



Fully Managed Stackable Switch

Hardware Installation Guide

M4300-96X

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The NETGEAR Fully Managed Switch Model M4300-96X is a high-performance, IEEE-compliant, 40G access and aggregation layer switch. The modular design of the switch includes 12 slots for port cards with support for up to 96 ports so that you can customize the switch for your network environment and add port cards as needed. The switch supports multispeed 10GBASE-T port cards for copper connections, including Power over Ethernet plus (PoE+) port cards, SFP+ port cards for 1 Gbps and 10 Gbps fiber connections, and QSFP+ port cards for 40G fiber connections. The switch is also stackable.

In this guide, the Fully Managed Switch Model M4300-96X is referred to as the switch.

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

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

- *Overview*
- *Features*
- *Stacking Concepts*
- *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 switch documentation, including the user manual, the command-line interface manual, and the data sheet, visit netgear.com/support/product/M4300-96X.aspx#docs.

Overview

The switch provides a full-width chassis with 12 slots for port cards and two small form-factor, modular power supply unit (PSU) bays. Each slot can support a 10G port card with 8 ports for a total of 96 ports on the switch, with each port supporting 10G. Alternately, each slot can support a 40G port card with 2 ports for a total of twenty-four 40G ports on the switch. Slots 1 through 6 can accept PoE+ port cards, with a total supported power budget of 1,440W for 48 ports. All 10G Ethernet port cards support 100M/1G/2.5G/5G/10GBASE-T ports. The SFP port cards support 1G/10GBASE-X SFP+ ports in which you can install 1G and 10G transceiver modules (GBICs) or direct-attach cables (DACs). The QSFP+ port cards support QSFP+ modules, break-out cables, and DACs.

The switch integrates full-duplex, nonblocking 1.92 terabit per second (Tbps) switch fabric that provides 10G line rate for all 96 ports or 40G line rate for up to 24 ports.

The switch supports the following port cards:

- **APM408C.** Provides eight 100M/1G/2.5G/5G/10GBASE-T ports.
- **APM408P.** Provides eight 100M/1G/2.5G/5G/10GBASE-T PoE+ ports.
- **APM408F.** Provides eight 1G/10GBASE-X SFP+ ports in which you can install 1G and 10G GBICs or DACs.
- **APM402XL.** Provides two 40GBASE-X QSFP+ ports in which you can install QSFP+ modules, break-out cables, or DACs. For an APM402XL port connection at 40 Gbps, use modules or cables that are compatible with 40GBASE-SR4, 40GBASE-LR4, and 40GBASE-CR4.

The switch lets you create high-speed connections to a server or network backbone. For example, you can do the following:

- Connect switches to each other with high-speed links
- Link to high-speed servers
- Provide 100M/1G/2.5G/5G/10G copper, 1G/10G fiber, and 40G fiber connectivity
- Connect up to eight switches in a stack to create a high-port-capacity solution with a single point of administration

You would typically rack-mount the switch in a wiring closet or equipment room, either as a standalone switch or stacked with other switches. The switch is IEEE compliant and offers low latency for high-speed networking. All ports can automatically negotiate to the highest speed, which makes the switch also suitable for environments with a mix of Ethernet, Fast Ethernet, Gigabit Ethernet, and 10-Gigabit Ethernet devices. The 10/100 Mbps ports can operate in half-duplex or full-duplex mode. The 1G/2.5G/5G/10G and 40G ports always operate in full-duplex mode.

Features

The switch supports the following key hardware features:

- Switch ports in various configurations through the use of the following port cards:
 - **APM408C.** Provides eight 100M/1G/2.5G/5G/10GBASE-T ports.
 - **APM408P.** Provides eight 100M/1G/2.5G/5G/10GBASE-T PoE+ ports.

Introduction

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- **APM408F.** Provides eight 1G/10GBASE-X SFP+ ports in which you can install 1G and 10G GBICs or DACs.
- **APM402XL.** Provides two 40GBASE-X QSFP+ ports in which you can install QSFP+ modules, break-out cables, or DACs.
- Support for 1.92 Tbps switching fabric (all ports line-rate).
- One out-of-band 1G Ethernet port.
- One RJ-45 RS232 console port.
- One mini USB console port.
- One regular USB port for connection to a storage device.
- Two PSU bays for small form-factor modular PSUs.
- Support for stacking on any 10G or 40G port.
- Full-width, 2U chassis.
- Full compatibility with IEEE standards:
 - IEEE 802.3 (Ethernet)
 - IEEE 802.3i (10BASE-T)
 - IEEE 802.3u (100BASE-TX)
 - IEEE 802.3ab (1000BASE-T)
 - IEEE 802.3an (10GBASE-T)
 - IEEE 802.3z (1000BASE-SX/LX)
 - IEEE 802.3ae (10GBASE-SR, 10GBASE-LR)
 - IEEE 802.3ba (40GBASE-SR4, 40GBASE-LR4, and 40GBASE-CR4)
 - IEEE 802.3x Full-duplex flow control
 - IEEE 802.3ad Link aggregation (LAG with LACP)
 - IEEE 802.3az Energy Efficient Ethernet (EEE)
 - IEEE 802.3af (PoE)
 - IEEE 802.3at (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.
- Nonstop Forwarding Failover (NSF) support for the master in a stack.

- NETGEAR green power-saving features, including energy efficiency mode that fully conforms to the IEEE802.3az standard.
- Support for an APS1200W PSU to provide a larger power PoE budget.

Stacking Concepts

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

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

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

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

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

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

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

A stack can contain a mix of up to eight switches. All models support stacking. The master supports Nonstop Forwarding Failover (NSF).

For information about how to configure stacking through the software, see the user manual, which you can download by visiting downloadcenter.netgear.com.

Safety Instructions and Warnings

Use the following safety guidelines to ensure your own personal safety and to help protect your system from potential damage.

To reduce the risk of bodily injury, electrical shock, fire, and damage to the equipment, observe the following precautions:

- This product is designed for indoor use only in a temperature-controlled (0–50°C or 32–122°F) and humidity-controlled (90 percent maximum relative humidity, noncondensing) environment. Any device that is located outdoors and connected to this product must be properly grounded and surge protected.
To the extent permissible by applicable law, failure to follow these guidelines can result in damage to your NETGEAR product, which might not be covered by NETGEAR's warranty.
- Observe and follow service markings:
 - Do not service any product except as explained in your system documentation.
 - Opening or removing covers that are marked with the triangular symbol with a lightning bolt can expose you to electrical shock. We recommend that only a trained technician services components inside these compartments.
- If any of the following conditions occur, unplug the product from the electrical outlet and replace the part or contact your trained service provider:
 - The power cable, extension cable, or plug is damaged.
 - An object fell into the product.
 - The product was exposed to water.
 - The product was dropped or damaged.
 - The product does not operate correctly when you follow the operating instructions.
- Keep your system away from radiators and heat sources. Also, do not block cooling vents.
- Do not spill food or liquids on your system components, and never operate the product in a wet environment. If the system gets wet, see the appropriate section in your troubleshooting guide, or contact your trained service provider.
- Do not push any objects into the openings of your system. Doing so can cause fire or electric shock by shorting out interior components.
- Use the product only with approved equipment.
- Allow the product to cool before removing covers or touching internal components.
- Operate the product only from the type of external power source indicated on the electrical ratings label. If you are not sure of the type of power source required, consult your service provider or local power company.
- To avoid damaging your system, be sure that the voltage selection switch (if provided) on the power supply is set to match the power at your location:

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- 115V, 60 Hz in most of North and South America and some Far Eastern countries such as South Korea and Taiwan
 - 100V, 50 Hz in eastern Japan and 100V, 60 Hz in western Japan
 - 230V, 50 Hz in most of Europe, the Middle East, and the Far East
-
- Be sure that attached devices are electrically rated to operate with the power available in your location.
 - Use only approved power cables. If you were not provided with a power cable for your system or for any AC-powered option intended for your system, purchase a power cable approved for your country. The power cable must be rated for the product and for the voltage and current marked on the product electrical ratings label. The voltage and current rating of the cable must be greater than the ratings marked on the product.
 - To help prevent electric shock, plug the system and peripheral power cables into properly grounded electrical outlets.
 - The peripheral power cables are equipped with three-prong plugs to help ensure proper grounding. Do not use adapter plugs or remove the grounding prong from a cable. If you must use an extension cable, use a three-wire cable with properly grounded plugs.
 - Observe extension cable and power strip ratings. Make sure that the total ampere rating of all products plugged into the extension cable or power strip does not exceed 80 percent of the ampere ratings limit for the extension cable or power strip.
 - To help protect your system from sudden, transient increases and decreases in electrical power, use a surge suppressor, line conditioner, or uninterruptible power supply (UPS).
 - Position system cables and power cables carefully. Route cables so that they cannot be stepped on or tripped over. Be sure that nothing rests on any cables.
 - Do not modify power cables or plugs. Consult a licensed electrician or your power company for site modifications.
 - Always follow your local and national wiring rules.

