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HP AdvanceStack 10Base-T Hubs

Installation and Reference Guide

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Publication Number

5964-4601
Edition 2
October 1995
Printed in Singapore.

Applicable Products

HP J2600A
HP J2601B
HP J2602B

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A copy of the specific warranty terms applicable to your Hewlett-Packard product and replacement parts can be obtained from your HP Sales and Service Office or authorized dealer.

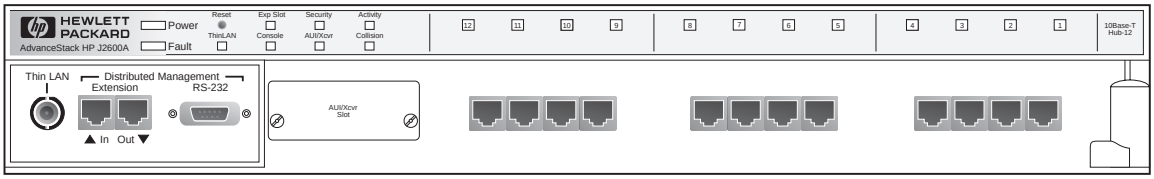
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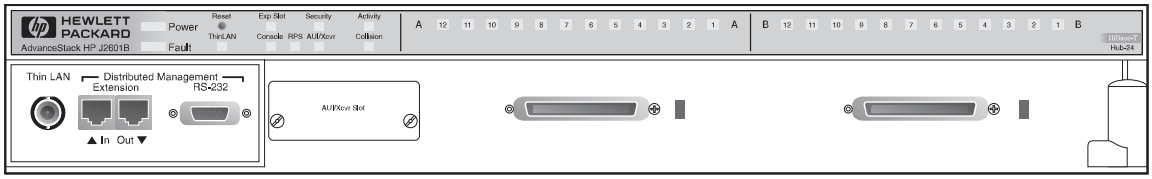
HP AdvanceStack 10Base-T Hubs

At A Glance

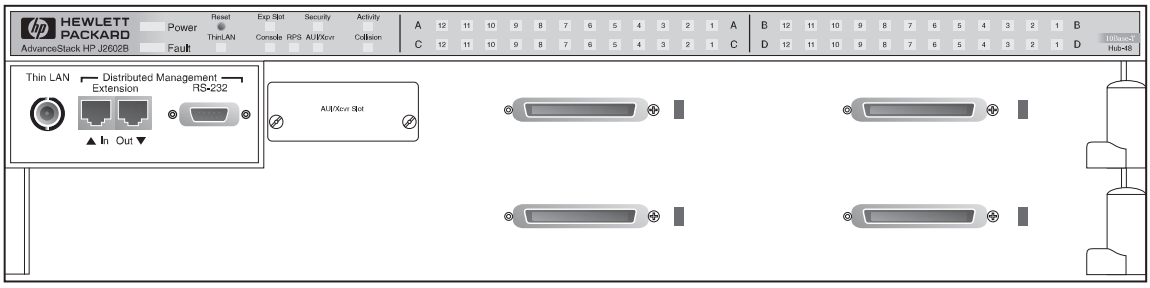
The HP AdvanceStack 10Base-T hubs are a family of multiport repeaters. With these hubs, you can connect computers and other devices together in an unshielded twisted-pair cable network. These hubs are compliant with the IEEE 802.3 Type 10Base-T standard and support both 802.3 and Ethernet networks. There are three models in the HP AdvanceStack 10Base-T hub family:



HP AdvanceStack 10Base-T Hub-12 (HP J2600A)



HP AdvanceStack 10Base-T Hub-24 (HP J2601B)



HP AdvanceStack 10Base-T Hub-48 (HP J2602B)

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Features

Network Connections

- 12, 24, or 48 twisted-pair ports. The 12-port hub has built-in RJ-45 jacks. The 24-port and 48-port hubs have industry-standard 50-pin telco connectors that can be fitted with 50-pin/RJ-45 Adapters included with the hubs.
- A ThinLAN port (BNC) for connection to a ThinLAN coaxial cable segment. This port is used to connect hubs together and to connect the hubs to a common network backbone.

