

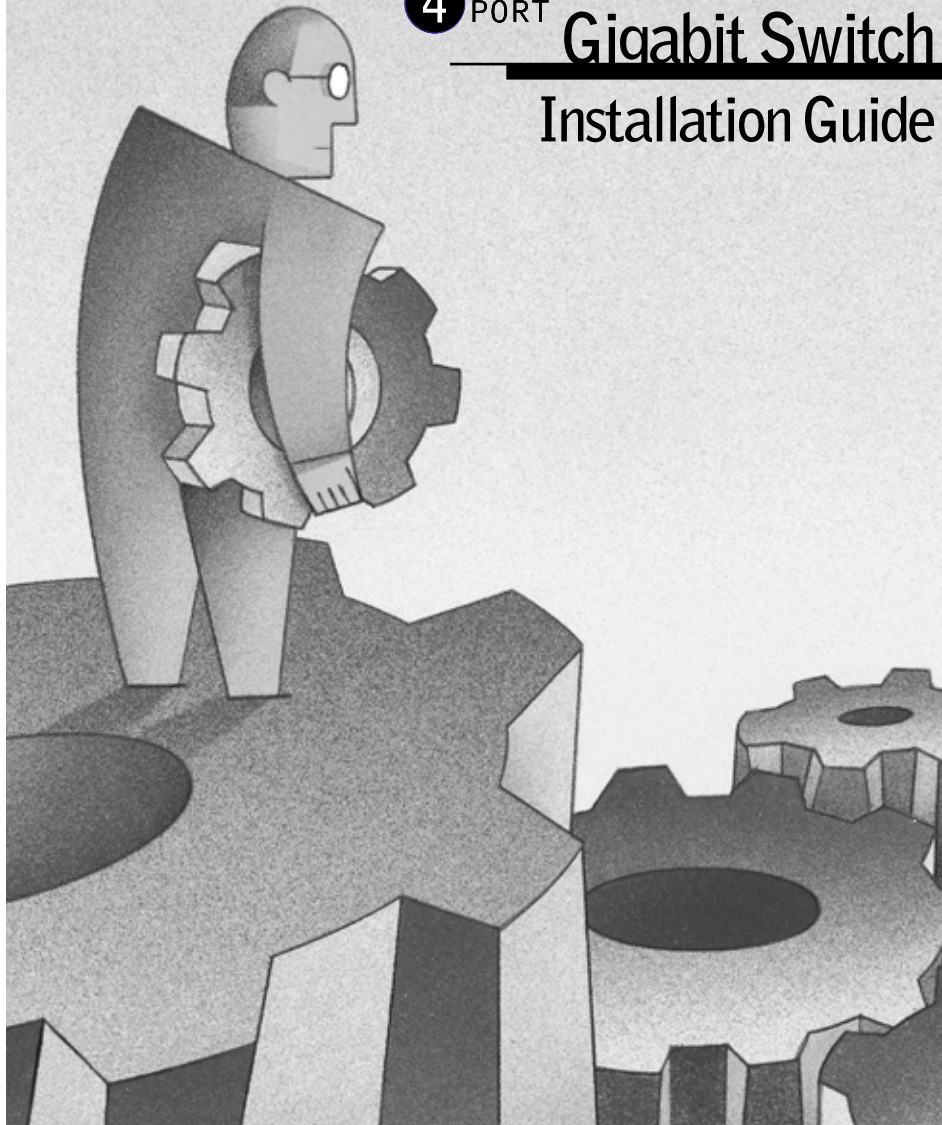
# NETGEAR

MODEL GS 504

4 PORT

## Gigabit Switch

### Installation Guide





## Start Here

The NETGEAR™ Model GS504 4-Port Gigabit Switch provides you with a low-cost, high-performance network solution and is designed to anchor and interconnect 10/100 megabits per second (Mbps) workgroups using gigabit fiber links.

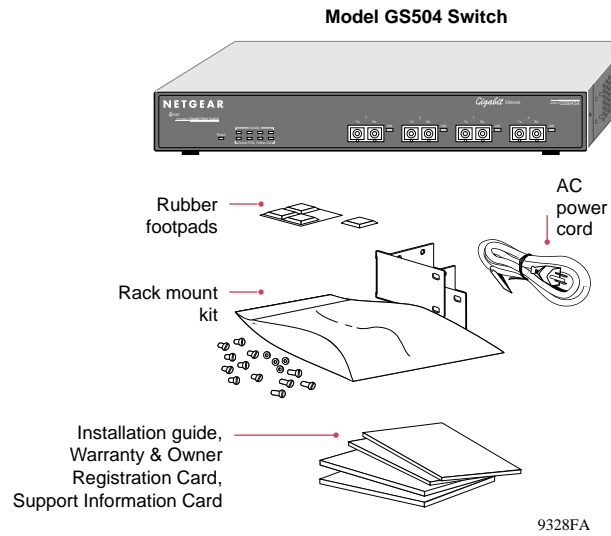


## Features

The Model GS504 switch has the following key features:

- Four full-duplex gigabit fiber ports with standard SC connectors  
The ports support multimode optical fiber (SX) up to 525 meters (m) with 50  $\mu\text{m}$ . With 62.5  $\mu\text{m}$  fiber cable, the maximum distance is 260 m.
- Automatic address learning function to build the packet-forwarding information table  
The table contains up to 8,000 MAC addresses (that is, the switch can support networks with as many as 8,000 devices).
- Full-duplex mode to double throughput of point-to-point connections by letting individual ports transmit and receive concurrently when the other end also supports full-duplex mode  
The default is full-duplex mode if the connected device does not support N-way negotiation. Most gigabit fiber links run in full-duplex mode.
- Wire-speed filtering and forwarding of the traffic with no delay
- Store-and-forward intelligent processing to minimize erroneous packets on the network
- Easy plug-and-play installation with no software to configure, which saves time and minimizes the potential for configuration errors

# Package Contents



Verify that your package contains the following:

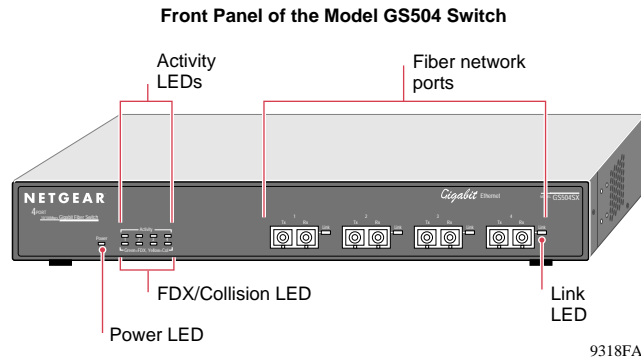
- Model GS504 switch
- Rubber footpads for tabletop installation
- This installation guide
- Rack mount kit for 19-inch rack installation
- Warranty & Owner Registration Card
- Support Information Card
- Power cord



## Product Illustration

### Front Panel

The front panel of the Model GS504 switch contains the following LEDs that correspond to each network port: Activity (Rx/Tx) and FDX (full-duplex)/Collision. Each fiber network port has its own Link LED (located to the right of each 1000 Mbps port).



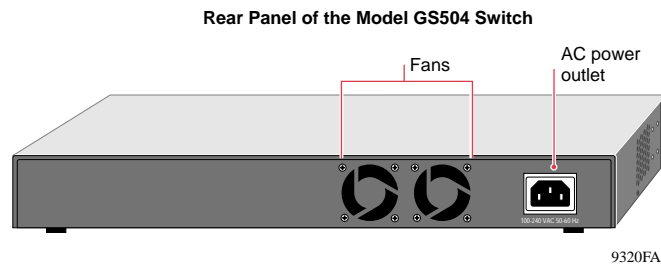
### LEDs

The table below describes the activity of the LEDs.

Label	Color	Activity	Description
Power	Green	On Off	Power is supplied to the switch. Power is disconnected.
FDX/Col	Green Yellow	On Off Blinking	The port is operating in full-duplex mode. The port is operating in half-duplex mode. Data collisions are occurring on the port. In a full-duplex environment, there is no collision. In a half-duplex environment, some collisions are normal.
Activity	Green	Blinking	Packet transmission or reception is occurring on the port.
Link	Green	On Off	A valid 1000 Mbps link is established on the port. A link is not established on the port.

## Rear Panel

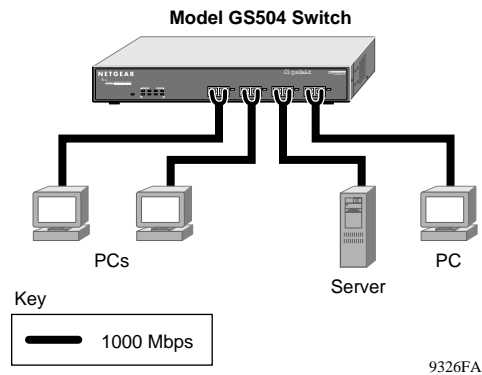
The rear panel of the Model GS504 switch has fans for cooling and a standard AC power receptacle for the supplied power cord.



