



# NETGEAR<sup>®</sup>

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## Managed Stackable Switch M5300 Series

Hardware Installation Guide

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USA

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# Introduction

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# 1

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:

<http://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 Rset 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 14.

# NETGEAR Managed Stackable Switch M5300 Series

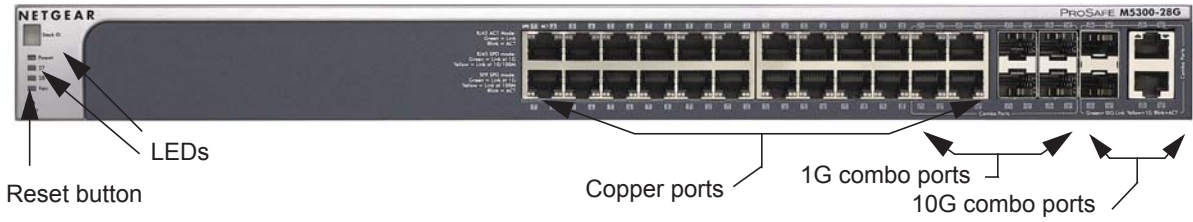


Figure 1. Typical series front panel



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	<ul style="list-style-type: none"> <li>• <b>Solid green:</b> The power module is present, is supplying power to the switch, and is working normally.</li> <li>• <b>Blinking green:</b> The power module has failed, and system power is being supplied from the RPS, or the RPS4000 is in EPS mode.</li> <li>• <b>Solid yellow:</b> The system is in the boot-up stage.</li> <li>• <b>Blinking yellow:</b> System boot-up has failed or there is some other failure.</li> <li>• <b>Off:</b> Power is disconnected.</li> </ul>
Fan	<ul style="list-style-type: none"> <li>• <b>Solid green:</b> The fan is operating normally.</li> <li>• <b>Solid yellow:</b> The fan has failed.</li> <li>• <b>Off:</b> No fan is detected.</li> </ul>
10GBT ports (1 LED per port)	<p>SPD/ Link/ACT LED:</p> <ul style="list-style-type: none"> <li>• <b>Off:</b> No SFP module link is established on the port.</li> <li>• <b>Solid Green</b> – A valid 10 Gbps link is established on the port.</li> <li>• <b>Blinking Green</b> –10 Gbps packet transmission or reception is occurring on the port.</li> <li>• <b>Solid Yellow</b> –A valid 100 Mbps or 1 Gbps link is established on the port.</li> <li>• <b>Blinking Yellow</b> – 100 Mbps or 1 Gbps packet transmission or reception is occurring on the port.</li> </ul> <p><i>Note: If a combo port media changes to SFP+, the copper port LED turns off.</i></p>
SFP+ ports (1 LED per port)	<ul style="list-style-type: none"> <li>• <b>Off:</b> No SFP/SFP+ module link is established on the port.</li> <li>• <b>Solid green:</b> A valid 10 Gbps SFP+ module link is established on the port.</li> <li>• <b>Blinking green:</b> The port is transmitting or receiving packets at 10 Gbps.</li> <li>• <b>Solid yellow:</b> A valid 1 Gbps SFP module link is established on the port.</li> <li>• <b>Blinking yellow:</b> Packet transmission or reception is occurring on the port at 1 Gbps.</li> </ul> <p><i>Note: If a combo port media changes to copper, the SFP/SFP+ port LED turns off.</i></p>