Upgradeable Design

- The AUI/Xcvr slot for installing one of the HP Transceiver Modules.:

  - HP Fiber-Optic Transceiver Module (HP J2606A)—for 10Base-FL
  - HP Twisted-Pair Transceiver Module (HP J2607A)—for 10Base-T
  - HP ThinLAN Transceiver Module (HP J2608A)—for 10Base2
  - HP AUI Port Module (HP J2609A)—to attach external transceivers

- Ability to expand the hubs' capabilities by adding to the Expansion Slot the following optional components:

  - HP Ethernet SNMP Module
  - HP AdvanceStack Dial-A-LAN 2A/Plus V.34
  - HP AdvanceStack Dial-A-LAN 4A
  - HP AdvanceStack Router 210 Module

Distributed Management

- RJ-45 extension ports for "chaining" the HP AdvanceStack hubs together, allowing access to all the hubs in the chain from one RS-232 out-of-band connection into the chain, or from a network management station. The out-of-band control is from a PC running HP Stack Manager or an ASCII terminal or PC emulating an ASCII terminal.
- The RS-232 out-of-band management port for attaching a personal computer running the included Windows-based HP Stack Manager software or for controlling the hub from an ASCII terminal or a PC emulating an ASCII terminal. If the hub has an HP Ethernet SNMP Module installed, this serial connection can also be made through a modem attached to the RS-232 port. The HP Stack Manager software can also configure, monitor, and diagnose the hub or an entire stack of hubs.

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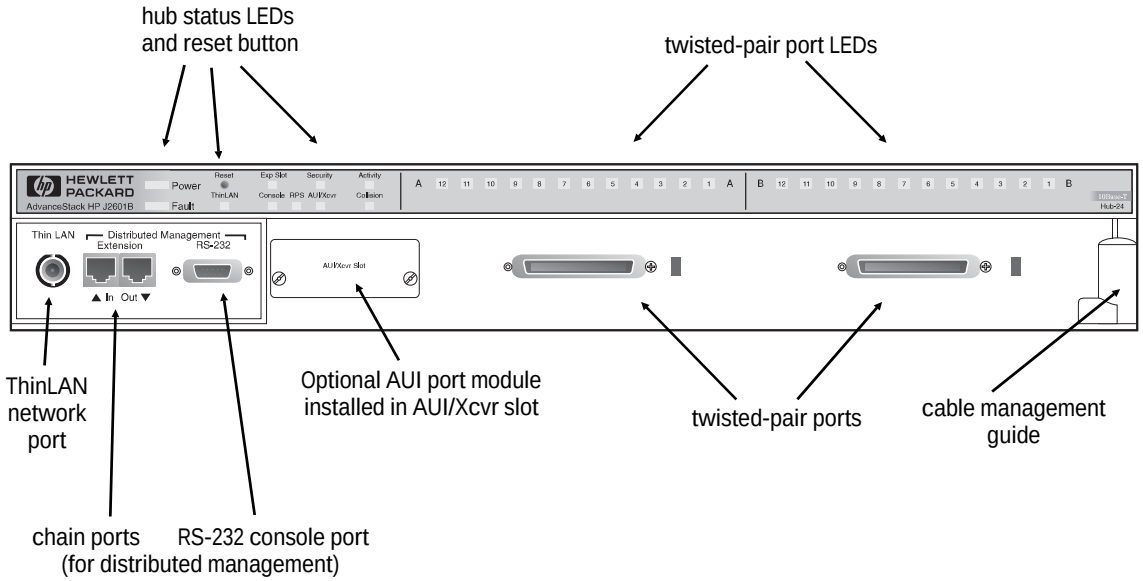
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Features *(continued)*

