

NETGEAR®

Hardware Installation Guide

10-Port Gigabit Ethernet Ultra60 PoE++ Smart Managed Pro Switch with 1 SFP and 1 Copper Uplink

Models

GS110TUP

GS710TUP

March 2020
202-12042-02

NETGEAR, Inc.

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

Support and Community

Visit 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.

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.

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
202-12042-02	March 2020	We revised Multi-function Reset button on page 19. We revised PoE++ overview on page 21.
202-12042-01	January 2020	We added model GS110TUP.
202-12044-01	December 2019	Initial publication for model GS710TUP.

Contents

Chapter 1 Introduction

Overview.....	6
Features.....	6
Management options.....	8
Safety instructions and warnings.....	9

Chapter 2 Hardware Overview

Model GS110TUP hardware.....	13
Model GS110TUP front panel with ports and LEDs.....	13
Model GS110TUP LEDs.....	14
Model GS110TUP back panel.....	15
Model GS710TUP hardware.....	15
Model GS710TUP front panel with ports and LEDs.....	15
Model GS710TUP LEDs.....	16
Model GS710TUP back panel.....	17
Switch hardware interfaces.....	17
RJ-45 ports for 10/100/1000M BASE-T Ethernet connectivity..	17
SFP uplink port for fiber connectivity.....	18
Multi-function Reset button.....	19

Chapter 3 Applications

PoE++ overview.....	21
PoE++ and desktop switching.....	22
Ultra60 PoE++ for high-resolution surveillance and security.....	24
Ultra60 PoE++ for PoE lighting in smart buildings.....	25

Chapter 4 Installation

Step 1: Prepare the site.....	28
Step 2: Protect against electrostatic discharge.....	29
Step 3: Unpack the switch.....	29
Unpack model GS110TUP.....	29
Unpack model GS710TUP.....	31
Step 4: Install the switch.....	32
Install the switch on a flat surface.....	32
Install the switch in a rack.....	32
Wall-mount model GS110TUP.....	34

Wall-mount model GS110TUP horizontally.....34

Wall-mount model GS110TUP vertically.....35

Mount model GS110TUP to a pole or another surface.....36

Optional Step 5: Install an SFP transceiver module.....37

Step 6: Connect devices to the switch.....37

Step 7: Check the installation.....38

Step 8: Apply power and check the LEDs.....38

Step 9: Manage the switch.....39

Chapter 5 Troubleshooting

Troubleshooting chart.....41

PoE troubleshooting suggestions.....42

Additional troubleshooting suggestions.....43

1

Introduction

This hardware installation guide complements the installation guide that came with your switch and applies to the following switches:

- **Model GS110TUP.** NETGEAR 10-Port Gigabit Ethernet Ultra60 PoE++ Smart Managed Pro Desktop Switch with 1 SFP and 1 Copper Uplink.
This model provides 60W PoE++ (IEEE 802.3bt) to each PoE++ port (1-4) and up to 30W PoE+ (IEEE 802.3at) to each PoE+ port (5-8). The maximum PoE power budget across all active PoE++ and PoE+ ports is 240W. In addition, this model provides one dedicated Gigabit Ethernet uplink port and one dedicated SFP fiber uplink port.
- **Model GS710TUP.** NETGEAR 10-Port Gigabit Ethernet Ultra60 PoE++ Smart Managed Pro Rackmount Switch with 1 SFP and 1 Copper Uplink.
This model provides 60W PoE++ (IEEE 802.3bt) to each PoE++ port (1-8). The maximum PoE power budget across all active PoE++ ports is 480W. In addition, this model provides one dedicated Gigabit Ethernet uplink port and one dedicated SFP fiber uplink port.

Power over Ethernet plus plus (PoE++, IEEE 802.3bt) lets you provide power to PoE-capable devices that require high power such as smart building LED lights, audio speakers, pan-tilt-zoom (PTZ) cameras, and audio-visual (AV) over IP devices.

In this guide, we refer to both models as the switch.

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

- [Overview](#)
- [Features](#)
- [Management options](#)
- [Safety instructions and warnings](#)

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

Note: For technical specifications, see the data sheet at netgear.com/business/products/switches/managed. For switch documentation, visit netgear.com/support/download.

Overview

Model GS110TUP provides eight 10/100/1000BASE-T RJ-45 copper ports. Ports 1-4 support PoE++ and ports 5-8 support PoE+.

Model GS710TUP provides eight 10/100/1000BASE-T RJ-45 copper PoE++ ports (1-8).

Both models provide one RJ-45 copper uplink port (9). All RJ-45 copper ports support nonstop 10/100/1000M Layer 2 networks. In addition, both models provide one SFP uplink port (10), which can accept a small form-factor pluggable (SFP) gigabit interface converter (GBIC) for 1G fiber connectivity. Both uplink ports (9 and 10) are intended for a network connection and, therefore, do not provide PoE.

You can use the switch to connect PoE++, PoE+, PoE, and non-PoE devices.

Note: For information about application samples, see [Applications](#) on page 20.

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:

- Four (model GS110TUP) or eight (model GS710TUP) 10/100/1000BASE-T RJ-45 copper ports that can provide PoE++ (IEEE 802.3bt).
- For model GS110TUP, four 10/100/1000BASE-T RJ-45 copper ports that can provide PoE+ (IEEE 802.at).
- One RJ-45 copper uplink port.
- One SFP fiber uplink port.
- Total PoE++ power budget:
 - For model GS110TUP, 240W across all active PoE++ and PoE+ ports.
 - For model GS710TUP, 480W across all active PoE++ ports.
- MAC table size of 8K.
- 20 Gbps full-duplex, nonblocking switch fabric.

- 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 Control Protocol (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 support for 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.
- Per-port PoE status LEDs and system PoE Max LED.
- 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

Management options

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

- **Local browser 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 local browser UI. In this mode, you can change all settings of the switch. For more information about the local browser UI, see the user manual, which you can download from netgear.com/support/download/.

Note: If you plan to use the NETGEAR Insight app or Insight Cloud portal to manage the switch, we recommend that you do not use the local browser 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 app and Insight Cloud portal.** 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:
 - **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.
 - **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.

For more information about NETGEAR Insight, visit netgear.com/insight and see the NETGEAR knowledge base articles at netgear.com/support.

By default, the management mode is set to Directly Connect to Web Browser Interface (which is the same as the local browser 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 app or the Insight Cloud portal. However, if you added the switch to a network on the Insight app or Insight portal

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 app or the Insight Cloud portal, you can temporarily change the management mode of the switch back to Directly Connect to Web Browser Interface and access the local browser 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.