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

LED	Description
10/100/1000M ports (2 LEDs per port)	<p>Link/ACT LED:</p> <ul style="list-style-type: none"> <li>• <b>Off:</b> No link is established on the port.</li> <li>• <b>Solid green:</b> A valid link is established on the port.</li> <li>• <b>Blinking green:</b> The port is sending or receiving packets.</li> </ul> <p>SPD LED:</p> <ul style="list-style-type: none"> <li>• <b>Off:</b> No link or a valid link is established on the port.</li> <li>• <b>Solid yellow:</b> A valid 10/100 Mbps link is established on the port.</li> <li>• <b>Solid green:</b> A valid 1000 Mbps link is established on the port.</li> </ul> <p><i>Note: If combo port media changes to fiber, the copper port LED turns off.</i></p>
SFP ports (1 LED per port)	<p>SPD/Link/ACT LED:</p> <ul style="list-style-type: none"> <li>• <b>Off:</b> No SFP module link is established on the port.</li> <li>• <b>Solid Green:</b> A valid 1000 Mbps SFP module link is established on the port.</li> <li>• <b>Blinking Green:</b> 1000 Mbps packet transmission or reception is occurring on the port.</li> <li>• <b>Solid Yellow:</b> A valid 100 Mbps SFP module link is established on the port.</li> <li>• <b>Blinking Yellow:</b> 100 Mbps packet transmission or reception is occurring on the port.</li> </ul> <p><i>Note: If combo port media changes to copper, the SFP port LED turns off.</i></p>

## 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)
- Future adapter/module.

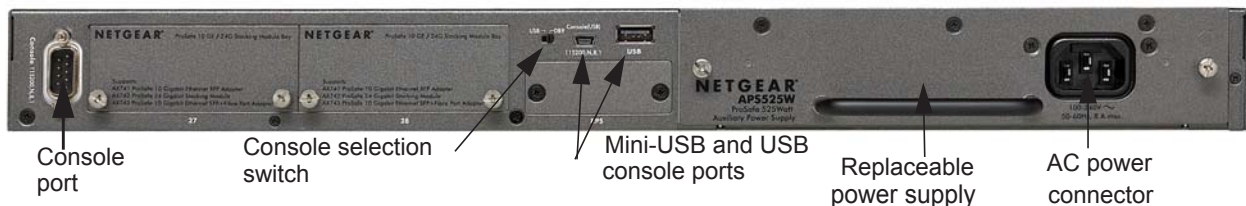


Figure 3. M5300 Series rear panel



## 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:

- 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. Only a trained service technician should service 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 has fallen into the product.
  - The product has been exposed to water.
  - The product has been 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:
  - 115 volts (V), 60 hertz (Hz) in most of North and South America and some Far Eastern countries such as South Korea and Taiwan
  - 100 V, 50 Hz in eastern Japan and 100 V, 60 Hz in western Japan
  - 230 V, 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 have not been 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

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# 2

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
- Resource CD: The CD either includes these documents or links to access them:
  - Managed Switch CLI Manual, Version 10.0
  - Managed Switch Administration Guide
  - Managed Switch Installation Guide
  - This hardware installation guide

### 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 12

3. Remove all packing material.
4. Make sure that all items are present. See [Package Contents](#) on page 10

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

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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 12
2. Install the switch. See [Install the Switch](#) on page 13
3. Check the installation. See [Check the Installation](#) on page 14
4. Apply power and check the LEDs. See [Connect to Power and Check the LEDs](#) on page 14

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**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.

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

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## 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	<ul style="list-style-type: none"> <li>• Desktop installations: Provide a flat table or shelf surface.</li> <li>• 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.</li> </ul>
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 <a href="#">Appendix A, Technical Specifications</a> 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*

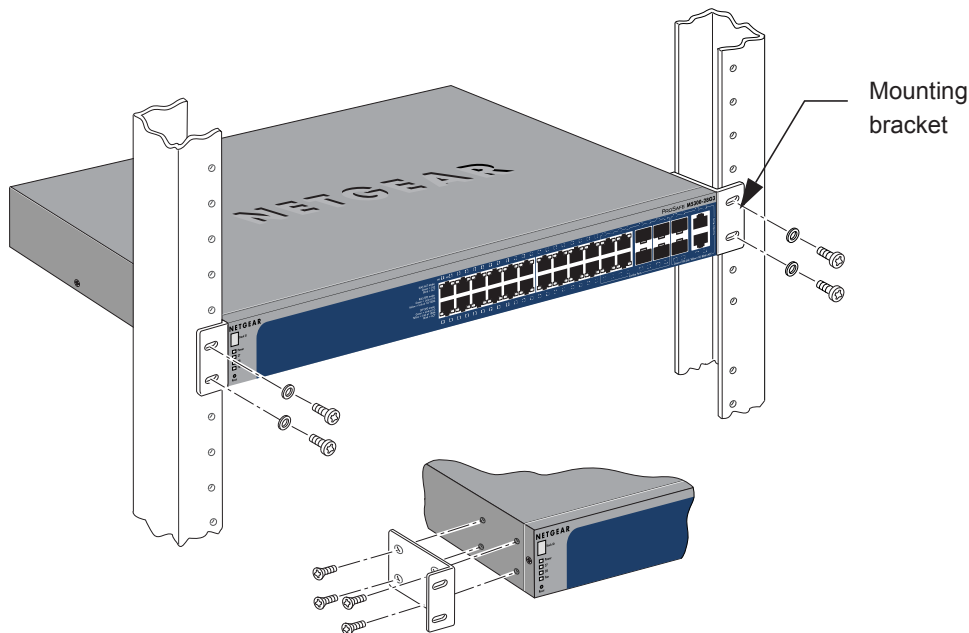
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**Note:** You need the 19-inch rack-mount kit supplied with your switch.

