

**NETGEAR®**

# Hardware Installation Guide

---

## 24-Port and 48-Port Gigabit Ethernet PoE+ Smart Switches with 4 SFP Ports or 4 10G SFP+ Ports and Optional Remote/Cloud Management

### Models

GS728TPv3

GS728TPPv3

GS728TXPv3

GS752TPv3

GS752TPPv3

GS752TXPv3

April 2024  
202-12742-01

**NETGEAR, Inc.**

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

## **Support and Community**

Visit [netgear.com/support](https://www.netgear.com/support) to get your questions answered and access the latest downloads.

You can also check out our NETGEAR Community for helpful advice at [community.netgear.com](https://community.netgear.com).

## **Regulatory and Legal**

Si ce produit est vendu au Canada, vous pouvez accéder à ce document en français canadien à <https://www.netgear.com/support/download/>.

(If this product is sold in Canada, you can access this document in Canadian French at <https://www.netgear.com/support/download/>.)

For regulatory compliance information including the EU Declaration of Conformity, visit <https://www.netgear.com/about/regulatory/>.

See the regulatory compliance document before connecting the power supply.

For NETGEAR's Privacy Policy, visit <https://www.netgear.com/about/privacy-policy>.

By using this device, you are agreeing to NETGEAR's Terms and Conditions at <https://www.netgear.com/about/terms-and-conditions>. If you do not agree, return the device to your place of purchase within your return period.

Do not use this device outdoors. The PoE source is intended for intra building connection only.

Applicable to 6 GHz devices only: Only use the device indoors. The operation of 6 GHz devices is prohibited on oil platforms, cars, trains, boats, and aircraft, except that operation of this device is permitted in large aircraft while flying above 10,000 feet. Operation of transmitters in the 5.925-7.125 GHz band is prohibited for control of or communications with unmanned aircraft systems.

## **Trademarks**

© NETGEAR, Inc., NETGEAR, and the NETGEAR Logo are trademarks of NETGEAR, Inc. Any non-NETGEAR trademarks are used for reference purposes only.

### Revision History

Publication Part Number	Publish Date	Comments
202-12742-01	April 2024	<p>We added the following two new models:</p> <ul style="list-style-type: none"><li>• GS728TXPv3</li><li>• GS752TXPv3</li></ul> <p>For more information about these models, see the following sections:</p> <ul style="list-style-type: none"><li>• <a href="#">Introduction</a> on page 6</li><li>• <a href="#">Features</a> on page 8</li><li>• <a href="#">Front panel</a> on page 14</li><li>• <a href="#">LEDs</a> on page 16</li><li>• <a href="#">SFP and SFP+ ports for fiber or copper connectivity</a> on page 19</li><li>• <a href="#">PoE overview</a> on page 23</li><li>• <a href="#">Optional Step 5: Install SFP or SFP+ transceiver modules</a> on page 32</li></ul> <p>We changed <a href="#">Step 9: Manage the switch</a> on page 35.</p> <p>We made other minor changes and improvements.</p>
202-12627-01	February 2023	First publication.

# Contents

## Chapter 1 Introduction

- Overview..... 8
- Features..... 8
- Safety instructions and warnings..... 10

## Chapter 2 Hardware Overview

- Hardware description..... 14
  - Front panel..... 14
  - LEDs..... 16
  - Back panel..... 18
- Switch hardware interfaces..... 18
  - RJ-45 ports for 10/100/1000M BASE-T Ethernet connectivity. 19
  - SFP and SFP+ ports for fiber or copper connectivity..... 19
  - Single-function Reset button..... 20
  - Dual-function Factory Defaults button..... 21
  - USB port..... 21

## Chapter 3 Applications

- PoE overview..... 23
- Gigabit aggregation switching with PoE..... 24
- Connect PoE equipment in a business environment..... 26
- Connect PoE equipment for surveillance and security..... 27

## Chapter 4 Installation

- Step 1: Prepare the site..... 29
- Step 2: Protect against electrostatic discharge..... 29
- Step 3: Unpack the switch..... 30
- Step 4: Install the switch..... 31
  - Mount the switch in a rack..... 31
  - Install the switch on a flat surface..... 32
- Optional Step 5: Install SFP or SFP+ transceiver modules..... 32
- Step 6: Connect devices to the switch..... 33
- Step 7: Check the installation..... 34
- Step 8: Apply power and check the LEDs..... 34
- Step 9: Manage the switch..... 35

## Chapter 5 Troubleshooting

- Troubleshooting chart..... 38
- PoE troubleshooting suggestions..... 39

Additional troubleshooting suggestions..... 40

# 1

## Introduction

---

This hardware installation guide is for the following NETGEAR 24-Port and 48-Port Gigabit Ethernet PoE+ Smart Switches with 4 SFP Ports or 4 10G SFP+ Ports and Optional Remote/Cloud Management:

- **GS728TPv3**: NETGEAR 24-Port Gigabit PoE+ Smart Switch With 4 SFP Ports. This model provides a PoE power budget of 190W.
- **GS728TPv3**: NETGEAR 24-Port Gigabit PoE+ Smart Switch With 4 SFP Ports. This model provides a PoE power budget of 380W.
- **GS728TXPv3**: NETGEAR 24-Port Gigabit PoE+ Smart Switch With 4 10G SFP+ Ports. This model provides a PoE power budget of 190W.
- **GS752TPv3**: NETGEAR 48-Port Gigabit PoE+ Smart Switch With 4 SFP Ports. This model provides a PoE power budget of 380W.
- **GS752TPv3**: NETGEAR 48-Port Gigabit PoE+ Smart Switch With 4 SFP Ports. This model provides a PoE power budget of 760W.
- **GS752TXPv3**: NETGEAR 48-Port Gigabit PoE+ Smart Switch With 4 10G SFP+ Ports. This model provides a PoE power budget of 380W.

The switch provides twenty-four or forty-eight Gigabit RJ-45 copper PoE+ ports with four dedicated SFP or SFP+ ports. Power over Ethernet plus (PoE+) provides power to PoE-capable devices such as WiFi access points, VoIP phones, and IP security cameras so that you don't need to use power adapters for those devices.

The maximum PoE+ (IEEE 802.3at) power that the switch can provide across all active PoE+ ports depends on the model:

190W for models GS728TPv3 and GS728TXPv3, 380W for models GS728TPv3, GS752TPv3, and GS752TXPv3, and 760W for model GS752TPv3.