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. For more information, see the environmental specifications in the appendix or the data sheet.
Do not use this device outdoors. The PoE source is intended for intra building connection only.
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 system documentation. Some devices should never be opened.
 - If applicable to your device, 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:
 - Depending on your device, 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 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.
- If applicable to your device, 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 device uses a power supply with a voltage selector, be sure that the selector 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.
- Depending on your device, use only a supplied power adapter or approved power cable:

If your device 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 device 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 electrical outlets.
 - If applicable to your device, 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:

- [Model GS110TUP hardware](#)
- [Model GS710TUP hardware](#)
- [Switch hardware interfaces](#)

Model GS110TUP hardware

Model GS110TUP provides four 60W PoE++ (IEEE 802.3bt) Gigabit Ethernet ports (1-4), four 30W PoE+ (IEEE 802.3at) Gigabit Ethernet ports (5-8), one dedicated Gigabit Ethernet uplink port (9), and one dedicated SFP fiber uplink port (10).

Model GS110TUP front panel with ports and LEDs

The following figure shows the front panel of model GS110TUP.

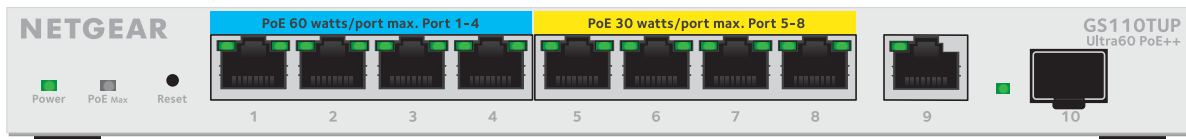


Figure 1. Model GS110TUP front panel

From left to right, the front panel of model GS110TUP provides the following components:

- Power LED (see [Model GS110TUP LEDs](#) on page 14).
- PoE Max LED (see [Model GS110TUP LEDs](#) on page 14).
- Recessed **Reset** button (see [Multi-function Reset button](#) on page 19).
- Four independent 10/100/1000BASE-T RJ-45 PoE++ ports (1-4, see the ports with the blue label) and four independent 10/100/1000BASE-T RJ-45 PoE+ ports (5-8, see the ports with the yellow label), each with a left LED that functions as the combined link, speed, and activity LED and a right LED that indicates the PoE status (see [Model GS110TUP LEDs](#) on page 14). For more information about the 10/100/1000BASE-T RJ-45 ports, see [RJ-45 ports for 10/100/1000M BASE-T Ethernet connectivity](#) on page 17.
- One, non-PoE, 10/100/1000BASE-T RJ-45 uplink port (9, see [RJ-45 ports for 10/100/1000M BASE-T Ethernet connectivity](#) on page 17). A single port LED functions as the combined link and activity LED (see [Model GS110TUP LEDs](#) on page 14).
- One dedicated Gigabit SFP fiber port (10, [SFP uplink port for fiber connectivity](#) on page 18) that can accept an optional transceiver module. A single port LED functions as the combined link and activity LED (see [Model GS110TUP LEDs](#) on page 14).

Model GS110TUP LEDs

This section describes the LED designations of model GS110TUP.

Table 1. LEDs on the front panel of model GS110TUP

LED	Description
Power LED	Solid green. The switch is powered on and operating normally. If you changed the management mode of the switch to NETGEAR Insight, the switch is not yet added to an Insight managed network or not yet connected to the Insight cloud management server. Solid blue. The management mode of the switch is NETGEAR Insight, the switch is added to an Insight managed network, and the switch is connected to the Insight cloud management server. You can manage and monitor the switch using the NETGEAR Insight app or Insight Cloud portal. Solid amber. The switch is booting. Off. Power is not supplied to the switch.
PoE Max LED	Off. Sufficient (more than 7W of) PoE power is available. Solid amber. Less than 7W of PoE power is available. Blinking amber. At least once during the previous two minutes, less than 7W of PoE power was available.
Ports 1–8 left LED Link, speed, and activity for Ethernet ports 1 to 8	Solid green. A valid 1 Gbps port link is established. Blinking green. The port is transmitting or receiving packets at 1 Gbps. Solid amber. A valid 10 Mbps or 100 Mbps port link is established. Blinking amber. The port is transmitting or receiving packets at 10 Mbps or 100 Mbps. Off. No port link is established.
Ports 1–8 right LED PoE status for Ethernet ports 1 to 8.	Off. The port is not delivering PoE power. Solid green. The port is delivering PoE power. Solid amber. A PoE fault occurred.
Port 9 LED Link, speed, and activity for Ethernet uplink port 9	Solid green. A valid 1 Gbps port link is established. Blinking green. The port is transmitting or receiving packets at 1 Gbps. Solid amber. A valid 10 Mbps or 100 Mbps port link is established. Blinking amber. The port is transmitting or receiving packets at 10 Mbps or 100 Mbps. Off. No port link is established.
Port 10 LED Link and activity for SFP fiber uplink port 10	Off. No SFP module link is established. Solid green. A valid 1 Gbps link is established. Blinking green. The SFP fiber port is transmitting or receiving packets at 1 Gbps.

Model GS110TUP back panel

The back panel of model GS110TUP contains a Kensington lock slot for an optional security cable and an DC power receptacle for the DC power adapter cable that came in the switch package.

The following figure shows the back panel of model GS110TUP.



Figure 2. Model GS110TUP back panel

Model GS710TUP hardware

Model GS710TUP provides eight 60W PoE++ (IEEE 802.3bt) Gigabit Ethernet ports (1–8), one dedicated Gigabit Ethernet uplink port (9), and one dedicated SFP fiber uplink port (10).

Model GS710TUP front panel with ports and LEDs

The following figure shows the front panel of model GS710TUP.

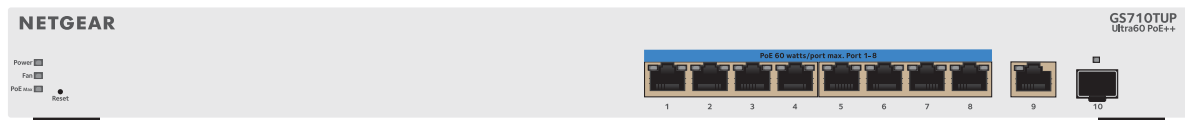


Figure 3. Model GS710TUP front panel

From left to right, the front panel of model GS710TUP provides the following components:

- Power LED (see [Model GS710TUP LEDs](#) on page 16).
- Fan LED (see [Model GS710TUP LEDs](#) on page 16).
- PoE Max LED (see [Model GS710TUP LEDs](#) on page 16).
- Recessed **Reset** button (see [Multi-function Reset button](#) on page 19).
- Eight independent 10/100/1000BASE-T RJ-45 PoE++ ports (1–8, see [RJ-45 ports for 10/100/1000M BASE-T Ethernet connectivity](#) on page 17), each with a left LED that functions as the combined link, speed, and activity LED and a right LED that indicates the PoE status (see [Model GS710TUP LEDs](#) on page 16).

- One, non-PoE, 10/100/1000BASE-T RJ-45 uplink port (9, see [RJ-45 ports for 10/100/1000M BASE-T Ethernet connectivity](#) on page 17). A single port LED functions as the combined link and activity LED (see [Model GS710TUP LEDs](#) on page 16).
- One dedicated Gigabit SFP fiber port (10, [SFP uplink port for fiber connectivity](#) on page 18) that can accept an optional transceiver module. A single port LED functions as the combined link and activity LED (see [Model GS710TUP LEDs](#) on page 16).