This chapter describes the switch hardware features.

The chapter includes the following sections:

- *Hardware Descriptions*
- *Switch Hardware Interfaces*
- *Power Supply Units*
- *PoE Power Budgets*

Hardware Descriptions

This section describes the front panel and back panel components and the system LEDs.

Front Panel

The front panel of the switch provides the system LEDs and 12 slots in which you can install port cards. Each port card provides its own LEDs (see *Port Cards and Port LEDs* on page 18).

The following figure shows the front panel with six port cards and six blank covers installed in the switch.

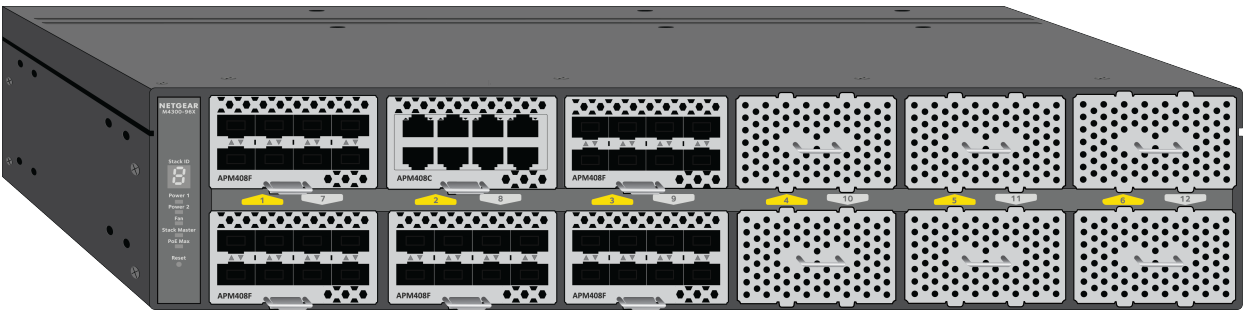


Figure 1. Front panel with six port cards and six blank covers installed

The following figure shows the front panel without any port cards or blank covers installed in the switch.

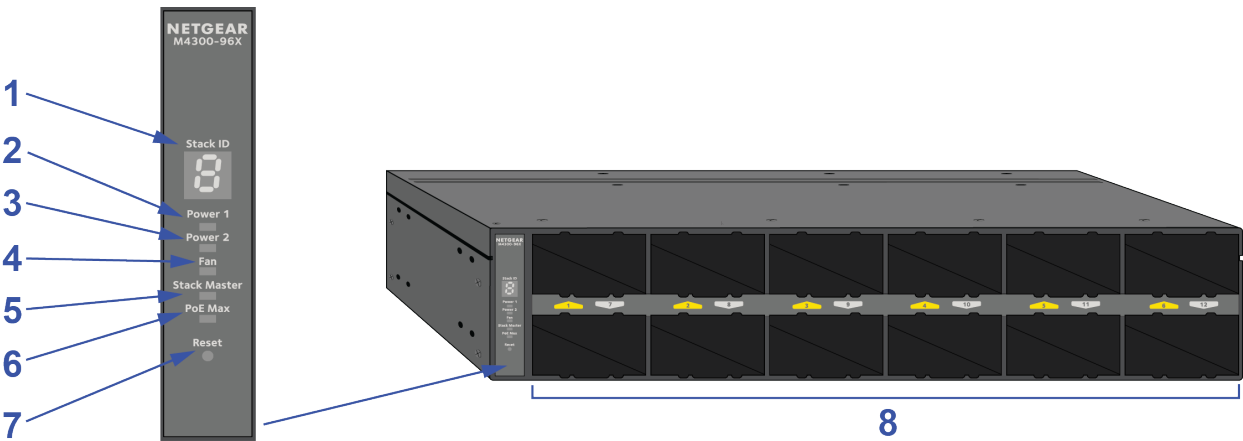


Figure 2. System LEDs and front panel showing empty chassis

Table 1. Front panel and system LEDs

Number	Description	
1	Stack ID LED	For information about the system LEDs, see <i>System LEDs</i> on page 14.
2	Power 1 LED for the PSU 1 bay on the back panel	
3	Power 2 LED for the PSU 2 bay on the back panel	
4	Fan LED	
5	Stack Master LED	
6	PoE Max LED	
7	Reset button (see <i>Reset Button</i> on page 21)	
8	Slots for port cards (see <i>Port Cards and Port LEDs</i> on page 18) The slots in the upper row are numbered 1 through 6 from left to right. The slots in the lower row are numbered 7 through 12 from left to right. For information about port numbering (interface conventions) for the ports on the port cards, see <i>Port Numbering</i> on page 15.	

Back Panel

The back panel of the switch provides a console port, out-of-band (OOB) port with associated LEDs, USB port, mini USB console port, two bays for power supply units (PSUs), three fixed fans, and the switch label.

The following figure shows the back panel.

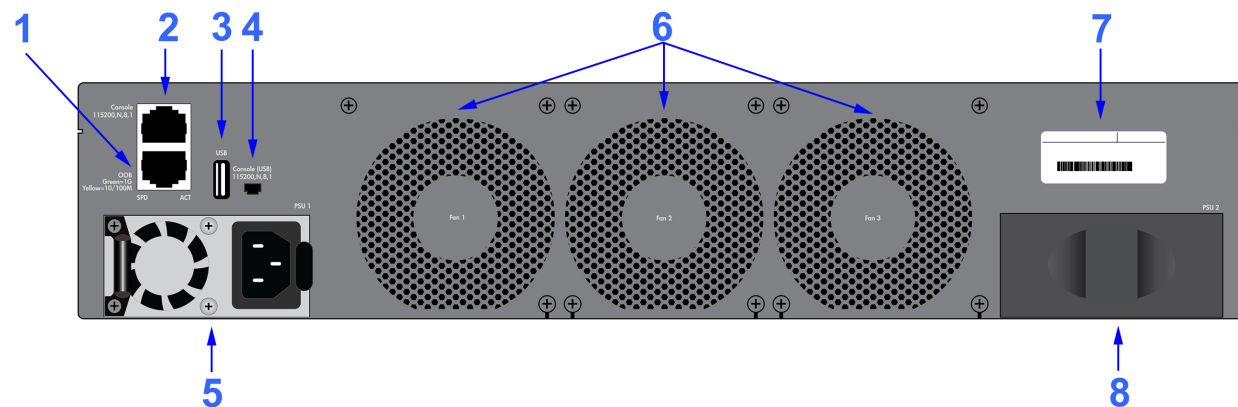


Figure 3. Back panel components

Table 2. Back panel components

Number	Description
1	Out-of-band (OOB) 1G Ethernet port (see Out-of-Band 1G Ethernet Port on page 21) with a left LED that indicates the speed and a right LED that indicates the link and activity (see System LEDs on page 14)
2	RJ-45 RS232 (115200, N, 8, 1) console port (see RJ-45 RS232 Console Port on page 21)
3	USB 2.0 port (see USB Port on page 21)
4	Mini USB (115200, N, 8, 1) console port (see Mini USB Console Port on page 22)

Table 2. Back panel components (Continued)

Number	Description
5	Bay 1 (PSU 1) for a modular PSU (see <i>Power Supply Units</i> on page 22)
6	Fixed fans for front-to-back air flow
7	Switch label
8	Bay 2 (PSU 2) for a second modular PSU (see <i>Power Supply Units</i> on page 22)

System LEDs

The following table describes the system LEDs on the front panel of switch and the single LED on the back panel of the switch.