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

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

- [Overview](#)
- [Features](#)

- [Safety instructions and warnings](#)

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

ⓘ **NOTE:** For switch documentation, visit [netgear.com/support/download/](http://netgear.com/support/download/) and enter your model number in the search box.

# Overview

The switch provides twenty-four or forty-eight 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+. Four additional ports can accept small form-factor pluggable (SFP) gigabit interface converters (GBICs) for 1G fiber or copper connectivity and, depending on the model, for 10G fiber or copper connectivity.

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 well-suited 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.

You can use the switch for multiple network applications with PoE and PoE+ devices and non-PoE devices. For more information, see [Applications](#) on page 22.

# Features

The switch supports the following key hardware features:

- 24 or 48 PoE+ Gigabit Ethernet ports:
  - 24 PoE+ ports: models GS728TPv3, GS728TPPv3, and GS728TXPv3
  - 48 PoE+ ports: models GS752TPv3, GS752TPPv3, and GS752TXPv3
- SFP or SFP+ ports:
  - SFP: 4 dedicated SFP ports for 1000BASE-SX, 1000BASE-LX, and 1000BASE-T connectivity for models GS728TPv3, GS752TPPv3, GS752TPv3 and GS752TPPv3
  - SFP+: 4 dedicated SFP+ ports for 1000BASE-SX, 1000BASE-LX, 1000BASE-T, 10GBASE-SX, 10GBASE-LX, and 10GBASE-T connectivity for models GS728TXPv3 and GS752TXPv3
- PoE+ power budget:
  - 190W: models GS728TPv3 and GS728TXPv3
  - 380W: models GS728TPPv3, GS752TPv3, and GS752TXPv3
  - 760W: model GS752TPPv3
- MAC table size of 16K.
- Variable speed fan that can lower the noise level during low operating temperatures.

- Acoustic noise (measured at 25°C) is equal to or less than:
  - 26.8 dBA: models GS728TPv3 and GS728TXPv3
  - 33.3 dBA: model GS728TPPv3
  - 36.6 dBA: models GS752TPv3 and GS752TXPv3
  - 39.3 dBA: model GS752TPPv3
- Full-duplex, nonblocking switch fabric:
  - 56 Gbps: models GS728TPv3 and GS728TPPv3
  - 104 Gbps: models GS752TPv3 and GS752TPPv3
  - 128 Gbps: model GS728TXPv3
  - 176 Gbps: model GS752TXPv3
- Includes 19-inch rack-mount kit for rack installation.
- Full compatibility with IEEE standards:
  - IEEE 802.3 Ethernet
  - IEEE 802.3i 10BASE-T
  - IEEE 802.3u 100BASE-T
  - IEEE 802.3ab 1000BASE-T
  - IEEE 802.3an 10GBASE-T 10 Gbit/s Ethernet over copper twisted-pair cable
  - IEEE 802.3z Gigabit Ethernet 1000BASE-SX/LX
  - IEEE 802.3ae 10-Gigabit Ethernet over fiber (10GBASE-SR, 10GBASE-LR, 10GBASE-ER, 10GBASE-LX4)
  - IEEE 802.3aq 10GBASE-LRM 10 Gbit/s Ethernet over multi-mode fiber with enhanced equalization
  - 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)

- IEEE 802.3af Power over Ethernet (PoE)
- IEEE 802.3at Power over Ethernet plus (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.
- 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 and humidity-controlled environment.

Note the following:

- For more information about the environment in which this product must operate, see the environmental specifications in the appendix or the data sheet.
- If you want to connect the product to a device located outdoors, the outdoor device must be properly grounded and surge protected, and you must install an Ethernet surge protector inline between the indoor product and the outdoor device. Failure to do so can damage the product.

 **WARNING:** Before connecting the product to outdoor cables or devices, see <https://kb.netgear.com/000057103> for additional safety and warranty information.

Failure to follow these guidelines can result in damage to your NETGEAR product, which might not be covered by NETGEAR's warranty, to the extent permissible by applicable law.

- Observe and follow service markings:
  - Do not service any product except as explained in your product documentation. Some devices should never be opened.
  - If applicable to your product, 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 power outlet, and then replace the part or contact your trained service provider:
  - Depending on your product, the power adapter, power adapter cable, 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 the product away from radiators and heat sources. Also, do not block cooling vents.
- Do not spill food or liquids on your product components, and never operate the product in a wet environment. If the product 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 product. Doing so can cause fire or electric shock by shorting out interior components.
- Use the product only with approved equipment.
- If applicable to your product, 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 avoid damaging your system, if your product uses a power supply with a voltage selector, be sure that the selector is set to match the power at your location:

## 24-Port and 48-Port Gigabit Ethernet PoE+ Smart Switches with 4 SFP Ports or 4 10G SFP+ Ports

- 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.
- Depending on your product, use only a supplied power adapter or approved power cable:

If your product uses a power adapter:

- If you were not provided with a power adapter, contact your local NETGEAR reseller.
- The power adapter must be rated for the product and for the voltage and current marked on the product electrical ratings label.

If your product uses a power cable:

- 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 power outlets.
- If applicable to your product, 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, power adapter cables, or 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 adapters, power adapter cables, power cables, or plugs. Consult a licensed electrician or your power company for site modifications.
- Always follow your local and national wiring rules.

# 2

## Hardware Overview

---

This chapter describes the switch hardware features.

The chapter includes the following sections:

- [Hardware description](#)
- [Switch hardware interfaces](#)

# Hardware description

The following sections describe the switch hardware features.

## Front panel

The switch provides twenty-four or forty-eight 10/100/1000BASE-T RJ-45 PoE+ ports and four SFP or SFP+ ports. The following figures show the front panels. (The front panels do not state the v3 model designation.)

Models GS728TPv3 and GS728TPv3 provide twenty-four 10/100/1000BASE-T RJ-45 PoE+ ports and four SFP ports.



Figure 1. Front panel model GS728TPv3 (also applies to model GS728TPv3)

Model GS728TXv3 provides twenty-four 10/100/1000BASE-T RJ-45 PoE+ ports and four SFP+ ports.

