VLANs for traffic control, link aggregation for increased bandwidth, Quality of Service (QoS) for prioritizing traffic, and network security.

Initial discovery of the switch on the network requires the Smart Control Center program, which runs on a Windows-based computer and is included on the resource CD. If you do not use a Windows-based computer, get the IP address of the switch from the DHCP server in the network or use an IP scanner utility.

After discovery, you can configure the switch using the web browser–based management interface for advanced setup and configuration of features, or the Smart Control Center program for very basic setup. For more information, see the user manual, which you can download from [downloadcenter.netgear.com](http://downloadcenter.netgear.com).

You can install the switch freestanding or rack mounted in a wiring closet or equipment room. The switch is IEEE compliant and offers low latency. All ports can automatically negotiate to the highest speed, which makes the switch very suitable for a mixed environment with Fast Ethernet and Gigabit Ethernet.

Use Category 5e (Cat 5e) or higher-rated Ethernet cables terminated with RJ-45 connectors to make Gigabit connections.

## Features

The switch supports the following key hardware features:

- 24 PoE+ Gigabit Ethernet ports.
- 2 dedicated SFP fiber ports.
- PoE support:
  - 24 PoE+ (802.3at) ports
  - Total PoE power budget of 190W for the switch
- MAC table size of 8K.
- Variable speed fan that can lower the noise level during low temperatures.
- Acoustic noise is equal to or less than 33 dBA at 25°C.
- 52 Gbps full-duplex, nonblocking switch fabric.

## GS724TPv2 ProSAFE 24-Port Gigabit Smart Managed Switch with PoE+ and 2 SFP Ports

- Includes 19-inch rack-mount kit for rack installation.
- Full compatibility with IEEE standards:
  - IEEE 802.3 Ethernet
  - IEEE 802.3u 100BASE-T
  - IEEE 802.3z Gigabit Ethernet 1000BASE-SX/LX
  - IEEE 802.3ab 1000BASE-T
  - IEEE 802.3i 10BASE-T
  - IEEE 802.1Q VLAN tagging
  - IEEE 802.3x Full-duplex flow control
  - IEEE 802.3ad Link aggregation (LAG with LACP)
  - IEEE 802.1ab LLDP
  - IEEE 802.1p Class of Service (QoS)
  - IEEE 802.1D Spanning Tree Protocol (STP)
  - IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
  - IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
  - IEEE 802.1x RADIUS network access control
  - IEEE 802.3az Energy Efficient Ethernet (EEE)
- 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 8K Media Access Control (MAC) addresses.
- Store-and-forward transmission to remove bad packets from the network.
- Active flow control to minimize packet loss and frame drops.
- Half-duplex backpressure control.
- Per-port status LEDs and system status LEDs.
- 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

## Safety Instructions and Warnings

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:

- This product is designed for indoor use only in a temperature-controlled (0–50°C) and humidity-controlled (10–90% relative humidity) environment.  
Any device that is located outdoors and connected to this product must be properly grounded and surge protected.  
To the extent permissible by applicable law, failure to follow these guidelines could result in damage to your NETGEAR product, which might not be covered by NETGEAR's warranty.
- 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 can expose you to electrical shock. We recommend that only a trained technician services 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 fell into the product.
  - The product was exposed to water.
  - The product was 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.

## GS724TPv2 ProSAFE 24-Port Gigabit Smart Managed Switch with PoE+ and 2 SFP Ports

- To avoid damaging your system, be sure that the voltage selection switch (if provided) on the power supply is set to match the power at your location:
  - 115V, 60 Hz in most of North and South America and some Far Eastern countries such as South Korea and Taiwan
  - 100V, 50 Hz in eastern Japan and 100V, 60 Hz in western Japan
  - 230V, 50 Hz in most of Europe, the Middle East, and the Far East
- Be sure that attached devices are electrically rated to operate with the power available in your location.
- Use only approved power cables. If you were not provided with a power cable for your system or for any AC-powered option intended for your system, purchase a power cable approved for your country. The power cable must be rated for the product and for the voltage and current marked on the product electrical ratings label. The voltage and current rating of the cable must 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.



This chapter describes the switch hardware features.

The chapter includes the following sections:

- *Front Panel* on page 10
- *Back Panel* on page 11
- *LEDs* on page 11
- *Switch Hardware Interfaces* on page 12

## Front Panel

The switch provides twenty four 10/100/1000BASE-T RJ-45 PoE+ ports and two SFP ports. The following figure shows the front panel.

