

NETGEAR®

Hardware Installation Guide

Managed Stackable Switch M5300 Series Hardware Installation Guide

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202-12075-01	February 2020	The CD is no longer shipped with product. Removed info about CD Updated branding Updated support and compliance section <u>Safety instructions on page 8</u> updated to reflect current standards Adapter (AX745) information added Added LED information to the "LED descriptions for the M5300 Series switches" table on <u>Table 1 on page 6</u> : - Added Poe and non-PoE, specific LED information and specs. - Right side and Left side LED specs added - Split the original 10/100/1000M ports row into separate rows for PoE and non PoE
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1

Introduction

The NETGEAR M5300 Series gigabit stackable switches are state-of-the-art, high-performance, IEEE-compliant network solutions. They include powerful management features that you can use to eliminate bottlenecks, boost performance, and increase productivity.

This guide describes hardware installation and basic troubleshooting for the M5300 Series switches. The M5300 Series includes the following:

- ProSafe 24-port Gigabit L2+ with 10 Gigabit Stacking M5300-28G
- ProSafe 48-port Gigabit L2+ with 10 Gigabit Stacking M5300-52G
- ProSafe 24-port Gigabit L2+ PoE+ with 10 Gigabit Stacking M5300-28G-POE+
- ProSafe 48-port Gigabit L2+ PoE+ with 10 Gigabit Stacking M5300-52G-POE+
- ProSafe 24-port Gigabit Fiber L3 with 10 Gigabit Stacking M5300-28GF3
- ProSafe 24-port Gigabit L3 with 10 Gigabit Stacking M5300-28G3
- ProSafe 48-port Gigabit L3 with 10 Gigabit Stacking M5300-52G3

These switches can be freestanding, or rack-mounted in a wiring closet or an equipment room. For information about features for each product, see the NETGEAR website at: <https://www.netgear.com/>.

M5300 series front panels

The following figures show the front panels of the M5300 Series switches. The front panel contains LEDs, a Reset button, 1G copper ports or 1G fiber ports, 1G copper/fiber combo ports, and 10G copper/fiber combo ports. The SFP+ ports support any combination of ProSafe 10GBASE-SR SFP+ Module AXM761, ProSafe 10GBASE-LR SFP+ Module AXM762, or ProSafe 10GBASE-LRM SFP+ Module AXM763. It also supports direct attached cable AXC761 and AXC763. See [SFP+ and SFP modules on page 15](#).