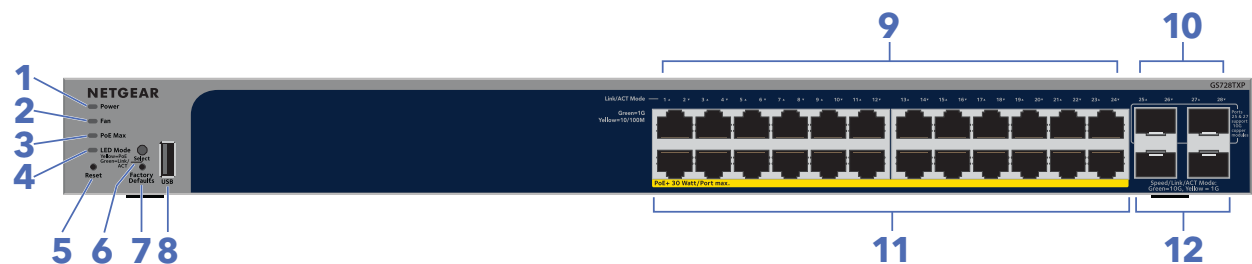


Figure 2. Front panel model GS728TXv3

Models GS752TPv3 and GS752TPv3 provide forty-eight 10/100/1000BASE-T RJ-45 PoE+ ports and four SFP ports.

## 24-Port and 48-Port Gigabit Ethernet PoE+ Smart Switches with 4 SFP Ports or 4 10G SFP+ Ports

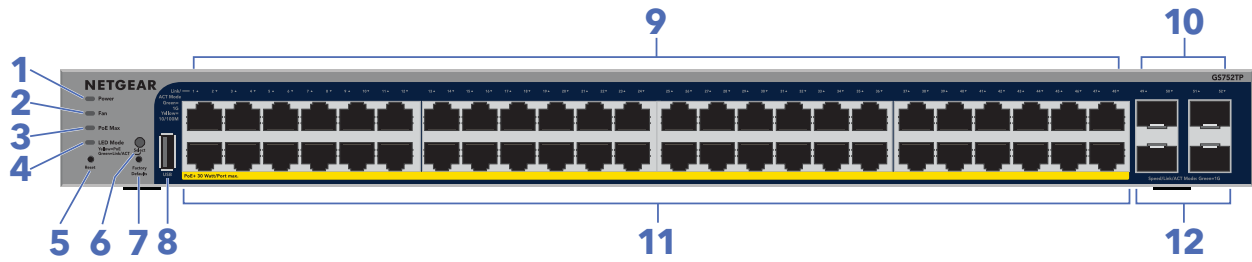


Figure 3. Front panel model GS752TPv3 (also applies to model GS752TPv3)

Model GS752TXPv3 provides forty-eight 10/100/1000BASE-T RJ-45 PoE+ ports and four SFP+ ports.

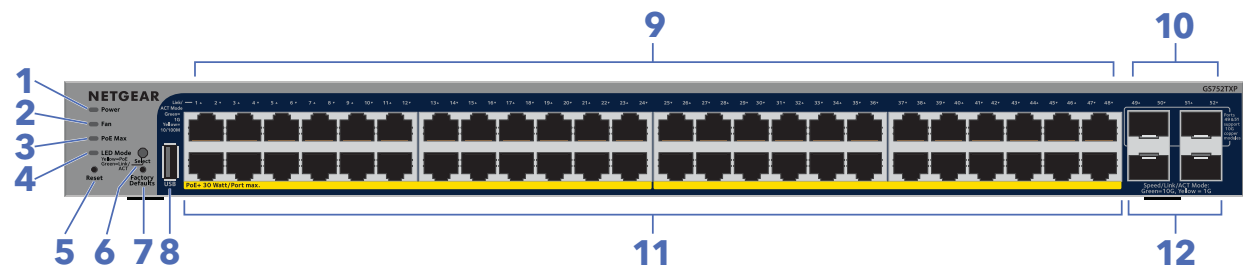


Figure 4. Front panel model GS752TXPv3

Table 1. Front panel

Number	Description	
1	Power LED	For more information, see <a href="#">LEDs</a> on page 16.
2	Fan LED	
3	PoE Max LED	
4	LED Mode LEDs	
5	<b>Reset</b> button. For more information, see <a href="#">Single-function Reset button</a> on page 20.	
6	<b>LED Mode</b> button. This button lets you change the information that the port LEDs provide, which is either switching information (link, speed, and activity) or PoE information (PoE-powered and PoE fault). For more information, see <a href="#">LEDs</a> on page 16.	
7	<b>Factory Defaults</b> button. For more information, see <a href="#">Dual-function Factory Defaults button</a> on page 21.	
8	USB 2.0 port for firmware updates, configuration backups, and memory dumps. For more information, see <a href="#">USB port</a> on page 21.	

Table 1. Front panel (Continued)

Number	Description
9	24 or 48 LEDs associated with the Ethernet ports. Depending on the position of the <b>LED Mode</b> button, the LEDs provide either switching information or PoE information. For more information, see <a href="#">LEDs</a> on page 16.
10	4 LEDs associated with the 4 SFP or 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 16.
11	24 or 48 independent 10/100/1000BASE-T RJ-45 PoE ports. For more information, see <a href="#">RJ-45 ports for 10/100/1000M BASE-T Ethernet connectivity</a> on page 19.
12	4 dedicated SFP or SFP+ ports in which you can install GBICs for fiber or copper connections. For more information, see <a href="#">SFP and SFP+ ports for fiber or copper connectivity</a> on page 19.

## LEDs

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

Table 2. Front panel LEDs

LED	Description
Power LED	<b>Solid green:</b> The switch is powered on. <b>Solid yellow:</b> The switch is starting. <b>Off:</b> Power is not supplied to the switch.
Fan LED	<b>Solid yellow:</b> The internal fan failed. <b>Off:</b> The internal fan is operating normally.
PoE Max LED	<b>Off:</b> Sufficient (more than 7W of) PoE power is available. <b>Solid yellow:</b> Less than 7W of PoE power is available. <b>Blinking yellow:</b> At least once during the previous two minutes, less than 7W of PoE power was available.
LED Mode LED	<b>Solid green:</b> The port LEDs function in Ethernet Mode. <b>Solid yellow:</b> The port LEDs function in PoE Mode.