Model GS710TUP LEDs

This section describes the LED designations of model GS710TUP.

Table 2. LEDs on the front panel of model GS710TUP

LED	Description
Power LED	Solid green. The switch is powered on and operating normally. If you changed the management mode of the switch to NETGEAR Insight, the switch is not yet added to an Insight managed network or not yet connected to the Insight cloud management server. Solid blue. The management mode of the switch is NETGEAR Insight, the switch is added to an Insight managed network, and the switch is connected to the Insight cloud management server. You can manage and monitor the switch using the NETGEAR Insight app or Insight Cloud portal. Solid amber. The switch is booting. Off. Power is not supplied to the switch.
Fan LED	Solid green. The internal fan is operating normally. Solid amber. The internal fan failed.
PoE Max LED	Off. Sufficient (more than 7W of) PoE power is available. Solid amber. Less than 7W of PoE power is available. Blinking amber. At least once during the previous two minutes, less than 7W of PoE power was available.
Ports 1-8 left LED Link, speed, and activity for Ethernet ports 1 to 8	Solid green. A valid 1 Gbps port link is established. Blinking green. The port is transmitting or receiving packets at 1 Gbps. Solid amber. A valid 10 Mbps or 100 Mbps port link is established. Blinking amber. The port is transmitting or receiving packets at 10 Mbps or 100 Mbps. Off. No port link is established.
Ports 1-8 right LED PoE status for Ethernet ports 1 to 8.	Off. The port is not delivering PoE power. Solid green. The port is delivering PoE power. Solid amber. A PoE fault occurred.

Table 2. LEDs on the front panel of model GS710TUP (Continued)

LED	Description
Port 9 LED Link, speed, and activity for Ethernet uplink port 9	Solid green. A valid 1 Gbps port link is established. Blinking green. The port is transmitting or receiving packets at 1 Gbps. Solid amber. A valid 10 Mbps or 100 Mbps port link is established. Blinking amber. The port is transmitting or receiving packets at 10 Mbps or 100 Mbps. Off. No port link is established.
Port 10 LED Link and activity for SFP fiber uplink port 10	Off. No SFP module link is established. Solid green. A valid 1 Gbps link is established. Blinking green. The SFP fiber port is transmitting or receiving packets at 1 Gbps.

Model GS710TUP back panel

The back panel of model GS710TUP contains a Kensington lock slot for an optional security cable and an AC power receptacle for the AC power cable that came in the switch package.

The following figure shows the back panel of model GS710TUP.



Figure 4. Model GS710TUP back panel

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 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 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.

On model GS110TUP, RJ-45 copper ports 1-4 support PoE++ and RJ-45 copper ports 5-8 support PoE+.

On model GS710TUP, RJ-45 copper ports 1-8 support PoE++.

SFP uplink port for fiber connectivity

To enable a fiber connection, an SFP fiber uplink port accommodates a standard small form-factor pluggable (SFP) gigabit interface converter (GBIC, also referred to as transceiver modules). GBICs are sold separately from the switch.

Model GS710TUP supports the NETGEAR SFP transceiver modules that are listed in the following table.

Table 3. Supported SFP transceiver modules

Speed and Medium	Model	Description
1G Ethernet short-reach fiber	AGM731F	SFP transceiver 1000BASE-SX
1G Ethernet long-reach fiber	AGM732F	SFP transceiver 1000BASE-LX
1G Ethernet copper	AGM734	SFP transceiver 1000BASE-T

For more information about NETGEAR SFP transceiver modules, visit netgear.com/business/products/switches/modules-accessories.

Note: If you use a third-party passive direct-attach cable (DAC), the length of the cable must not exceed 5 meters (16.4 feet).

Multi-function Reset button

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

- **Restart (power-cycle) the switch.** The switch restarts. All saved settings are retained. We recommend that you save the settings before you press the **Reset** button to restart the switch.
- **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 restart or reset the switch using the Reset button:

1. Insert a device such as a straightened paper clip into the opening.
2. Do one of the following:
 - **Restart the switch.** Press the **Reset** button for less than 5 seconds. (Do not press the button for more than 5 seconds!)
 - **Reset the switch to factory default settings but maintain the registration status.** Press the **Reset** button for more than 5 seconds 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 **Reset** button for more than 10 seconds.

During the restart or reset process, the Power LED lights amber.

3

Applications

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++, PoE+, PoE, and non-PoE devices. You can also use the switch in a network with 1 Gbps, 100 Mbps, and 10 Mbps Ethernet and fiber hubs, routers, access points, and other switches.

This chapter includes the following sections:

- [PoE++ overview](#)
- [PoE++ and desktop switching](#)
- [Ultra60 PoE++ for high-resolution surveillance and security](#)
- [Ultra60 PoE++ for PoE lighting in smart buildings](#)

PoE++ overview

The PoE++ ports on model GS110TUP (port 1-4) and model GS710TUP (port 1-8) support IEEE 802.3bt Type 3 with 4-pair PoE. These models are also compatible with PoE+ (IEEE 802.3at) and PoE (IEEE 802.3af) and can support non-PoE devices.

The maximum PoE power budget on the switch depends on the model:

- **Model GS110TUP.** The maximum PoE power budget across all active PoE++ and PoE+ ports is 240W.
The maximum PoE power that an individual PoE++ port can supply is 60W.
The maximum PoE power that an individual PoE+ port can supply is 30W.
- **Model GS710TUP.** The maximum PoE power budget across all active PoE++ ports is 480W.
The maximum PoE power that an individual PoE++ port can supply is 60W.

The PoE++ and PoE+ power supplied by the switch is prioritized in ascending port order (from port 1 to port 8), with a total power budget of 240W (model GS110TUP) or 480W (model GS710TUP) across all active PoE++ and PoE+ ports.

The following 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.

Table 4. PoE classes and PoE power allocations

Device Class	Compatible PoE Standard	Class Description	Maximum Power Supplied by the Switch	Power Delivered to the Device
0	PoE, PoE+, and PoE++	Default power (full)	15.4W	0.44W-13.0W
1	PoE, PoE+, and PoE++	Very low power	4.0W	0.44W-3.84W
2	PoE, PoE+, and PoE++	Low power	7.0W	3.84W-6.49W
3	PoE, PoE+, and PoE++	Mid power	15.4W	6.49W-13.0W
4	PoE+ and PoE++	High power	30.0W	13.0W-25.5W
5	PoE++	Ultra high power	45.0W	25.5W-40.0W
6-8	PoE++	Ultra high power	60.0W	40.05W-51.0W

The switch supports uninterrupted PoE, which enables the switch to provide PoE power while rebooting. By default, the uninterrupted PoE feature is disabled, causing the switch to stop providing PoE power while it is rebooting. If you enable the uninterrupted PoE feature, the switch continues to provide PoE power to any attached PDs while the switch is rebooting, even if it is rebooting after a regular firmware update.

