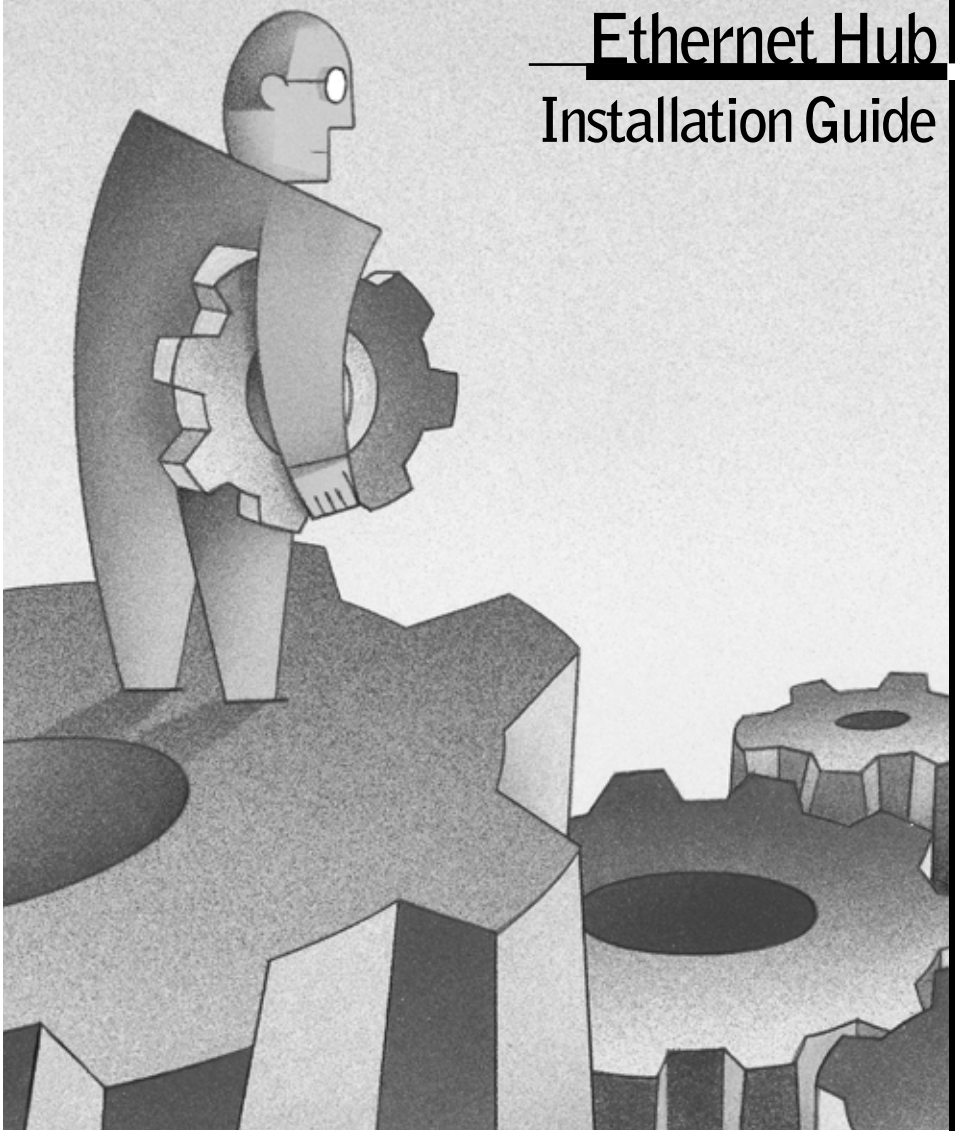
NETGEAR

MODEL EN308TC

Ethernet Hub

Installation Guide



Start Here

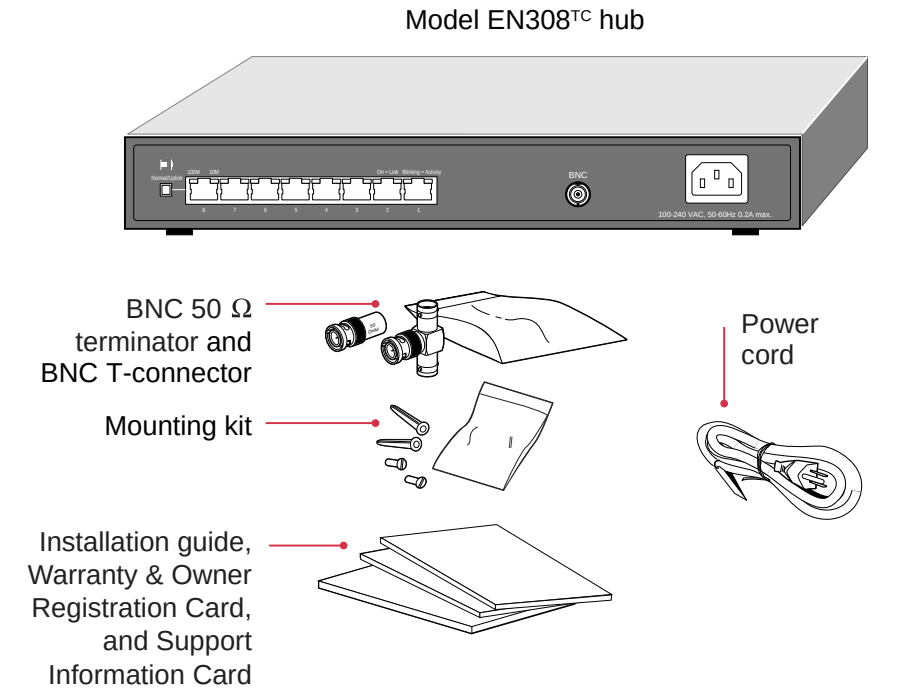
Congratulations on your purchase of the NETGEAR™ Model EN308^{TC} Ethernet hub. This hub delivers standards-based, plug-and-play networking solutions for small businesses, home offices, and low-density workgroups of larger companies.

Features

The Model EN308^{TC} hub has the following features:

- Eight 10BASE-T network ports (RJ-45) that provide 10 megabit per second (Mbps) networking using simple unshielded twisted pair (UTP) wiring
- Coaxial BNC backbone support for connecting to an existing Ethernet segment or external transceiver, or for network expansion by connecting multiple hubs together using coaxial cabling
- Built-in LED indicators for at-a-glance status checks by networks ports
- Uplink port for connecting to other hubs using simple straight-through cables