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➤ **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.

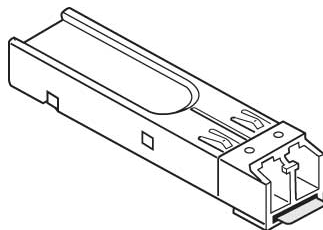
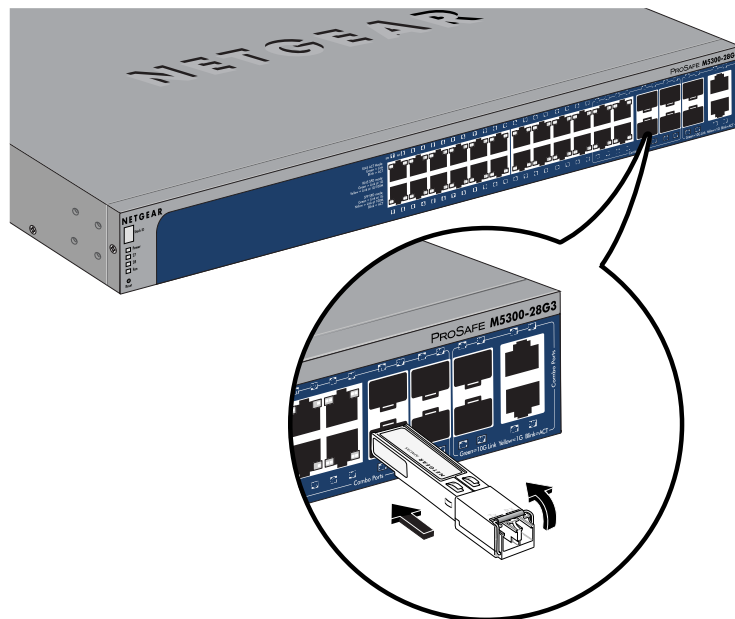


Figure 4. SFP+ SFP Modules

- 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 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 module with an LC connector, compatible with the IEEE802.3u 100BASE-FX Standard.