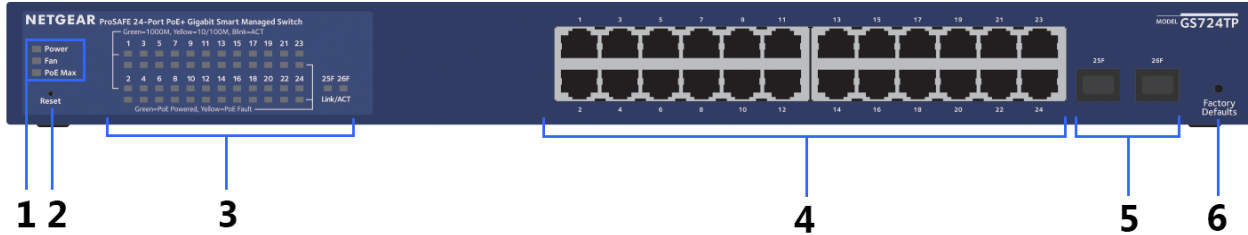


Figure 1. Front panel

Table 1. Front panel

Number	Description
1	Power, Fan, and PoE Max LEDs. For more information, see <a href="#">LEDs</a> on page 11.
2	Reset button. For more information, see <a href="#">Reset Button</a> on page 13.
3	48 LEDs associated with the 24 Ethernet ports. For each port, the associated upper LED functions as the combined speed and activity LED and the associated lower LED indicates the PoE status.  2 LEDs associated with the 2 SFP ports. For each port, the associated LED functions as the combined link and activity LED.  For more information, see <a href="#">LEDs</a> on page 11.
4	24 independent 10/100/1000BASE-T RJ-45 PoE ports. For more information, see <a href="#">RJ-45 Ports for 10/100/1000BASE-T Ethernet Connectivity</a> on page 12.
5	2 dedicated SFP fiber ports in which you can install GBICs for fiber connections. For more information, see <a href="#">SFP Ports for Fiber Connectivity</a> on page 13.
6	Factory Defaults button. For more information, see <a href="#">Factory Defaults Button</a> on page 13.

## Back Panel

The back panel provides a Kensington lock and AC power receptacle. (The switch integrates a fixed, internal power supply.)

The following figure shows the back panel.



Figure 2. Back panel

## LEDs

This section describes the LEDs on the front panel of the switch.

**Table 2. Front panel LEDs**

LED	Description
Power LED	<p><b>Solid green.</b> The switch is powered on.</p> <p><b>Solid amber.</b> The switch is booting.</p> <p><b>Off.</b> Power is not supplied to the switch.</p>
Fan LED	<p><b>Solid amber.</b> The internal fan failed.</p> <p><b>Off.</b> The internal fan is operating normally.</p>
PoE Max LED	<p><b>Off.</b> Sufficient (more than 7W of) PoE power is available.</p> <p><b>Solid amber.</b> Less than 7W of PoE power is available.</p> <p><b>Blinking amber.</b> At least once during the previous two minutes, less than 7W of PoE power was available.</p>
<p>RJ-45 upper LEDs 1–24</p> <p>These LEDs indicate the link status, speed, and activity of an associated port.</p>	<p><b>Off.</b> No Ethernet link is established.</p> <p><b>Solid green.</b> A valid 1000 Mbps Ethernet link is established.</p> <p><b>Blinking green.</b> The port is transmitting or receiving packets at 1000 Mbps.</p> <p><b>Solid amber.</b> A valid 10 Mbps or 100 Mbps Ethernet link is established.</p> <p><b>Blinking amber.</b> The port is transmitting or receiving packets at 10 Mbps or 100 Mbps.</p>

**Table 2. Front panel LEDs (Continued)**

LED	Description
RJ-45 lower LEDs 1–24 These LEDs indicate the PoE status of an associated port.	<p><b>Off.</b> The port is not delivering PoE.</p> <p><b>Solid green.</b> The port is delivering PoE.</p> <p><b>Solid amber.</b> A PoE fault occurred. For more information, see <a href="#">PoE Troubleshooting Suggestions</a> on page 27.</p>
Link and ACT LEDs 25F–26F	<p><b>Off.</b> No SFP module link is established.</p> <p><b>Solid green.</b> A valid 1000 Mbps link is established.</p> <p><b>Blinking green.</b> The SFP fiber port is transmitting or receiving packets at 1000 Mbps.</p>

## Switch Hardware Interfaces

The following sections describe the hardware interfaces on the switch.

### RJ-45 Ports for 10/100/1000BASE-T Ethernet Connectivity

All RJ-45 copper ports support autosensing. When you insert a cable into an RJ-45 port, the switch automatically ascertains the maximum speed (10 Mbps, 100 Mbps, or 1 Gbps) and duplex mode (half-duplex or full-duplex) of the attached device. All ports support a Category 5e (Cat 5e) unshielded twisted-pair (UTP) cable terminated with an 8-pin RJ-45 connector.