- Front-panel LED indicators to monitor overall hub status
- Plug-and-play installation with no software to configure
- Complete hub functions including packet retiming, collision detection, preamble regeneration, and fragment extension
- Automatic partitioning and reconnection of a port that has excessive collisions or is jabbering
- Automatic polarity detection for recognizing and correcting incorrect polarity on the receive pair
- Compact design, enabling easy tabletop or rack-mounting installation
- Internal power adapter
- Limited five-year warranty

Package Contents



Verify that your package contains the following:

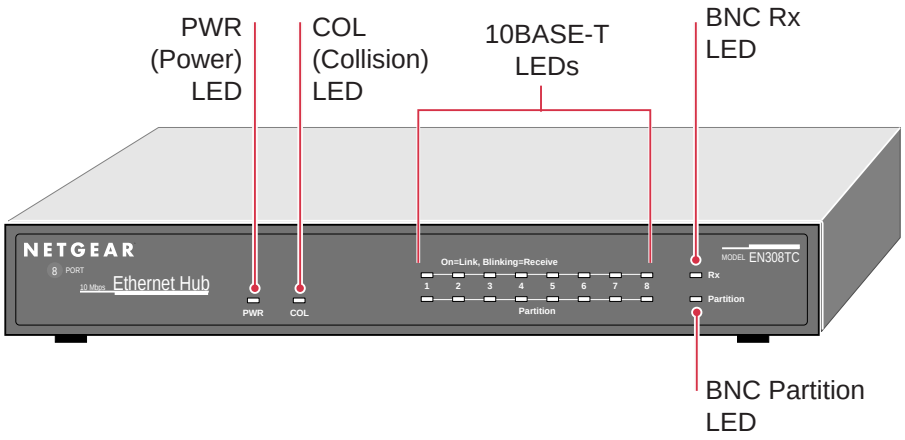
- Model EN308^{TC} hub
- Mounting kit (for wall installation)
- BNC T-connector and BNC 50 Ω terminator
- This installation guide
- Warranty & Owner Registration Card
- Support Information Card
- Power cord