However, note the following situations during which the switch temporarily stops providing PoE:

- The switch reboots because you reset it to factory default settings.
- The switch reboots because you upgrade the switch firmware with a change in the configuration structure, an update to the chip driver, or a change to the default PoE settings.

For more information about PoE, see the installation guide and user manual, both of which you can download from netgear.com/support/download/.

PoE++ and desktop switching

The following figure shows a sample desktop switching configuration with PoE++, PoE+, and non-PoE devices.

In this sample configuration, connect the Ethernet uplink port (port 9, or another LAN port) on the switch to a LAN port on a router (see 2 in the following figure) that is connected to the Internet (see 3). You can also make a 1 Gbps fiber connection from port 10 on the switch to a router that supports fiber and that is connected to the Internet or to another device that supports fiber.

If you connect a WiFi access point (see 9 in the following figure) to the switch, you can connect a laptop or smartphone to the WiFi network and use NETGEAR Insight to discover and manage the switch.

The following figure shows model GS710TUP. However, the same sample configuration could apply to model GS110TUP: Ports 1–4 provide PoE++, ports 5 and 6 provide PoE+, port 7 and 8 provide non-PoE, and port 9 is an uplink port.

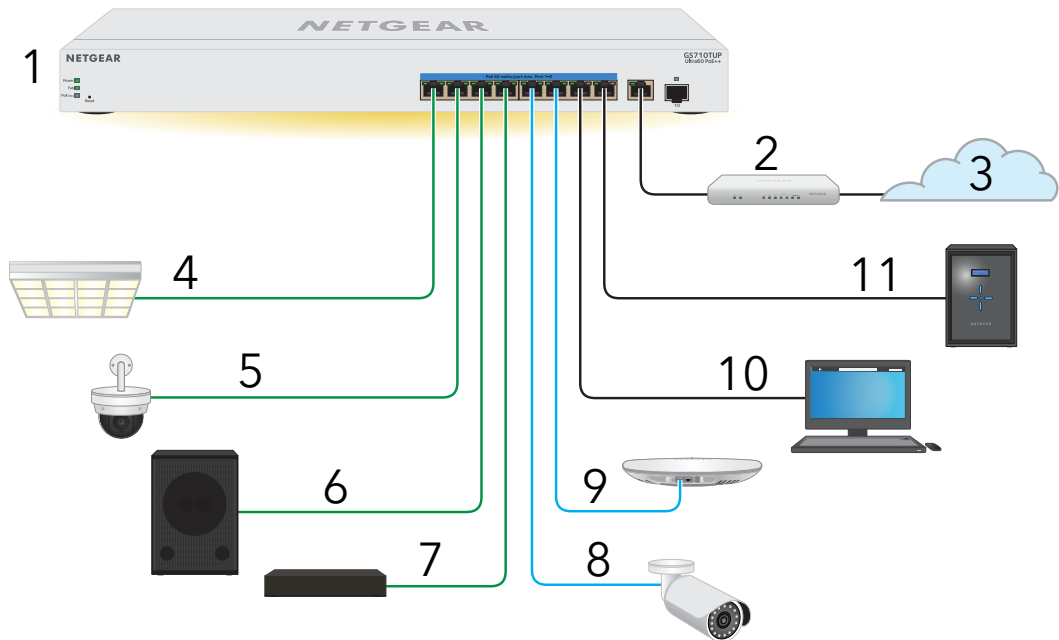


Figure 5. Sample PoE++ and desktop switching configuration

— PoE++ — PoE+ — Non-PoE

Number	Device	Number	Device
1	Switch model GS710TUP	7	PoE++ AV over IP encoder
2	Router	8	PoE+ IP camera
3	Internet	9	PoE+ WiFi access point
4	PoE++ LED lighting	10	Computer
5	PoE++ PTZ camera	11	ReadyNAS storage system
6	PoE++ speaker		

Ultra60 PoE++ for high-resolution surveillance and security

The switch supports Ultra60 PoE++ with a very high PoE budget of 480W, which works well for a surveillance and security configuration with high-resolution pan-tilt-zoom (PTZ) cameras that require high PoE power. The following figure shows a PoE++ lighting sample configuration in which seven PTZ cameras are powered through PoE++ ports (1-7 in the following figure) on the switch. One port (port 8) connects to a ReadyNAS storage system for data collection.

In this sample configuration, connect the Ethernet uplink port (port 9 in the following figure) on the switch to a LAN port on a router (see 2) that is connected to the Internet (see 3). You can also make a 1 Gbps fiber connection from port 10 on the switch to a router that supports fiber, and which is connected to the Internet or to another device that supports fiber.

The following figure shows model GS710TUP. A similar sample configuration could apply to model GS110TUP if you attach PoE++ PTZ cameras to ports 1-4 only. (On model GS110TUP, ports 5-8 support PoE+, not PoE++.)

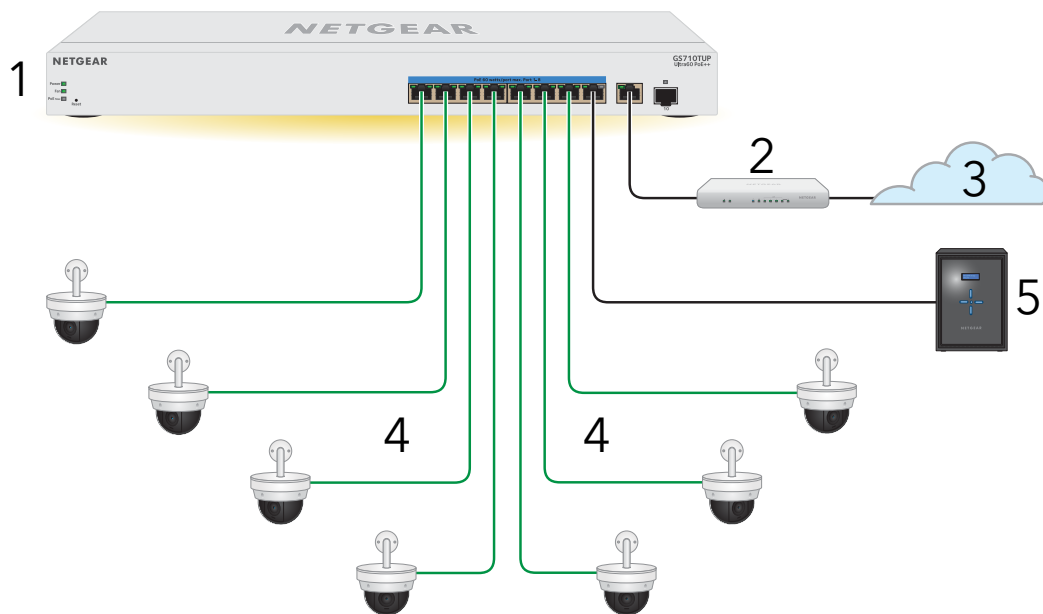


Figure 6. Sample PoE++ surveillance and security configuration

— PoE++ — Non-PoE

Number	Device	Number	Device
1	Switch model GS710TUP	4	PoE++ PTZ camera
2	Router	5	ReadyNAS storage system
3	Internet		

Ultra60 PoE++ for PoE lighting in smart buildings

The switch supports Ultra60 PoE++ with a very high PoE budget of 480W so that it can provide low-voltage power for PoE lighting in smart buildings. The following figure shows a PoE lighting sample configuration in which eight office rooms are illuminated through PoE LED lights that are powered through the PoE++ ports (1-8) on the switch.

