

NETGEAR®

Hardware Installation Guide

Insight Instant VPN Router

BR500

March 2020
202-11927-03

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Revision History

Publication Part Number	Publish Date	Comments
202-11927-03	March 2020	Revised Limitation for a Mac VPN client on page 7. Revised Remote VPN connectivity on page 16.
202-11927-02	March 2020	Added Limitation for a Mac VPN client on page 7. Revised Remote VPN connectivity on page 16.
202-11927-01	October 2018	First publication for router model BR500.

Contents

Chapter 1 Introduction

Overview.....	6
Limitation for a Mac VPN client.....	7
Key hardware features.....	7
Safety instructions and warnings.....	8

Chapter 2 Hardware Overview

Front panel with LEDs.....	12
Back panel.....	13
RJ-45 ports for 10/100/1000M BASE-T Ethernet connectivity.....	13
Reset button.....	14

Chapter 3 Applications

Remote VPN connectivity.....	16
Site-to-site VPN connectivity.....	17
Edge routing for a small to medium-sized business.....	18

Chapter 4 Installation

Step 1: Prepare the site.....	20
Step 2: Protect against electrostatic discharge.....	21
Step 3: Unpack the router.....	21
Step 4: Install the router.....	22
Install the router on a flat surface.....	22
Install the router in a rack.....	23
Wall-mount the router.....	23
Wall-mount the router horizontally.....	24
Wall-mount the router vertically.....	25
Mount the router to a pole or another surface.....	27
Step 5: Connect the router to a modem.....	27
Step 6: Connect devices to the router.....	27
Step 7: Check the installation.....	28
Step 8: Apply power and check the LEDs.....	28
Step 9: Configure and manage the router.....	29

Chapter 5 Troubleshooting

Hardware troubleshooting chart.....	31
-------------------------------------	----

Additional troubleshooting suggestions.....	32
---	----

1

Introduction

This hardware installation guide is for the NETGEAR Insight Instant VPN Router model BR500. In this manual, this model is referred to as the *router*, unless we mention otherwise.

The router is designed to provide firewall and VPN gateway functionality for small business environments. A pair of routers can provide VPN functionality to users between remote sites. The router can support up to 10 simultaneous remote VPN users.

The router provides four Gigabit RJ-45 copper LAN ports and one dedicated Gigabit RJ-45 copper WAN port in a chassis that you can place on a desktop or mount to a wall. The router can also be mounted in a rack. The LEDs are on the front panel and the ports are on the back panel.

This hardware installation guide complements the installation guide that came with your router.

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

- [Overview](#)
- [Limitation for a Mac VPN client](#)
- [Key hardware features](#)
- [Safety instructions and warnings](#)

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

Note: For more documentation about the router, including the data sheet with technical specifications, visit netgear.com/support/download/.

Overview

The router provides five Gigabit Ethernet copper ports, one of which is a dedicated Internet uplink port. All copper ports use RJ-45 connectors. The router integrates a Stateful Packet Inspection (SPI) firewall and provides instant Virtual Private Network (VPN) technology for remote access (client-to-site) and office-to-office (site-to-site) connectivity. The IPSec encryption options include 56-bit DES, 168-bit 3DES, and 128-, 192-, and 256-bit AES. The authentication options include SHA-1 and MD5. The router also supports VPN passthrough.

Note: For information about application examples, see [Applications](#) on page 15.

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

- **Local browser user interface (UI).** You must access the local browser UI to set up the WAN (Internet) connection and basic settings of the router. For more information about the local browser UI, see the user manual, which you can download from netgear.com/support/download/.
- **NETGEAR Insight mobile app.** After you set up the WAN connection of the router using the local browser UI, you can use the NETGEAR Insight mobile app to discover the router on the network and add the router to the NETGEAR Insight app. Doing so allows you to set up the router in the network and manage and monitor the router remotely from your smartphone. You can choose from four methods to add the router to the NETGEAR Insight app: You can scan your network for the router, scan the QR code or the barcode of the router, or add the serial number of the router. For more information, visit netgear.com/insight and see the NETGEAR knowledge base articles at netgear.com/support/.
- **Insight Cloud portal.** As an Insight Premium or Pro user, after you set up the WAN connection of the router using the local browser UI, you can use the NETGEAR Insight Cloud portal to set up the router in the network, perform advanced remote management, monitor the router, analyze the router and network usage, and, if necessary, troubleshoot the router and the network.

You can install the router freestanding (on a desktop) or wall-mounted, using the VESA-standard mounting holes and supplied wall-mount kit. You can also rack-mount the router in a standard 19-inch rack, using rack-mount kit that is supplied with the router. The router is IEEE compliant and offers low latency. All ports can automatically negotiate to the highest speed, which makes the router very suitable for a mixed environment with Gigabit Ethernet and Fast Ethernet.

For Gigabit Ethernet connections, use Category 5 (Cat 5) or higher-rated Ethernet cables terminated with RJ-45 connectors.

Limitation for a Mac VPN client

If you use a NETGEAR Insight Instant VPN configuration, the Mac VPN client does not function in a client-to-gateway VPN connection.