Product Illustration

Front Panel

The front panel of the Model EN308^{TC} hub contains LEDs that monitor the activity status of the hub.

For ease of use, the front panel 10BASE-T LEDs that indicate link, receive, or partition activity are duplicated on the 10BASE-T ports on the rear panel. Use the rear panel LEDs when setting up the device, and use the same LEDs on the front panel for monitoring the ports when the hub is positioned in place and set up.



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Front Panel LEDs

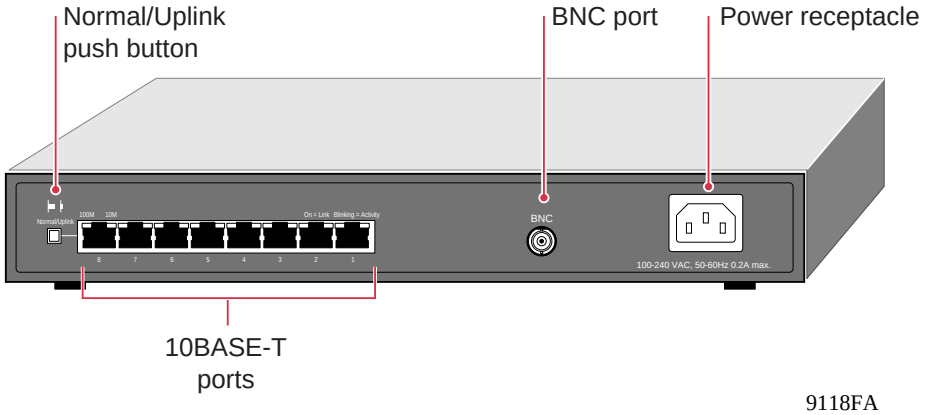
The table below describes the activity of the front panel LEDs.

Label	Color	Activity	Description
Pwr (Power)	Green	On	Power is supplied to the hub.
Col (Collision)	Amber	Blinking	Data collision is occurring on the network. Note that occasional collisions are normal.
10BASE-T LEDs Link/Receive (For ports 1 through 8)	Green	On	The link between this port and the connected port is good.
		Blinking	There is incoming data on the port.
Partition	Amber	On	The port is partitioned because of excessive collisions.
BNC LEDs Rx	Green	Blinking	There is incoming data on the BNC port.
Partition	Green	On	The BNC port is partitioned because of excessive collisions.

Rear Panel

The rear panel of the Model EN308^{TC} hub has eight RJ-45 10BASE-T ports, a BNC port that you can use to connect to a backbone network or other PCs using thin coaxial cable, and a Normal/Uplink push button.

The rear panel also includes a DC power receptacle.



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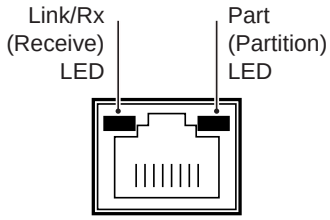
RJ-45 10BASE-T Network Ports with Built-in LEDs

Two LEDs—the Link/Rx (Receive) LED and the Part (Partition) LED—are built into each 10BASE-T port.



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The table below describes the activity of the LEDS.