NETGEAR Managed Stackable Switch M5300 Series

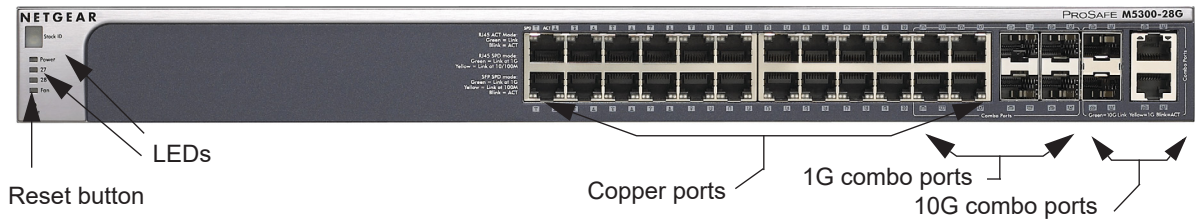


Figure 1. Typical series front panel

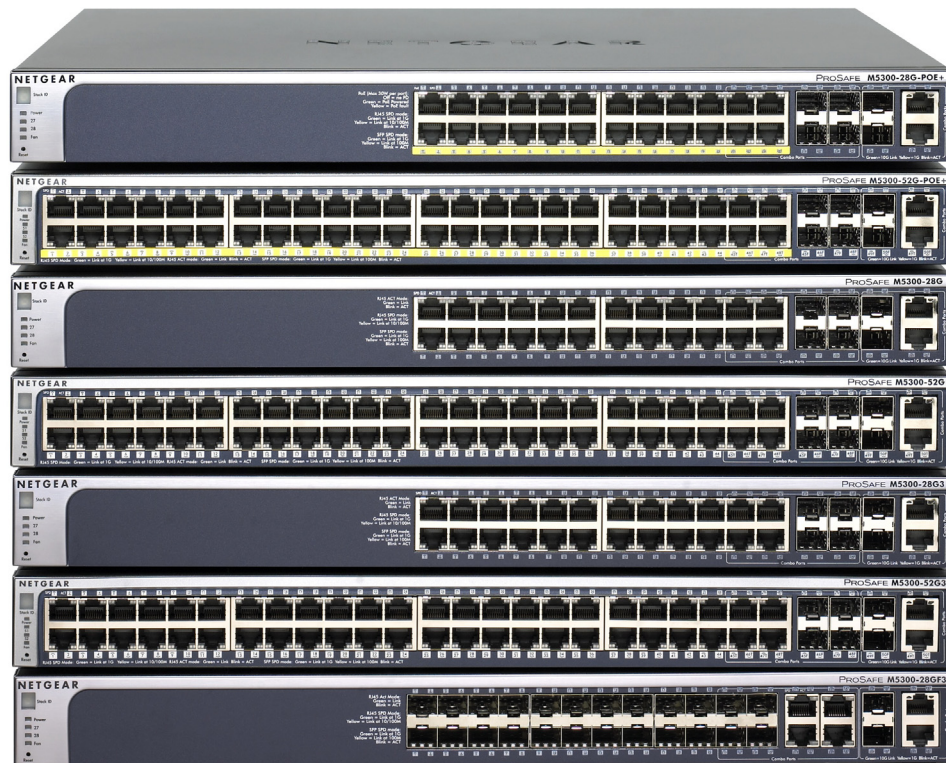


Figure 2. M5300 series front panels**Table 1. LED descriptions for M5300 Series switches**

LED	Description
Stack ID	Stack ID is the stack member ID (1–8) that the software assigns to the switch. The decimal point to the right of the ID number lights up when the switch acts as a master unit in an M5300 Series stack.
Power	• Solid green: The power module is present, is supplying power to the switch, and is working normally. • Blinking green: The power module has failed, and system power is being supplied from the RPS, or the RPS4000 is in EPS mode. • Solid yellow: The system is in the boot-up stage. • Blinking yellow: System boot-up has failed or there is some other failure. • Off: Power is disconnected.
Fan	• Solid green: The fan is operating normally. • Solid yellow: The fan has failed. • Off: No fan is detected.
10GBT ports (1 LED per port)	SPD/ Link/ACT LED: • Off: No SFP module link is established on the port. • Solid Green: A valid 10 Gbps link is established on the port. • Blinking Green: –10 Gbps packet transmission or reception is occurring on the port. • Solid Yellow: A valid 100 Mbps or 1 Gbps link is established on the port. • Blinking Yellow: 100 Mbps or 1 Gbps packet transmission or reception is occurring on the port. Note: If a combo port media changes to SFP+, the copper port LED turns off.
SFP+ ports (1 LED per port)	• Off: No SFP/SFP+ module link is established on the port. • Solid green: A valid 10 Gbps SFP+ module link is established on the port. • Blinking green: The port is transmitting or receiving packets at 10 Gbps. • Solid yellow: A valid 1 Gbps SFP module link is established on the port. • Blinking yellow: Packet transmission or reception is occurring on the port at 1 Gbps. Note: If a combo port media changes to copper, the SFP/SFP+ port LED turns off.

Table 1. LED descriptions for M5300 Series switches (continued)

LED	Description
PoE model 10/100/1000M ports (2 LEDs per port)	SPD/Link/ACT LED (Right side): • Off: No link is established on the port. • Solid green: A valid 1000Mbps link is established on the port. • Blinking green: The port is sending or receiving packets on the port at 1000 Mbps. • Solid Yellow: A valid 10/100 Mbps link is established on the port. • Blinking Yellow: The port is sending or receiving packets on the port at the 10/100 Mbps. PoE Status LED (Left side): • Off: No PoE powered device (PD) connected. • Solid green: The PoE PD is connected and the port is supplying power successfully. • Solid yellow: Indicates one of the following failures resulted in stopping power to that port: - Short circuit on PoE power circuit - PoE power demand exceeds power available - PoE current exceeds PD's classification - Out of proper voltage band (44 ~ 57 VDC for 802.3af, 50~57 VDC for 802.3at) Note: If combo port media changes to fiber, the copper port LED turns off.
Non PoE model 10/100/1000M ports (2 LEDs per port)	Link/ACT LED (Right side): • Off: No link is established on the port. • Solid green: A valid link is established on the port • Blinking green: The port is sending or receiving packets. SPD LED (Left side): • Off: No link or a valid link is established on the port • Solid green: A valid 1000 Mbps link is established in the port • Solid Yellow: A valid 10/100 Mbps link is established on the port. Note: If combo port media changes to fiber, the copper port LED turns off.
SFP ports (1 LED per port)	SPD/Link/ACT LED: • Off: No SFP module link is established on the port. • Solid Green: A valid 1000 Mbps SFP module link is established on the port. • Blinking Green: 1000 Mbps packet transmission or reception is occurring on the port. • Solid Yellow: A valid 100 Mbps SFP module link is established on the port. • Blinking Yellow: 100 Mbps packet transmission or reception is occurring on the port. Note: If combo port media changes to copper, the SFP port LED turns off.