Key hardware features

The router includes the following key hardware features:

- Four Gigabit Ethernet LAN ports
- One dedicated Gigabit Ethernet WAN (Internet) port
- Media Access Control (MAC) address table size of 16K entries, automatic address learning function to build the packet-forwarding information table
- Processor speed of 1700 MHz
- 1 GB of RAM and 128 MB of flash memory
- Includes the following mounting hardware:
 - Four rubber footpads for tabletop installation
 - Wall-mount screw kit for wall installation
 - Rack-mount brackets and screw kit for rack-mount installation in a standard 19-inch rack
- AutoSensing and autonegotiating capabilities for all ports
- Auto Uplink™ technology is supported on all ports
- Store-and-forward transmission to remove bad packets from the network
- Active flow control to minimize packet loss and frame drops
- Half-duplex backpressure control
- Per-port status LEDs and system status LEDs:
 - System Power LED
 - System Internet LED
 - Cloud Connection LED
 - VPN LED for VPN connections
 - Per-port link, speed, and activity LED
- VPNC (Basic, AES Interop), ICSA Firewall

Safety instructions and warnings

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

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

- This product is designed for indoor use only in a temperature-controlled and humidity-controlled environment. For more information, see the environmental specifications in the appendix or the data sheet.
Any device that is located outdoors and connected to this product must be properly grounded and surge protected.
Failure to follow these guidelines can result in damage to your NETGEAR product, which might not be covered by NETGEAR's warranty, to the extent permissible by applicable law.
- Observe and follow service markings:
 - Do not service any product except as explained in your system documentation. Some devices should never be opened.
 - If applicable to your device, opening or removing covers that are marked with the triangular symbol with a lightning bolt can expose you to electrical shock. We recommend that only a trained technician services components inside these compartments.
- If any of the following conditions occur, unplug the product from the electrical outlet and replace the part or contact your trained service provider:
 - Depending on your device, the power adapter, power adapter cable, power cable, extension cable, or plug is damaged.
 - An object fell into the product.
 - The product was exposed to water.
 - The product was dropped or damaged.
 - The product does not operate correctly when you follow the operating instructions.
- Keep your system away from radiators and heat sources. Also, do not block cooling vents.

- Do not spill food or liquids on your system components, and never operate the product in a wet environment. If the system gets wet, see the appropriate section in your troubleshooting guide, or contact your trained service provider.
- Do not push any objects into the openings of your system. Doing so can cause fire or electric shock by shorting out interior components.
- Use the product only with approved equipment.
- If applicable to your device, allow the product to cool before removing covers or touching internal components.
- Operate the product only from the type of external power source indicated on the electrical ratings label. If you are not sure of the type of power source required, consult your service provider or local power company.
- To avoid damaging your system, if your device uses a power supply with a voltage selector, be sure that the selector is set to match the power at your location:
 - 115V, 60 Hz in most of North and South America and some Far Eastern countries such as South Korea and Taiwan
 - 100V, 50 Hz in eastern Japan and 100V, 60 Hz in western Japan
 - 230V, 50 Hz in most of Europe, the Middle East, and the Far East
- Be sure that attached devices are electrically rated to operate with the power available in your location.
- Depending on your device, use only a supplied power adapter or approved power cable:
If your device uses a power adapter:
 - If you were not provided with a power adapter, contact your local NETGEAR reseller.
 - The power adapter must be rated for the product and for the voltage and current marked on the product electrical ratings label.
If your device uses a power cable:
 - If you were not provided with a power cable for your system or for any AC-powered option intended for your system, purchase a power cable approved for your country.
 - The power cable must be rated for the product and for the voltage and current marked on the product electrical ratings label. The voltage and current rating of the cable must be greater than the ratings marked on the product.
- To help prevent electric shock, plug the system and peripheral power cables into properly grounded electrical outlets.

- If applicable to your device, the peripheral power cables are equipped with three-prong plugs to help ensure proper grounding. Do not use adapter plugs or remove the grounding prong from a cable. If you must use an extension cable, use a three-wire cable with properly grounded plugs.
- Observe extension cable and power strip ratings. Make sure that the total ampere rating of all products plugged into the extension cable or power strip does not exceed 80 percent of the ampere ratings limit for the extension cable or power strip.
- To help protect your system from sudden, transient increases and decreases in electrical power, use a surge suppressor, line conditioner, or uninterruptible power supply (UPS).
- Position system cables, power adapter cables, or power cables carefully. Route cables so that they cannot be stepped on or tripped over. Be sure that nothing rests on any cables.
- Do not modify power adapters, power adapter cables, power cables or plugs. Consult a licensed electrician or your power company for site modifications.
- Always follow your local and national wiring rules.

2

Hardware Overview

This chapter describes the router hardware features.

The chapter includes the following sections:

- [Front panel with LEDs](#)
- [Back panel](#)
- [RJ-45 ports for 10/100/1000M BASE-T Ethernet connectivity](#)
- [Reset button](#)

Front panel with LEDs

The following figure shows the front panel of model BR500.

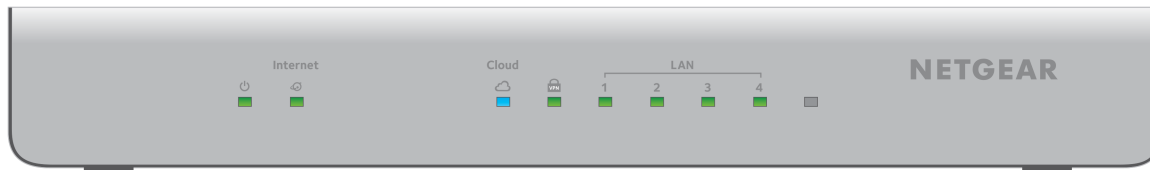


Figure 1. Front panel model BR500

The following table describes the LEDs.