Table 3. System LEDs

LED	Description
Front panel LEDs	
Stack ID LED	<p>The Stack LED contains segments that can indicate the stack unit number of the switch.</p> <p>Solid green indicating a number. The switch is a member of a stack. The LED displays the stack unit number.</p> <p>Solid green indicating E. The switch functions in economy (ECO) mode with all port LEDs turned off.</p> <p>Off. The switch is not a member of a stack.</p>
Power 1 LED (for the PSU 1 bay) and Power 2 LED (for the PSU 2 bay)	<p>Solid green. The power supply unit is present, is supplying power to the switch, and is functioning normally.</p> <p>Solid yellow. The switch is starting.</p> <p>Blinking yellow. The switch failed to start correctly or another failure occurred.</p> <p>Off. Power is not supplied to the switch.</p>
Fan LED	<p>Solid green. The fans are functioning normally.</p> <p>Blinking yellow. One or more fans failed.</p> <p>Off. Power is not supplied to the switch. The fans are off.</p>
Stack Master LED	<p>Solid green. The switch is functioning as a master in a stack.</p> <p>Off. The switch is not a member of a stack or is functioning as a slave in a stack.</p>
PoE Max LED	<p>Off. Sufficient (more than 7W of) PoE power is available on the switch.</p> <p>Solid yellow. Less than 7W of PoE power is available on the switch.</p> <p>Blinking yellow. At least once during the previous two minutes, less than 7W of PoE power was available on the switch.</p>

Table 3. System LEDs (Continued)

LED	Description
Back panel LEDs	
OOB Ethernet port	Left side speed LED: Solid green. The link speed is 1000 Mbps. Solid yellow. The link speed is 10 Mbps or 100 Mbps. Off. No link is established on the port.
	Right side link and activity LED: Solid green. A valid link is established on the port. Blinking green. The port is transmitting or receiving packets. Off. No link is established on the port.

For information about the LEDs on the port cards, see [Port Cards and Port LEDs](#) on page 18.

Port Numbering

The ports (interfaces) on the port cards in the slots are numbered *switch unit number/slot number/port number*.

For the APM408C, APM408P, and APM408F port cards, the ports on the port cards in the slots are numbered as described in the following table. (In the interface convention examples in the table, the switch is designated as unit number 1.)

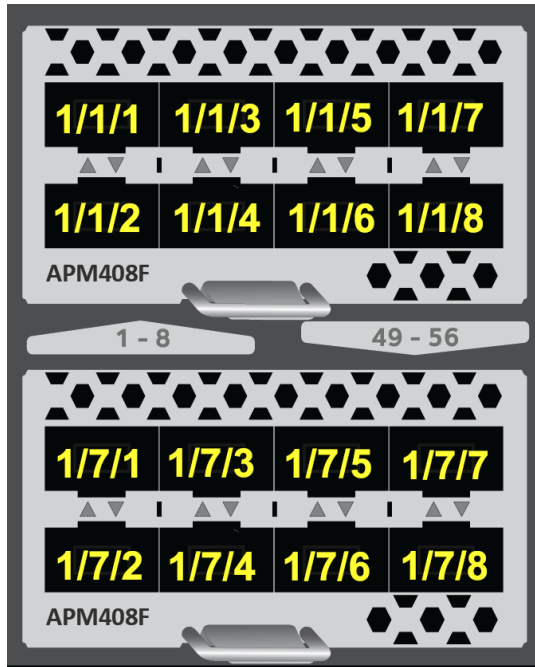
Table 4. Port numbering for the APM408C, APM408P, and APM408F port cards

Slot Number	Slot Location	Port Card Upper Port Numbers	Port Card Lower Port Numbers	Interface Convention
1	Upper row	1, 3, 5, 7	2, 4, 6, 8	1/1/1, 1/1/2, 1/1/3, and so on through 1/1/8
2	Upper row	1, 3, 5, 7	2, 4, 6, 8	1/2/1, 1/2/2, 1/2/3, and so on through 1/2/8
3	Upper row	1, 3, 5, 7	2, 4, 6, 8	1/3/1, 1/3/2, 1/3/3, and so on through 1/3/8
4	Upper row	1, 3, 5, 7	2, 4, 6, 8	1/4/1, 1/4/2, 1/4/3, and so on through 1/4/8
5	Upper row	1, 3, 5, 7	2, 4, 6, 8	1/5/1, 1/5/2, 1/5/3, and so on through 1/5/8
6	Upper row	1, 3, 5, 7	2, 4, 6, 8	1/6/1, 1/6/2, 1/6/3, and so on through 1/6/8
7	Lower row	1, 3, 5, 7	2, 4, 6, 8	1/7/1, 1/7/2, 1/7/3, and so on through 1/7/8
8	Lower row	1, 3, 5, 7	2, 4, 6, 8	1/8/1, 1/8/2, 1/8/3, and so on through 1/8/8
9	Lower row	1, 3, 5, 7	2, 4, 6, 8	1/9/1, 1/9/2, 1/9/3, and so on through 1/9/8
10	Lower row	1, 3, 5, 7	2, 4, 6, 8	1/10/1, 1/10/2, 1/10/3, and so on through 1/10/8
11	Lower row	1, 3, 5, 7	2, 4, 6, 8	1/11/1, 1/11/2, 1/11/3, and so on through 1/11/8
12	Lower row	1, 3, 5, 7	2, 4, 6, 8	1/12/1, 1/12/2, 1/12/3, and so on through 1/12/8

Slots 1 through 6 support PoE port cards. If you install a PoE port card in another slot, the ports provide connectivity but no PoE power.

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The following figure shows the port numbering in port cards that are installed in slots 1 and 7 of a switch with unit number 1.



The numbering of the ports on the APM402XL port card is different from the other port cards. You can use a 40G port either with a break-out cable, in which case the single 40G port can support up to four individual 10G ports, or with a connection to another single 40G port.

Port 1 (the left 40G port on the port card) uses the following numbering:

- If connected with a break-out cable to four individual 10G ports, the port numbers are 1, 2, 3, and 4.
- If connected to another single 40G port, the port number is 9. In that situation, only port number 9 is used and port numbers 1, 2, 3, and 4 are not used on the port card.

Port 2 (the right 40G port on the port card) uses the following numbering:

- If connected with a break-out cable to four individual 10G ports, the port numbers are 5, 6, 7, and 8.
- If connected to another single 40G port, the port number is 10. In that situation, only port number 10 is used and port numbers 5, 6, 7, and 8 are not used on the port card.

For example, if a switch with unit number 1 includes an APM402XL port card in slot 9, port 1 on the port card is connected to four individual port cards, and port 2 on the port card is connected to another single 40G port, the port numbering is as follows: 1/9/1, 1/9/2, 1/9/3, 1/9/4, and 1/9/10.

For the APM402XL port card, the ports on the port cards in the slots are numbered as described in the following table. (In the interface convention examples in the table, the switch is designated as unit number 1.)