M5300 series rear panel

The rear panel has a DB9 console port, a mini-USB console port, a USB host port, a replaceable power supply, and an RPS interface. The IO module bays support any combination of:

- ProSafe 10 Gigabit Ethernet XFP Adapter (AX741)
- ProSafe 24 Gigabit Stackable Module (AX742)
- ProSafe 10 Gigabit Ethernet SFP+ Adapter (AX743)
- ProSafe 10 Gigabit Ethernet CX4 Adapter (AX744)
- ProSafe 1 Port 10 GBASE-T I/O Module Adapter (AX745)

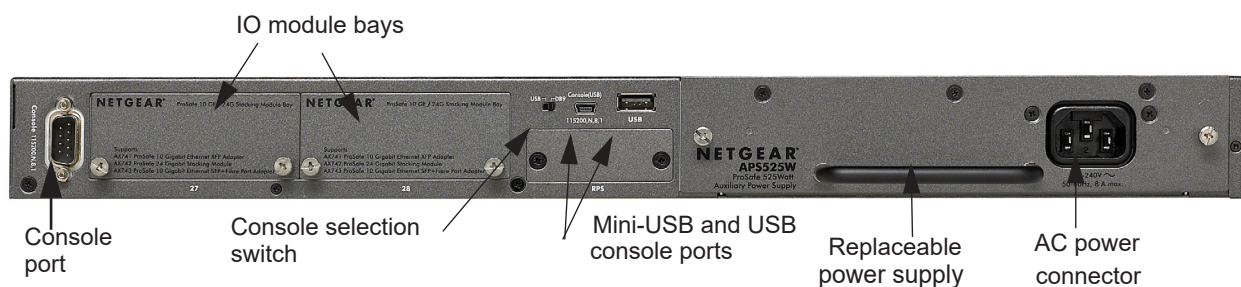


Figure 3. M5300 Series rear panel

Safety instructions

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:
 - 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.

2

Hardware Installation

This chapter explains how to install the hardware for the Managed Stackable Switch M5300 Series.

Package contents

Each switch is packed and shipped separately. The package contains the following items:

- Managed stackable switch with preinstalled software
- Power cord
- USB console cable
- Rubber footpads for tabletop installation
- Rubber caps for the SFP / SFP+ sockets
- Rack-mounting kit
- USB console cable with one mini-B connector and one type A connector

Protect against electrostatic discharge



WARNING:

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

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

1. 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.
2. Before moving a sensitive component, place it in an antistatic container or package.
3. Handle all sensitive components in a static-safe area. If possible, use antistatic floor pads, workbench pads, and an antistatic grounding strap.

Unpacking the hardware

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

1. Place the container on a clean flat surface, and cut all straps securing the container.
2. Unpack the hardware from the boxes.

Carefully remove the hardware, and place it on a secure and clean surface. See [Select a location on page 13](#).

3. Remove all packing material.
4. Make sure that all items are present. See [Package contents on page 11](#).

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

5. Inspect the products and accessories for damage. Report any damage immediately.

Installation

Install the equipment in the sequence presented in this section:

1. Select a location. See [Select a location on page 13](#).
2. Install the switch. See [Install the switch on page 14](#).
3. Check the installation. See [Check the installation on page 15](#).
4. Apply power and check the LEDs. See [Connect to power and check the LEDs on page 15](#).

Note: This equipment is intended to be installed and used in a location other than home, school, or a public area accessible to the general population.

Note: The thumbscrews on the rear modules must be tightened with a tool after both initial installation and subsequent access to the modules.

Select a location

The switch can be mounted in a standard 19-inch (48.26-centimeter) rack, wall-mounted, or left freestanding (placed on a tabletop).

The site where you install the switch can greatly affect its performance. Before installing the switch or switches, make sure that the chosen installation location meets the following site requirements.

Table 2. Site requirements for switch location

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 need the rack-mount kit supplied with your switch.
Access	Locate the switch in a position that lets you access the front panel RJ-45 ports, view the front panel LEDs, and access the rear-panel power connector.
Power source	Provide a power source within 6 feet (1.8 meters) of the installation location. Power specifications for the switch are shown in Appendix A, Technical Specifications on page 24 . Be sure that the AC outlet is not controlled by a wall switch, which can accidentally turn off power to the outlet and the switch.
Environment	Install the switch in a site free from strong electromagnetic field generators (such as motors), vibration, dust, and direct exposure to sunlight.
Temperature	The ambient switch operating temperature range is 0° to 50°C (32° to 122°F). Keep the switch away from heat sources such as direct sunlight, warm air exhausts, hot-air vents, and heaters.
Operating humidity	Install the switch in a dry area with a maximum relative humidity of 90%, non-condensing.
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. Be sure that there is adequate airflow in the room or wiring closet where you intend to install the switch.
Cabling	Route the cable to avoid sources of electrical noise such as radio transmitters, broadcast amplifiers, power lines, and fluorescent lighting fixtures.

Install the switch

You can install the switch on a flat surface or in a standard 19-inch rack.