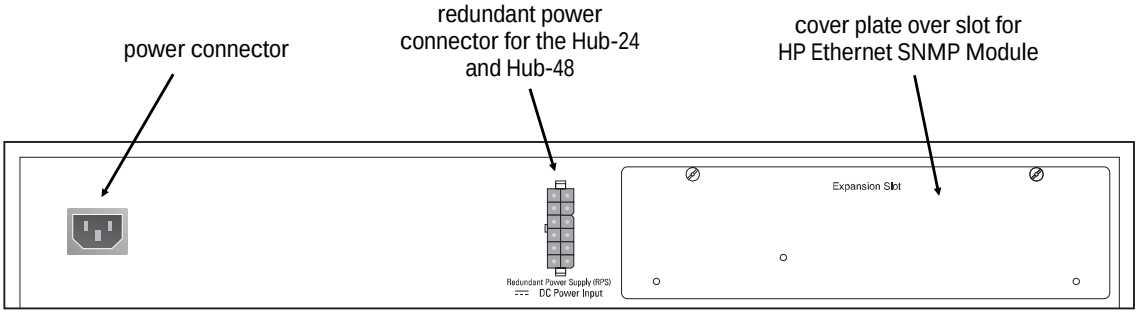
Modular, Easy-to-Use Design	■ LEDs showing power, activity, collisions, and port status provide quick, easy-to-read hub status information and troubleshooting assistance. ■ A small footprint that allows you to install the hub in a large variety of ways, including on a desk, under a desk, or on a wall. ■ Metal brackets (included with the hub) that can be easily attached to the hub for mounting it in a standard 19-inch telco rack or on a wall. ■ Automatic segmentation (also called auto-partitioning) of ports that are experiencing excessive collision problems. This improves network integrity and aids in fault isolation.
Reliable Operation	■ A power supply that automatically adjusts to the voltage range of the ac power being supplied to the hub (90-120 volts or 200-240 volts). No voltage range setting or fuse change is needed. ■ For the Hub-24 and Hub-48, a power connector for the HP J2962A Redundant Power Supply (RPS) which will be available at the end of 1995. With the rack-mountable RPS, your hub will receive redundant DC power for increased reliability. ■ The ability to "hot swap" a hub. Removing a hub connected to other hubs through the built-in ThinLAN connector does not bring down the network; you can upgrade or replace hubs in a stack with the network up and running. ■ A self-test for fault identification when the hub is powered on or when it is reset. (The hub can be reset from the HP Stack Manager, from a network management station, or by pressing the Reset button.)
Standards-Based Compatibility	■ Compatible with the IEEE 802.3 Type 10Base-T standard to support both 802.3 and Ethernet networks.

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Front Panel



Back Panel



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HP Customer Support Services

How to get the latest software/agent firmware

You can download any of the following:

HP AdvanceStack SNMP firmware:	asfw.exe
HP Interconnect Manager:	icmupdt.exe
HP Stack Manager	stkmgr.exe

from the HP BBS, HP FTP Library Service, CompuServe, and the World Wide Web. After you download the file, exact the file by typing *filename /x*. For example asfw.exe /x

HP BBS

Set your modem to N-8-1, set speed up to 14400 bps, and with your telecommunication program (e.g., Windows Terminal) dial (208) 344-1691 to get the latest software for your HP networking product.

HP FTP Library Service

1) FTP to Internet IP Address - ftp ftp-boi.external.hp.com
2) Log in as anonymous and press Return at the password prompt.
3) Type bin to set the transfer type.
4) Type cd pub/networking/software
5) Type get *filename* to transfer the file to your computer and quit.

CompuServe

1) Login to CompuServe.
2) Type go hpsys
3) Type lib 7
4) Type download *filename* and then quit.

World Wide Web

http://www.hp.com/go/network_city

Select the Support section, then Downloads and Patches. Download the file you need and extract it by typing: *filename* /x

Do you have questions about designing your expanding network? From this web site, you can also download the *Designing HP AdvanceStack Networks Guide* which addresses capacity planning or dial 1-800-752-0900 to receive a copy through the mail.

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Obtain the latest agent firmware (asfw.exe, icmupdt.exe, stkmgr.exe) from:

HP FTP Library:	ftp ftp-boi.external.hp.com
World Wide Web:	http://www.hp.com/go/network_city
HP BBS	(208) 344-1691
CompuServe	go hpsys lib 7 download asfw.exe

HP NETWORK CONNECTIVITY

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Installing the HP AdvanceStack 10Base-T Hubs

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Installation Summary

The basic hardware installation procedure for the HP AdvanceStack 10Base-T Hubs is as follows:

1. Install the Ethernet SNMP Module and/or one of the Transceiver Modules (optional).
2. Verify the hub's operation.
3. Mount the hub in a rack, on a wall, or on a tabletop.
4. Connect the hub to a network or other hubs, and connect computer(s) and/or other device(s) to the hub's ports.
5. Connect an out-of-band management console to the hub (optional).