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 switch's RJ-45 port, the 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 the need to set up uplink connections while eliminating concern about whether to use crossover or straight-through cables when you attach devices.

All RJ-45 ports also support Power over Ethernet (PoE+, IEEE 802.3at). The switch can supply up to 30W PoE+ to each port, with a maximum PoE power budget of 190W across all active PoE+ ports.

## SFP Ports for Fiber Connectivity

To enable fiber connections on the switch, SFP+ fiber ports accommodate standard small form-factor pluggable (SFP) gigabit interface converters (GBICs, also referred to as transceiver modules) for 1G fiber connectivity. GBICs are sold separately from the switch.

The switch supports the following NETGEAR ProSAFE SFP short-reach transceiver modules:

- AGM731F SFP transceiver 1000BASE-SX, SFP multimode LC GBIC
- AGM734 SFP transceiver 1000BASE-T, SFP copper RJ-45 GBIC

For more information about NETGEAR ProSAFE SFP and SFP+ transceiver modules and cables, visit [netgear.com/business/products/switches/modules-accessories](http://netgear.com/business/products/switches/modules-accessories).

## Reset Button

The switch provides a **Reset** button on the front panel so that you can reboot the switch. We recommend that you save the configuration before you press the **Reset** button.

### ► To reboot the switch:

1. Insert a device such as a straightened paper clip into the opening.
2. Press the recessed **Reset** button.  
The switch reboots.

## Factory Defaults Button

The switch provides a **Factory Defaults** button on the front panel so that you can return the switch to its factory default settings, causing all custom settings to be erased.

### ► To return the switch to its factory default settings:

1. Insert a device such as a straightened paper clip into the opening.
2. Press the recessed **Factory Defaults** button for more than two seconds.  
The switch reboots and returns to its factory default settings.

This chapter describes the installation procedures for the switch.

Switch installation involves the steps that are described in the following sections:

- *Step 1: Prepare the site* on page 15
- *Step 2: Protect Against Electrostatic Discharge* on page 16
- *Step 3: Unpack the Switch* on page 16
- *Step 4: Mount or Place the Switch* on page 17
- *Optional Step 5: Install SFP Transceiver Modules* on page 18
- *Step 6: Attach Devices* on page 19
- *Step 7: Check the Installation* on page 19
- *Step 8: Apply AC Power and Check the LEDs* on page 20
- *Step 9: Manage the Switch* on page 20

## Step 1: Prepare the site

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

**Table 3. Site requirements**

Characteristics	Requirements
Mounting	<p><b>Desktop installations.</b> Provide a flat table or shelf surface.</p> <p><b>Rack-mount installations.</b> 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 switch.</p>
Access	Install the switch in a position that allows you to access the front panel 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 switch. Make sure that the AC outlet is not controlled by a wall switch, which can accidentally turn off power to the outlet and the switch.
Cabling	Route cables to avoid sources of electrical noise such as radio transmitters, broadcast amplifiers, power lines, and fluorescent lighting fixtures.
Environmental	<p><b>Temperature.</b> Install the switch in a dry area with an ambient temperature between 32°F and 122°F (0°C and 50°C). Keep the switch away from heat sources such as direct sunlight, warm-air exhausts, hot-air vents, and heaters.</p> <p><b>Operating humidity.</b> The maximum relative humidity of the installation location must not exceed 90%, noncondensing.</p> <p><b>Ventilation.</b> 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. The room or wiring closet in which you install the switch must provide adequate airflow.</p> <p><b>Operating conditions.</b> Keep the switch at least 6 feet (1.83 meters) away from the nearest source of electromagnetic noise, such as a photocopy machine.</p>

## Step 2: Protect 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):

- 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.
- Before moving a sensitive component, place it in an antistatic container or package.
- Handle all sensitive components in a static-safe area. If possible, use antistatic floor pads, workbench pads, and an antistatic grounding strap.

## Step 3: Unpack the Switch

The following figure shows the package contents for the switch.