Install the Switch on a Flat Surface

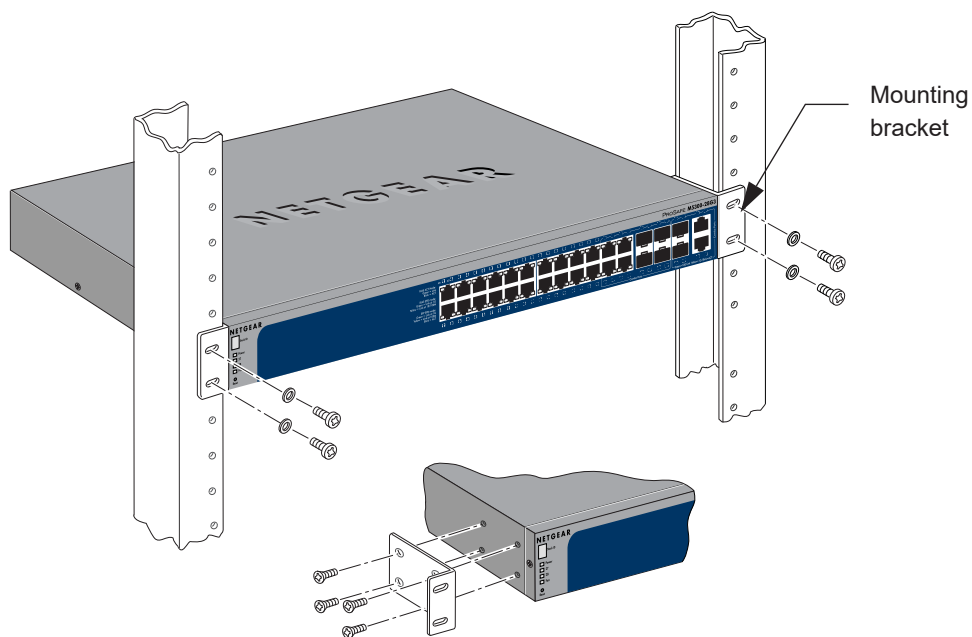
The switch ships with four self-adhesive rubber footpads. Stick one rubber footpad on each of the four concave spaces on the bottom of the switch. The rubber footpads cushion the switch against shock and vibrations.

Install the Switch in a Rack

Note: You need the 19-inch rack-mount kit supplied with your switch.

To install the switch in a rack:

1. Attach the supplied mounting brackets to the side of the switch.
2. Use the provided Phillips head screws to fasten the brackets to the sides of the switch.



3. Tighten the screws with a No. 1 Phillips screwdriver to secure each bracket.
4. Align the bracket and rack holes. Use two pan-head screws with nylon washers to fasten each bracket to the rack.
5. Tighten the screws with a No. 2 Phillips screwdriver to secure the switch in the rack.

Check the installation

Before you apply power, perform the following checks:

1. Inspect the equipment thoroughly.
2. Verify that all cables are installed correctly.
3. Check cable routing to ensure that cables are not damaged and do not create a safety hazard.
4. Be sure that all equipment is mounted properly and securely.

Connect to power and check the LEDs

The switch does not have an On/Off switch. The only way to apply or remove power is to connect or disconnect the power cord. Before you connect the power cord, select an AC outlet that is not controlled by a wall switch (which can turn off power to the switch).

After you select an appropriate outlet, follow these steps to apply AC power:

1. Connect one end of the AC power adapter cable to the rear of the switch, and the other end to a grounded three-prong AC outlet.
2. Check the Power LED on the front panel of the switch. The LED lights up in the following sequence:
 - The LED turns yellow as the switch runs a power-on self-test (POST).
 - If the switch passes the test, the LED turns green. The switch is working and ready to pass data.
 - If the POST fails, the Power LED blinks yellow.

If the Power LED does not light up, check that the power cable is plugged in correctly and that the power source is good. For help with troubleshooting, see [Chapter 3, Troubleshooting on page 22](#).

SFP+ and SFP modules

SFP+ and SFP modules (sold separately) can be inserted directly into the switch ports.

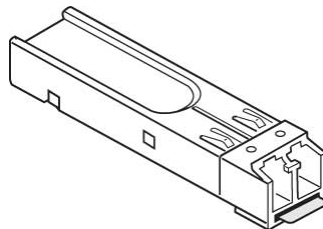
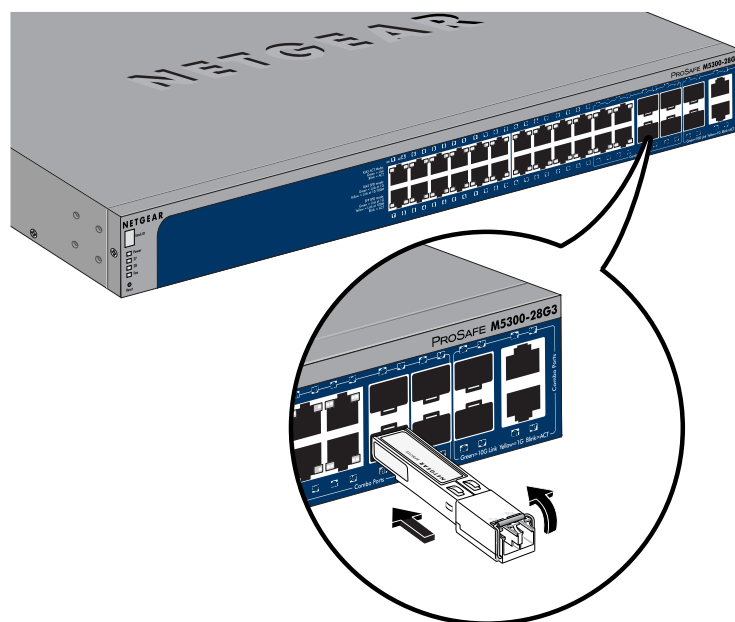