In this sample configuration, connect the Ethernet uplink port (port 9 in the following figure) on the switch to a LAN port on a router (see 2) that is connected to the Internet (see 3). You can also make a 1 Gbps fiber connection from port 10 on the switch to a router that supports fiber, and which is connected to the Internet or to another device that supports fiber.

The following figure shows model GS710TUP. A similar sample configuration could apply to model GS110TUP if you attach LED lighting to ports 1-4 only. (On model GS110TUP, ports 5-8 support PoE+, not PoE++.)

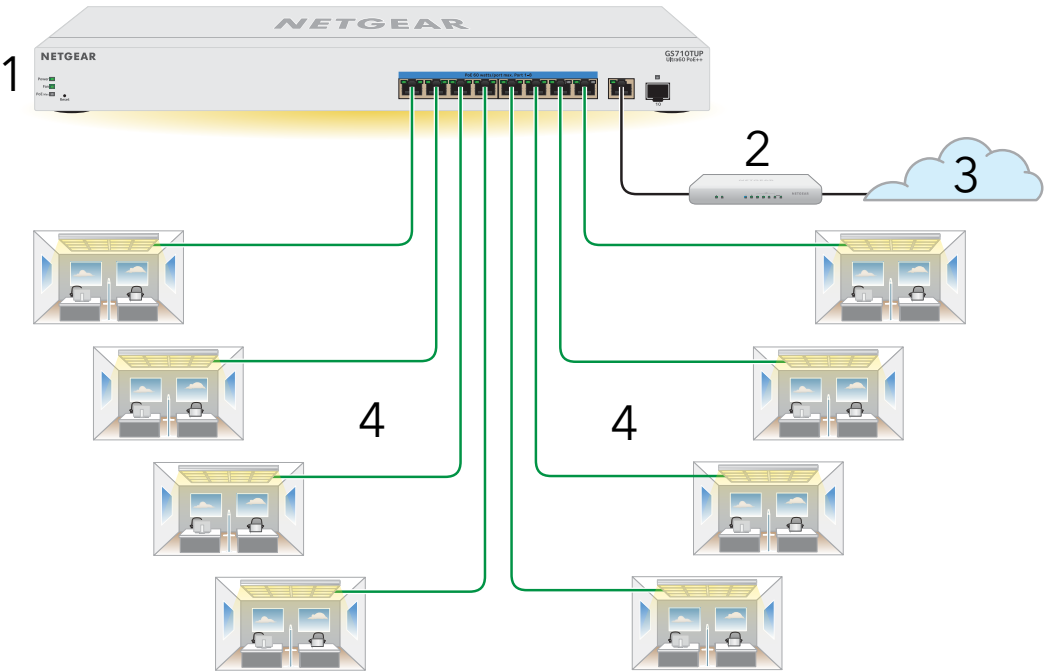


Figure 7. Sample PoE++ lighting configuration

— PoE++ — Non-PoE

Number	Device	Number	Device
1	Switch model GS710TUP	3	Internet
2	Router	4	LED lighting in an office room

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 an SFP transceiver module](#)
- [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	Desktop installations. Provide a flat table or shelf surface. Rack-mount installations. Use a 19-inch (48.3-centimeter) EIA standard equipment rack that is grounded and physically secure. You also need the rack-mount kit that is supplied with the switch. Wall installations (model GS110TUP only). Use the wall-mount screws that are supplied with the switch to attach the switch to a wall. Pole (or other surface) installations (model GS110TUP only). Use an off-the-shelf 100 mm VESA standard mount to secure the switch to a pole or another surface. The bottom panel of the switch provides two mount holes that are VESA-compliant.
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	Temperature. Install the switch in a dry area. Keep the switch away from heat sources such as direct sunlight, warm-air exhausts, hot-air vents, and heaters. For model GS110TUP, the ambient temperature must be between 32°F and 104°F (0°C and 40°C). For model GS710TUP, the ambient temperature must be between 32°F and 122°F (0°C and 50°C). Operating humidity. The maximum relative humidity of the installation location must not exceed 90 percent, noncondensing. Ventilation. Do not restrict airflow by covering or obstructing air inlets on the sides of the switch. Keep at least 2 inches (5.08 centimeters) free on all sides for cooling. The room or wiring closet in which you install the switch must provide adequate airflow. Operating conditions. Keep the switch at least 6 feet (1.83 meters) away from the nearest source of electromagnetic noise, such as a photocopy machine.

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

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

Unpack model GS110TUP

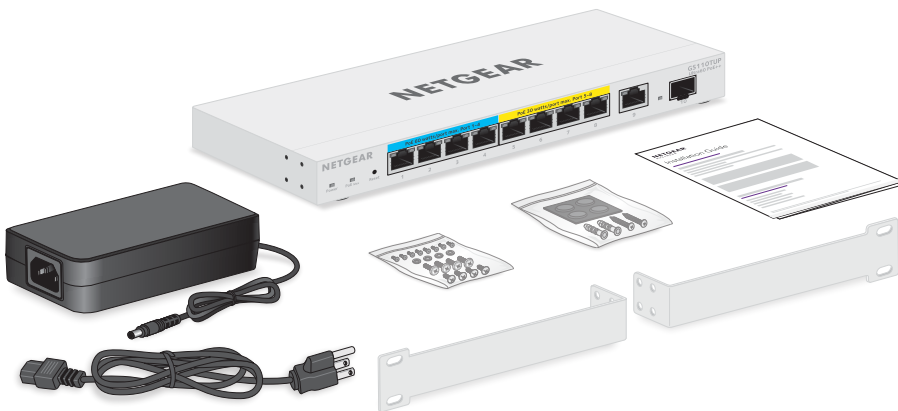


Figure 8. Model GS110TUP package contents

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:
 - Model GS110TUP switch.
 - DC power adapter with a detachable power cable (varies by region).
 - Two large rack-mount installation brackets.
 - One plastic bag that contains the following rack-mount installation screws and washers:
 - Eight small screws to attach the brackets to the switch (four small screws for each side).
 - Four large screws and four washers to attach the brackets to the rack (two screws and two washers for each side).
 - Four additional large screws of a different size to attach the brackets to the rack, allowing you to select the most suitable set of screws for the rack.
 - Another plastic bag that contains the following items:
 - Rubber feet for desktop or table installation.
 - Two wall-mount installation anchors.
 - Two wall-mount installation screws.
 - Installation guide.
5. If any item is missing or damaged, contact your local NETGEAR reseller for replacement.