Table 2. Front panel LEDs (Continued)

LED	Description
<p>RJ-45 LEDs for ports 1-24 or ports 1-48</p> <p>Depending on the position of the <b>LED Mode</b> button, the LEDs for an associated port function either in Ethernet Mode and indicate the link status, speed, and activity or in PoE Mode and indicate the PoE status.</p>	<p>The <b>LED Mode</b> button is set to Ethernet Mode:</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 yellow:</b> A valid 10 Mbps or 100 Mbps Ethernet link is established.</p> <p><b>Blinking yellow:</b> The port is transmitting or receiving packets at 10 Mbps or 100 Mbps.</p> <hr/> <p>The <b>LED Mode</b> button is set to PoE Mode:</p> <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 yellow:</b> A PoE fault occurred. For more information, see <a href="#">PoE troubleshooting suggestions</a> on page 39.</p>
<p>Link and ACT LEDs for ports 25-28 or ports 49-52</p>	<p>Models GS728TPv3, GS728TPv3, GS752TPv3, and GS752TPv3:</p> <p><b>Off:</b> No SFP module link is established.</p> <p><b>Solid green:</b> A valid 1 Gbps link is established.</p> <p><b>Blinking green:</b> The SFP port is transmitting or receiving packets at 1 Gbps.</p> <p>Models GS728TXv3 and GS752TXv3:</p> <p><b>Off:</b> No SFP+ module link is established.</p> <p><b>Solid green:</b> A valid 10 Gbps link is established.</p> <p><b>Blinking green:</b> The SFP+ port is transmitting or receiving packets at 10 Gbps.</p> <p><b>Solid yellow:</b> A valid 1 Gbps link is established.</p> <p><b>Blinking yellow:</b> The SFP+ port is transmitting or receiving packets at 1 Gbps.</p>

## Back panel

The back panel provides a Kensington lock and AC power receptacle. (The switch integrates a fixed, internal power supply.) The console port is not for customer use.

The following figures show the back panels.



Figure 5. Back panel models GS728TPv3, GS728TPv3, and GS728TXPv3



Figure 6. Back panel models GS752TPv3, GS752TPv3, and GS752TXPv3

## Switch hardware interfaces

The following sections describe the hardware interfaces on the switch.

## RJ-45 ports for 10/100/1000M BASE-T Ethernet connectivity

All RJ-45 copper ports support autosensing. When you insert a cable into an RJ-45 port, the switch automatically detects 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) cable (or higher-rated Ethernet 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 setting uplink connections while eliminating concern about whether to use crossover or straight-through cables when you attach devices.

All copper ports also support Power over Ethernet (PoE+).

## SFP and SFP+ ports for fiber or copper connectivity

To enable fiber or additional copper connections on the switch, SFP and SFP+ ports accommodate standard small form-factor pluggable (SFP) gigabit interface converters (GBICs, also referred to as transceiver modules) for 1G fiber or copper connectivity and, for models GS728TXPv3 and GS752TXPv3, 10G fiber or copper connectivity. GBICs are sold separately from the switch.

Table 3. Supported transceiver modules and direct attach cables

Model	Description
<b>1G Fiber SFP Transceivers</b>	
AGM731F	NETGEAR 1000BASE-SX SFP LC Transceiver (multimode, 1000m OM4, 550m OM3 50/125µm, 275m OM2/OM1 62.5/125µm)

Table 3. Supported transceiver modules and direct attach cables (Continued)

Model	Description
AGM732F	NETGEAR 1000BASE-LX SFP LC Transceiver (single mode, 10km 9/125µm)
<b>1G Copper SFP Transceiver</b>	
AGM734	NETGEAR 1000BASE-T SFP RJ45 Transceiver
<b>10G SFP+ Direct Attach Cables (DAC)</b>	
AXC761	NETGEAR 10G SFP+ to SFP+ 1-Meter Passive Direct Attach Cable
AXC763	NETGEAR 10G SFP+ to SFP+ 3-Meter Passive Direct Attach Cable
<b>10G Fiber SFP+ Transceiver</b>	
AXM761	NETGEAR 10GBASE-SR SFP+ LC Transceiver (multimode, 550m OM4, 300m OM3 50/125µm, 33m OM2/OM1 62.5/125µm)
AXM762	NETGEAR 10GBASE-LR SFP+ LC Transceiver (single mode, 10km 9/125µm)
AXM763	NETGEAR 10GBASE-LRM SFP+ LC Transceiver (multimode, 220m 62.5/125µm)
AXM764	NETGEAR 10GBASE-LR LITE SFP+ LC Transceiver (single mode, 2km 9/125µm)
<b>10G Copper SFP+ Transceiver</b>	
AXM765v2	NETGEAR 10GBASE-T, SFP+ RJ45 Transceiver

**⚠ CAUTION:** On model GS728TXPv3, only ports 25 and 27 support 10G copper modules; On model GS752TXPv3, only ports 49 and 51 support 10G copper modules. If you insert a 10G copper module in an upper SFP+ port, do not insert any module in the SFP+ port just below it. If you insert 10G copper modules in the two upper SFP+ ports, do not insert any modules in the two lower SFP+ ports.

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

## Single-function Reset button

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

### To restart the switch:

1. Insert a device such as a straightened paper clip into the opening.
2. Press the recessed **Reset** button for more than one second.

During the restart process, the Power LED lights yellow.

# Dual-function Factory Defaults button

The switch provides a dual-function **Factory Defaults** button on the front panel. Depending on how long you press the button (for details, see the following procedure), this button lets you perform the following tasks:

- **Reset the switch to factory default settings but maintain the registration status:** All settings are erased and the switch restarts with factory default settings. The NETGEAR registration status is maintained and not reset.
- **Reset the switch to factory default settings and reset the registration status:** All settings are erased, the switch restarts with factory default settings, and the NETGEAR registration status is reset. You must reregister the switch with NETGEAR.

## To reset the switch:

1. Insert a tool such as a straightened paper clip into the opening.
2. Do one of the following:
  - **Reset the switch to factory default settings but maintain the registration status:** Press the **Factory Defaults** button for more than one second but less than 10 seconds. (Do not press the button for more than 10 seconds!)
  - **Reset the switch to factory default settings and reset the registration status:** Press the **Factory Defaults** button for more than 10 seconds.

When the switch restarts, the Power LED lights yellow.

# USB port

The switch provides one USB 2.0 port that lets you 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.

# 3

## Applications

---

The switch is designed to provide flexibility in configuring network connections. You can use the switch as an aggregation switch in a larger network or as a backbone switch in a small office or home office network to support 10 Mbps, 100 Mbps, and 1 Gbps Ethernet and fiber routers, switches, and hubs. You can connect PoE and PoE+ devices and non-PoE devices directly to the switch.

This chapter includes the following sections:

- [PoE overview](#)
- [Gigabit aggregation switching with PoE](#)
- [Connect PoE equipment in a business environment](#)
- [Connect PoE equipment for surveillance and security](#)

# PoE overview

The switch can supply up to 30W Power over Ethernet Plus (PoE+, IEEE 802.3at) to each copper port, up to the maximum power PoE budget for all active PoE+ ports. The switch is backward compatible with PoE (IEEE 802.3af).