Figure 4. SFP+ SFP Modules

- AXM761: SFP+ module with an LC connector that is compatible with the IEEE 802.3ae (10GBASE-SR)
- AXM762: SFP+ module with an LC connector that is compatible with the IEEE 802.3ae (10GBASE-LR)
- AXM763: SFP+ module with an LC connector that is compatible with the IEEE 802.3aq (10GBASE-LRM)
- SFP+ module with an LC connector that is compatible with the IEEE 802.3aq (10GBASE-LRM) and IEEE 802.3ae (10GBASE Ethernet) standards.
- AGM731F: SFP module with an LC connector, compatible with the IEEE 802.3z 1000BASE-SX standard.
- AGM732F: SFP module with an LC connector, compatible with the IEEE 802.3z 1000BASE-LX standard.
- SFP or SFP+ module with an LC connector, compatible with the IEEE 802.3z 1000BASE-X standard.
- AFM735: SFP module with an LC connector, compatible with the IEEE 802.3u 100BASE-FX standard.
- SFP or SFP+ module with an LC connector, compatible with the IEEE802.3u 100BASE-FX Standard.

To install SFP+ or SPF modules:

1. Insert the SFP+ or SPF module into the switch port.
2. Press firmly to ensure that the module seats into the connector.



Create a stack

You can connect up to eight switches to form a stack with a single management IP address. The switches automatically select a master unit. Once the master is selected, you can use its console to manage all the switches in the stack. You can use either the SFP+ ports on the front panel or the IO modules on the rear panel of a switch to create a stack.

Stack Using SFP+ on the Front Panel

The cabling shown in the stacking procedure has a single loop. You can use additional loops to provide redundancy and allow load balancing.

Any SFP+ ports on the front panel can be used for stacking using the following:

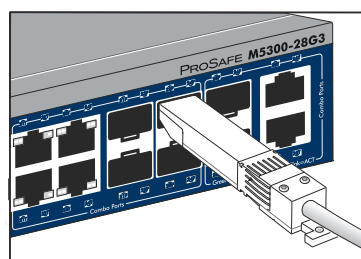
- Two AXM761/AXM762/AXM763 10G SFP+ modules per switch
- Two AXC761/AXC763 Direct Attach SFP+ cables per switch
- Two Cat 6a RJ45 patch cables per switch

Use fiber links between stacked switches in different locations. Different cable types can be used in a stack. For SFP+ ports, use LC optical cables. For RJ45 ports, use Cat 6A cables.

To set up a stack:

1. Install a 10G SFP+ module (AXM761/762/763) into the SFP+ port at the front of each switch.
2. Connect a fiber cable between a pair of 10G SFP+ modules (AXM761/762/763) modules in each switch in a stack.

Connecting switches with AXM modules and stacking cables



3. Connect each switch to the next in a cascade to build the backplane of the stack. Finally, connect the last switch in the stack to the first switch to close the ring and provide redundancy and resiliency to the stack.

The switches automatically select the master switch in the stack.

4. To use the console and command-line interface (CLI), use a serial cable to connect the console to the master switch. This single console connection lets you manage all the switches in the stack.

For information about working with the CLI, visit www.netgear.com/support to download the *Command Line Interface manual*.

Power module bay

The power module bay provides an easy way to replace a failed power module APS135W or APS525W. If the switch must continue to operate while you replace the power supply, another APS135 or APS525 must be installed in the second power supply bay on the switch rear panel.

Install a Power Module

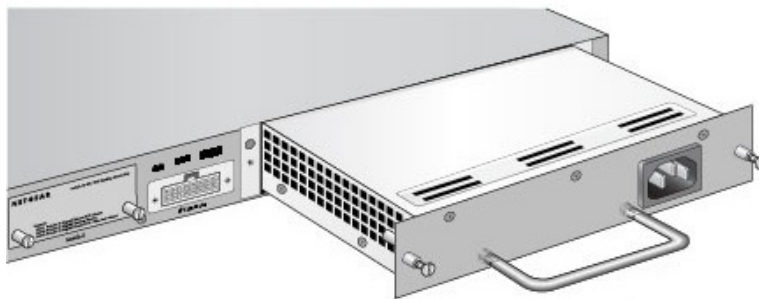
To install a power module:



WARNING:

When inserting a power module into the switch, do not use unnecessary force. Doing so can damage the connectors on the rear of the supply and on the midplane.

1. Insert the new power supply module into the power module slot, and gently push the module into the slot.



2. Align the two captive screws with the screw holes in the switch rear panel.
3. Using a screwdriver, gently tighten the captive screws.