➤ **To install SFP+ or SFP modules:**

1. Insert the SFP+ or SFP 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:

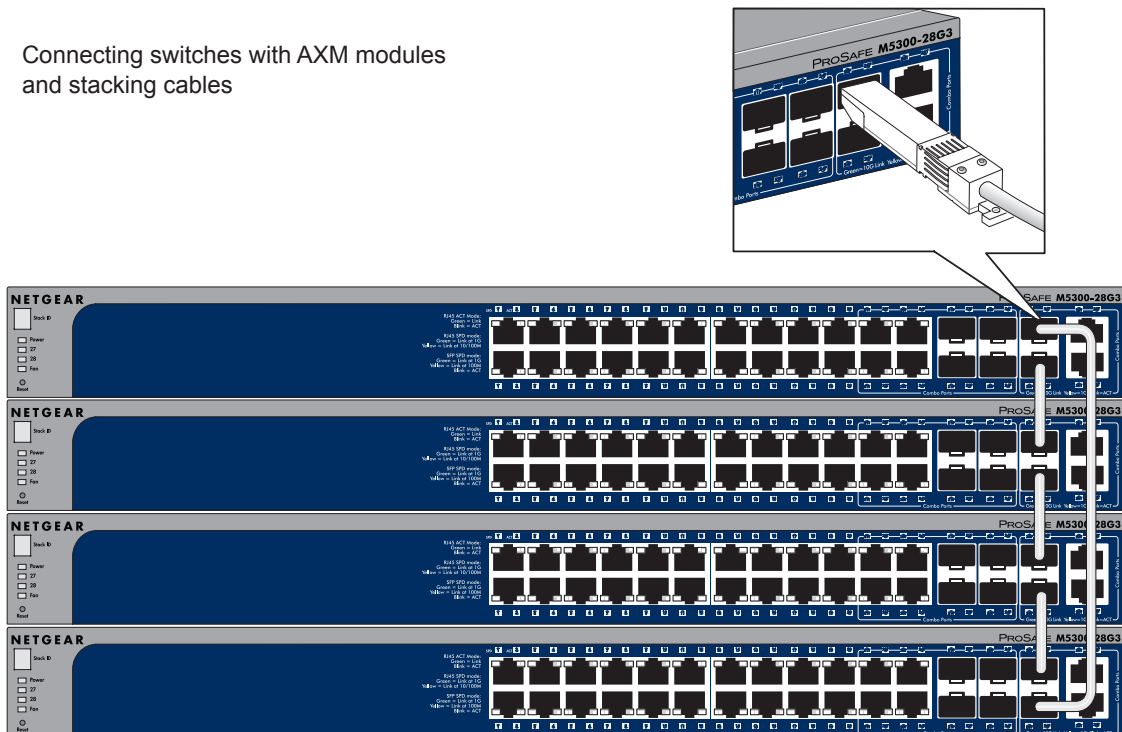
- Two AXM761/AXM762/AXM63 10G SFP+ modules per switch
- Two AXC761/AXC763 Direct Attach SFP+ cables per switch
- Two Cat6 RJ45 patch cables per switch

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 Cat6A 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, see the *Command Line Interface* manual on the resource CD that shipped with your product.

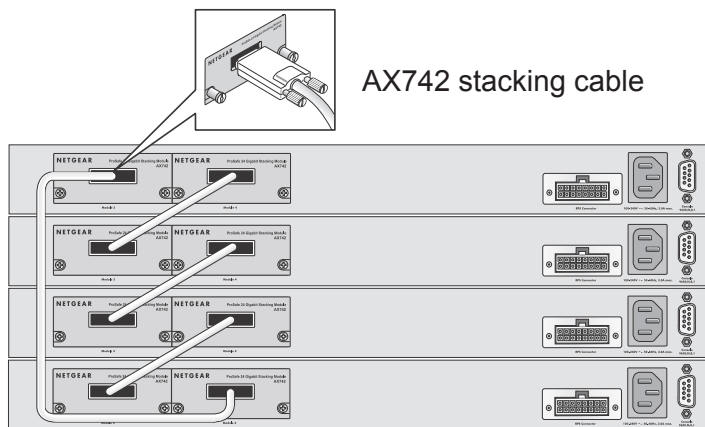
### Stacking Using IO Module on the Rear Panel

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.

Two of the I/O module slots can be used for stacking, while the remaining two I/O module bays can be used for 10-Gigabit Ethernet uplinks.

#### ➤ To set up a stack:

1. Install up to two 24-Gigabit Stackable Modules (AX742) into the high-speed I/O module bays at the front or the rear of each switch.
2. Connect the provided stacking cable between a pair of AX742 modules in each switch within a stack.



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, see the *Command Line Interface Reference for the ProSafe M5300 Series Stackable Switches* on the Resource CD that shipped with your product.