The number of PoE+ ports and the maximum PoE power budget across all active PoE+ ports depends on the switch model:

- **GS728TPv3**: 24 PoE+ ports with a maximum PoE power budget of 190W
- **GS728TPv3**: 24 PoE+ ports with a maximum PoE power budget of 380W
- **GS728TXPv3**: 24 PoE+ ports with a maximum PoE power budget of 190W
- **GS752TPv3**: 48 PoE+ ports with a maximum PoE power budget of 380W
- **GS752TPv3**: 48 PoE+ ports with a maximum PoE power budget of 760W
- **GS752TXPv3**: 48 PoE+ ports with a maximum PoE power budget of 380W

Supplied power is prioritized according to the port order, up to the total power budget of the device. For example, for model GS728TPv3, 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 PoE+ ports to be active simultaneously when the devices correctly report their PoE class to the switch.

Table 4. PoE classes and PoE power allocations

Device Class	Compatible PoE Standard	Class Description	Maximum Power Reserved for the Device	Power Delivered to the Device
0	PoE and PoE+	Default power (full)	15.4W	0.44W-12.95W
1	PoE and PoE+	Very low power	4.0W	0.44W-3.84W
2	PoE and PoE+	Low power	7.0W	3.84W-6.49W
3	PoE and PoE+	Mid power	15.4W	6.49W-12.95W
4	PoE+ only	High power	30.0W	12.95W-25.5W

The previous table shows the standard power ranges, calculated with the maximum cable length of 328 feet (100 meters). If a device receives insufficient PoE power from the switch, consider using a shorter cable.

Using the local browser UI, you can control how PoE power is allocated across active PoE+ ports by overriding the default or autodetected PoE power limits for individual PoE+ ports. You can also specify the exact PoE power limit per port from 3.0W to 30.0W.

For more information about PoE, see the installation guide and user manual. To find your installation guide and user manual, visit [netgear.com/support/download/](https://netgear.com/support/download/) and enter your model number in the search box.

# Gigabit aggregation switching with PoE

You can use the switch as an aggregation switch that serves as power sourcing equipment (PSE) in a network that gives users Gigabit access to network devices and the Internet. The switch can provide PoE or PoE+ to devices such as WiFi access points, cameras, and VoIP phones.

In a small office or home office network, you can use the switch as a Gigabit backbone switch and connect it directly to your Internet router or Internet modem.

The following figure shows the switch functioning as an aggregation switch with an uplink to a network router, a firewall, and the Internet and connected to one managed

## 24-Port and 48-Port Gigabit Ethernet PoE+ Smart Switches with 4 SFP Ports or 4 10G SFP+ Ports

switch and one unmanaged switch, a storage device, computers and workstations, PoE+ WiFi access points, and PoE VoIP phones.

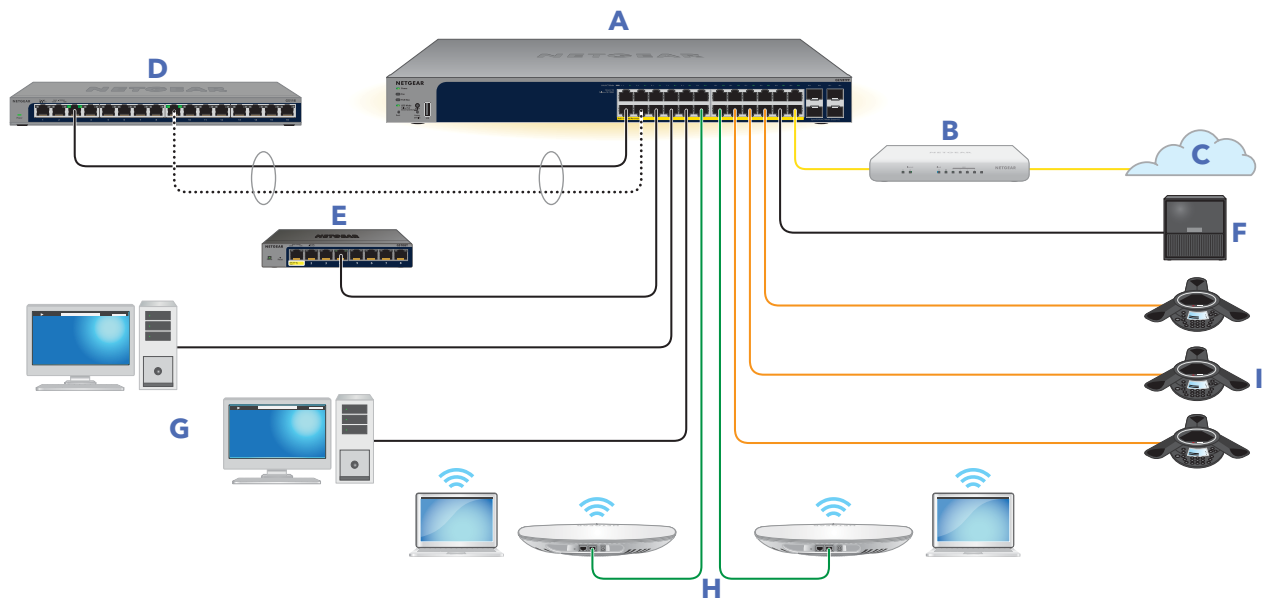


Figure 7. Sample aggregation switching with PoE+

Letter	Device	Letter	Device
A	Switch model GS728TPv3	E	Switch model GS108 (Gigabit Ethernet unmanaged switch)
B	Network router or firewall	F	Storage system
C	Internet	G	Computers and workstations
D	Switch model GS116E (Gigabit Ethernet Plus switch)	H	PoE+ WiFi access points
		I	PoE VoIP conference phones
Cable color	Connection		
Yellow	1G connection to a router or firewall and the Internet		
Black	1G connection to network devices, including switches such as the GS108 and GS116E, computers, workstations, and a storage system		
Dotted black	1G connection in a link aggregation group (LAG)		
Green	1G connection to PoE+ devices such as PoE+ WiFi access points		
Orange	1G connection to PoE devices such as PoE VoIP conference phones		

# 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, you can connect the switch directly to your Internet router or Internet modem.