Included Parts

Each of the three HP AdvanceStack 10Base-T hubs has the following components shipped with it:

- HP Stack Manager Software Kit
- *HP AdvanceStack 10Base-T Hubs Installation and Reference Guide*—this manual (5964-4601)
- Product Registration Kit
- Serial cable for attaching a PC to the out-of-band management port (5182-4794)
- 50-pin/RJ-45 Adapters (J2605-61001)—2 supplied with the 24-port hub, 4 with the 48-port hub
- accessory kit(s)—accessories vary with hub model purchased:
  - the 5063-4251 kit (shipped with all hub models):
    - two mounting brackets
    - two cable ties
    - four 3/8-inch M4 machine screws
    - four 5/8-inch number 12-24 screws
  - the 5063-4252 kit (shipped with the 24-port and 48-port hubs):
    - four telco hooks
    - four telco hook screws

(continued on next page)

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- Power cord, one of the following:

  Australia/New Zealand (8120-6175)
  Denmark (8120-6178)
  Europe (8120-6174)
  Switzerland (8120-6179)
  Japan (8120-6176)
  United Kingdom (8120-6173)
  United States/Canada (8120-6177)

Installation Steps

1. Install Add-in Modules (optional)

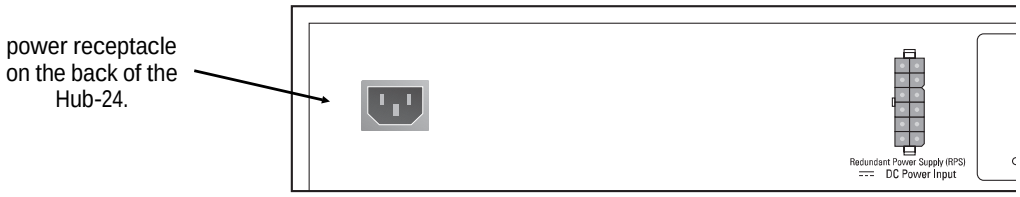
The HP AdvanceStack 10Base-T Hubs can be custom-configured by installing an optional Ethernet SNMP Module and/or an HP Transceiver Module. If you intend to install any of these optional modules, refer to the documentation that was shipped with it.

It may be more convenient to install these optional modules before installing the hub in a rack or other location. Inspect your installation site and identify whether the hub's module slots will be accessible.

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2. Verify the Hub's Operation

1. **Plug the power cord into the hub's power cord receptacle and into an ac power source.**



Caution **If your installation requires a different power cord than the one supplied with the hub, be sure to use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country. The mark is your assurance that the power cord can be used safely with the hub.**

Note The hub does not have a power switch; it is powered on when the power cord is plugged in. The hub's power supply automatically adjusts to any ac power source between 90 and 240 volts. You do not have to set the voltage range.

2. **Check the LEDs on the hub's front panel.**

   When the hub is powered on, it performs a self-diagnostic test during which time all the LEDs are lit.
   - For a hub without an optional SNMP Module installed, the self-test takes approximately 3 seconds.
   - For a hub with an SNMP Module, the self-test takes up to 60 seconds. While the SNMP Module is being tested, the Activity, Collision, and RPS LEDs are not lit (or flickering if there is network traffic on the hub) and the Exp Slot LED flashes slowly.

   At the end of the self-test, a correctly operating hub keeps the Power LED on, the Fault LED will be off, and, if an SNMP Module is installed, the Exp Slot LED will stay lit. If an RPS is connected, the RPS LED stays on.

3. **Unplug the hub.**

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3. Mount the Hub

The HP AdvanceStack hubs can be mounted in three ways:

- in a rack or cabinet
- on a wall
- on a table

The hardware for mounting the hub is included in the Accessory Kit (5063-4251) packed with the hub. If you are mounting the hub to a wall, however, you will also need four 5/8-inch number 12 wood screws, which are not included in the Accessory Kit.

To mount a hub in a rack or on a wall, you will need a Phillips (cross-head) number 1 screwdriver.

To locate the hub on a table or other horizontal surface, no special tools are necessary. Be certain to pick a sturdy table in an isolated area. You may want to secure the hub's cables to the leg of the table to prevent people from tripping over them.

Mounting Precautions:

- Before mounting a hub, plan its location and orientation relative to other devices and equipment. Also consider the cabling that will be attached to the hub and ports that will be used. If you use the cable guide bar on the right side of the hub's front, make room for the grouped cables to trail out from the right side of the hub.
- *Ensure that the HP AdvanceStack hub(s) do not overload the power circuits, wiring, and over-current protection.* To determine the possibility of overloading the supply circuits, add together the ampere ratings from the nameplates of all your hubs (and other equipment) installed on the same circuits and compare the total with the rating limits for the supply circuits.
- Make sure that the power source circuits are properly grounded, then use the supplied power cord to connect the HP AdvanceStack hub to the circuit. *See the Safety Statements at the end of this manual.*
- Do not install the HP AdvanceStack hub in an environment where the operating ambient temperature might exceed 55°C (131°F).
- Make sure the air flow around the sides of the hub is not restricted.