Label	Color	Activity	Description
Link/Rx (Located in the top left corner of each 10BASE-T port)	Green	On Blinking	The link between this port and the connected port is good. There is incoming data on the port.
Part (Located in the top right corner of each 10BASE-T port)	Amber	Blinking	The port is partitioned because of excessive collisions.

Normal/Uplink Push Button for Port 8

The Normal/Uplink push button allows you to select Normal (MDI-X) wiring for direct PC connection. The push button also allows you to select Uplink (MDI) wiring for connection to another hub or to a switch through port 8 on the Model EN308^{TC} hub. This uplink configuration eliminates the need to use a crossover cable. The other 10BASE-T ports are permanently configured for normal wiring for connection to a PC.

Installation Procedures

Prepare the Site

Before you begin installing your Model EN308^{TC} hub, 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 photocopy machine or arc welder).
Service access	Minimum 12 inches (19.68 cm) front and back for service access and maintenance. Front and back clearance for cables and wiring hardware such as punchdown blocks.
Power	Adequate power source within 6 feet (1.83 m).
Wiring hardware	Wiring hardware, such as punchdown blocks or patch panels, should be complete before installing the hub.

Install the Hub

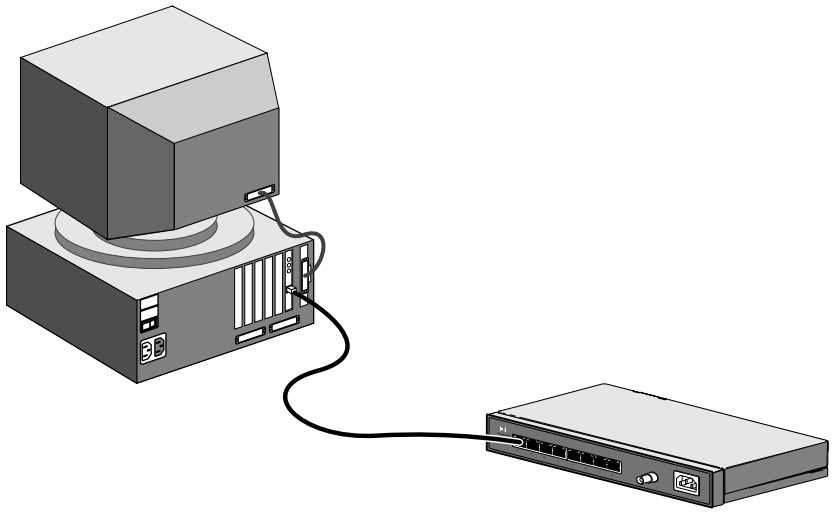
To install your hub on a flat surface, you do not need any special tools. Be sure the hub is positioned with at least 2 inches of space on all sides for ventilation.

To install the hub on a wall, measure the distance between the mounting holes on the back of the hub and mark the wall to match the location of the mounting holes on the hub. At the marked location, screw into the wall the two screws that you received with the mounting kit included in your package contents. Be sure to choose a location that is near the devices to be connected, is close to an electrical outlet, and provides at least 2 inches of space all around the hub for ventilation.

3 Connect a PC to the Hub

You can connect PCs, Apple Macintosh computers, UNIX workstations, or any device equipped with a 10BASE-T Ethernet interface to the RJ-45 ports on your hub by using twisted pair Ethernet cables.

To connect any of the RJ-45 ports on your hub to a PC, use a regular straight-through UTP cable. If you are connecting using port 8 on the Model EN308^{TC} hub, set the Normal/Uplink push button to Normal.



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Note: Ethernet specifications limit the cable length between your PC or server and the hub to 328 feet (100 meters) in length.

4 Connect the Hub to a Network

Cascading refers to connecting hubs together to increase the number of ports or the number of users supported on the network. The 10BASE-T ports can be used to cascade hubs together.

The twisted pair cable extended from a 10BASE-T port (or UTP port) is called a twisted pair segment and can be up to 100 meters (m) in length. The 10BASE-T ports, with the exception of port 8, are MDI-X (or Normal) ports. Use the following table as a guide for selecting the appropriate network cable.