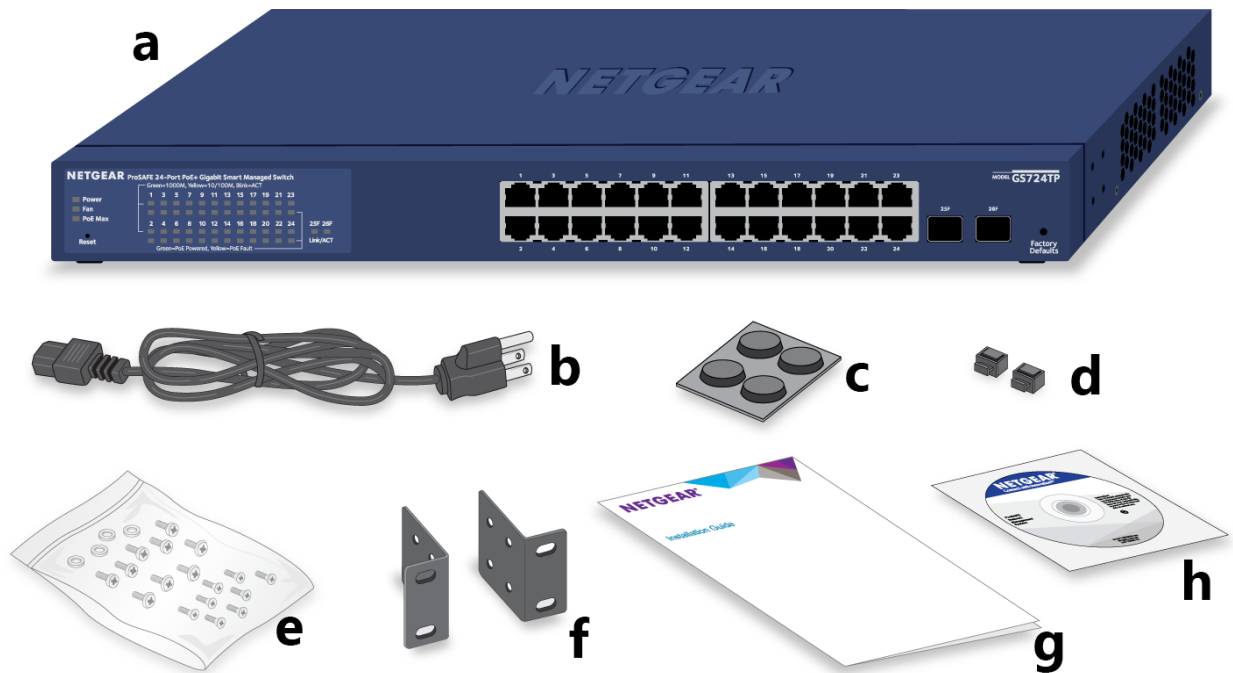


Figure 3. Switch package contents

Check the contents of the boxes to make sure that all items are present before installing the switch.



### ► To check the package contents:

1. Place the container on a clean flat surface, and cut all straps securing the container.
2. Unpack the hardware from the boxes by carefully removing the hardware and placing it on a secure and clean surface.
3. Remove all packing material.
4. Verify that the package contains the following items:
  - a. Switch
  - b. Power cord
  - c. Rubber footpads for tabletop installation
  - d. Rubber protection caps, which are already installed in the SFP sockets. If you install an SFP transceiver module, you must remove the cap from the SFP socket.
  - e. Screws for rack mounting
  - f. Brackets for rack mounting
  - g. Installation guide
  - h. Resource CD with NETGEAR Smart Control Center utility
5. If any item is missing or damaged, contact your local NETGEAR reseller for replacement.

## Step 4: Mount or Place the Switch

You can mount the switch in a standard 19-inch (48.26-centimeter) network equipment rack or place the switch on a flat surface.

### Mount the Switch in a Rack

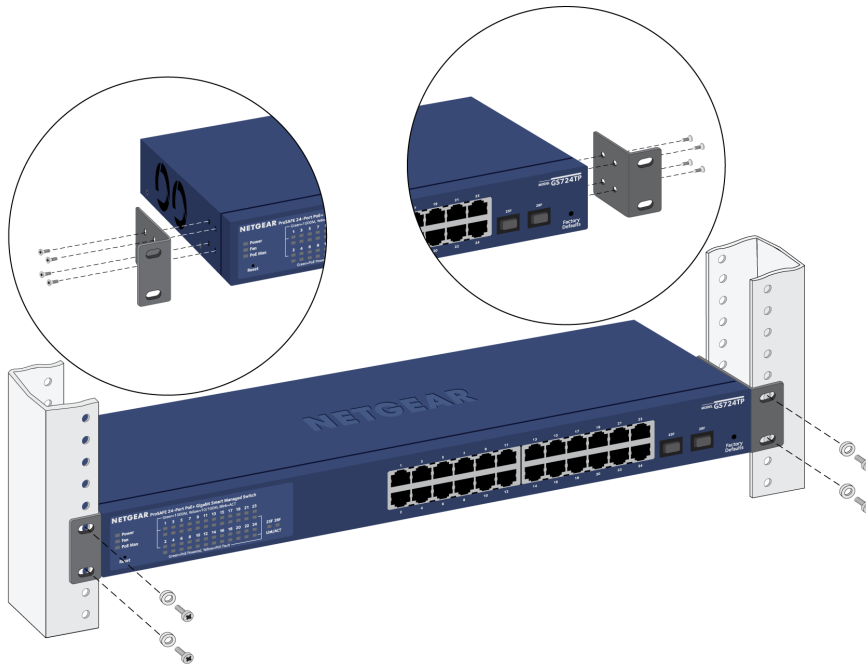
To install the switch in a rack, you need the 19-inch rack-mount kit supplied with the switch.