Table 5. Port numbering for the 40G ports on the APM402XL port card

Slot Number	Slot Location	Port	Port Numbers for 10G	Port Numbers for 40G	Interface Convention
1	Upper row	1	1, 2, 3, 4	9	For 10G: 1/1/1, 1/1/2, 1/1/3, and 1/1/4. For 40G: 1/1/9.
		2	5, 6, 7, 8	10	For 10G: 1/1/5, 1/1/6, 1/1/7, and 1/1/8. For 40G: 1/1/10.
2	Upper row	1	1, 2, 3, 4	9	For 10G: 1/2/1, 1/2/2, 1/2/3, and 1/2/4. For 40G: 1/2/9.
		2	5, 6, 7, 8	10	For 10G: 1/2/5, 1/2/6, 1/2/7, and 1/2/8. For 40G: 1/2/10.
3	Upper row	1	1, 2, 3, 4	9	For 10G: 1/3/1, 1/3/2, 1/3/3, and 1/3/4. For 40G: 1/3/9.
		2	5, 6, 7, 8	10	For 10G: 1/3/5, 1/3/6, 1/3/7, and 1/3/8. For 40G: 1/3/10.
4	Upper row	1	1, 2, 3, 4	9	For 10G: 1/4/1, 1/4/2, 1/4/3, and 1/4/4. For 40G: 1/4/9.
		2	5, 6, 7, 8	10	For 10G: 1/4/5, 1/4/6, 1/4/7, and 1/4/8. For 40G: 1/4/10.
5	Upper row	1	1, 2, 3, 4	9	For 10G: 1/5/1, 1/5/2, 1/5/3, and 1/5/4. For 40G: 1/5/9.
		2	5, 6, 7, 8	10	For 10G: 1/5/5, 1/5/6, 1/5/7, and 1/5/8. For 40G: 1/5/10.
6	Upper row	1	1, 2, 3, 4	9	For 10G: 1/6/1, 1/6/2, 1/6/3, and 1/6/4. For 40G: 1/6/9.
		2	5, 6, 7, 8	10	For 10G: 1/6/5, 1/6/6, 1/6/7, and 1/6/8. For 40G: 1/6/10.
7	Lower row	1	1, 2, 3, 4	9	For 10G: 1/7/1, 1/7/2, 1/7/3, and 1/7/4. For 40G: 1/7/9.
		2	5, 6, 7, 8	10	For 10G: 1/7/5, 1/7/6, 1/7/7, and 1/7/8. For 40G: 1/7/10.
8	Lower row	1	1, 2, 3, 4	9	For 10G: 1/8/1, 1/8/2, 1/8/3, and 1/8/4. For 40G: 1/8/9.
		2	5, 6, 7, 8	10	For 10G: 1/8/5, 1/8/6, 1/8/7, and 1/8/8. For 40G: 1/8/10.
9	Lower row	1	1, 2, 3, 4	9	For 10G: 1/9/1, 1/9/2, 1/9/3, and 1/9/4. For 40G: 1/9/9.
		2	5, 6, 7, 8	10	For 10G: 1/9/5, 1/9/6, 1/9/7, and 1/9/8. For 40G: 1/9/10.
10	Lower row	1	1, 2, 3, 4	9	For 10G: 1/10/1, 1/10/2, 1/10/3, and 1/10/4. For 40G: 1/10/9.
		2	5, 6, 7, 8	10	For 10G: 1/10/5, 1/10/6, 1/10/7, and 1/10/8. For 40G: 1/10/10.
11	Lower row	1	1, 2, 3, 4	9	For 10G: 1/11/1, 1/11/2, 1/11/3, and 1/11/4. For 40G: 1/11/9.
		2	5, 6, 7, 8	10	For 10G: 1/11/5, 1/11/6, 1/11/7, and 1/11/8. For 40G: 1/11/10.
12	Lower row	1	1, 2, 3, 4	9	For 10G: 1/12/1, 1/12/2, 1/12/3, and 1/12/4. For 40G: 1/12/9.
		2	5, 6, 7, 8	10	For 10G: 1/12/5, 1/12/6, 1/12/7, and 1/12/8. For 40G: 1/12/10.

Switch Hardware Interfaces

This section describes the hardware interfaces of the switch.

Port Cards and Port LEDs

The switch supports the following hot-swappable ports cards, which you can install in the switch slots on the front panel:

- **APM408C.** Provides eight 100M/1G/2.5G/5G/10GBASE-T ports.
- **APM408P.** Provides eight 100M/1G/2.5G/5G/10GBASE-T PoE+ ports. Slots 1–6 of the switch support PoE and PoE+.
- **APM408F.** Provides eight 1G/10GBASE-X SFP+ ports in which you can install 1G and 10G transceiver modules (GBICs) or direct attach cables (DACs).
- **APM402XL.** Provides two fiber 40GBASE ports that support Quad Small Form-factor Pluggable Plus (QSFP+) modules, 40G break-out cables, or 40G DACs.

The following table describes the port LEDs on the port cards.

Table 6. Port LEDs on the port cards

Port Type	Link, Speed, and Activity LED Behavior
RJ-45 ports	
Multispeed 10GBASE-T	<p>Solid green. A 10 Gbps link is established.</p> <p>Blinking green. 10 Gbps traffic is being processed.</p> <p>Solid yellow. A 100 Mbps, 1000 Mbps, 2.5 Gbps, or 5 Gbps link is established.</p> <p>Blinking yellow. 100 Mbps, 1000 Mbps, 2.5 Gbps, or 5 Gbps traffic is being processed.</p> <p>Off. No link is established.</p>
Multispeed 10GBASE-T with PoE	<p>Solid blue. A 10 Gbps link is established. The port is delivering PoE.</p> <p>Blinking blue. 10 Gbps traffic is being processed. The port is delivering PoE.</p> <p>Solid purple. A 100 Mbps, 1000 Mbps, 2.5 Gbps, or 5 Gbps link is established. The port is delivering PoE.</p> <p>Blinking purple. 100 Mbps, 1000 Mbps, 2.5G, or 5G traffic is being processed. The port is delivering PoE.</p> <p>Solid light blue. The port is delivering PoE. No Ethernet link is established.</p> <p>Solid green. A 10 Gbps link is established. The port is <i>not</i> delivering PoE.</p> <p>Blinking green. 10 Gbps traffic is being processed. The port is <i>not</i> delivering PoE.</p> <p>Solid yellow. A 100 Mbps, 1000 Mbps, 2.5 Gbps, or 5 Gbps link is established. The port is <i>not</i> delivering PoE.</p> <p>Blinking yellow. 100 Mbps, 1000 Mbps, 2.5 Gbps, or 5 Gbps traffic is being processed. The port is <i>not</i> delivering PoE.</p> <p>Off. No link is established and the port is <i>not</i> delivering PoE.</p>

Table 6. Port LEDs on the port cards (Continued)

Port Type	Link, Speed, and Activity LED Behavior
SFP+ ports	
SFP+ 1G/10GBASE-X	<p>Solid green. A 10 Gbps SFP+ transceiver module link is established.</p> <p>Blinking green. 10 Gbps traffic is being processed.</p> <p>Solid yellow. A 1000 Mbps SFP transceiver module link is established.</p> <p>Blinking yellow. 1000 Mbps traffic is being processed.</p> <p>Off. No link is established.</p>
QSFP+ ports	
QSFP+ 40GBASE-X	<p>Solid green. A 40 Gbps QSFP+ module link is established.</p> <p>Blinking green. 40 Gbps traffic is being processed.</p> <p>Off. No link is established.</p>

For more information about the port cards, see the *NETGEAR Fully Managed Switch Port Cards Installation Guide*, which you can download by visiting downloadcenter.netgear.com.

Cables and Speed

The following table describes the network cables that you can use for the switch copper connections and the speeds that these cables can support, up to 100 meters (328 feet).

Table 7. Cables and speeds

Speed	Cable Type
100 Mbps	Category 5 (Cat 5) or higher rated
1 Gbps, 2.5 Gbps, or 5 Gbps	Category 5e (Cat 5e) or higher rated
10 Gbps	Category 6a (Cat 6a) or higher rated

Note For speeds of 10 Gbps, if the cable length is shorter than 180 feet (55 meters), you can use a Category 6 (Cat 6) cable.