Connecting Port on the Hub	Connecting Device	Cable Used
Ports 1–7	PC, server, or router	Straight-through cable
Ports 1–7	Hub or switch	Crossover cable

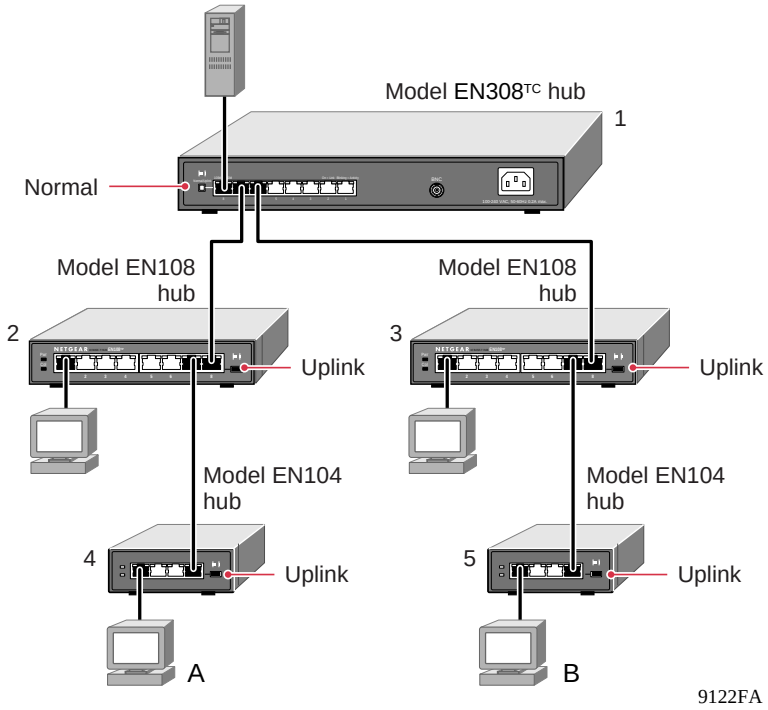
Set the Normal/Uplink Push Button

If you are connecting to port 8 on the Model EN308^{TC} hub, use the following table. Determine the type of cable to use and how to set the Normal/Uplink push button.

Connecting Port	Connecting Device	Cable Used
Port 8 set to Normal	PC, server, or router	Straight-through cable
Port 8 set to Uplink	Hub or switch	Straight-through cable

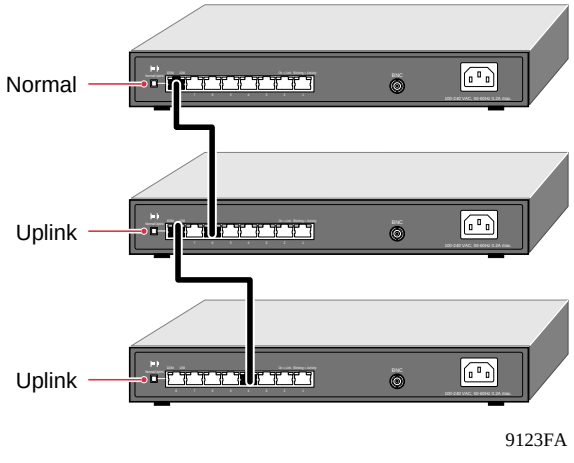
Cascade the Hub Using the 10BASE-T Ports

The following illustration shows cascading hubs together in a hierarchical star through the 10BASE-T ports and indicates the setting of the Normal/Uplink push button on each hub.



Note: Ethernet specifications limit the number of hubs with twisted pair links in any communication path to five, as shown in the example. When PC "A" communicates with PC "B," the communication path goes from hub 4 to hub 2, to hub 1, to hub 3, and then to hub 5 (or five paths).