Table 1. LEDs on the front panel

LED	Description
Power LED	Solid green. The router is powered on. Blinking green. The router is booting or shutting down. Solid amber. The router did not boot successfully. Blinking amber. A firmware update is in progress. Off. Power is not supplied to the router.
WAN LED	Solid green. The router established an Internet connection but is not processing Internet traffic. Blinking green. The router established an Internet connection and is transmitting or receiving packets. Solid amber. The router attempted but failed to establish an Internet connection. Blinking amber. The router is in the process of establishing an Internet connection. Off. No cable is not connected to the Internet port or the cable is not connected to an Internet modem.
Cloud Connection LED	Solid blue. The router is connected to the cloud server and is set up to be managed by NETGEAR Insight. Off. The router is not connected to the cloud server or is set up to be managed by the local browser UI.
VPN LED	Solid green. The router established a VPN connection. Off. The router did not establish a VPN connection.
LAN LEDs Link, speed, and activity for Ethernet ports 1 to 4	Solid green. A valid 1 Gbps link is established. Blinking green. The port is transmitting or receiving packets at 1 Gbps. Solid amber. A valid 10 Mbps or 100 Mbps link is established. Blinking amber. The port is transmitting or receiving packets at 10 Mbps or 100 Mbps. Off. No link is established.
Rightmost LED	For future use.

Back panel

The following figure shows the back panel of model BR500.



Figure 2. Back panel model BR500

From left to right, the back panel contains the following components:

- Recessed **Reset** button (see [Reset button](#) on page 14).
- Four independent 10/100/1000BASE-T RJ-45 LAN ports (see [RJ-45 ports for 10/100/1000M BASE-T Ethernet connectivity](#) on page 13) for connections to devices such as a switch, WiFi access point, ReadyNAS storage system, security camera, and computer.
- One independent 10/100/1000BASE-T RJ-45 WAN (Internet) port (see [RJ-45 ports for 10/100/1000M BASE-T Ethernet connectivity](#) on page 13) for connection to an uplink such as a cable or DSL modem.
- DC power receptacle to be used with the power adapter that is provided with the router.
- **On/Off** power button.
- Kensington lock for an optional security cable.

RJ-45 ports for 10/100/1000M BASE-T Ethernet connectivity

All RJ-45 copper ports support autosensing. When you insert a cable into an RJ-45 port, the router automatically ascertains the maximum speed (10 Mbps, 100 Mbps, or 1 Gbps) and duplex mode (half-duplex or full-duplex) of the attached device. All ports support a Category 5e (Cat 5e) cable (or higher-rated Ethernet cable) terminated with an 8-pin RJ-45 connector.

To simplify the procedure for attaching devices, all RJ-45 ports support Auto Uplink technology. This technology allows you to attach devices to the RJ-45 ports with either straight-through or crossover cables.

When you insert a cable into the router's RJ-45 port, the router automatically performs the following actions:

- Senses whether the cable is a straight-through or crossover cable.
- For the LAN Ethernet ports, determines whether the link to the attached device requires a normal connection (such as when you are connecting the port to a computer) or an downlink connection (such as when you are connecting the port to a switch or WiFi access point).
- Automatically configures the RJ-45 port to enable communications with the attached device. The Auto Uplink technology compensates for setting uplink connections while eliminating concern about whether to use crossover or straight-through cables when you attach devices.

Reset button

The router provides a **Reset** button so that you can return the router to its factory default settings.

CAUTION: This process erases all settings that you configured in the router.

To reset the router to factory default settings:

1. Locate the **Reset** button on the back panel.
2. Using a straightened paper clip, press and hold the recessed **Reset** button until the Power LED lights amber, which takes about five seconds.
3. Release the **Reset** button
The Power LED starts blinking amber and the configuration is reset to factory default settings. When the reset is complete, the router reboots. This process takes about two minutes.

3

Applications

The router is designed to provide flexibility in configuring network connections. You can use the router for remote VPN connections (for example, between a local office and a remote worker), for site-to-site VPN connections (for example, between a local office and a remote office), and as a Gigabit backbone router in a small to medium-sized business network.

This chapter includes the following sections:

- [Remote VPN connectivity](#)
- [Site-to-site VPN connectivity](#)
- [Edge routing for a small to medium-sized business](#)

Remote VPN connectivity

With one router at a site, you can provide secure, encrypted VPN connections to up to 10 remote users. These users can access all resources that are connected to the router, for example, file servers, ReadyNAS storage systems, security cameras, and so on.

Note: If you use a NETGEAR Insight Instant VPN configuration, the Mac VPN client does not function in a client-to-gateway VPN connection.

After the router is connected to the Internet, you can use the NETGEAR Insight app or Insight Cloud portal to discover the router on the network and add the router to the Insight app and Insight Cloud portal.

Note: For an Insight managed network, the VPN authentication traffic requires a connection with the NETGEAR cloud, but the actual data is transferred between the remote client and the router and does not go through the NETGEAR cloud. If you use an OpenVPN connection, the VPN authentication traffic does not require a connection with the NETGEAR cloud.

The following figure shows model BR500 router providing edge routing and VPN connectivity for remote users.