Multi-Gigabit RJ-45 Ports

Port cards with multi-Gigabit copper RJ-45 ports support 100M/1G/2.5G/5G/10GBASE-T with autosensing. When you insert a cable into an RJ-45 port, the switch automatically ascertains the maximum speed (100 Mbps, 1 Gbps, 2.5 Gbps, 5 Gbps, or 10 Gbps) of the attached device. For devices that support 100 Mbps, the switch automatically ascertains the duplex mode (half-duplex or full-duplex). All ports support a Category 5 (Cat 5) unshielded twisted-pair (UTP) cable or higher-rated Ethernet cable terminated with an 8-pin RJ-45 connector. For more information about Ethernet cables, see [Cables and Speed](#) on page 19.

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 an RJ-45 port on a port card, 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.

10GBASE-X and 1000BASE-X Transceiver Modules and Cables for SFP+ Ports

To enable high-speed fiber and long-distance connections on the switch, port cards with SFP+ fiber ports accommodate standard 10G and 1G SFP+ transceiver modules (gigabit interface converters, or GBICs) and direct attach cables (DACs), which are sold separately from the port cards.

The port cards supports the following NETGEAR SFP and SFP+ transceiver modules and cables:

- Short reach transceiver modules:
 - **AGM731F**. SFP transceiver 1000BASE-SX, SFP multimode LC GBIC
 - **AGM734**. SFP transceiver 1000BASE-T, SFP copper RJ-45 GBIC
 - **AXM761**. SFP+ transceiver 10GBASE-SR, SFP+ multimode LC GBIC
- Long reach transceiver modules:
 - **AGM732F**. SFP transceiver 1000BASE-LX, SFP single mode LC GBIC
 - **AXM762**. SFP+ transceiver 10GBASE-LR, SFP+ single mode LC GBIC
 - **AXM764**. SFP+ transceiver 10GBASE-LR Lite, SFP+ single mode LC GBIC
- 1G/10GBASE-T transceiver modules:
 - **AXM765**. SFP+ transceiver 10GBASE-T, SFP+ copper RJ-45 GBIC
- Direct attach cables:
 - **AXC761**. SFP+ 1m direct attach cable
 - **AXC763**. SFP+ 3m direct attach cable
 - **AXC765**. SFP+ 5m direct attach cable
 - **AXC767**. SFP+ 7m direct attach cable
 - **AXC7610**. SFP+ 10m direct attach cable

- **AXC7615**. SFP+ 15m direct attach cable
- **AXC7620**. SFP+ 20m direct attach cable

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

40GBASE-X Transceiver Modules and Cables for QSFP+ Ports

To enable very high-speed fiber and long-distance connections on the switch, port cards with Quad Small Form-Factor Pluggable Plus (QSFP+) fiber ports accommodate standard 40G transceiver modules (gigabit interface converters, or GBICs), break-out cables, and direct attach cables (DACs), which are sold separately from the port cards.

At this time, NETGEAR does not offer any QSFP+ transceiver modules or cables. However, you can obtain any third-party, IEEE-compliant, 40GBASE-X transceiver module or cable for use with the switch.

Reset Button

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

► To reboot the switch:

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

RJ-45 RS232 Console Port

The back panel of the switch provides one RJ-45 RS232 port for console access only. This serial port is configured for 115200 baud, eight data bits, one stop bit, and no parity. The product package includes one console cable with one DB9 connector and one RJ-45 connector. You can use this cable to connect the RJ-45 RS232 console port on the switch to a DB9 port on a VT100-compatible terminal or a Windows-based computer that runs VT100 terminal emulation software.

Out-of-Band 1G Ethernet Port

The back panel of the switch provides one out-of-band (OOB) 1000BASE-T RJ-45 Ethernet port that lets you access the switch over its local browser interface or over a Telnet or SSH connection.

USB Port

The back panel of the switch provides one USB 2.0 port that lets you upgrade firmware from a disk and back up the configuration to a storage device and that allows for the collection of a memory dump for debugging purposes.

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

- The USB device must support USB 2.0.
- The USB device must support the FAT32 or VFAT file type. The NTFS file type is not supported.

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

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

Mini USB Console Port

The back panel of the switch provides one mini USB port for console access only. This port is configured for 115200 baud, eight data bits, one stop bit, and no parity. The product package includes one USB console cable with one mini B connector and one type A connector. You can use this cable to connect the mini USB console port on the switch to a USB port on a VT100-compatible terminal or a Windows-based computer that runs VT100 terminal emulation software.

Note For you to be able to use the mini USB port and access the switch from a Windows-based computer that runs VT100 terminal emulation software, you must install the USB driver on the computer. The Windows USB driver is on the resource CD in the product package.

Power Supply Units

The switch can support the following power supply unit (PSU) configurations for dual PSU configurations:

- One APS600W PSU
- Two APS600W PSUs
- One APS1200W PSU
- Two APS1200W PSUs
- One APS600W PSU and one APS1200W PSU

The PSUs provide one AC OK LED. During normal operation, this LED lights green to indicate that the PSU is receiving power.

For more information about the PSUs, see the *NETGEAR Power Supplies Units for Managed Switches Installation Guide*, which you can download by visiting downloadcenter.netgear.com.

PoE Power Budgets

The PoE power budget depends on the installed PSU or PSUs. The following table describes the possible PoE power budgets. To calculate the PoE power budget, subtract from the available power 100W for the switch system and 38W for *each* installed port card.

Table 8. PSU configuration and PoE budgets

PSU Configuration	Power Input	Available Power	PoE Power Budget
Single APS600W	110 VAC	600W	600W–110W–(38W x number of port cards)
	220 VAC	600W	600W–110W–(38W x number of port cards)
Dual APS600W	110 VAC	1200W	1200W–110W–(38W x number of port cards)
	220 VAC	1200W	1200W–110W–(38W x number of port cards)
Single APS1200W	110 VAC	1050W	1050W–110W–(38W x number of port cards)
	220 VAC	1200W	1200W–110W–(38W x number of port cards)
Dual APS1200W	110 VAC	2100W	1440W (You do not need to subtract wattage.)
	220 VAC	2400W	1440W (You do not need to subtract wattage.)
One APS600W and One APS1200W	110 VAC	1650W	1650W–110W–(38W x number of port cards)
	220 VAC	1800W	1800W–110W–(38W x number of port cards)

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*
- *Step 5: Connect PoE and Non-PoE Devices to the Switch*
- *Step 6: Install SFP or QSFP Transceiver Modules*
- *Step 7: Install a Power Supply Unit*
- *Step 8: Check the Installation Before You Apply Power*
- *Step 9: Apply AC Power and Check the LEDs*
- *Optional Step 10: Connect a Console to the Switch*

Step 1: Prepare the Site

We recommend that you install the switch at a location where access is restricted to qualified service personnel only.

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

Table 9. Site requirements

Characteristics	Requirements
Mounting	<p>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.</p> <p>Desktop installations. Provide a flat table or shelf surface.</p>
Access	Locate the switch in a position that allows you to access the front panel slots, view the front panel system LEDs, and access the PSU bays and ports 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>Temperature. Install the switch in a dry area with an ambient temperature between 0°C and 50°C (32°F and 122°F). Keep the switch away from heat sources such as direct sunlight, warm-air exhausts, hot-air vents, and heaters.</p> <p>Operating humidity. The maximum relative humidity of the installation location must not exceed 90%, noncondensing.</p> <p>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.</p> <p>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.</p>

Step 2: Protect Against Electrostatic Discharge



WARNING:

Static electricity can harm delicate components inside your system. To prevent static damage, discharge static electricity from your body before you touch any of the electronic components, such as the microprocessor. You can do so by periodically touching an unpainted metal surface on the switch.