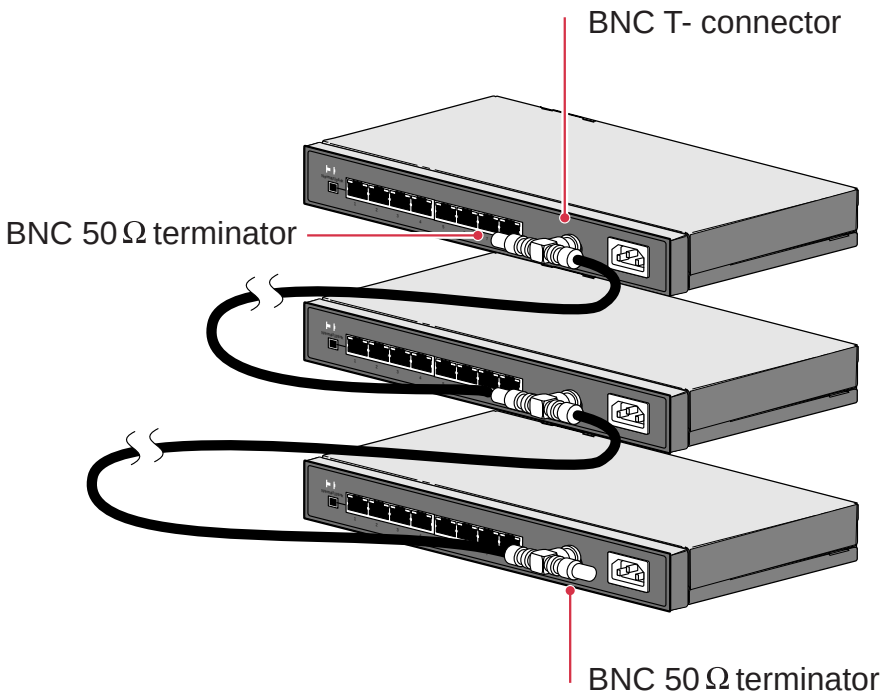
The following illustration shows cascading Model EN308^{TC} hubs together daisy-chain style. Refer to the illustration for setting the Normal/Uplink push button on each hub.



Connect to a Network Using the BNC Port

The BNC port on the rear panel of the hub is used for connecting to a thin coaxial segment. You can connect other Model EN308^{TC} hubs, servers, workstations, or other devices to the BNC port. A BNC T- connector is inserted in the port, and the BNC 50 Ω terminator terminates the connection at each end device. By using the BNC port for cascading, you treat each connected hub as just another node on the coaxial segment.

The separation marks in the coaxial cable between the hubs in the following illustration represent the incorporation of other devices and show that interconnection is not limited to hubs.



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Note: Ethernet specifications limit a BNC segment to 30 BNC connections, specify a minimum of 1.64 feet (0.5 m) between any two stations, and limit segments to 607 feet (185 m) in length.

5 Verify the Installation

To complete the installation, connect the power cord first to the power receptacle on the hub rear panel and then to the power outlet on the wall. When power has been applied to the hub:

- The green Pwr (Power) LED on the front panel is on.
- The green Link/Receive LED on each connected port is on.

If there are any problems, refer to "Troubleshooting Information." Refer to the troubleshooting table and the information that follows to troubleshoot your hub.

Network Interface Cards

Make sure the network interface cards installed in the workstations are in working condition and the software driver has been installed.

Hub Integrity

If required, verify the integrity of the hub by resetting it. Turn power to the hub off and then back on. If the problem continues and you have completed all the preceding diagnoses, contact NETGEAR Customer Support. For the phone number of the representative in your area, see the Support Information Card included in your package contents.