4. Connect the power cord to the module and to an AC-powered outlet.

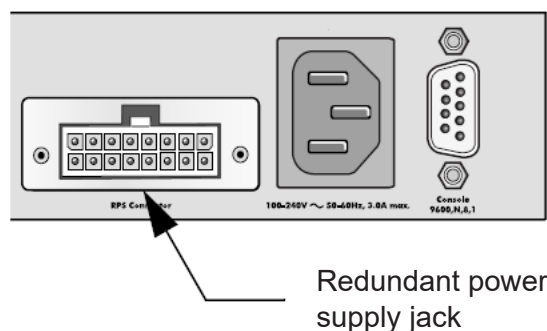
Remove a power module

To remove a power module:

1. Disconnect the power cord from the power module.
2. Remove the power cord from the power connector.
3. Loosen the two captive screws on the power module.
4. Remove the power module from the power module slot by pulling on the extraction handle.

Connect a redundant power supply

Each switch has a redundant power supply (RPS) connector at the rear of the switch next to the power receptacle.



You can connect an external UL-listed DC-to-DC power supply unit to the switch to provide redundant power in case the primary power supply fails. To connect an (RPS) unit to the switch, first turn off the switch. When the power is off, you can remove the cover plate and connect the RPS unit to the switch. After all connections are completed, apply power to the switch.

Connect equipment to the switch

You can connect devices, a Gigabit Ethernet module, and/or a console to the switch.

RJ-45 ports

The switch uses Auto Uplink™ technology, which enables you to attach devices using either straight-through or crossover cables. Use a Category 5 (Cat 5) unshielded twisted-pair (UTP) cable 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).

Connect a console to the switch

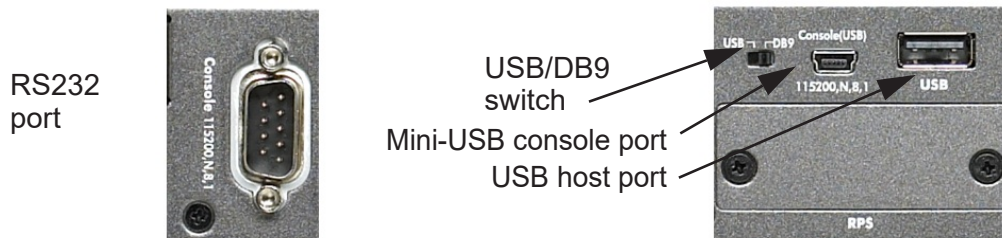
After you install the switch and apply power, you can connect to it with a terminal or workstation. You can use the command-line interface (CLI) to identify the IP address.

To use a console, you need the following items:

- VT100/ANSI terminal, or a Windows or Apple Macintosh computer, or a UNIX workstation.
- Depending on the connector type at your computer or terminal, you need an appropriate cable.
 - USB cable (shipped with the product) for use with the USB port
 - Null-modem cable (not included) with 9-pin connectors (DB9) on each end for use with the DB9 port

To connect a console to the switch:

1. Connect a cable to the appropriate console port on the rear of the switch.



2. If you are using the DB9 or USB console port, select the appropriate setting using the console slide switch on the rear panel.
 - Select the mini-USB (cable included) as the console port by pushing the slide switch to the left. To download the USB driver onto your computer, visit <http://www.netgear.com/support/>, enter your model number in the search box, and click the Downloads button on the product page.
 - Select the DB9 (cable not included) as the console port by pushing the slide switch to the right.
3. Connect the other end of the cable to your computer, workstation, or terminal.
4. If you attached a workstation, start a terminal emulation program.
 - On Microsoft Windows computers, you can use HyperTerminal or to install another terminal emulator such as Tera Term.
 - On a Macintosh, you can use ZTerm.
 - On UNIX systems, you can use a terminal emulator such as TIP.
5. Configure the terminal emulation program 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 will need to configure it. The following documents are provided for this purpose:

- Installation guide: Explains basic setup and configuration.
- Command line manual: Gives detailed examples of how to use the CLI.
- Software administration guide: Describes configuration tasks.

Note: To access and download these documents, visit <https://www.netgear.com/support/>, enter your model number in the search box, and click the **Downloads** button on the product pages.

3

Troubleshooting

Troubleshooting chart

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

Table 3. Troubleshooting chart

Problem	Cause	Solution
Power LED is off.	No power is received.	Check the power cord connections for the switch at the switch and the connected device. Make sure that all cables used are correct and comply with Ethernet specifications.
Link LED is off or intermittent.	Port connection is not working.	• Check the crimp on the connectors. Make sure that the plug is fully inserted and locked into the port at both the switch and the connecting device. • Make sure that all cables used are correct and comply with Ethernet specifications. See Appendix A, Technical Specifications on page 24. • Check for a defective adapter card, cable, or port by testing it in an alternate environment where all products are functioning.
Slow file transfer or there is performance degradation.	Half- or full-duplex setting on the switch and the connected device are not the same.	• Make sure that the attached device is set to auto negotiate. • Check the system message log.
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. Be sure that all connectors are securely positioned in the required ports. Equipment might have been accidentally disconnected.
ACT LED flashes continuously on all connected ports, and the network is disabled.	A network loop (redundant path) has been created.	Break the loop by ensuring that there is only one path from any networked device to any other networked device.