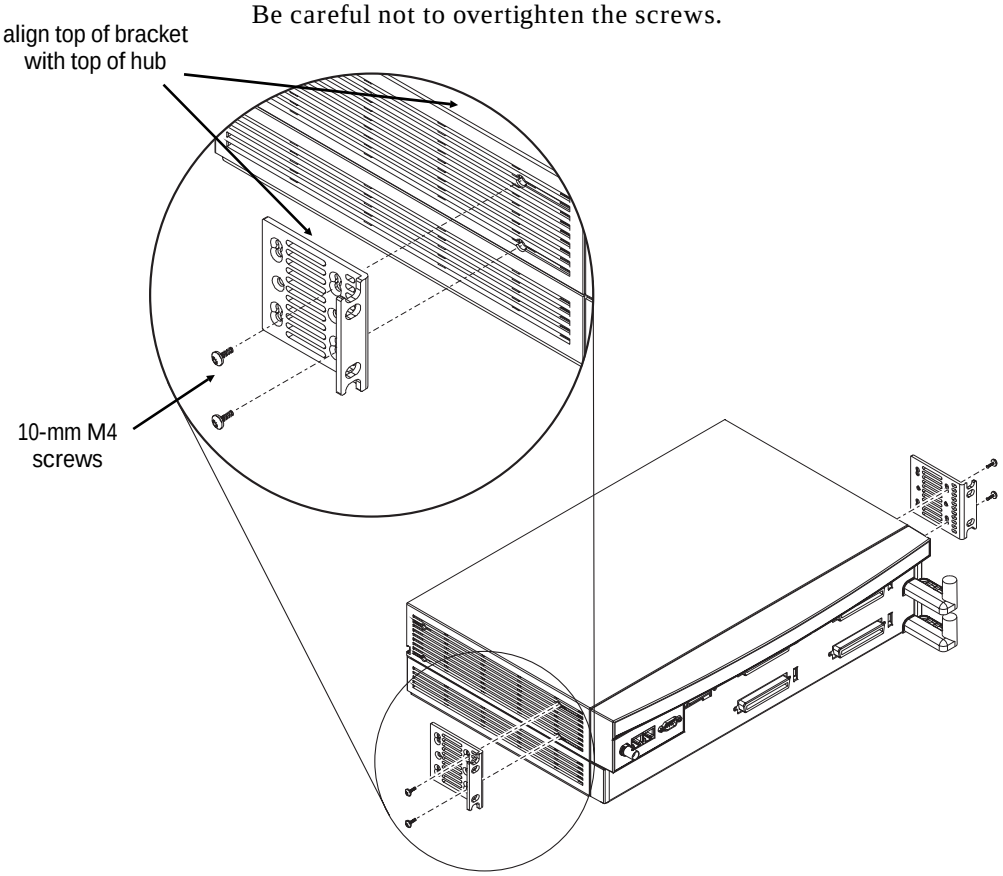
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Mounting the Hub in a Rack or Cabinet

Note that the rack or cabinet should be adequately secured to prevent it from falling over.

1. Using a Phillips (cross-head) screwdriver, attach the mounting brackets to the hub with the 10-mm M4 screws included in the Accessory Kit. The top of each bracket should align with the top of the hub.

   Be careful not to overtighten the screws.



Note that several different rack mount positions are possible by using the different holes in the bracket and the hub. The illustration shows the recommended position for a rack mounting; it provides the most well balanced position for the hub.