### ► To install the switch in a rack:

1. Attach the supplied mounting brackets to the side of the switch.
2. Insert the screws provided in the product package through each bracket and into the bracket mounting holes in the switch.
3. Tighten the screws with a No. 2 Phillips screwdriver to secure each bracket.

## GS724TPv2 ProSAFE 24-Port Gigabit Smart Managed Switch with PoE+ and 2 SFP Ports

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 the mounting brackets to the rack.



### Place the Switch on a Flat Surface

The switch ships with four self-adhesive rubber footpads.

#### ► To install the switch on a flat surface:

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. They also provide ventilation space between stacked switches.

### Optional Step 5: Install SFP Transceiver Modules

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

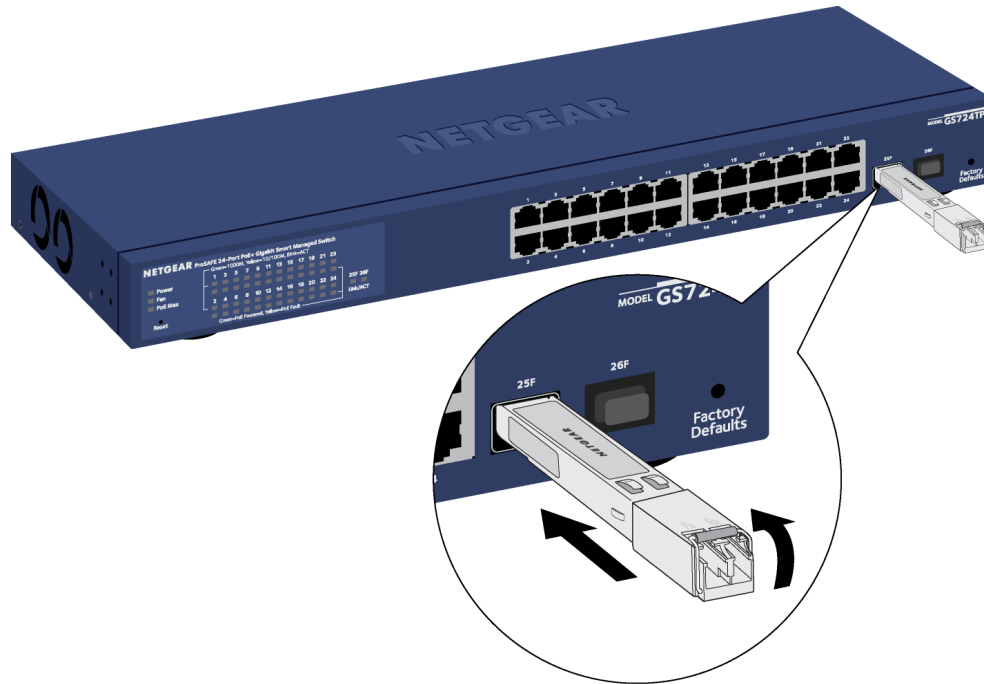
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**Note** Contact your NETGEAR sales office to purchase these modules. If you do not want to install an SFP module, skip this procedure.

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## ► To install an SFP transceiver module:

1. Insert the transceiver into the SFP port.  
Use port 25F or 26F.
2. Press firmly on the flange of the module to seat it securely into the connector.



## Step 6: Attach Devices

All RJ-45 ports on the switch support PoE+. For application examples and information about PoE, see [Applications](#) on page 21.

### ► To attach devices:

1. Attach PoE and non-PoE devices to the switch.
2. Verify that all cables are installed correctly.

## Step 7: Check the Installation

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

### ► To check the installation:

1. Inspect the equipment thoroughly.
2. Verify again that all cables are installed correctly.

3. Check cable routing to make sure that cables are not damaged or creating a safety hazard.
4. Make sure that all equipment is mounted properly and securely.

### Step 8: Apply AC Power and Check the LEDs

The 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 switch.

#### ► To apply AC power:

1. Connect the end of the power cord to the AC power receptacle on the front of the switch.
2. Plug the AC power cord into a power source such as a wall socket or power strip.
3. Check to see that the LEDs on the front panel of the switch light correctly.