Unpack model GS710TUP

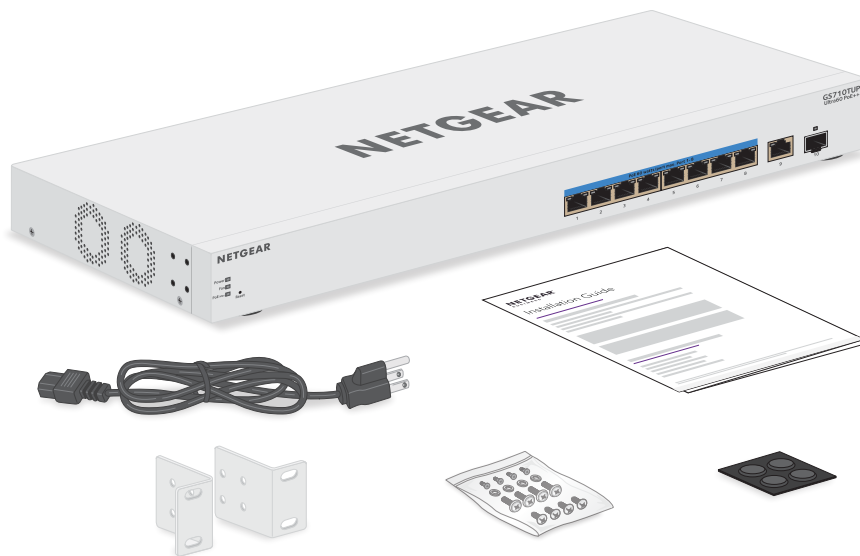


Figure 9. Model GS710TUP package contents

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:
 - Model GS710TUP switch.
 - AC power cable (varies by region).
 - A plastic bag that contains the following rack-mount installation components:
 - Two brackets.
 - Eight small screws to attach the brackets to the switch (four small screws for each side).
 - Four large screws and four washers to attach the brackets to the rack (two screws and two washers for each side).
 - Four additional large screws of a different size to attach the brackets to the rack, allowing you to select the most suitable set of screws for the rack.

- Rubber feet for desktop or table installation.
 - Installation guide.
5. 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.

On model GS110TUP, the bottom panel provides two VESA-compliant mount holes, which let you attach that model to a wall. If you purchase an optional off-the-shelf 100 mm VESA standard mount, you can attach model GS110TUP to a pole or another surface.

Install the switch on a flat surface

The switch comes 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.

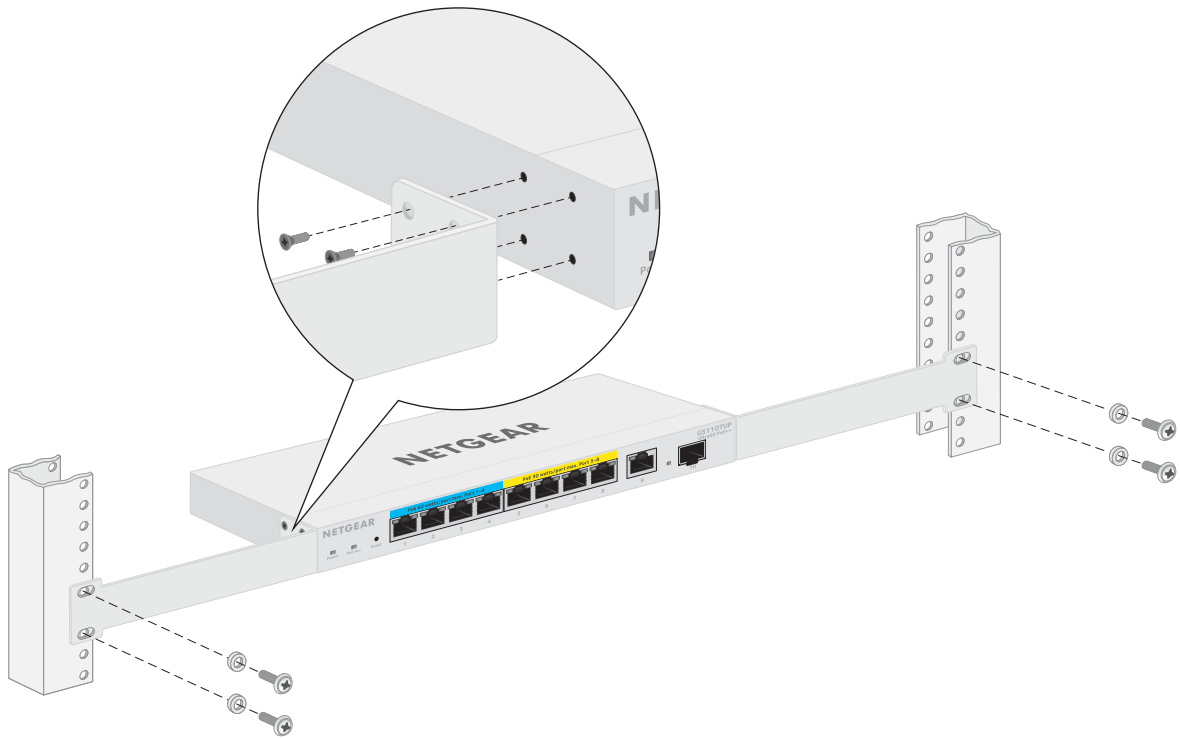
Install the switch in a rack

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

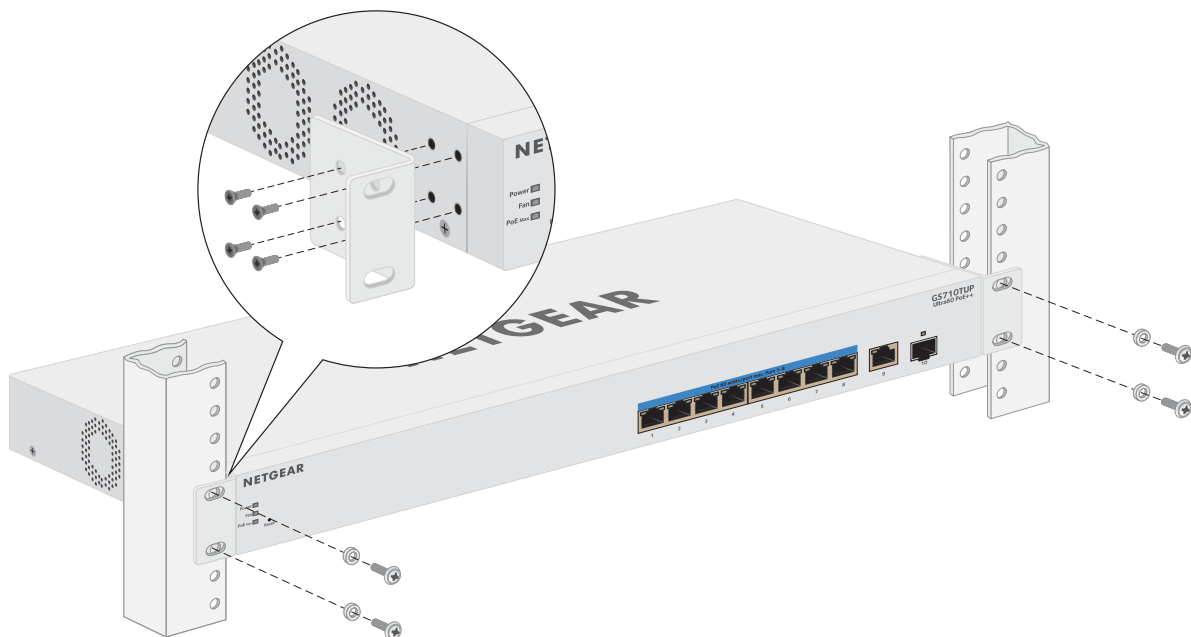
To install the switch in a 19-inch rack:

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 mounting brackets to the rack.