Additional troubleshooting suggestions

If the suggestions in [Table 3 on page 22](#) do not solve your problem, refer to the troubleshooting suggestions in this section.

- **Network adapter cards**
Make sure that the network adapter cards installed in the PCs are in working condition and the software driver has been installed.
- **Configuration:**
If problems occur after you change the network configuration, restore the original connections. Then find the problem by making the connections, 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:**
You can verify the integrity of the switch by resetting the switch. To reset the switch, use the Tools > Reset command or remove AC power from the switch and then reapply AC power. If the problem continues, contact NETGEAR technical support.
- **Auto-negotiation:**
If the device at the other end of the link supports auto-negotiation, the copper 10/100/1000 Mbps ports negotiate the correct duplex mode and speed. If the device does not support auto-negotiation, the switch determines only the speed correctly, and the duplex mode defaults to half-duplex. If the attached device supports auto-negotiation, the fiber gigabit ports negotiate speed, duplex mode, and flow control.



Technical Specifications

Specifications for M5300 series

Table 4. M5300 Series technical specifications

Feature	M5300
IEEE Network Protocol and Standards compatibility	• 802.3i 10BASE-T • 802.3u 100BASE-TX • 802.3z 1000BASE-X • 802.3ab 1000BASE-T • 802.3ae 10GBASE-SR • 802.3ae 10GBASE-LR • 802.3aq 10GBASE-LRM • 802.3an 10GBASE-T • 802.3ak 10GBASE-CX4 • 802.3az-EEE (only in 10GBASE-T) • 802.3x Flow Control

Table 4. M5300 Series technical specifications (continued)

Layer 2 services	• 802.1Q Static VLAN (Up to 4k) • 802.1p Class of Service (CoS) • 802.1D Spanning Tree Protocol (STP) • 802.1w Rapid Spanning Tree Protocol (RSTP) • 802.1s Multiple Spanning Tree Protocol (MSTP) • 802.3ad Link Aggregation (LACP) • IGMP v1, v2 Snooping Support • DHCP L2 Relay • UDP Relay • SNTP • SNMP v1/v2/v3 • LLDP/LLDP-MED • ISDP • MLD Snooping • Multicast VLAN Registration (MVR) • Jumbo Frames (up to 12 KB) • GARP/GVRP • Voice VLAN • Auto VOIP
Switch management	• Port mirroring (TX, RX, Both) • CPU port mirroring • SNMP v1, v2c, v3 • RFC2819 RMON Groups 1, 2, 3, and 9, RFC1213 MIB II • RFC1643 Ethernet Interface MIB • RFC1493 Bridge MIB • RFC2131 DHCP Client (and BootP) • RFC2138 RADIUS Client • Broadcast storm control • Telnet sessions for management CPU (5) • Ping support • ARP support • Private enterprise MIB • Config File up/down load (X/Y/Z Modem, TFTP, SCP, SFTP, USB, HTTP/HTTPS) • Runtime image download (X/Y/Z Modem, TFTP, SCP, SFTP, USB, HTTP/HTTPS) • Command-line interface • Web-based graphic user interface • Simple Network Time Protocol (SNTP) • Syslog • SSLv3/TLSv1.0 Web Security • Secured Shell (SSHv1, v2)

Table 4. M5300 Series technical specifications (continued)

QoS	• Mapping 802.1p, DSCP • Strict Priority Scheduling • Weighted Round Robin • Weighted Random Early Detection (WRED) • Ingress rate limiting • Egress rate limiting (1 Kbps) • DiffServ QoS
Security	• IAS • RADIUS • TACACS+ • 802.1x • MAC Filter • Port Security • Protected Port • Private VLAN • Storm Control • DHCP Snooping • IP Source Guard • Dynamic ARP Inspection • Captive Portal • MAC ACL (inbound/outbound) • IP ACL (inbound/outbound) • IPv6 ACL (inbound/outbound)
System Service	• DHCP, BOOTP Relay • DHCP Server
Stacking	• Maximum of 8 switches in a single stack • RING Topology support • CHAIN Topology support
Addressing	48-Bit MAC address
MAC Address entries	32K MAC addresses per system
Performance	• Forwarding Modes: Store-and-Forward • Network latency: - 3.782 μs for 64-byte frames for 1000 Mbps to 1000 Mbps transmission - 8.415 μs for 64-byte frames for 10G to 10G transmission

Table 4. M5300 Series technical specifications (continued)