## 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

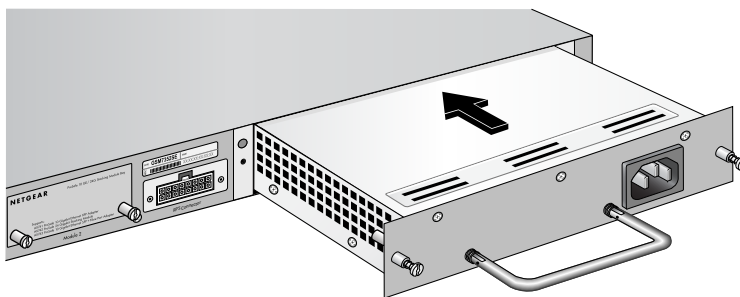
- To install a power module:



#### **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

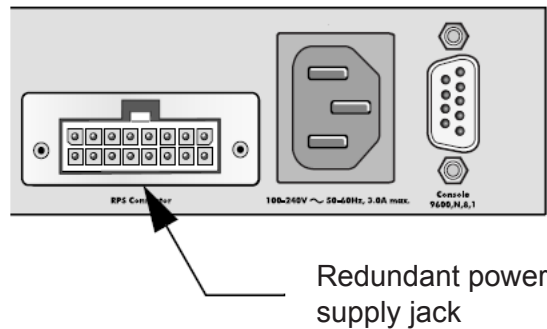
- To remove a power module:

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 (Cat5) unshielded twisted-pair (UTP) cable terminated with an RJ-45 connector.

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

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## Connect a Console to the Switch

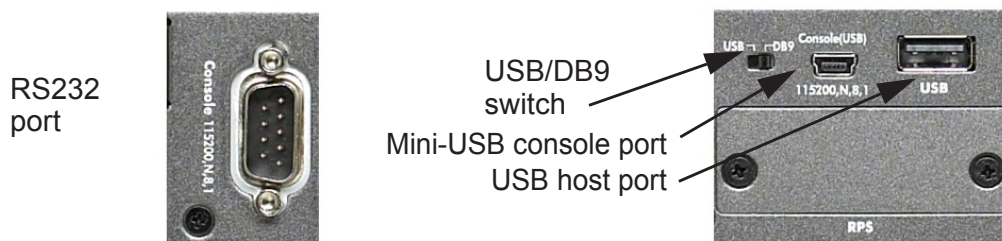
After you install the switch and apply power, you can connect to it with a terminal or workstation. You can use the command-line interface (CLI) to identify the IP address.

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. Use the resource CD to install the USB driver on your computer.
  - 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 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 (provided as both a print document and in PDF format on the resource CD).
- Command line manual: Gives detailed examples of how to use the CLI.
- Software administration guide: Describes configuration tasks.

## 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.	<ul style="list-style-type: none"><li>• 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.</li><li>• Make sure that all cables used are correct and comply with Ethernet specifications. See <a href="#">Appendix A, Technical Specifications</a> on page 24.</li><li>• Check for a defective adapter card, cable, or port by testing it in an alternate environment where all products are functioning.</li></ul>
Slow file transfer or there is performance degradation.	Half- or full-duplex setting on the switch and the connected device are not the same.	<ul style="list-style-type: none"><li>• Make sure that the attached device is set to auto negotiate.</li><li>• Check the system message log.</li></ul>
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-nNegotiation:**  
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	<ul style="list-style-type: none"><li>• 802.3i 10BASE-T</li><li>• 802.3u 100BASE-TX</li><li>• 802.3z 1000BASE-X</li><li>• 802.3ab 1000BASE-T</li><li>• 802.3ae 10GBASE-SR</li><li>• 802.3ae 10GBASE-LR</li><li>• 802.3aq 10GBASE-LRM</li><li>• 802.3an 10GBASE-T</li><li>• 802.3ak 10GBASE-CX4</li><li>• 802.3az-EEE (only in 10GBASE-T)</li><li>• 802.3x Flow Control</li></ul>
Layer 2 services	<ul style="list-style-type: none"><li>• 802.1Q Static VLAN (Up to 4k)</li><li>• 802.1p Class of Service (CoS)</li><li>• 802.1D Spanning Tree Protocol (STP)</li><li>• 802.1w Rapid Spanning Tree Protocol (RSTP)</li><li>• 802.1s Multiple Spanning Tree Protocol (MSTP)</li><li>• 802.3ad Link Aggregation (LACP)</li><li>• IGMP v1, v2 Snooping Support</li><li>• DHCP L2 Relay</li><li>• UDP Relay</li><li>• SNTP</li><li>• SNMP v1/v2/v3</li><li>• LLDP/LLDP-MED</li><li>• ISDP</li><li>• MLD Snooping</li><li>• Multicast VLAN Registration (MVR)</li><li>• Jumbo Frames (up to 12 KB)</li><li>• GARP/GVRP</li><li>• Voice VLAN</li><li>• Auto VOIP</li></ul>