## Applications

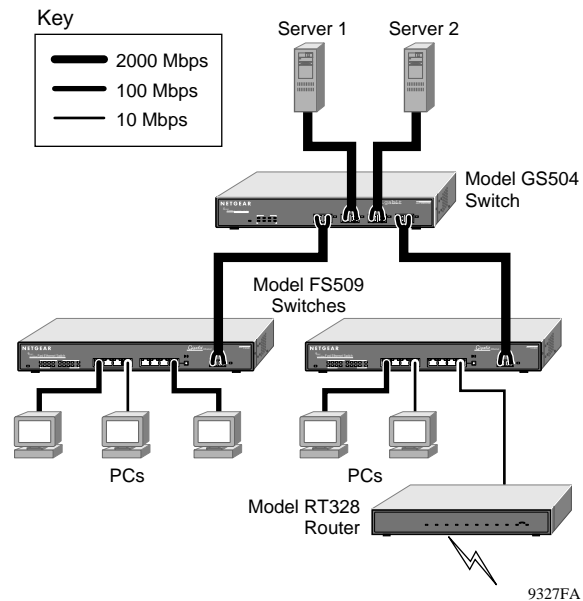
### Desktop Switching

The Model GS504 switch is used as a desktop switch to build a powerful network that enables users to have 1000 Mbps access to a file server. If a full-duplex adapter card is installed in the server or PC, a 2000 Mbps connection will be provided to each server and PC.



## Segment Switching and Bridging from 10/100 Mbps to 1000 Mbps

The Model GS504, as illustrated below, connects multiple power workgroups and servers using high-speed gigabit fiber links. Each power workgroup is anchored by a NETGEAR FS509 switch. Because each fiber link can be up to 525 m long, these workgroups can be located on separate floors or in different buildings.



### 1 Prepare the Site

Before you begin installing your switch, prepare the installation site. Make sure your operating environment meets the operating environment requirements of the equipment.

Characteristic	Requirement
Temperature	Ambient temperature between 0° and 40° C (32° and 104° F). No nearby heat sources such as direct sunlight, warm air exhausts, or heaters.
Operating humidity	Maximum relative humidity of 90%, noncondensing.
Ventilation	Minimum 2 inches (5.08 cm) on all sides for cooling. Adequate airflow in room or wiring closet.
Operating conditions	At least 6 feet (1.83 m) to nearest source of electromagnetic noise (such as photocopier machine or arc welder).
Power	Adequate power source within 6 feet (1.83 m).

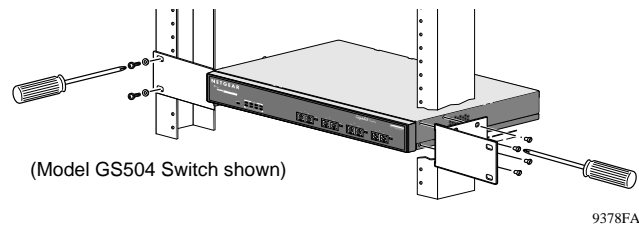
## 2 Installation

### Installation on a Flat Surface

To install the switch on a flat surface, be sure to attach the rubber footpads to the bottom of the switch.

### Installation in a Rack

Refer to the following illustration when installing the switch in a rack.



## 3 Connecting Devices to the Switch

To connect the switch:

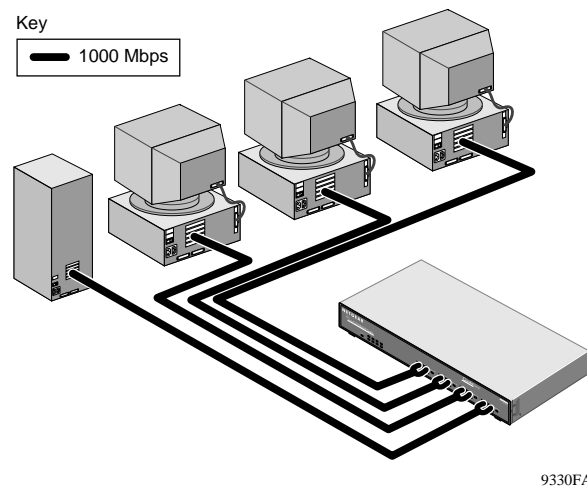
1. **Connect the devices to the network ports on the switch, using 50  $\mu\text{m}$  or 62.5  $\mu\text{m}$  multimode fiber cables with SC plugs.**



**Note:** Ethernet specifications limit the cable length between your PC or server and the switch to 525 m for 50  $\mu\text{m}$  and 260 m for 62.5  $\mu\text{m}$  fiber.