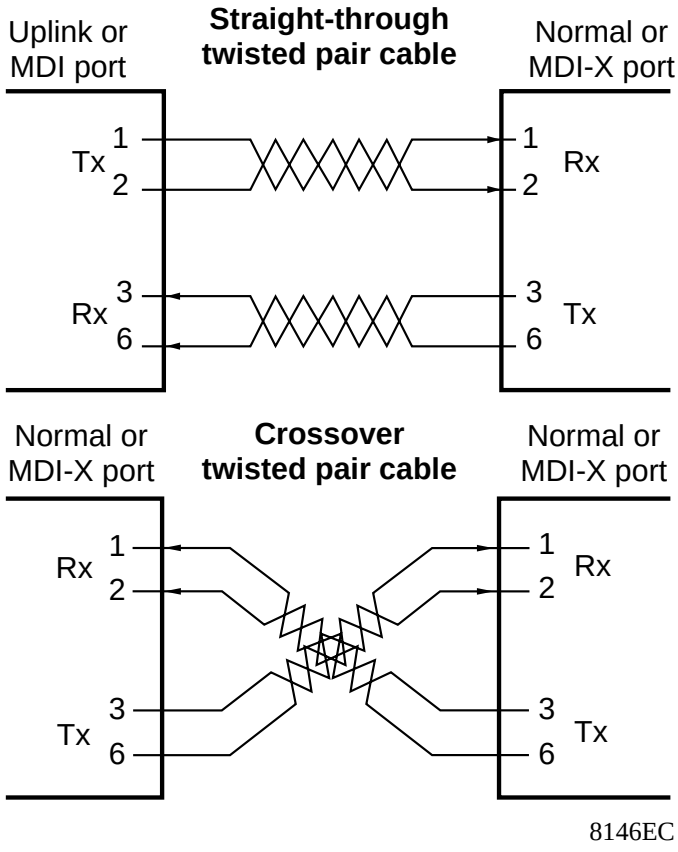
Troubleshooting Information

Symptom	Cause	Solution
Amber Col LED blinks.	There is data collision on the network.	Data collision is normal on Ethernet networks. No action is required.
Amber Col LED blinks excessively.	There is data collision on the network because the network is extremely busy or defective devices are connected on the network that cannot detect network traffic or collision.	Make sure connected devices are operating in half-duplex mode. The hub is not compatible with devices that operate in full-duplex mode. If you suspect that there might be a defective device on the network, disconnect devices one at a time to isolate the defective unit on the network. If the network is extremely busy, you may have to segment the network with an Ethernet switch such as a NETGEAR Ethernet switch or to upgrade your network to Fast Ethernet operation.
	Wrong or miswired cables are used.	Make sure the correct UTP cables are used. See the tables in the installation section of this guide for cable use and Normal/Uplink push button information. Note that home telephone cables can cause a collision condition and cannot be used in place of UTP cables.
Link/Rx LED on front panel or Link/Rx green LED on rear panel is off when a cable is attached.	The port is not detecting a successful link.	Check for a bad cable, cable pairs that are not correctly wired, or loose connectors. Make sure that there is power to both the hub and the Ethernet transceiver on the connected device.
Link/Rx LED on front panel or Link/Rx green LED on rear panel is not blinking when there is data transmission.	The port is not detecting data transmission.	Check for a bad cable, cable pairs that are not correctly wired, or loose connectors. Make sure that there is power to both the hub and the Ethernet transceiver on the connected device.
Green Rx LED on the BNC port is not on when the port is connected.	The port is not detecting a successful link.	Make sure that each segment is terminated with a BNC 50 Ω terminator at both ends. Check for a bad cable.
Green Rx LED on the BNC port is not blinking when there is data transmission.	The port is not detecting data transmission.	Check for a bad cable or loose connectors. Make sure that there is power to both the hub and the connected device.

Twisted Pair Cables

Twisted Pair Cables

For two devices to communicate, the transmitter of each device must be connected to the receiver of the other device. The crossover function is usually implemented internally as part of the circuitry in the device. Most ports on switches and repeaters have media dependent interfaces with crossover ports. These ports are referred to as MDI-X or Normal ports. Computer and workstation adapter cards are usually media-dependent interface ports referred to as MDI or Uplink ports. The figures above illustrate the use of straight-through and crossover twisted pair cables.