**Table 4. M5300 Series technical specifications (continued)**

Switch management	<ul style="list-style-type: none"> <li>• Port mirroring (TX, RX, Both)</li> <li>• CPU port mirroring</li> <li>• SNMP v1, v2c, v3</li> <li>• RFC2819 RMON Groups 1, 2, 3, and 9, RFC1213 MIB II</li> <li>• RFC1643 Ethernet Interface MIB</li> <li>• RFC1493 Bridge MIB</li> <li>• RFC2131 DHCP Client (and BootP)</li> <li>• RFC2138 RADIUS Client</li> <li>• Broadcast storm control</li> <li>• Telnet sessions for management CPU (5)</li> <li>• Ping support</li> <li>• ARP support</li> <li>• Private enterprise MIB</li> <li>• Config File up/down load (X/Y/Z Modem, TFTP, SCP, SFTP, USB, HTTP/HTTPS)</li> <li>• Runtime image download (X/Y/Z Modem, TFTP, SCP, SFTP, USB, HTTP/HTTPS)</li> <li>• Command-line interface</li> <li>• Web-based graphic user interface</li> <li>• Simple Network Time Protocol (SNTP)</li> <li>• Syslog</li> <li>• SSLv3/TLSv1.0 Web Security</li> <li>• Secured Shell (SSHv1, v2)</li> </ul>
QoS	<ul style="list-style-type: none"> <li>• Mapping 802.1p, DSCP</li> <li>• Strict Priority Scheduling</li> <li>• Weighted Round Robin</li> <li>• Weighted Random Early Detection (WRED)</li> <li>• Ingress rate limiting</li> <li>• Egress rate limiting (1 Kbps)</li> <li>• DiffServ QoS</li> </ul>
Security	<ul style="list-style-type: none"> <li>• IAS</li> <li>• RADIUS</li> <li>• TACACS+</li> <li>• 802.1x</li> <li>• MAC Filter</li> <li>• Port Security</li> <li>• Protected Port</li> <li>• Private VLAN</li> <li>• Storm Control</li> <li>• DHCP Snooping</li> <li>• IP Source Guard</li> <li>• Dynamic ARP Inspection</li> <li>• Captive Portal</li> <li>• MAC ACL (inbound/outbound)</li> <li>• IP ACL (inbound/outbound)</li> <li>• IPv6 ACL (inbound/outbound)</li> </ul>

**Table 4. M5300 Series technical specifications (continued)**

System Service	<ul style="list-style-type: none"> <li>• DHCP, BOOTP Relay</li> <li>• DHCP Server</li> </ul>
Stacking	<ul style="list-style-type: none"> <li>• Maximum of 8 switches in a single stack</li> <li>• RING Topology support</li> <li>• CHAIN Topology support</li> </ul>
Addressing	48-Bit MAC address
MAC Address entries	32K MAC addresses per system
Performance	<ul style="list-style-type: none"> <li>• Forwarding Modes: Store-and-Forward</li> <li>• Network latency:                             <ul style="list-style-type: none"> <li>- 3.782 <math>\mu</math>s for 64-byte frames for 1000 Mbps to 1000 Mbps transmission</li> <li>- 8.415 <math>\mu</math>s for 64-byte frames for 10G to 10G transmission</li> </ul> </li> </ul>
Interface	<p>M5300-28G/M5300-28G3/M5300-28G-PoE+</p> <ul style="list-style-type: none"> <li>• 24 RJ-45 port for 10/100/1000M</li> <li>• 24 PoE+ port (M5300-28G-PoE+ only)</li> <li>• 4 SFP/RJ45 combo port for 100M/1000M</li> <li>• 2 SFP+/RJ45 combo port for 1G/10G</li> <li>• 1 power module slot</li> <li>• 2 IO module bays</li> <li>• 1 USB host port</li> <li>• 1 DB9 console port</li> <li>• 1 mini-USB console port</li> </ul> <p>M5300-52G/M5300-52G3/M5300-52G-PoE+</p> <ul style="list-style-type: none"> <li>• 48 RJ-45 port for 10/100/1000M</li> <li>• 48 PoE+ port (M5300-52G-PoE+ only)</li> <li>• 4 SFP/RJ45 combo port for 100M/1000M</li> <li>• 2 SFP+/RJ45 combo port for 1G/10G</li> <li>• 1 power module slot</li> <li>• 2 IO module bays</li> <li>• 1 USB host port</li> <li>• 1 DB9 console port</li> <li>• 1 mini-USB console port</li> </ul> <p><b>M5300-28GF3</b></p> <ul style="list-style-type: none"> <li>• 24 SFP port for 10/100/1000M</li> <li>• 4 SFP/RJ45 combo port for 100M/1000M</li> <li>• 2 SFP+/RJ45 combo port for 1G/10G</li> <li>• 1 power module slot</li> <li>• 2 IO module bays</li> <li>• 1 USB host port</li> <li>• 1 DB9 console port</li> <li>• 1 mini-USB console port</li> </ul>