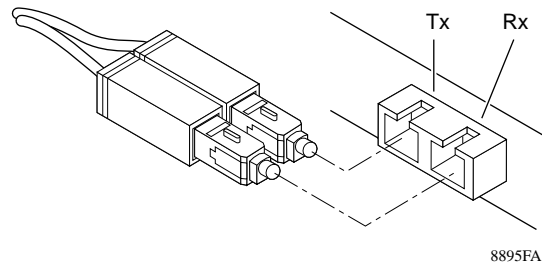
2. **Connect one end of the DC power adapter cable to the power outlet on the rear panel of the switch and the other end of the power adapter cable to the wall outlet.**

Refer to the following illustration when connecting the switch.



## Using the SC Connector

The duplex SC connector connects stations, hubs, and switches that support the 1000BASE-SX fiber interface. Each fiber link needs a clearly defined, external crossover. In other words, the transmit port of one interface must be wired to the receive port of the opposite interface and vice versa. Fiber cables must be connected in this manner to transmit and receive data.



## 4 Verify Installation

When power has been applied to the switch, verify that:

- The green Pwr LED on the front panel is on.
- The green Link LED on each connected port is on.

When the switch is connected and operating, refer to the table in “LEDs” for information about the LEDs and their activity.





## Troubleshooting Information

Symptom	Cause	Solution
Power LED is off.	No power is received at the hub.	Check the power cord connections for the switch and the connected device. Make sure all cables used are correct and comply with Ethernet specifications.
Link LED is off or intermittent.	Port connection is not functioning.	Check the crimp on the fiber 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 all cables used are correct and comply with Ethernet specifications. Check for a defective adapter card, cable, or port by testing them in an alternate environment where all products are functioning.
File transfer is slow or performance degradation is a problem.	Half- or full-duplex setting on the NETGEAR switch and the connected device are not the same.	Make sure the remote link partner is set to autonegotiate or forced to full-duplex operation.
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 all cable connectors are securely positioned in the required ports. Equipment may have been accidentally disconnected.
FDX/Col LED is blinking yellow excessively.	Collisions are occurring on the connected segment.	Some collisions are normal when the connection is operating in half-duplex mode.
	Duplex modes are mismatched.	Recheck the link partner settings.



## Technical Specifications

<b>General Specifications</b>	Model GS504 Switch
<b>Network Protocol and Standards Compatibility</b>	IEEE 8023z 1000BASE-SX
<b>Data Rate</b>	1000 Mbps with 8B/10B encoding
<b>Interface</b>	Duplex SC connector for 1000BASE-SX Gigabit Ethernet
<b>Power Consumption</b>	25 W
<b>Input Voltage (Power Adapter)</b>	100–240 V AC
<b>Physical Specifications</b>	
Dimensions:	13.0 x 1.7 x 8.0 in. 33.0 x 4.3 x 20.7 cm
Weight:	5.3 lb; 2.3 kg
<b>Environmental Specifications</b>	
Operating temperature:	0° to 40° C (32° to 104° F)
Operating humidity:	90% maximum relative humidity, noncondensing
<b>Electromagnetic Compliance</b>	CE mark, commercial FCC Part 15 Class A VCCI Class A EN 55022 (CISPR 22) Class A, EN50082-1 C-Tick
<b>Safety Agency Approvals</b>	UL Listed (UL 1950), cUL  TUV Licensed (EN 60 950), IEC 95
<b>Performance Specifications</b>	
Frame filter rate:	1,480,000 frames/second maximum
Frame forward rate:	1,480,000 frames/second maximum
Network latency (using 64-byte packets):	30 microseconds maximum
Address database size:	8,000 media access control (MAC) addresses
Addressing:	48-bit MAC address
Queue buffer:	2 MB memory per port

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### **Trademarks**

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### **Statement of Conditions**

In the interest of improving internal design, operational function, and/or reliability, NETGEAR reserves the right to make changes to the products described in this document without notice.

NETGEAR does not assume any liability that may occur due to the use or application of the product(s) or circuit layout(s) described herein.

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

It is hereby certified that the NETGEAR Model GS504 Gigabit Switch has 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 equipment is in the first category (information equipment to be used in commercial and/or industrial areas) and conforms to the standards set by the Voluntary Control Council for Interference by Data Processing Equipment and Electronic Office Machines that are aimed at preventing radio interference in commercial and/or industrial areas.

Consequently, when this equipment is used in a residential area or in an adjacent area thereto, radio interference may be caused to equipment such as radios and TV receivers.

### **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 to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### **EN 55 022 Declaration of Conformance**

This is to certify that the NETGEAR Model GS504 Gigabit Switch is 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).

**Canadian Department of Communications Radio Interference Regulations**

This digital apparatus (NETGEAR Model GS504 Gigabit Switch) 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 Model GS504 Gigabit Switch) 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.

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