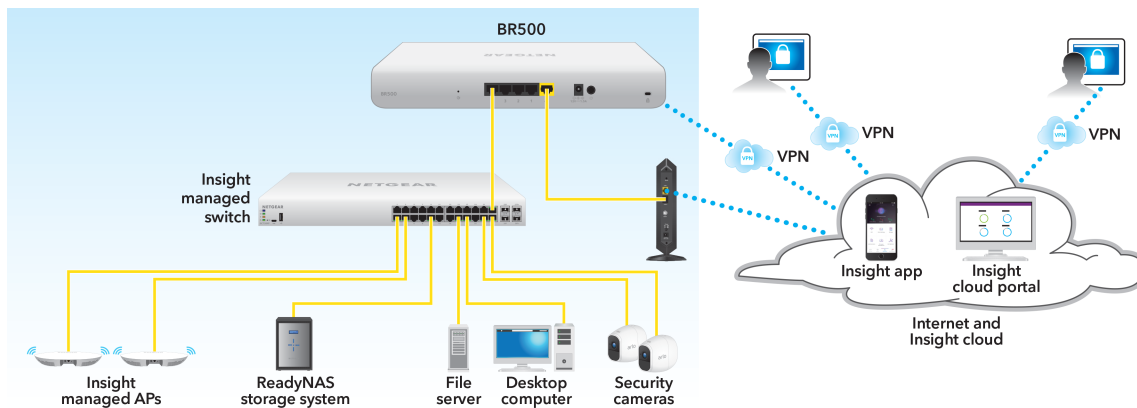


Figure 3. Remote VPN connectivity

Site-to-site VPN connectivity

With two routers, each at a different site, you can create a site-to-site VPN, which means that you can connect two local LANs and separate networks together as if they were physically connected and colocated.

A VPN group that consists of two model BR500 routers can support up to 20 remote users with access to both sites.

These users can access all resources that are connected to each router, for example, file servers, ReadyNAS storage systems, security cameras, and so on.

After each router is connected to the Internet, you can use the NETGEAR Insight app or Insight Cloud portal to discover each router on the network and add each router to the Insight app and Insight Cloud portal.

Note: For an Insight managed network, the VPN authentication traffic requires a connection with the NETGEAR cloud, but the actual data is transferred between the routers at the sites and does not go through the NETGEAR cloud.

The following figure shows two model BR500 routers providing edge routing, site-to-site VPN connectivity, and VPN connectivity for remote users.

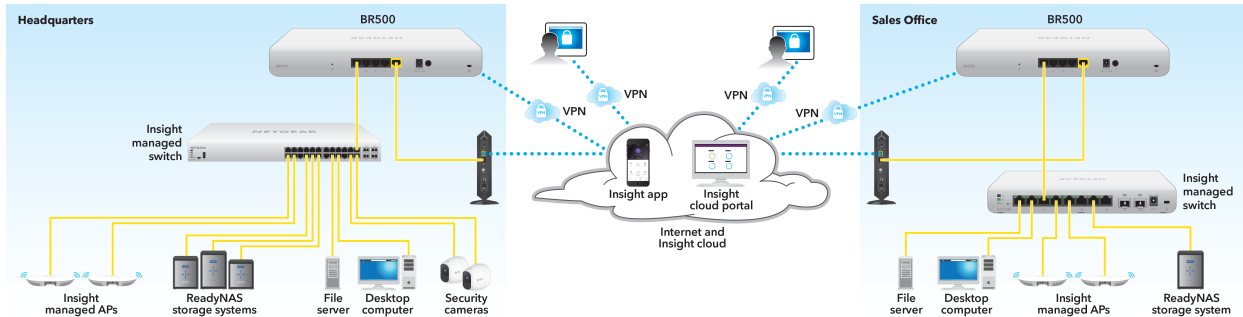


Figure 4. Site-to-site VPN connectivity

Edge routing for a small to medium-sized business

Even if you do yet not need VPN connectivity, you can use the router as an edge router with firewall functionality in a small to medium-sized business network that gives users Gigabit-speed access to network devices and the Internet.

The following figure shows a model BR500 router functioning as an edge router in a small business network. The router is connected to the Internet over a modem. Two switches are connected to the router, providing ReadyNAS storage connectivity, computer connectivity, and WiFi connectivity through WiFi access points that are connected to one of the switches.

After the router is connected to the Internet, you can use the NETGEAR Insight app or Insight Cloud portal to discover the router on the network and add the router to the Insight app and Insight Cloud portal.

The following figure shows a model BR500 router providing edge routing for a network with switches and WiFi access points.

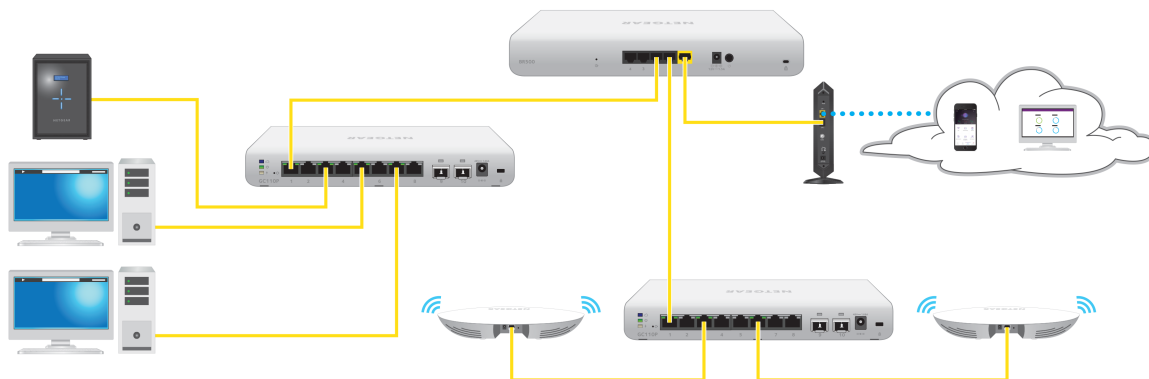


Figure 5. Edge routing

4

Installation

This chapter describes the installation procedures for the router.