The following figure shows model GS110TUP.



The following figure shows model GS710TUP.



Wall-mount model GS110TUP

The bottom panel of the switch provides two VESA mount holes that allow you to mount the switch to a wall. The switch comes with wall-mount screws and anchors that you can secure to a wall and attach the switch to.

The distance between the VESA holes is 3.94 in. (100 mm). The following figure shows the bottom panel of the switch.

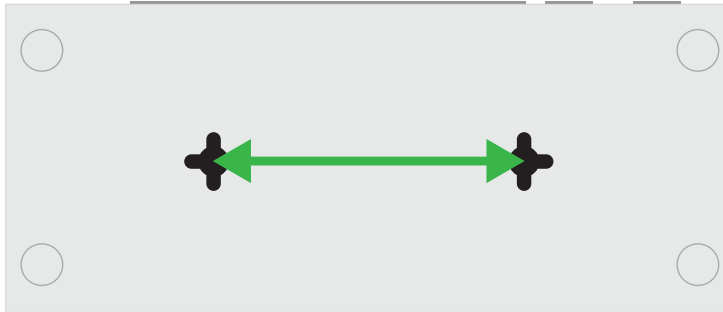


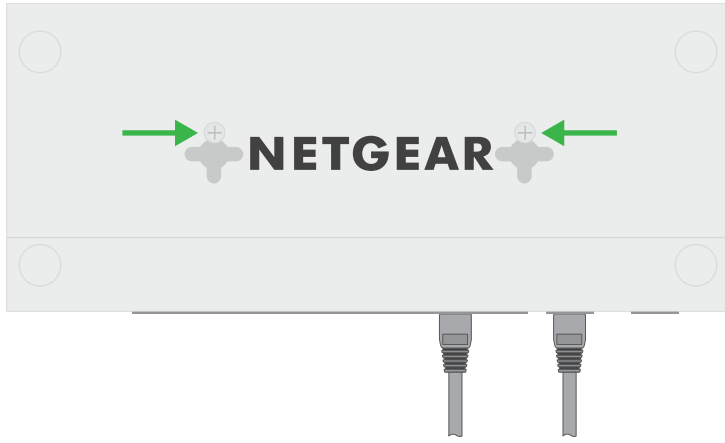
Figure 10. VESA holes at the bottom panel of model GS110TUP

Wall-mount model GS110TUP horizontally You can mount model GS110TUP horizontally to a wall, either with the back panel facing down (the cables will be at the bottom) or facing up (the cables will be at the top).

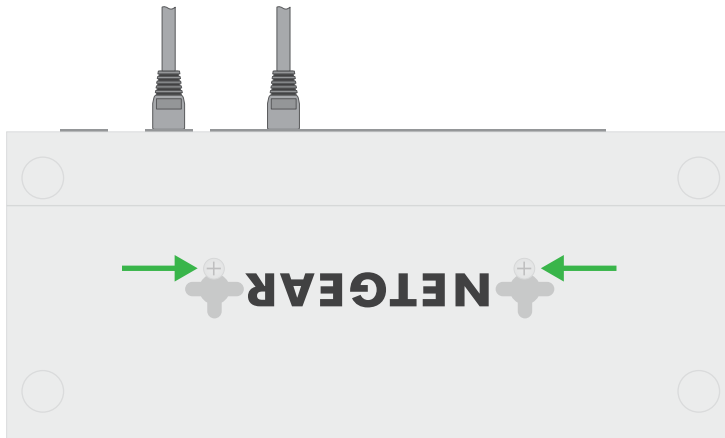
To mount model GS110TUP horizontally to a wall:

1. Locate the two holes on the bottom panel of the switch.
2. Mark the two mounting holes on the wall where you want to mount the switch.
The two mounting holes must be at a precise horizontal distance of 3.94 in. (100 mm) from each other.
3. Drill holes into the wall for two anchors in which you will insert M4 x L25 mm screws. The screws and anchors are in the switch package.
4. Insert the anchors into the wall and tighten the screws with a No. 2 Phillips screwdriver. Leave about 6 mm (¼ inch) of each screw protruding from the wall so that you can insert the screws into the holes on the bottom of the switch.
5. Line up the holes on the bottom panel of the switch with the screws in the wall and mount the switch to the wall.

You can mount the switch with the back panel facing down (the cables will be at the bottom). The following figure shows the top panel of the switch, with the VESA holes at the bottom shown transparently.



You can also mount the switch with the back panel facing up (the cables will be at the top). The following figure shows the top panel of the switch, with the VESA holes at the bottom shown transparently.



Wall-mount model GS110TUP vertically You can mount model GS110TUP vertically to a wall, either with the back panel facing left (the cables will be on the left) or facing right (the cables will be on the right).

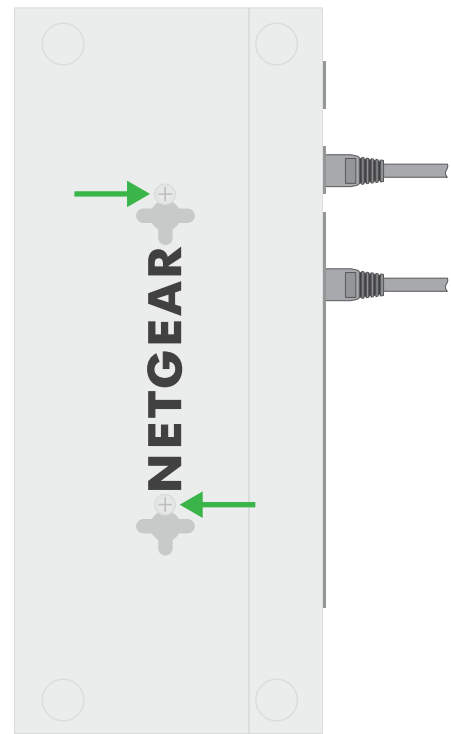
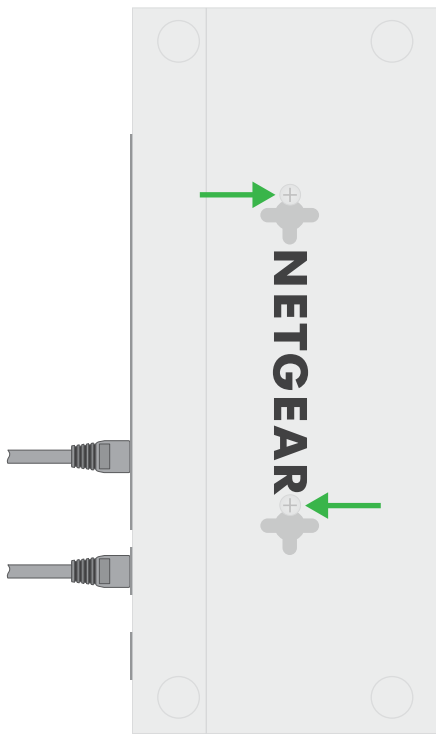
To mount model GS110TUP vertically to a wall:

1. Locate the two holes on the bottom panel of the switch.
2. Mark the two mounting holes on the wall where you want to mount the switch.
The two mounting holes must be at a precise horizontal distance of 2.95 in. (75 mm) from each other.
3. Drill holes into the wall for two anchors in which you will insert M4 x L25 mm screws.

The screws and anchors are in the switch package.

4. Insert the anchors into the wall and tighten the screws with a No. 2 Phillips screwdriver. Leave about 6 mm (¼ inch) of each screw protruding from the wall so that you can insert the screws into the holes on the bottom of the switch.
5. Line up the holes on the bottom panel of the switch with the screws in the wall and mount the switch to the wall.

You can mount the switch with the back panel facing left (the cables will be on the left, see the figure on the left) or facing right (the cables will be on the right, see the figure on the right). Both figures show the top panel of the switch, with the VESA holes at the bottom shown transparently.



Mount model GS110TUP to a pole or another surface

You can use an off-the-shelf 100 mm VESA standard mount to secure the switch to a pole or another surface. The bottom panel of the switch provides two mount holes that are VESA-compliant.

Optional Step 5: Install an SFP transceiver module

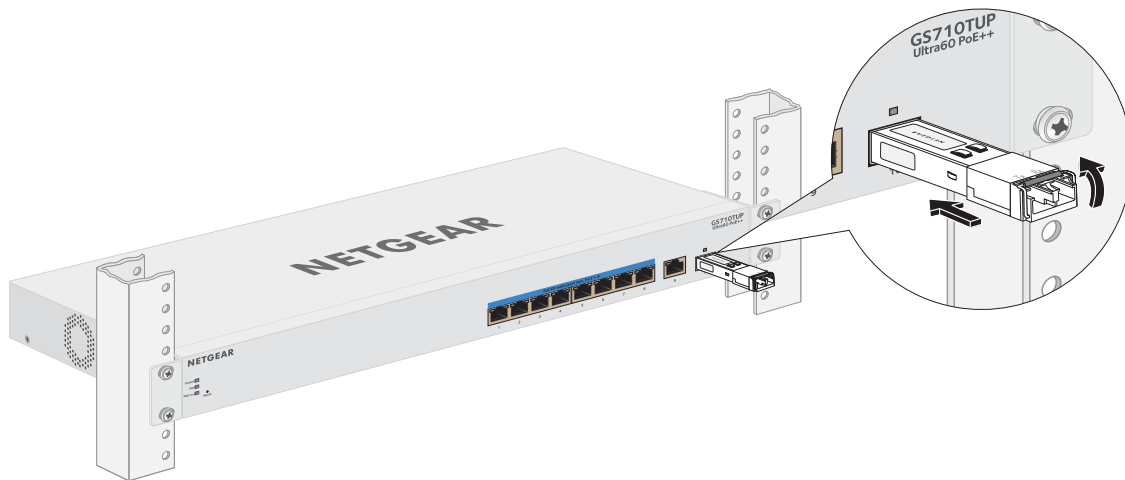
The following optional procedure describes how to install an optional SFP transceiver module into the SFP uplink port (10). For information about SFP transceiver modules, see [SFP uplink port for fiber connectivity](#) on page 18.

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

To install an SFP transceiver module:

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

The following figure shows model GS710TUP. Model GS110TUP provides the same SFP uplink port.



Step 6: Connect devices to the switch

You can connect the following devices:

- **Model GS110TUP.** Connect PoE++, PoE+, PoE, and non-PoE devices to ports 1–4 and PoE+, PoE, and non-PoE devices to ports 5–8. Connect either port 9 with an Ethernet cable to your network or port 10 with an SFP transceiver module and cable to your network. (For information about the SFP transceiver module, see [Optional Step 5: Install an SFP transceiver module](#) on page

37.) The network connection can be to a hub, another switch, router, or Internet gateway.

- **Model GS710TUP.** Connect PoE++, PoE+, PoE, and non-PoE devices to ports 1-8. Connect either port 9 with an Ethernet cable to your network or port 10 with an SFP transceiver module and cable to your network. (For information about the SFP transceiver module, see [Optional Step 5: Install an SFP transceiver module](#) on page 37.) The network connection can be to a hub, another switch, router, or Internet gateway.

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 5 (Cat 5), Cat 5e, or Cat 6 cable that is terminated with an RJ-45 connector.

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

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

1. Connect a device to an RJ-45 network port on the switch.
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 cable connection controls the power.

Before connecting the power cable to the power receptacle on the switch, select an AC outlet for the DC power adapter (model GS110TUP) or AC power cable (model

GS710TUP). Make sure that the AC outlet is not controlled by a wall switch, which can turn off power to the switch.

To apply power:

1. Connect the plug of the power cable to the power receptacle on the back of the switch.
2. Plug the DC power adapter (model GS110TUP) or AC power cable (model GS710TUP) 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 amber while the switch starts. After about one minute, the switch completes its startup process and the Power LED turns from amber to solid dark green.

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

Step 9: Manage the switch

The switch is a plug-and-play device that starts switching as soon as you plug it into power and your network.

After you complete the initial log-in procedure, you can configure the switch using the local browser UI. After you complete the initial log-in procedure, you can also change the management mode so that you configure the switch using the Insight app, or if you are an Insight Premium or Insight Pro subscriber, the Insight Cloud portal. For more information, see [Management options](#) on page 8.

For more information about managing the switch using the local browser UI, including information about tools to discover the switch IP address in your network, see the user manual, which you can download from netgear.com/support/download/.

For more information about NETGEAR Insight, visit netgear.com/insight and see the NETGEAR knowledge base articles at netgear.com/support.

For very basic setup and management, you can use the Smart Control Center (SCC) utility (which requires a Windows-based computer). For information about the SCC utility, see netgear.com/support/product/SCC.

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.

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.	• 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.
The left and right port LEDs for a port are off although the port is connected to a powered-on device.	The 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.
A file transfer is slow or performance is degraded.	One possible cause is that a network loop (redundant path) was created and that a broadcast storm occurred.	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.	• 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.
The left and right 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 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 right port LED on the switch lights solid green. If the right 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, 30W for a PoE+ connection, and 60W 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 restarting it. To restart 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/.
- **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.