When you apply power, the Power LED on the switch front panel lights and the ports LEDs for attached devices light.

If the Power LED does not light, check to see that the power cord is plugged in correctly and that the power source is good.

For information about the LEDs, see [LEDs](#) on page 11.

### Step 9: Manage the Switch

The switch contains built-in web browser–accessible software for viewing, changing, and monitoring the way it functions. This management software is not required for the 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 switch, which results in the improvement of its overall performance as well as the performance of the network.

After you power on the switch for the first time, you can configure the smart managed switch using the web browser–based management interface for advanced setup and configuration of features, or the Smart Control Center program (which requires a Windows-based computer) for very basic setup. For more information about managing the switch, see the installation guide on the resource CD and the user manual, which you can download from [downloadcenter.netgear.com](http://downloadcenter.netgear.com).

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**Note** The switch's default IP address is 192.168.0.239 and its default subnet mask is 255.255.255.0.

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The switch is designed to provide flexibility in configuring network connections. The switch can be used as your only network traffic–distribution device for PoE and non-PoE devices or with 10 Mbps, 100 Mbps, and 1 Gbps Ethernet and fiber hubs, routers, and switches.

This chapter includes the following sections:

- *PoE Applications* on page 22
- *Desktop Switching* on page 24

## PoE Applications

This section covers the following topics:

- *PoE Overview* on page 22
- *Connect PoE Equipment in a Business Environment* on page 22
- *Connect PoE Equipment for Surveillance and Security* on page 23

### PoE Overview

The switch supports 24 Power over Ethernet (PoE) ports. The switch can supply up to 30W PoE+ (IEEE 802.3at) to each port up to its total maximum PoE power budget of 190W across all active PoE+ ports.

Supplied power is prioritized according to the port order, up to the total power budget of the device. Port 1 receives the highest PoE priority, while port 24 is relegated to the lowest PoE priority.

If the power requirements for attached devices exceed the total power budget of the switch, the PoE power to the device on the highest-numbered active PoE port is disabled to make sure that the devices connected to the higher-priority, lower-numbered PoE ports are supported first.

Although a device is listed as an 802.3at PoE+-powered or 802.3af PoE-powered device, it might not require the maximum power limit that is specified by its IEEE standard. Many devices require less power, allowing all 24 PoE ports to be active simultaneously when the devices correctly report their PoE class to the switch.

### Connect PoE Equipment in a Business Environment

The following figure shows an example of how you can connect PoE wireless access points, PoE VoIP phones, and PoE surveillance equipment to the switch in a business environment.

In a small office or home office network, the blue network icon represents a router that is connected to an Internet modem. In such a setup, you must connect one port on the switch to a LAN port on the router.

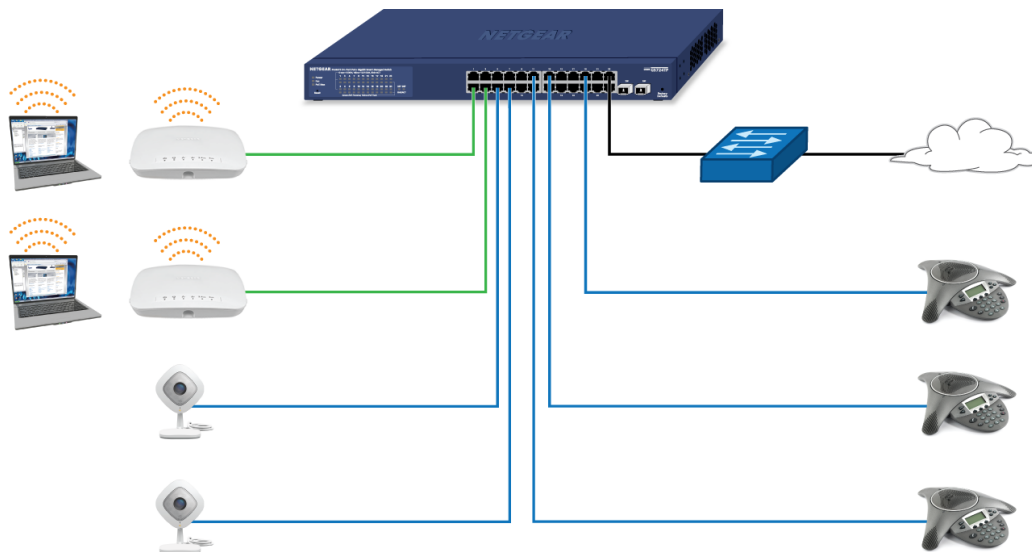


Figure 4. Sample PoE business use case

**Table 4. Line color descriptions PoE business use case**

Line Color	Description
Green	PoE+ (such as WiFi access points)
Blue	PoE (such as VoIP phones and security cameras)
Black	Internet

## Connect PoE Equipment for Surveillance and Security

The following figure shows an example of how you can connect PoE and non-PoE equipment to the switch for surveillance and security purposes.