**Table 4. M5300 Series technical specifications (continued)**

Bandwidth	<ul style="list-style-type: none"> <li>• 136 Gbps (M5300-28G3/M5300-28G/M5300-28GF3/M5300-28G-POE+)</li> <li>• 184 Gbps (M5300-52G3/M5300-52G/M5300-52G-POE+)</li> </ul>
Dimensions (W x D x H)	440 x 391 x 43 mm (17.3 x 15.4 x 1.7 in.)
Environment	<p>Operating:</p> <ul style="list-style-type: none"> <li>- Temperature: 32° to 122°F (0° to 50°C)</li> <li>- Humidity: 90% maximum relative humidity, noncondensing</li> <li>- Altitude: 10,000 ft (3,000 m) maximum</li> </ul> <p>Non-Operating:</p> <ul style="list-style-type: none"> <li>- Temperature: – 4° to 158°F (–20° to 70°C)</li> <li>- Humidity: 95% maximum relative humidity, noncondensing</li> <li>- Altitude: 10,000 ft (3,000 m) maximum</li> </ul>
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	<ul style="list-style-type: none"> <li>• VLAN routing</li> <li>• Port routing</li> <li>• RFC2328 OSPF v2 (license needed)</li> <li>• RFC2740 OSPF for IPv6 (license needed)</li> <li>• RFC2453 RIP v2 (license needed)</li> <li>• RFC1112 IGMP v1 (license needed)</li> <li>• RFC2236 IGMP v2 (license needed)</li> <li>• RFC3376 IGMP v3 (license needed)</li> <li>• RFC4601 PIM-SM (license needed)</li> <li>• RFC3973 PIM-DM (license needed)</li> <li>• RFC2710 MLD (license needed)</li> </ul>	<ul style="list-style-type: none"> <li>• VLAN routing</li> <li>• Port routing</li> <li>• RFC2328 OSPF version 2</li> <li>• RFC2740 OSPF for IPv6</li> <li>• RFC2453 RIP Version 2</li> <li>• RFC1112 IGMP version 1</li> <li>• RFC2236 IGMP version 2</li> <li>• RFC3376 IGMP version 3</li> <li>• RFC4601 PIM-SM</li> <li>• RFC3973 PIM-DM</li> <li>• RFC2710 MLD</li> </ul>
Heat dissipation (Btu/hr)	<p>M5300-28G-PoE+ 1829</p> <p>M5300-52G-PoE+: 1896</p> <p>M5300-28G: 186</p> <p>M5300-52G3: 268</p>	<p>M5300-28G3: 186</p> <p>M5300-52G3: 268</p> <p>M5300-52GF3: 274</p>
Acoustic noise (dB) (ANSI-S10.12)	<p>MM5300-28G-POE+: 44.8</p> <p>M5300-28G: 37.3</p> <p>M5300-52G-POE+: 43.2</p> <p>M5300-52G: 34.9</p>	<p>M5300-28G3: 37.3</p> <p>M5300-28GF3: 35.6</p> <p>M5300-52G3: 34.9</p>