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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.

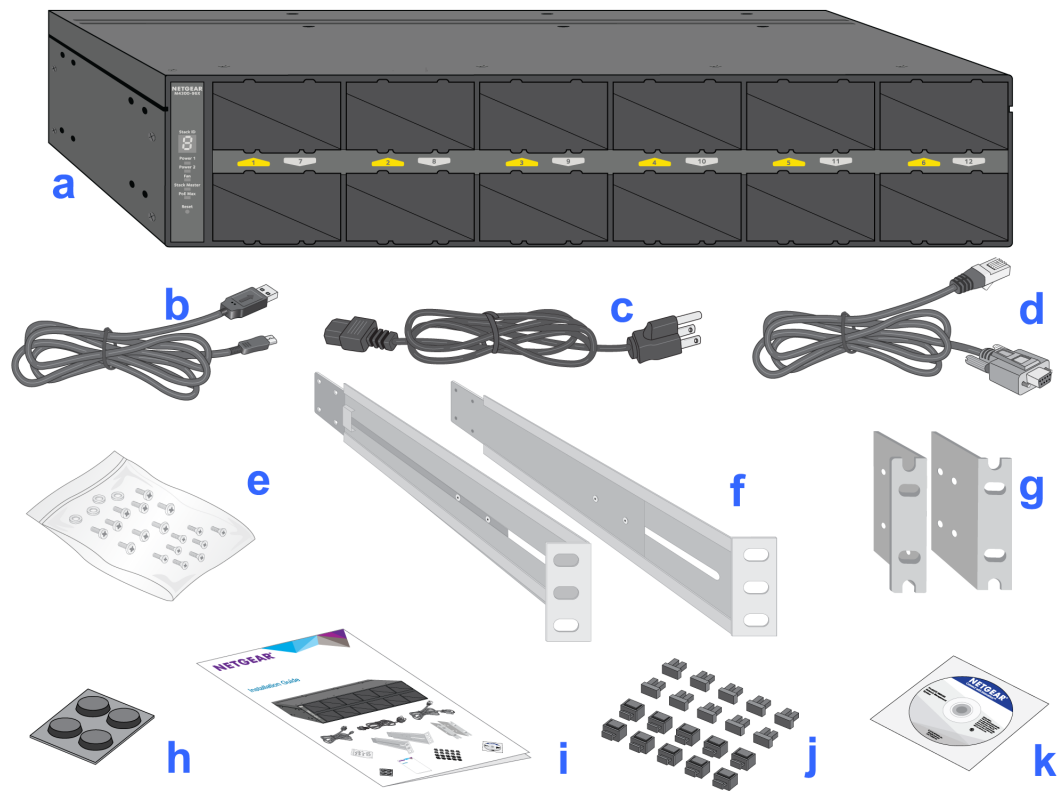


Figure 4. Package contents

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 model M4300-96X (The previous figure shows the chassis without port cards and blank covers.)
 - b. USB console cable with one mini B connector and one type A connector
 - c. Power cord for the PSU
 - d. Console cable with one DB9 connector and one RJ-45 connector
 - e. Rack-mounting screws
 - f. Rear rack-mounting brackets with rails
 - g. Front rack-mounting brackets
 - h. Rubber footpads for tabletop installation
 - i. Installation guide
 - j. Rubber caps to protect unused RJ-45 ports and SFP+ ports
 - k. Resource CD
5. If any item is missing or damaged, contact your local NETGEAR reseller for replacement.

Step 4: Install the Switch

You would typically mount the switch in a standard 19-inch (48.26-centimeter) network equipment rack. However, you can install the switch on a flat surface.

Install the Switch in a Rack Using the Front Rack-Mounting Brackets

The switch package includes front rack-mounting brackets and screws for installation in a 19-inch rack.

► To install the switch in a rack using the front rack-mounting brackets:

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

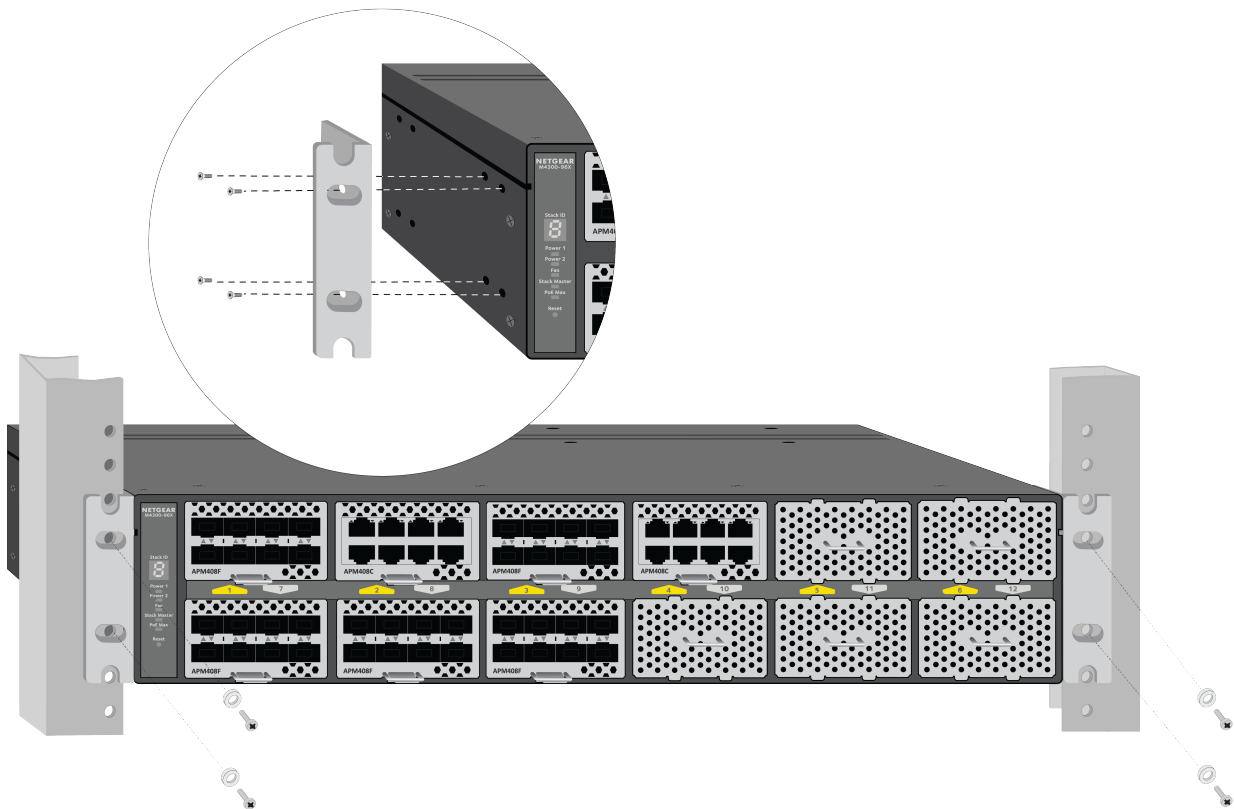


Figure 5. Installing the switch in a rack using the front rack-mounting brackets

Install the Switch in a Rack Using the Rear Rack-Mounting Brackets With Rails

The switch package includes rear rack-mounting brackets with rails and screws for installation in a 19-inch rack.

► To install the switch in a rack using the rear rack-mounting brackets with rails:

1. Attach the supplied rear rack-mounting brackets with rails to the sides of the switch.
2. Insert the supplied rack-mounting screws through each bracket and into the bracket mounting holes in the switch.
3. Tighten the screws with a No. 1 Phillips screwdriver to secure each bracket.
4. Adjust the length of the brackets, 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 brackets to the rack.