Router installation involves the steps that are described in the following sections:

- [Step 1: Prepare the site](#)
- [Step 2: Protect against electrostatic discharge](#)
- [Step 3: Unpack the router](#)
- [Step 4: Install the router](#)
- [Step 5: Connect the router to a modem](#)
- [Step 6: Connect devices to the router](#)
- [Step 7: Check the installation](#)
- [Step 8: Apply power and check the LEDs](#)
- [Step 9: Configure and manage the router](#)

Step 1: Prepare the site

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

Table 2. Site requirements

Characteristics	Requirements
Mounting	<p>Desktop installations. Provide a flat table or shelf.</p> <p>Wall installations. Use the wall-mount screws that are supplied with the router to attach the router to a wall.</p> <p>Pole (or other surface) installations. Use an off-the-shelf 100 mm VESA standard mount to secure the router to a pole or another surface. The bottom panel of the router provides four mount holes that are VESA-compliant.</p> <p>Rack-mount installations. Use a 19-inch (48.3-centimeter) EIA standard equipment rack that is grounded and physically secure. You also need the rack-mount kit that is supplied with the router.</p>
Access	Install the router in a position that allows you to access the ports and power connector on the back panel and view the LEDs on the front panel.
Power source	Use the DC power adapter that is supplied with the router. Make sure that the AC outlet in which you plug the power adapter is not controlled by a wall switch, which can accidentally turn off power to the outlet and the router.
Cabling	Route cables to avoid sources of electrical noise such as radio transmitters, broadcast amplifiers, power lines, and fluorescent lighting fixtures.
Environmental	<p>Temperature. Install the router in a dry area with an ambient temperature between 32°F and 122°F (0°C and 50°C). Keep the router away from heat sources such as direct sunlight, warm-air exhausts, hot-air vents, and heaters.</p> <p>Operating humidity. The maximum relative humidity of the installation location must not exceed 90 percent, noncondensing.</p> <p>Ventilation. Do not restrict airflow by covering or obstructing air inlets on the sides of the router. Keep at least 2 inches (5.08 centimeters) free on all sides for cooling. The room or wiring closet in which you install the router must provide adequate airflow.</p> <p>Operating conditions. Keep the router at least 6 feet (1.83 meters) away from the nearest source of electromagnetic noise, such as a photocopy machine.</p>

Step 2: Protect against electrostatic discharge

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

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

- When unpacking a static-sensitive component from its shipping carton, leave it in the antistatic package until you are ready to install it. Just before unwrapping the antistatic package, discharge static electricity from your body.
- Before moving a sensitive component, place it in an antistatic container or package.
- Handle all sensitive components in a static-safe area. If possible, use antistatic floor pads, workbench pads, and an antistatic grounding strap.

Step 3: Unpack the router

The following figure shows the package contents for model BR500.

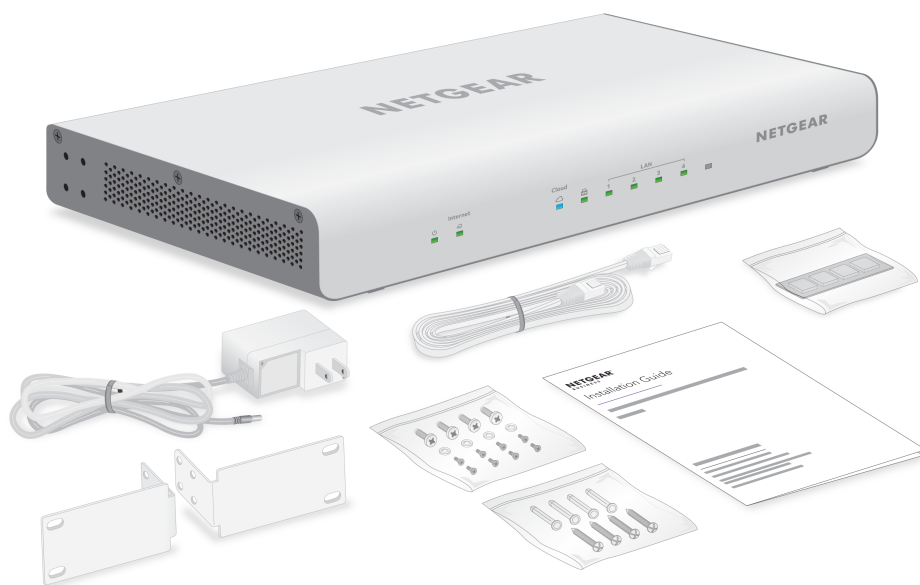


Figure 6. Router package contents model BR500

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

To check the package contents:

1. Place the container on a clean flat surface, and cut all straps securing the container.
2. Unpack the hardware from the boxes by carefully removing the hardware and placing it on a secure and clean surface.
3. Remove all packing material.
4. Verify that the package contains the following items:
 - BR500 router
 - DC power adapter (varies by region)
 - Wall-mounting screws and anchors
 - Rack-mounting brackets
 - Rack-mounting screws and washers
 - Installation guide
 - Rubber footpads for tabletop installation
5. If any item is missing or damaged, contact your local NETGEAR reseller for replacement.

Step 4: Install the router

You can place the router on a flat surface, attach it to a wall, or install it in a standard 19-inch (48.26-centimeter) network equipment rack.

You can also use any off-the-shelf 100 mm VESA standard mount to secure the router to a wall, a pole, or another surface.

Install the router on a flat surface

The router ships with four self-adhesive rubber footpads.

To install the router on a flat surface:

Stick one rubber footpad on each of the four concave spaces on the bottom of the router.