**NETGEAR Managed Stackable Switch M5300 Series**

**Table 5. Technical specifications - model specific**

<b>Feature</b>	<b>M5300-28G-POE+ M5300-52G-POE+ M5300-28G M5300-52G</b>	<b>M5300-28G3 M5300-52G3 M5300-28GF3</b>
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
Mean time between failure (MTBF)	<p><b>MTBF at 55°C</b>                      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)</p> <p><b>MTBF at 25°C</b>                      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)</p>	<p><b>MTBF at 55°C</b>                      M5300-28G3: 183046 hrs (~20.9 years)                      M5300-52G3: 126162 hrs (~14.4 years)                      M5300-28GF3: 163656 hrs (~18.7 years)</p> <p><b>MTBF at 25°C</b>                      M5300-28G3: 560449 hrs (~64.0 years)                      M5300-52G3: 421113 hrs (~48.1 years)                      M5300-28GF3: 539481 hrs (~61.6 years)</p>
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

# B Default Configuration Settings

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**Table 6. Default settings**

Feature	Default Setting
Port speed	Auto-negotiation
Port duplex	Auto-negotiation
Flow control (half duplex)	Enabled
Flow control (full duplex)	Disabled
Broadcast storm control	Enabled
Gigabit port type	Auto detect
Management IP configuration	DHCP
Password protection	Disabled
User name	Admin
Password	(none)
Web access	Enabled
Java mode	Enabled
VLAN	All ports belong to default VLAN (VLAN 1) as untagged ports
IP multicast filtering	Disabled
Spanning Tree Protocol	Enabled (IEEE 802.1s)
Admin edge port	Enabled
Link aggregation	Disabled
Port mirroring	Disabled
Traffic prioritization	Disabled
ACL	Disabled
GVRP	Disabled



**Table 6. Default settings**

<b>Feature</b>	<b>Default Setting</b>
GMRP	Disabled
IP routing	Disabled
MAC address aging	300 seconds
SNMP community	public (read-only access), private (read/write access)
DHCP server	Disabled
VLAN ingress filtering	Enabled
IP multicast filtering	Disabled
802.1x	Disabled
Port security	Disabled
Captive portal	Disabled
Auto install	Enabled
LLDP	Enabled
LLDP-MED	Enabled
ISDP	Enabled

# c Notification of Compliance

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## **Certificate of the Manufacturer/Importer**

It is hereby certified that the NETGEAR M5300 Managed Stackable Switches have been suppressed in accordance with the conditions set out in the BMPT-AmtsblVfg 243/1991 and Vfg 46/1992. The operation of some equipment (for example, test transmitters) in accordance with the regulations may, however, be subject to certain restrictions. Please refer to the notes in the operating instructions.

Federal Office for Telecommunications Approvals has been notified of the placing of this equipment on the market and has been granted the right to test the series for compliance with the regulations.

## **Voluntary Control Council for Interference (VCCI) Statement**

This is Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.”

この装置は、情報処理装置等電波障害自主規制協議会 (VCCI) の基準に基づくクラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

## **Federal Communications Commission (FCC) Compliance Notice: Radio Frequency Notice**

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## **Canadian Department of Communications Radio Interference Regulations**

This digital apparatus (NETGEAR M5300 Managed Stackable Switches) does not exceed the Class A limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

## Règlement sur le brouillage radioélectrique du ministère des Communications

Cet appareil numérique (NETGEAR M5300 Managed Stackable Switches) respecte les limites de bruits radioélectriques visant les appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada.

### EN 55 022 Declaration of Conformance

This is to certify that the NETGEAR M5300 Managed Stackable Switches are shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55024 Class A (CISPR 22).

### EN 55 022 and EN 55 024 Statements

This is to certify that the NETGEAR M5300 Managed Stackable Switches are shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55 022 Class A (CISPR 22) and EN 55 024.



#### **WARNING:**

**This is a Class A product. In a domestic environment, this product might cause radio interference, in which case the user might be required to take appropriate measures.**