In a small office or home office network, the blue network icon represents a router that is connected to an Internet modem. In such a setup, you must connect one port on the switch to a LAN port on the router.

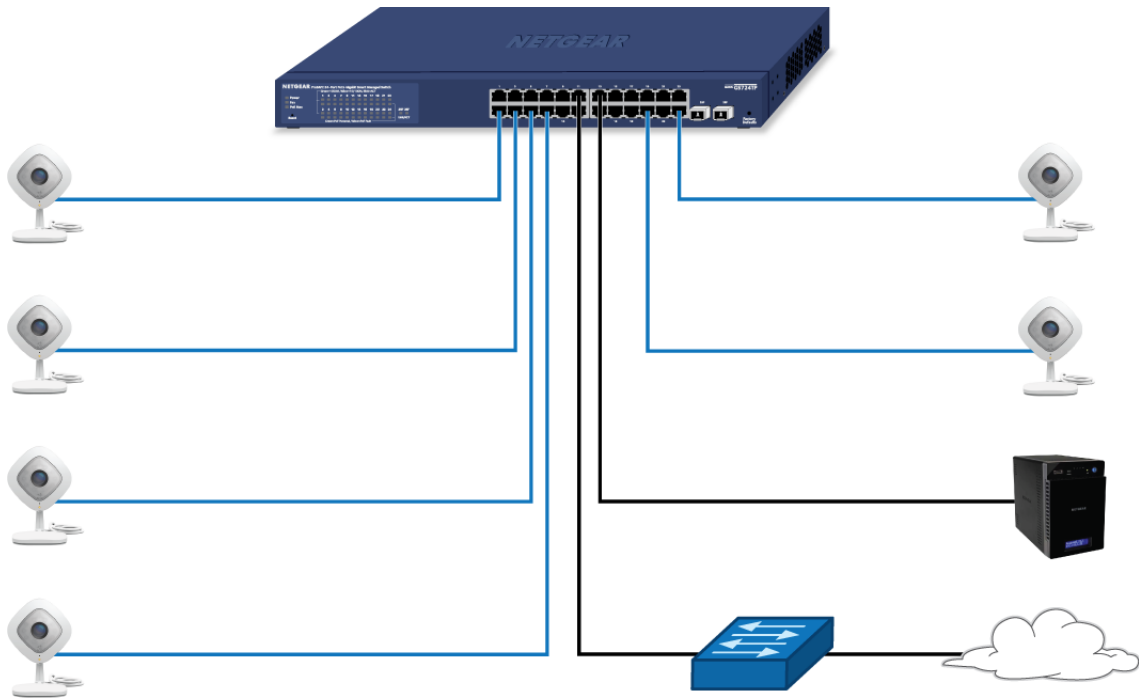


Figure 5. Sample switch surveillance and security application

**Table 5. Line color descriptions switch surveillance and security application**

Line Color	Description
Blue	PoE (such as security cameras)
Black	Non-PoE (such as a ReadyNAS and network connection)

## Desktop Switching

You can use the switch as a desktop switch to build a small network that provides up to 1 Gbps access to servers such as a file server. In a small network such as a small office or home office network, connect the switch to a router that, in turn, is connected to an Internet modem.

With 1 Gbps connections, the switch always functions in full-duplex mode. Any switch port that is connected to a computer or file server can provide up to 2 Gbps bidirectional throughput.

In a small office or home office network, the blue network icon represents a router that is connected to an Internet modem. In such a setup, you must connect one port on the switch to a LAN port on the router.