Interface	M5300-28G/M5300-28G3/M5300-28G-PoE+ • 24 RJ-45 port for 10/100/1000M • 24 PoE+ port (M5300-28G-PoE+ only) • 4 SFP/RJ45 combo port for 100M/1000M • 2 SFP+/RJ45 combo port for 1G/10G • 1 power module slot • 2 IO module bays • 1 USB host port • 1 DB9 console port • 1 mini-USB console port
	M5300-52G/M5300-52G3/M5300-52G-PoE+ • 48 RJ-45 port for 10/100/1000M • 48 PoE+ port (M5300-52G-PoE+ only) • 4 SFP/RJ45 combo port for 100M/1000M • 2 SFP+/RJ45 combo port for 1G/10G • 1 power module slot • 2 IO module bays • 1 USB host port • 1 DB9 console port • 1 mini-USB console port
	M5300-28GF3 • 24 SFP port for 10/100/1000M • 4 SFP/RJ45 combo port for 100M/1000M • 2 SFP+/RJ45 combo port for 1G/10G • 1 power module slot • 2 IO module bays • 1 USB host port • 1 DB9 console port • 1 mini-USB console port
Bandwidth	• 136 Gbps (M5300-28G3/M5300-28G/M5300-28GF3/M5300-28G-POE+) • 184 Gbps (M5300-52G3/M5300-52G/M5300-52G-POE+)
Dimensions (W x D x H)	445 x 392 x 42 mm (17.5 x 15.4 x 1.7 in.)
Environment	Operating: - Temperature: 32° to 122°F (0° to 50°C) - Humidity: 90% maximum relative humidity, noncondensing - Altitude: 10,000 ft (3,000 m) maximum Non-Operating: - Temperature: – 4° to 158°F (–20° to 70°C) - Humidity: 95% maximum relative humidity, noncondensing - Altitude: 10,000 ft (3,000 m) maximum

Table 4. M5300 Series technical specifications (continued)

Electromagnetic emissions and immunity	CE mark, commercial, FCC Part 15 Class A, VCCI Class A, Class A EN 55022 (CISPR 22) Class A, Class A C-Tick, EN 50082-1, EN 55024
Safety	CE mark, commercial, CSA certified (CSA 22.2 #950), UL listed (UL 1950)/cUL IEC950/EN60950

Table 5. Technical specifications - model specific

Feature	M5300-28G-POE+ M5300-52G-POE+ M5300-28G M5300-52G	M5300-28G3 M5300-52G3 M5300-28GF3
Layer 3 services	- VLAN routing - Port routing - RFC2328 OSPF v2 (license needed) - RFC2740 OSPF for IPv6 (license needed) - RFC2453 RIP v2 (license needed) - RFC1112 IGMP v1 (license needed) - RFC2236 IGMP v2 (license needed) - RFC3376 IGMP v3 (license needed) - RFC4601 PIM-SM (license needed) - RFC3973 PIM-DM (license needed) - RFC2710 MLD (license needed)	- VLAN routing - Port routing - RFC2328 OSPF version 2 - RFC2740 OSPF for IPv6 - RFC2453 RIP Version 2 - RFC1112 IGMP version 1 - RFC2236 IGMP version 2 - RFC3376 IGMP version 3 - RFC4601 PIM-SM - RFC3973 PIM-DM - RFC2710 MLD
Heat dissipation (Btu/hr)	M5300-28G-PoE+ 1829 M5300-52G-PoE+: 1896 M5300-28G: 186 M5300-52G3: 268	M5300-28G3: 186 M5300-52G3: 268 M5300-52GF3: 274
Acoustic noise (dB) (ANSI-S10.12)	MM5300-28G-POE+: 44.8 M5300-28G: 37.3 M5300-52G-POE+: 43.2 M5300-52G: 34.9	M5300-28G3: 37.3 M5300-28GF3: 35.6 M5300-52G3: 34.9
Maximum power consumption	M5300-28G-PoE+: 535W M5300-52G-PoE+: 556W M5300-28G: 55W M5300-52G: 79W	M5300-28G3: 55W M5300-52G3: 79W M5300-28GF3: 80W

Table 5. Technical specifications - model specific

Feature	M5300-28G-POE+ M5300-52G-POE+ M5300-28G M5300-52G	M5300-28G3 M5300-52G3 M5300-28GF3
Mean time between failure (MTBF)	MTBF at 55°C M5300-28G: 183046 hrs (~20.9 years) M5300-52G: 126162 hrs (~14.4 years) M5300-28G-PoE+: 85059 hrs (~9.7 years) M5300-52G-PoE+: 64838 hrs (~7.4 years) MTBF at 25°C M5300-28G: 560449 hrs (~64.0 years) M5300-52G: 421113 hrs (~48.1 years) M5300-28G-PoE+: 285927 hrs (~32.6 years) M5300-52G-PoE+: 194138 hrs (~22.2 years)	MTBF at 55°C M5300-28G3: 183046 hrs (~20.9 years) M5300-52G3: 126162 hrs (~14.4 years) M5300-28GF3: 163656 hrs (~18.7 years) MTBF at 25°C M5300-28G3: 560449 hrs (~64.0 years) M5300-52G3: 421113 hrs (~48.1 years) M5300-28GF3: 539481 hrs (~61.6 years)
Weight (kg)	M5300-28G-PoE+: 7.2 kg M5300-52G-PoE+: 7.8 kg M5300-28G: 6.3 kg M5300-52G: 6.9 kg	M5300-28G3: 6.3 kg M5300-52G3: 6.9 kg M5300-28GF3: 6.1 kg