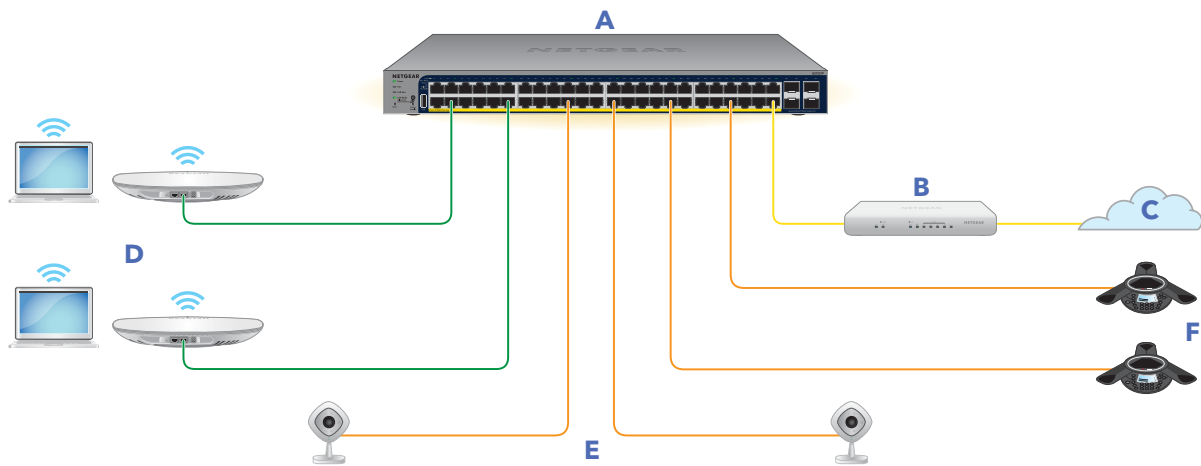


Figure 8. Sample PoE business use case

Letter	Device	Letter	Device
A	Switch model GS752TPv3	D	PoE+ WiFi access points
B	Network router or firewall	E	PoE security cameras
C	Internet	F	PoE VoIP conference phones

Cable color	Connection
Yellow	1G connection to a router or firewall and the Internet
Green	1G connection to PoE+ devices such as PoE+ WiFi access points.
Orange	1G connection to PoE devices such as PoE security cameras and PoE VoIP conference phones

# 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, you can connect the switch directly to your Internet router or Internet modem.

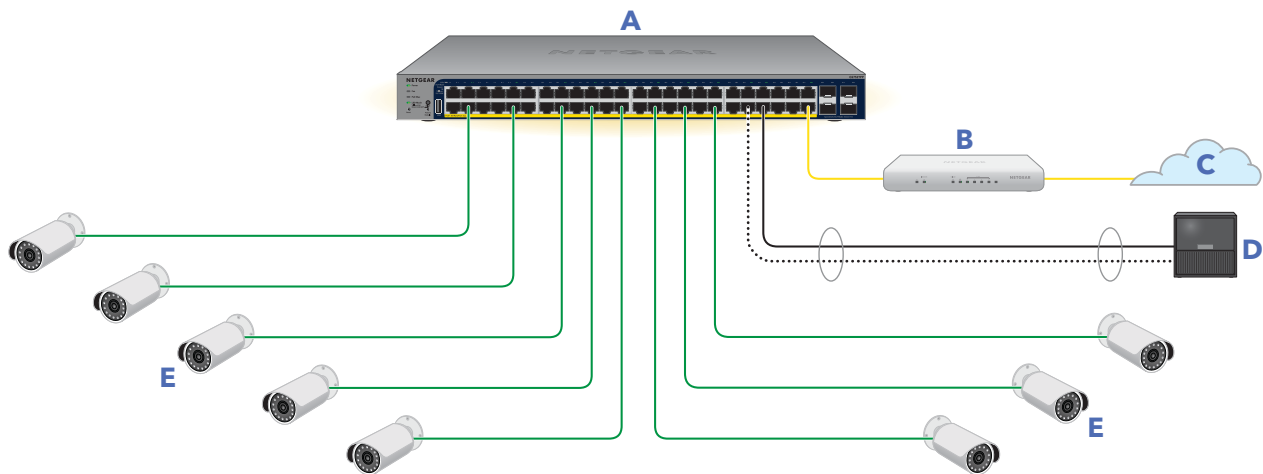


Figure 9. Sample switch surveillance and security application

Letter	Device	Letter	Device
A	Switch model GS752TPPv3	D	Storage system
B	Network router or firewall	E	PoE+ Pan-tilt-zoom (PTZ) cameras
C	Internet		
Cable color	Connection		
Yellow	1G connection to a router or firewall and the Internet		
Black	1G connection to network devices such as a storage system		
Dotted black	1G connection in a link aggregation group (LAG)		
Green	1G connection to PoE+ devices such as pan-tilt-zoom (PTZ) security cameras		

# 4

## Installation

---

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

- [Step 1: Prepare the site](#)
- [Step 2: Protect against electrostatic discharge](#)
- [Step 3: Unpack the switch](#)
- [Step 4: Install the switch](#)
- [Optional Step 5: Install SFP or SFP+ transceiver modules](#)
- [Step 6: Connect devices to the switch](#)
- [Step 7: Check the installation](#)
- [Step 8: Apply power and check the LEDs](#)
- [Step 9: Manage the switch](#)


# 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 5. 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	Locate 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 percent, 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 switch. To prevent static damage, discharge static electricity from your body before you touch any of the electronic components. 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.