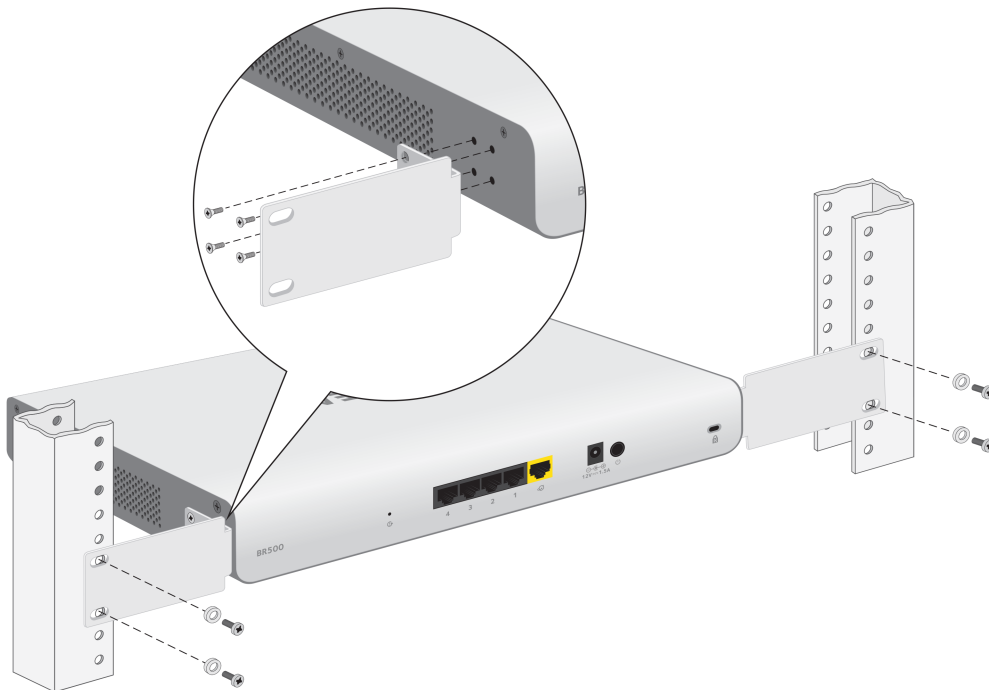
The rubber footpads cushion the router against shock and vibrations. They also provide ventilation space between stacked routers.

Install the router in a rack

To install model BR500 in a rack, you need the 19-inch rack-mount kit supplied with model BR500.

To install model BR500 in a rack:

1. Attach the supplied mounting brackets to the side of the router.
2. Insert the small screws provided in the product package through each bracket and into the bracket mounting holes in the router.
The package provides eight small screws, four for each side.
3. Tighten the screws with a No. 2 Phillips screwdriver to secure each bracket.
4. Align the mounting holes in the brackets with the holes in the rack, and insert two pan-head screws with nylon washers through each bracket and into the rack.
5. Tighten the screws with a No. 2 Phillips screwdriver to secure mounting brackets to the rack.



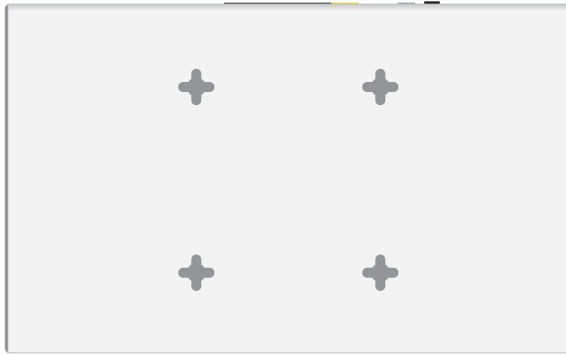
Wall-mount the router

The bottom panel of model BR500 provides four VESA mount holes that allow you to mount the router to a wall. The router ships with wall-mount screws and anchors that you can secure to a wall and attach the router to. We recommend that you use all four screws for greater stability and correct positioning. Because of the hardware differences between these models, the wall-mounting procedures also differ.

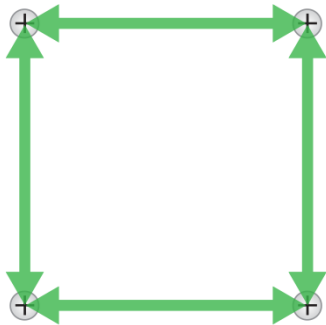
Wall-mount the router horizontally You can mount model BR500 horizontally to a wall with the cables either at the bottom or top of the router.

To mount model BR500 horizontally to a wall:

1. Locate the four holes on the bottom panel of the router.

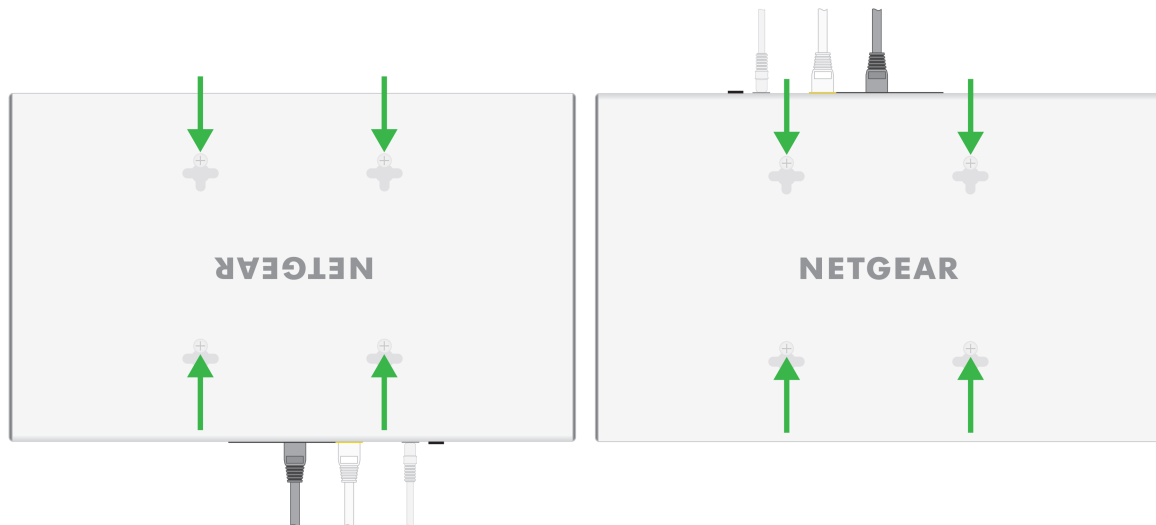


2. Mark the four mounting holes on the wall where you want to mount the router.
The four mounting holes must be in a square at precise distances of 4 inches (100 mm) from each other. In the following figure, each green arrow represents 100 mm.