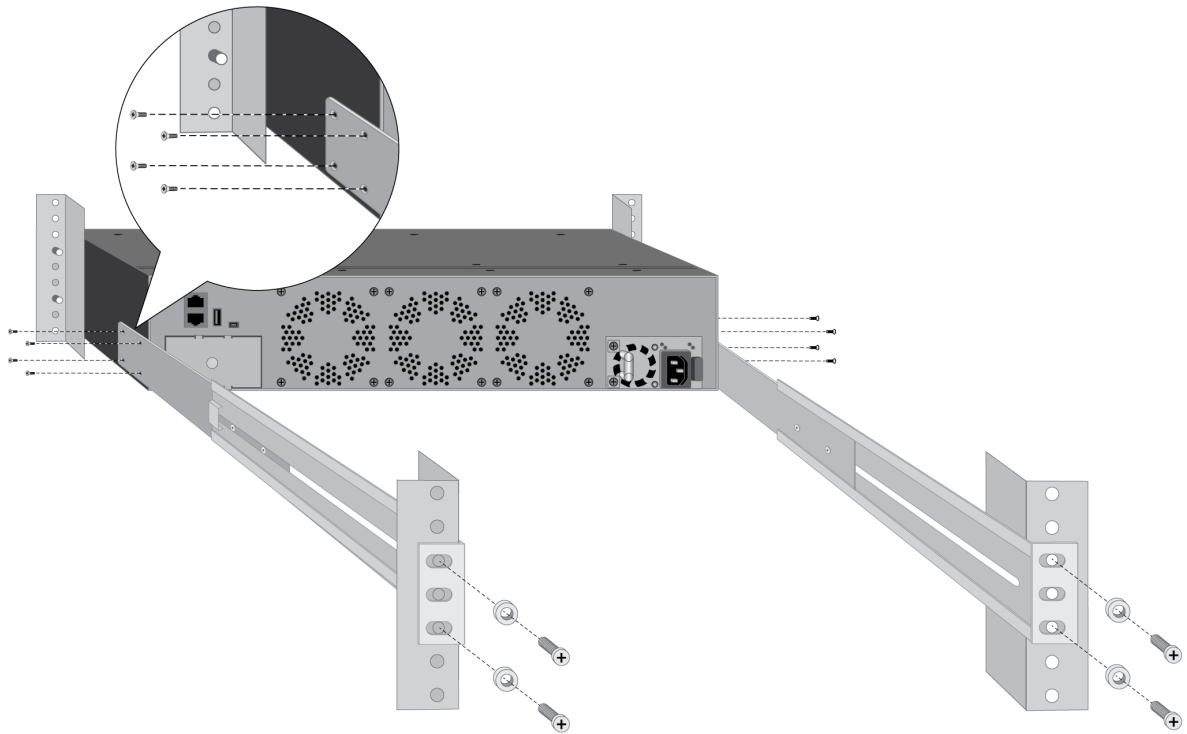


Figure 6. Installing the switch in a rack using the rear rack-mounting brackets with rails

Install the Switch on a Flat Surface

The switch ships with four self-adhesive rubber footpads. The rubber footpads cushion the switch against shock and vibrations. They also provide ventilation space between stacked switches.

► 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.

Step 5: Connect PoE and Non-PoE Devices to the Switch

Note If you do not use APM408C or APM408P port cards, you can skip this step.

The following procedure describes how to connect devices to an RJ-45 port on an APM408C or APM408P port card. 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 (see [Cables and Speed](#) on page 19).

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

► To connect a PoE or non-PoE device to an RJ-45 port on an APM408C or APM408P port card:

1. Connect the device to an RJ-45 port on a port card.
2. Verify that all cables are installed correctly.

Step 6: Install SFP or QSFP Transceiver Modules

If you do not use APM408F or APM402XL port cards, you can skip this step.

Install SFP Transceiver Modules

Note If you do not use APM408F port cards, you can skip this step.

This procedure describes how to install an SFP transceiver module into an SFP+ port on an APM408F port card.

► To install an SFP transceiver module into an SFP+ port on an APM408F port card:

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



CAUTION:

The edges of the SFP+ port opening are sharp. We recommend that you do not touch the port opening with your fingers but use a tool to insert the transceiver module.

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

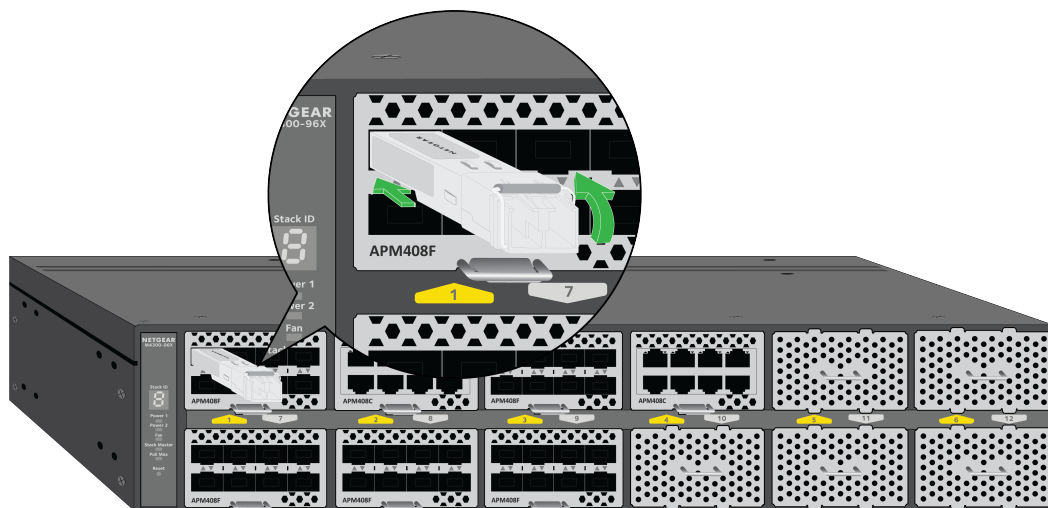


Figure 7. Inserting an SFP transceiver module

Install QSFP Transceiver Modules

Note If you do not use APM402XL port cards, you can skip this step.

This procedure describes how to install a QSFP transceiver module into a QSFP+ port on an APM402XL port card.

► **To install a QSFP transceiver module into a QSFP+ port on an APM402XL port card:**

1. Insert the transceiver module into the QSFP+ port.



CAUTION:

The edges of the QSFP+ port opening are sharp. We recommend that you do not touch the port opening with your fingers but use a tool to insert the transceiver module.

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



Figure 8. Inserting a QSFP transceiver module

Step 7: Install a Power Supply Unit

Note If the switch came with a power supply unit (PSU) installed and you do not want to install a second PSU, you can skip this step.

The back panel of the switch provides two PSU bays. For information about the PSUs that are supported for the switch, see [Power Supply Units](#) on page 22.

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If the switch came with a PSU installed, it is installed in the PSU bay on the left, which is marked PSU 1. You can install a second PSU in the power supply bay on the right, which is marked PSU 2. The switch can continue to operate while you install a second PSU.

► To install a PSU in either the PSU 1 bay or PSU 2 bay:

1. Pull out the cover plate from the bay.
2. Insert the PSU into the bay, and gently push the PSU into the bay until the latch locks.



CAUTION:

When you insert the PSU, do not use unnecessary force. Doing so can damage the connectors on the rear of the PSU and on the midplane.



3. Connect the end of the power cord to the power receptacle on the PSU.
4. Plug the AC power cord into a power source such as a wall socket or power strip.

When you apply power to the PSU, depending on the bay in which you installed the PSU, the Power 1 LED or Power 2 LED on the front panel of the switch lights. If the associated Power LED does not light, check to see that the power cord is plugged in correctly and that the power source is good.

Step 8: Check the Installation Before You Apply Power

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

► To check the installation:

1. Inspect the equipment thoroughly.
2. Verify 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 9: Apply AC Power and Check the LEDs

The switch does not provide an on/off switch. The power cord connection controls the power. Before connecting the power cord, select an AC outlet that is not controlled by a wall switch, which can turn off power to the switch.