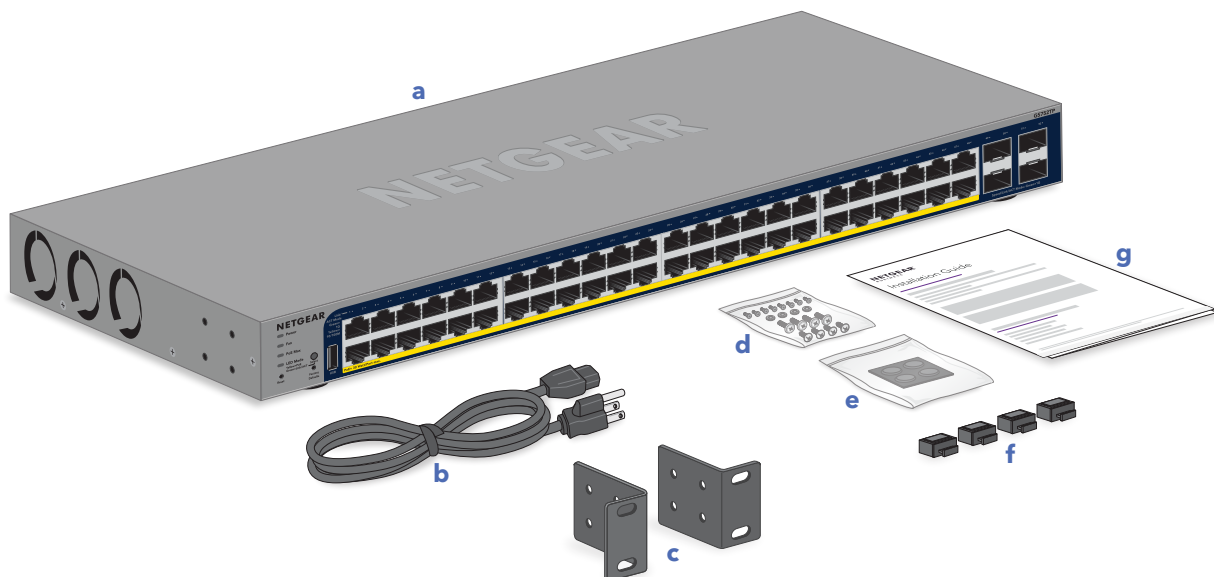


Figure 10. Switch package contents

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. Brackets for rack mounting
- d. Screws for rack mounting
- e. Rubber footpads for tabletop installation
- f. Rubber protection caps, which are already installed in the SFP sockets. If you install an SFP or SFP+ transceiver module, you must remove the cap from the SFP socket.
- g. Installation guide

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

## Step 4: Install the switch

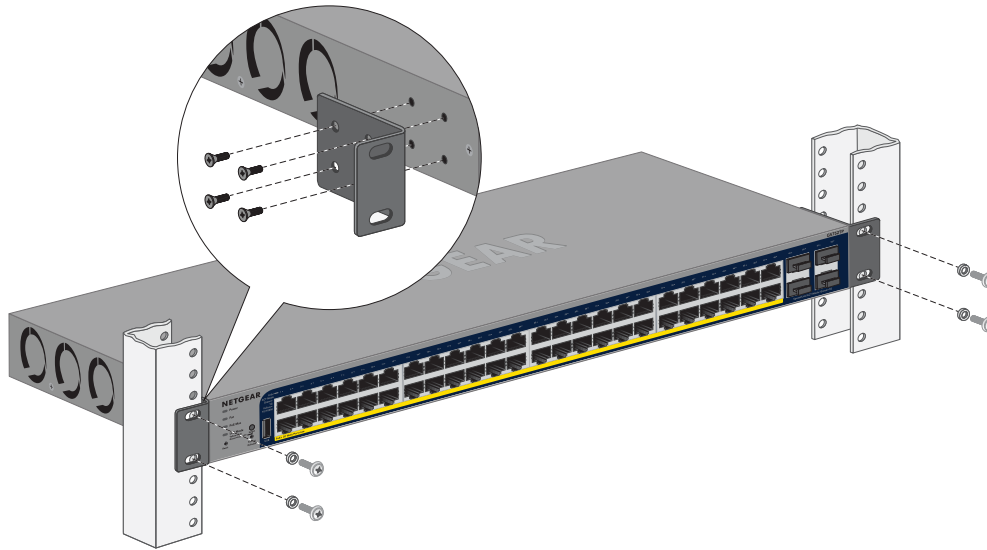
You can install the switch in a standard 19-inch (48.26-centimeter) network equipment rack or on a flat surface.

### Mount the switch in a rack

To install the switch in a rack, you need the rack-mount brackets and screws 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.
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.



## Install 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 or SFP+ transceiver modules

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

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

### To install an SFP or SFP+ transceiver module:

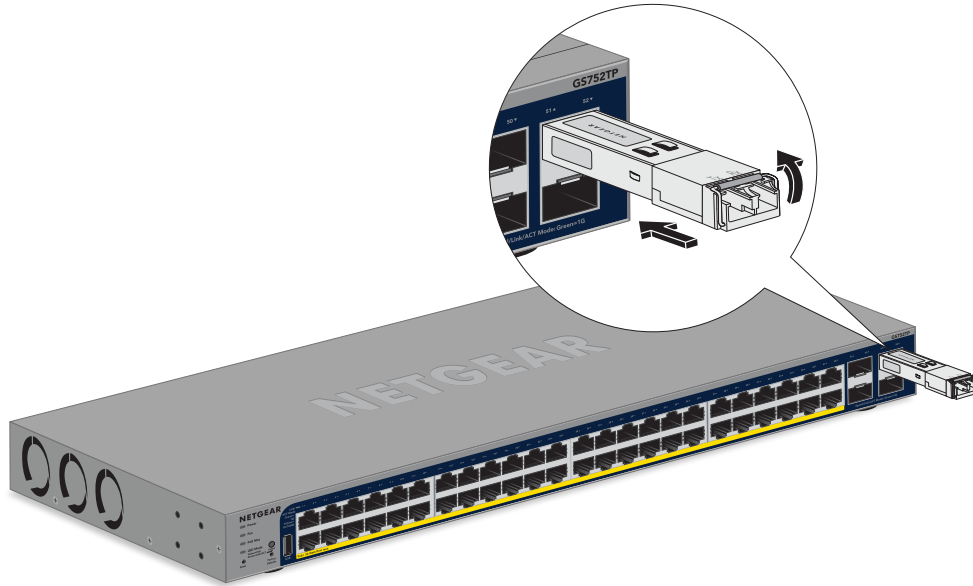
1. Insert the transceiver into the SFP or SFP+ port.

On models GS728TPv3, GS728TPv3, and GS728TXPv3, use port 25, 26, 27, or 28.

On models GS752TPv3, GS752TPv3, and GS752TXPv3, use port 49, 50, 51, or 52.

**⚠ CAUTION:** On model GS728TXPv3, only ports 25 and 27 support 10G copper modules; On model GS752TXPv3, only ports 49 and 51 support 10G copper modules. If you insert a 10G copper module in an upper SFP+ port, do not insert any module in the SFP+ port just below it. If you insert 10G copper modules in the two upper SFP+ ports, do not insert any modules in the two lower SFP+ ports.

2. Press firmly on the flange of the module to seat it securely into the connector.



## Step 6: Connect devices to the switch

This switch is designed for indoor use only. If you want to connect to a device located outdoors, the outdoor device must be properly grounded and surge protected, and you must install an Ethernet surge protector inline between the switch and the outdoor device. Failure to do so can damage the switch.