3. Drill holes into the wall for four anchors in which you will insert M4 x L25 mm screws. The screws and anchors are in the router package.
4. Insert the anchors into the wall and tighten the screws with a No. 2 Phillips screwdriver. Leave about ¼ inch (6 mm) of each screw protruded from the wall so that you can insert the screws into the holes on the bottom of the router.

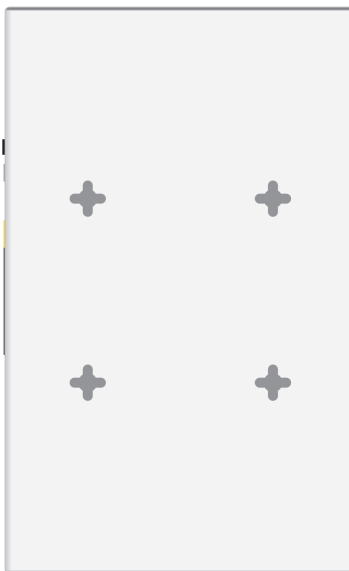
5. Line up the holes on the bottom panel of the router with the screws in the wall and mount the router to the wall with the cables either at the bottom (see the left figure) or top (see the right figure) of the router.



Wall-mount the router vertically You can mount model BR500 vertically to a wall with the cables either at the left or right of the router.

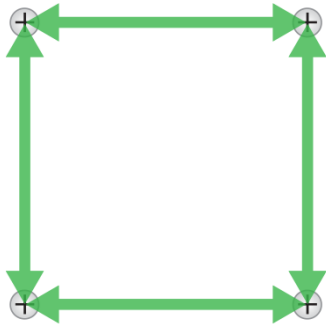
To mount model BR500 vertically to a wall:

1. Locate the four holes on the bottom panel of the router.

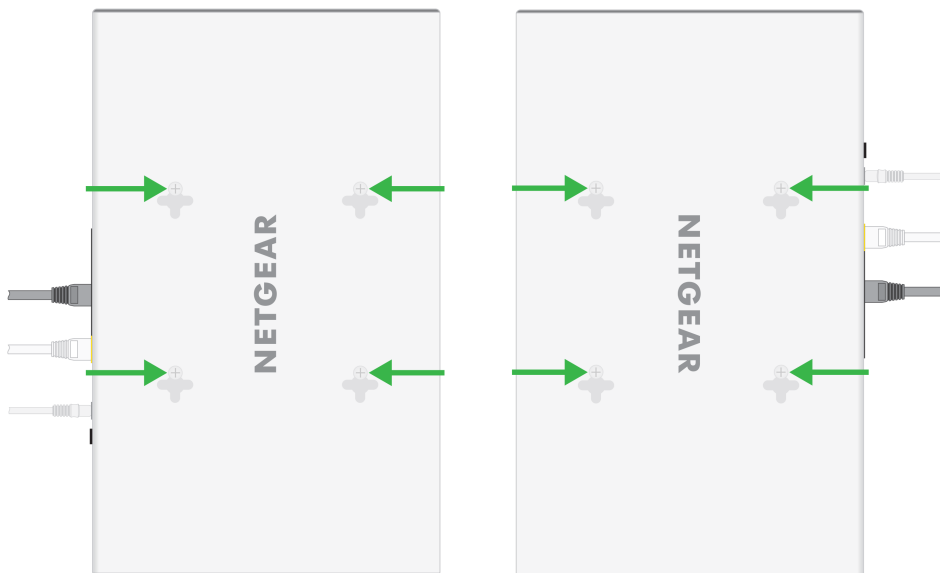


2. Mark the four mounting holes on the wall where you want to mount the router.

The four mounting holes must be in a square at precise distances of 4 inches (100 mm) from each other. In the following figure, each green arrow represents 100 mm.



3. Drill holes into the wall for four anchors in which you will insert M4 x L25 mm screws. The screws and anchors are in the router package.
4. Insert the anchors into the wall and tighten the screws with a No. 2 Phillips screwdriver. Leave about ¼ inch (6 mm) of each screw protruded from the wall so that you can insert the screws into the holes on the bottom of the router.
5. Line up the holes on the bottom panel of the router with the screws in the wall and mount the router to the wall with the cables either at the left (see the left figure) or right (see the right figure) of the router.



Mount the router to a pole or another surface

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

Step 5: Connect the router to a modem

The following procedure describes how to connect the router to a modem such as a DSL or cable modem that provides Internet connectivity. The router's RJ-45 WAN (Internet) port supports Auto Uplink technology, which allows you to attach devices using either straight-through or crossover cables. Use a Category 5 (Cat 5), Cat 5e, or Cat 6 cable that is terminated with an RJ-45 connector.

Note: Instead of a modem, you can also use an existing LAN that provides Internet connectivity. In that case, connect the cable from the LAN to the WAN port on the router. For more information, see the user manual, which you can download by visiting netgear.com/support/download/.