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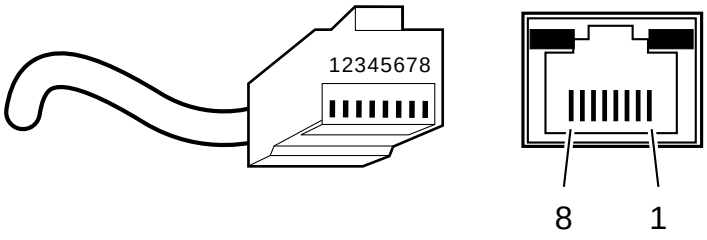
RJ-45 Connector

The RJ-45 connector (shown in the illustration with an RJ-45 plug) is used to connect workstations, hubs, and switches through unshielded twisted pair cable. The RJ-45 connector accepts four-pair Category 3 or Category 5 UTP cable. Only two pairs are used for 10BASE-T wiring.



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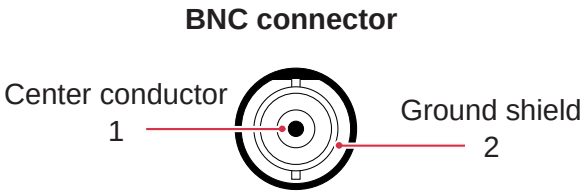
RJ-45 Connector Pin Assignment	Normal Assignment: Port 1 - 8	Uplink Assignment: Port 8
1	Input Receive Data +	Output Transmit Data +
2	Input Receive Data -	Output Transmit Data -
3	Output Transmit Data +	Input Receive Data +
6	Output Transmit Data -	Input Receive Data -
4, 5, 7, 8	Not used	Not used

BNC Connector

The BNC connector for the hub supports 10 Mbps data transmission and connects the hub to other devices.



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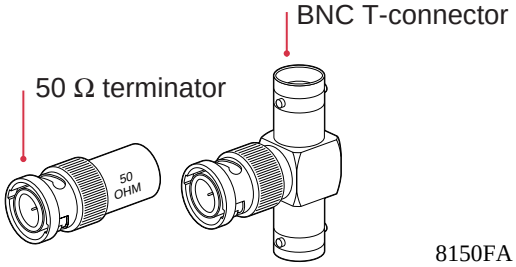
The BNC T-connector and the 50 Ω terminator enable the BNC port on the hub to connect a thin coaxial segment.



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Technical Specifications

General Specifications	
Network Protocol and Standards Compatibility	
IEEE 802.3i, 10BASE-T, 10BASE-2, 10BASE-5 Ethernet	
Data Rate	10 Mbps, Manchester encoded
Interface	10BASE-T ports (RJ-45), BNC port
Power Consumption	3.5 W
Physical Specifications	
Dimensions:	3.37 by 4.0 by 1.1 in. 94 by 101 by 28 mm
Weight:	0.74 lb (0.34 kg)
Environmental Specifications	
Operating temperature:	0° to 40° C (32° to 104° F)
Operating humidity:	90% maximum relative humidity, noncondensing
Electromagnetic Emissions	
CE mark, commercial	
FCC Part 15 Class A	
EN 55 022 (CISPR 22), Class A	
VCCI Class 1 ITE	
Electromagnetic Susceptibility	
CE mark, commercial	
Electrostatic discharge (ESD):	IEC 801-2, Level 2/3/4
Radiated electromagnetic field:	IEC 801-3, Level 2
Electrical fast transient/burst:	IEC 801-4, Level 2
Electrical surge:	IEC 801-5, Level 2

Trademarks

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 EN308^{TC} hub 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

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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy. If it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to take whatever measures may be necessary to correct the interference at their own expense.

EN 55 022 Statement

This is to certify that the NETGEAR Model EN308^{TC} hub 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).

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

Canadian Department of Communications Radio Interference Regulations

This digital apparatus (NETGEAR Model EN308^{TC} hub) 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 EN308^{TC} hub) 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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