**⚠ WARNING:** Before connecting this switch to outdoor cables or devices, see <https://kb.netgear.com/000057103> for safety and warranty information.

The following procedure describes how to connect devices to the switch's RJ-45 ports. The switch supports Auto Uplink technology, which allows you to attach devices using either straight-through or crossover cables. Use a Category 5e (Cat 5e) or Cat 6 cable that is terminated with an RJ-45 connector.

**To connect devices to the switch's RJ-45 ports:**

1. Connect a non-PoE device to an RJ-45 network port on the switch.  
Ethernet specifications limit the cable length between the switch and the attached device to 328 feet (100 meters).
2. Verify that all cables are installed correctly.

## Step 7: Check the installation

Before you apply power to the switch, perform the following steps.

**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. Make sure that all equipment is mounted properly and securely.

## Step 8: Apply power and check the LEDs

The switch does not provide an on/off power 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 that might turn off power to the switch.

**To apply power:**

1. Connect the end of the power cord to the AC power receptacle on the back 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 switch light correctly.

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

**!** **NOTE:** After you apply power, the Power LED lights solid yellow while the switch starts. After two or three minutes, the switch completes its startup process and the Power LED turns from yellow to solid green.

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

## 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 multiple features (such as VLANs and LAGs) 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.

**!** **NOTE:** By default, the DHCP client of the switch is enabled. If the switch cannot get an IP address from a DHCP server, the switch's default IP address is 192.168.0.239 and the default subnet mask is 255.255.255.0.

### Management options

The switch provides the following management options that let you discover the switch on the network and configure, monitor, and control the switch:

- **Device user interface (UI):** By default, the management mode of the switch is set to *Directly Connect to Web Browser Interface*, which lets you access the device UI. In this mode, you can change all settings of the switch.

For more information about the device UI, see the user manual, which you can download from [netgear.com/support/download](http://netgear.com/support/download).

**!** **NOTE:** If you plan to use the NETGEAR Insight Cloud Portal or Insight app to manage the switch, we recommend that you do not use the device UI to change settings that are *Insight manageable* because they would not be synchronized with Insight or to the network location and other devices to which you assigned the switch.

- **NETGEAR Insight Cloud Portal and Insight app:** If you set the management mode of the switch to *NETGEAR Insight Mobile App and Insight Cloud Portal*, you can use the following applications to manage the switch remotely:
  - **Insight Cloud Portal:** As an Insight Premium or Insight Pro subscriber, you can use the NETGEAR Insight Cloud Portal to set up the switch in the network, perform advanced remote setup, configuration, and management, monitor the switch,

analyze the switch and network usage, and, if necessary, troubleshoot the switch and the network.

- **NETGEAR Insight app:** With the NETGEAR Insight app, you can discover the switch on the network and add the switch to the NETGEAR Insight app so that you can set up the switch in the network and manage and monitor the switch remotely from your smartphone or tablet. You can choose from four methods to add the switch to the NETGEAR Insight app: You can scan your network for the switch, scan the QR code or the barcode of the switch, or add the serial number of the switch.

For more information about NETGEAR Insight, visit [netgear.com/insight](https://netgear.com/insight) and see the NETGEAR knowledge base articles at [netgear.com/support](https://netgear.com/support).

- **Smart CLI:** The smart command-line interface (CLI) is a text-based way to manage and monitor the switch. You can access the CLI by using a direct serial connection, or by using a remote logical connection with telnet or SSH. For more information about the smart CLI, see the CLI manual. To find the CLI manual, visit [netgear.com/support/download/](https://netgear.com/support/download/) and enter your model number in the search box.

### Changing the management mode

By default, the management mode is set to *Directly Connect to Web Browser Interface* (which is the same as the device UI). Note the following about changing the management mode:

- **Changing to NETGEAR Insight Mobile App and Insight Cloud Portal mode:** The first time that you change to this mode, the switch is set to factory default settings so that you can manage the switch using the Insight Cloud Portal or Insight app. However, if you added the switch to a network on the Insight Cloud Portal or Insight app before, all Insight-manageable device settings are returned to the last configuration saved on the cloud server, including the switch password (that is, the password is reset to the Insight network password).

❗ **NOTE:** If you use the NETGEAR Insight Cloud Portal or Insight app, you can temporarily change the management mode of the switch back to *Directly Connect to Web Browser Interface* and access the device UI for settings that are not Insight-manageable, for complex tasks such as integrating with an existing network of devices that are not managed through Insight, and for debugging purposes. When you are done, you can change the management mode back to *NETGEAR Insight Mobile App and Insight Cloud Portal*.

- **Changing back to Directly Connect to Web Browser Interface mode:** The *NETGEAR Insight Mobile App and Insight Cloud Portal* management mode is disabled and the current Insight-manageable device settings are saved to the cloud server. Any changes that you make using the *Directly Connect to Web Browser Interface* management mode are not saved to the cloud server.

# 5

## Troubleshooting

---

This chapter provides information about troubleshooting the switch. The chapter includes the following sections:

- [Troubleshooting chart](#)
- [PoE troubleshooting suggestions](#)
- [Additional troubleshooting suggestions](#)

# 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
The Power LED is off.	Power is not supplied to the switch.	<ul style="list-style-type: none"> <li>• Check the power cable connections at the switch and the power source.</li> <li>• Make sure that all cables are used correctly and comply with the Ethernet specifications.</li> </ul>
When the <b>LED Mode</b> button is set to Ethernet Mode, the port LED for a port is off although the port is connected to a powered-on device.	The port connection is not working.	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Make sure that all cables are used correctly and comply with the Ethernet specifications.</li> <li>• Check for a defective port, cable, or module by testing them in an alternate environment where all products are functioning.</li> </ul>
A 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 local browser UI, 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.	<ul style="list-style-type: none"> <li>• Verify that the cabling is correct.</li> <li>• Make sure that all connectors are securely positioned in the required ports. It is possible that equipment was accidentally disconnected.</li> </ul>
When the <b>LED Mode</b> button is set to Ethernet Mode, the port LEDs for all connected ports are blinking continuously 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 local browser UI, 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 yellow, 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. If the **LED Mode** button is set to PoE Mode, for each powered device (PD) that is connected to the switch, the associated port LED on the switch lights solid green. If the port LED lights solid yellow, 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 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 power from the switch and then reconnect the power. If the problem continues, contact NETGEAR technical support. For more information, visit the support website at [netgear.com/support](http://netgear.com/support).
- **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.