To connect a modem to the router's RJ-45 WAN port:

1. Unplug the modem's power, leaving the modem connected to the wall jack for your Internet service.
If the modem uses a battery backup, remove the battery.
2. Connect the modem to the RJ-45 WAN port on the router.
Ethernet specifications limit the cable length between the router and the Internet modem to 328 feet (100 meters).
3. Verify that the cable is installed correctly.
4. If the modem uses a battery backup, put the battery back in the modem.
5. Plug in and turn on the modem.

Step 6: Connect devices to the router

The following procedure describes how to connect devices such as a switch, WiFi access point, and computer to the router's RJ-45 LAN ports. (The router's WAN port is reserved for the Internet connection.) The router supports Auto Uplink technology, which allows you to attach devices using either straight-through or crossover cables. Use a Category 5 (Cat 5), Cat 5e, or Cat 6 cable that is terminated with an RJ-45 connector.

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

1. Connect a device to an RJ-45 LAN port on the router.
Ethernet specifications limit the cable length between the router and the attached device to 328 feet (100 meters).
2. Verify that all cables are installed correctly.

Step 7: Check the installation

Before you apply power to the router, perform the following steps.

To check the installation:

1. Inspect the equipment thoroughly.
2. Verify that all cables are installed correctly.
3. Check cable routing to make sure that cables are not damaged or creating a safety hazard.
4. Make sure that all equipment is mounted properly and securely.

Step 8: Apply power and check the LEDs

Before connecting the DC power adapter to the DC connector on the router, select an AC outlet for the DC power adapter. Make sure that the AC outlet is not controlled by a wall switch, which can turn off power to the router.

To apply power:

1. Connect the plug of the DC power adapter to the DC power receptacle on the back of the router.
2. Plug the DC power adapter into a power source such as a wall socket or power strip.
3. If the router does not start, press the **On/Off** power button on the back panel.
4. Check to see that the LEDs on the router light correctly.

When you apply power, the Power LED on the router front panel lights and the port LEDs for attached devices light.

Note: After you apply power, the Power LED blinks green while the router starts. After two or three minutes, the router completes its startup process and the Power LED turns from blinking green to solid green.

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

Step 9: Configure and manage the router

After you power on the router for the first time, you must use the local browser UI to configure the WAN (Internet) connection of the router. For more information, see the installation guide and user manual, which you can download from netgear.com/support/download/.

After the router is connected to the Internet, you can discover the router on the network using the NETGEAR Insight app. If you are an Insight Premium or Pro user, you can also use the Cloud portal. These tools let you perform remote management and monitoring tasks from your smartphone, tablet, or computer. For more information about Insight, visit netgear.com/insight and see the NETGEAR knowledge base articles at netgear.com/support/.

You can use the router without creating an Insight-managed topology (using the Insight app or Insight Cloud portal), but in that situation you cannot remotely monitor, manage, and troubleshoot the router, nor receive push notifications from the router, and the router operates in standalone mode only, like a traditional router.

Using the Insight app and Insight Cloud portal, as well as network-based policies and zero-touch configuration, you can configure and manage the router, along with Insight-managed WiFi access points and NAS devices, at the network level. Also, using the Insight app or Insight Cloud portal, you can improve the efficiency of the router, which results in the improvement of its overall performance as well as the performance of the network.

Note: The router's default IP address is 192.168.1.1 and its default subnet mask is 255.255.255.0.

5

Troubleshooting

This chapter provides information about troubleshooting the router. The chapter includes the following sections:

- [Hardware troubleshooting chart](#)
- [Additional troubleshooting suggestions](#)

Hardware troubleshooting chart

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

Table 3. Troubleshooting chart

Symptom	Possible Cause	Possible Solution
Power LED is off.	Power is not supplied to the router.	Check the power cable connections at the router and the power source. Make sure that all cables are used correctly and comply with the Ethernet specifications.
A combined speed and activity LED is off when the port is connected to a device.	Port connection is not working.	Check the crimp on the connectors and make sure that the plug is properly inserted and locked into the port at both the router and the connecting device. Make sure that all cables are used correctly and comply with the Ethernet specifications. Check for a defective port, cable, or module by testing them in an alternate environment where all products are functioning.
File transfer is slow or performance is degraded.	One possible cause is that a broadcast storm occurred and that a network loop (redundant path) was created.	Break the loop by making sure that only one path exists from any networked device to any other networked device.
A segment or device is not recognized as part of the network.	One or more devices are not properly connected, or cabling does not meet Ethernet guidelines.	Verify that the cabling is correct. Make sure that all connectors are securely positioned in the required ports. It is possible that equipment was accidentally disconnected.
A combined speed and activity LED is blinking continuously on all connected ports and the network is disabled.	A network loop (redundant path) was created.	Break the loop by making sure that only one path exists from any networked device to any other networked device.

Additional troubleshooting suggestions

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

- **Network adapter cards.** Make sure that the network adapters that are installed in the computers are in working condition and the software driver was installed.
- **Configuration.** If problems occur after you alter the network configuration, restore the original connections and determine the problem by implementing the new changes, one step at a time. Make sure that cable distances, repeater limits, and other physical aspects of the installation do not exceed the Ethernet limitations.
- **Router integrity.** If necessary, verify the integrity of the router by resetting it. To reset the router, press the **On/Off** power button twice. If the problem continues, contact NETGEAR technical support. For more information, visit the support website at netgear.com/support.
- **Autonegotiation.** The RJ-45 ports negotiate the correct duplex mode, speed, and flow control if the device at the other end of the link supports autonegotiation. If the device does not support autonegotiation, the router determines only the speed correctly, and the duplex mode defaults to half-duplex.
The Gigabit Ethernet ports negotiate speed, duplex mode, and flow control if the attached device supports autonegotiation.