► To apply AC power and check the LEDs:

1. Connect the end of the power cord to the power receptacle on the PSU on back panel of the switch.
If you installed two PSUs, do this for both PSUs.
2. When you apply power, the Power LED that is associated with the bay in which you installed the PSU lights.
The Power 1 LED on the front panel is associated with the PSU 1 bay. The Power 2 LED is associated with the PSU 2 bay. If a Power LED does not light, check to see that the power cord is plugged in correctly and that the power source is good.
3. Check to see that the system LEDs on the front panel function as expected.
For more information, see [System LEDs](#) on page 14.
4. Check to see that the LEDs on the port cards function as expected.
For more information, see [Port Cards and Port LEDs](#) on page 18.

Optional Step 10: Connect a Console to the Switch

This procedure is optional.

You can manage the switch through its local browser interface or through a console that is attached to the switch. To be able to use a console, you need the following items:

- A computer with a Windows, MAC, or Linux operating system, a UNIX workstation, or a VT100/ANSI terminal.
- Depending on the connector type at your computer or terminal, use one of the following cables, both of which are included in the product package:
 - Ethernet cable for use with the RJ-45 RS232 console port
 - Mini USB cable for use with the mini USB console port

► To connect a console to the switch:

1. Connect either the RJ-45 RS232 cable or the mini USB cable to the appropriate port on the back panel of the switch.
For more information, see [RJ-45 RS232 Console Port](#) on page 21 or [Mini USB Console Port](#) on page 22.
2. Connect the other end of the cable to your computer, workstation, or terminal.

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- On a computer with a Windows operating system, you can use HyperTerminal or install another terminal emulator such as Tera Term.
 - On a computer with a MAC operating system, you can use ZTerm.
 - On a UNIX workstation, you can use a terminal emulator such as TIP.
3. If you attach a computer or workstation, start a terminal emulation application, which you must configure to use the following settings:
- **Baud rate.** 115,200 bps
 - **Data bits.** 8
 - **Parity.** None
 - **Stop bit.** 1
 - **Flow control.** None

After you connect a console to the switch, you can configure the switch. For information about configuring the switch, see the command-line interface (CLI) manual, which you can download by visiting downloadcenter.netgear.com.

For information about configuring the switch through its local browser interface, see the user manual, which you can also download by visiting downloadcenter.netgear.com.

This chapter provides information about maintaining and troubleshooting the switch.

The chapter includes the following sections:

- *Replace a Power Supply Unit*
- *Troubleshooting Chart*
- *PoE Troubleshooting Suggestions*
- *Additional Troubleshooting Suggestions*

Replace a Power Supply Unit

You can replace a power supply unit (PSU). If the switch is operating with two PSUs, you can replace one PSU while the other PSU enables the switch to remain powered on and functioning.

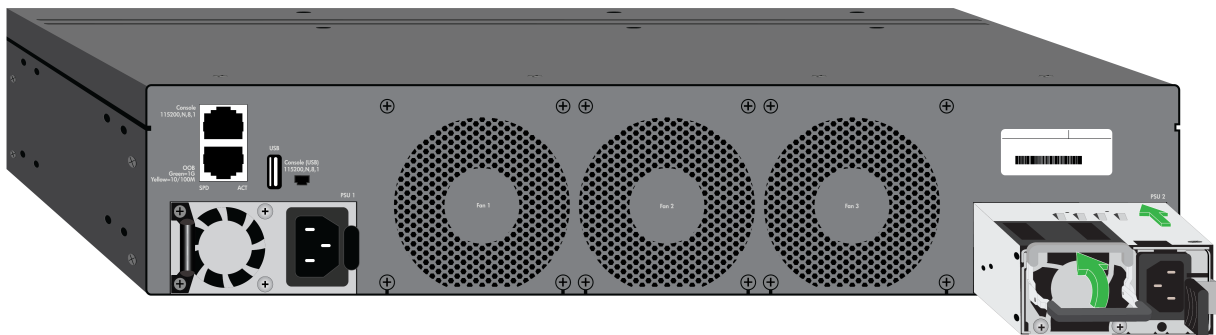
► **To remove one PSU and reinstall another PSU in the same PSU bay:**

1. If the switch functions with a single PSU only, disconnect the power cord from the PSU and let the switch power down.
If your switch functions with two PSUs, you do not need to power down the switch and can perform a hot swap.
2. Remove the PSU from its bay by moving the release latch to the left and pulling the extraction handle.
3. Insert the other PSU into the bay, and gently push the PSU into the bay until the latch locks.



CAUTION:

When you insert the PSU, do not use unnecessary force. Doing so can damage the connectors on the rear of the PSU and on the midplane.



4. Connect the end of the power cord to the power receptacle on the PSU.
5. Plug the AC power cord into a power source such as a wall socket or power strip.
When you apply power to the PSU, depending on the bay in which you installed the PSU, the Power 1 LED or Power 2 LED on the front panel of the switch lights. If the associated Power LED does not light, check to see that the power cord is plugged in correctly and that the power source is good.

Troubleshooting Chart

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

Table 10. Troubleshooting chart

Symptom	Possible Cause	Possible Solution
A Power LED is off.	Power is not supplied to the switch.	Check the power cable connections at the switch and the power source. Make sure that all cables are used correctly and comply with the Ethernet specifications.
Combined speed and activity LED is off when the port is connected to a device.	Port connection is not working.	Check the crimp on the connectors and make sure that the plug is properly inserted and locked into the port at both the 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, port card, or module by testing them in an alternate environment where all products are functioning.
File transfer is slow or performance is degraded.	One possible cause is that a broadcast storm occurred and that a network loop (redundant path) was created.	Break the loop by making sure that only one path exists from any networked device to any other networked device. After you connect to the local browser interface of the switch, you can configure the Spanning Tree Protocol (STP) to prevent network loops.
A segment or device is not recognized as part of the network.	One or more devices are not properly connected, or cabling does not meet Ethernet guidelines.	Verify that the cabling is correct. Make sure that all connectors are securely positioned in the required ports. It is possible that equipment was accidentally disconnected.
Combined speed and activity LED is blinking continuously on all connected ports and the network is disabled.	A network loop (redundant path) was created.	Break the loop by making sure that only one path exists from any networked device to any other networked device. After you connect to the local browser interface of the switch, you can configure the Spanning Tree Protocol (STP) to prevent network loops.
A unit is linked to a stack but does not join the stack.	The stacking ports of the new unit are configured differently from the stack, or the unit is configured as a standalone unit.	Remove the unit from the stack. Use the local browser interface to configure the unit as a stackable unit, with combo links used as the stacking ports.

PoE Troubleshooting Suggestions

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

- Make sure that the PoE Max LED on the front panel of the switch 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. For each powered device (PD) that is connected to the switch, the associated port LED on the port card lights the appropriate color (see [Port Cards and Port LEDs](#) on page 18). If the port LED lights a color that indicates that no PoE power is being delivered, a PoE fault occurred and PoE halted because of one of the conditions that are listed in the following table.

Table 11. PoE fault conditions and possible solutions

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

Additional Troubleshooting Suggestions

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

- **Network adapter cards.** Make sure that the network adapters that are installed in the computers are in working condition and the software driver was installed.
- **Configuration.** If problems occur after you alter the network configuration, restore the original connections and determine the problem by implementing the new changes one step at a time. Make sure that cable distances, repeater limits, and other physical aspects of the installation do not exceed the Ethernet limitations.
- **Switch integrity.** If necessary, verify the integrity of the switch by resetting it. To reset the switch, disconnect the AC power from the switch and then reconnect the AC power. If the problem continues, contact NETGEAR Technical Support. For more information, visit the support website at netgear.com/support.
- **Autonegotiation.** The RJ-45 multispeed Ethernet ports negotiate speed, duplex mode (if applicable), 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.