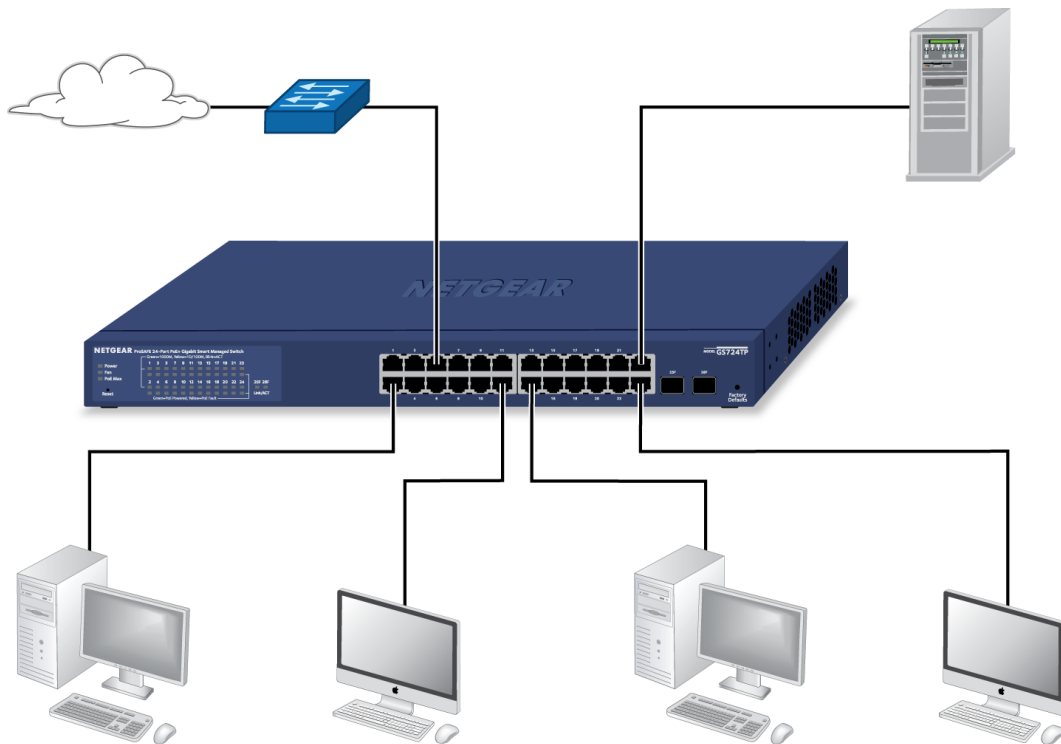


Figure 6. Sample desktop switching



This chapter provides information about troubleshooting the switch.

The chapter includes the following sections:

- *Troubleshooting Chart* on page 26
- *PoE Troubleshooting Suggestions* on page 27
- *Additional Troubleshooting Suggestions* on page 27

## Troubleshooting Chart

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

**Table 6. Troubleshooting chart**

Symptom	Possible Cause	Possible Solution
Power LED is off.	Power is not supplied to the switch.	Check the power cable connections at the switch and the power source.  Make sure that all cables are used correctly and comply with the Ethernet specifications.
Combined speed and activity LED or an individual speed LED and an individual activity LED are 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 switch and the connecting device.  Make sure 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.	One possible cause is that a broadcast storm occurred and that a network loop (redundant path) was created.	Break the loop by making sure that only one path exists from any networked device to any other networked device. After you connect to the switch web management interface, you can configure the Spanning Tree Protocol (STP) to prevent network loops.
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.  Make sure that all connectors are securely positioned in the required ports. It is possible that equipment was accidentally disconnected.
Combined speed and activity LED or an individual speed LED and an individual activity LED are blinking continuously on all connected ports and the network is disabled.	A network loop (redundant path) was created.	Break the loop by making sure that only one path exists from any networked device to any other networked device. After you connect to the switch web management interface, you can configure the Spanning Tree Protocol (STP) to prevent network loops.

## PoE Troubleshooting Suggestions

Here are some tips for correcting PoE problems that might occur:

- Make sure that the PoE Max LED is off. If the PoE Max LED is solid amber, disconnect one or more PoE devices to prevent PoE oversubscription. Start by disconnecting the device from the highest-numbered port.
- Make sure that the Ethernet cables are plugged in correctly. For each powered device (PD) that is connected to the switch, the associated lower port LED on the switch lights solid green. If the lower port LED lights solid amber, a PoE fault occurred and PoE halted because of one of the conditions that are listed in the following table.

**Table 7. PoE fault conditions and possible solutions**

PoE Fault Condition	Possible Solution
A PoE-related short circuit occurred on the port.	The problem is most likely with the attached PD. Check the condition of the PD or restart the PD by disconnecting and reconnecting the PD.
The PoE power demand of the PD exceeded the maximum level that the switch permits. The maximum level is 15.4W for a PoE connection or 30W for a PoE+ connection.	
The PoE current on the port exceeded the classification limit of the PD.	
The PoE voltage of the port is outside the range that the switch permits.	Restart the switch to see if the condition resolves itself.

## Additional Troubleshooting Suggestions

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

- **Network adapter cards.** Make sure that the network adapters that are 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. Make sure 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 switch by resetting it. To reset the switch, disconnect the AC power from the switch and then reconnect the AC power. If the problem continues, contact NETGEAR technical support. For more information, visit the support website at [support.netgear.com](http://support.netgear.com).
- **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 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.