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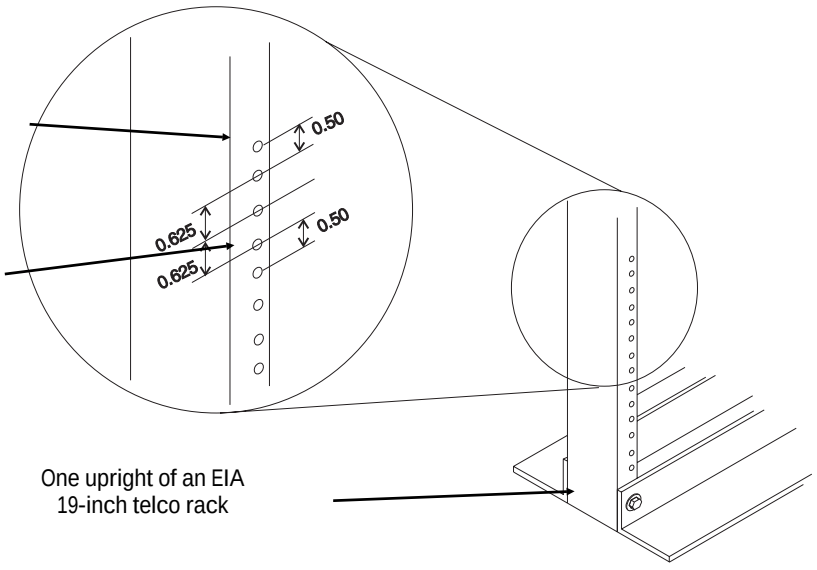
Important Note

Steps 2 through 4 below apply to mounting a single hub or the first of multiple hubs in a rack. The mounting brackets are designed to make it easy to install this first hub, and once it is installed correctly, to easily install subsequent hubs by placing them on top, one at a time, and then securing them to the rack. To make the process easy, it is important to get the first hub located correctly.

This first hub (or single hub) should be mounted in a position toward the bottom of the rack for stability and to make it easier to put the other hubs on top.

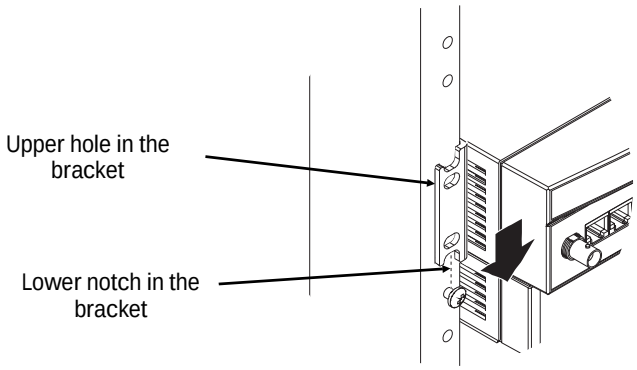
2. As shown below, partially install a screw (5/8-inch number 12-24) in each rack upright. Ensure that the screws in each upright are at the same level.

   If you are stacking multiple hubs in a single rack and want them to fit tightly, the selection of the first screw holes is important. In an EIA-standard 19" telco rack, the screw hole pattern is repetitive-pairs of holes are separated by 0.5-inch or 0.625-inch. Insert these first screws in the repeats with vertical pairs of the holes being close together. Insert these first screws in the upper hole of one of these close pairs, as shown in the illustration.

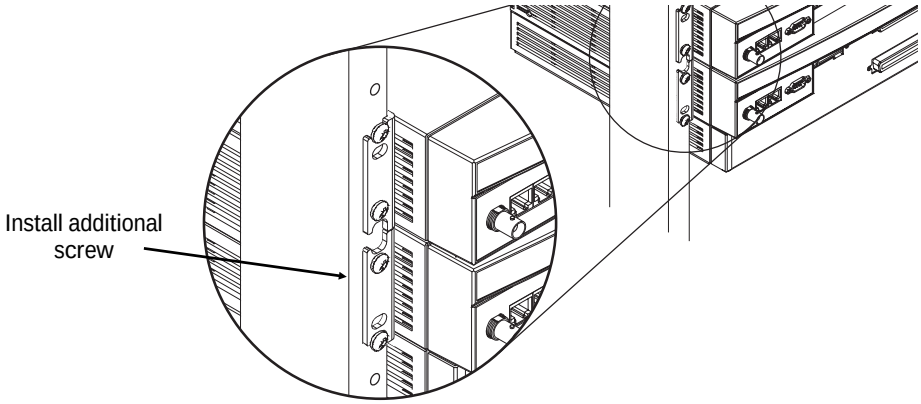


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3. Place the hub in the rack and lower it so the notches in the bottom of the bracket slide onto the two screws. Tighten these screws—be careful not to overtighten.



4. Install the other two number 12-24 screws into the *upper* hole in each bracket. Be careful not to overtighten these screws.

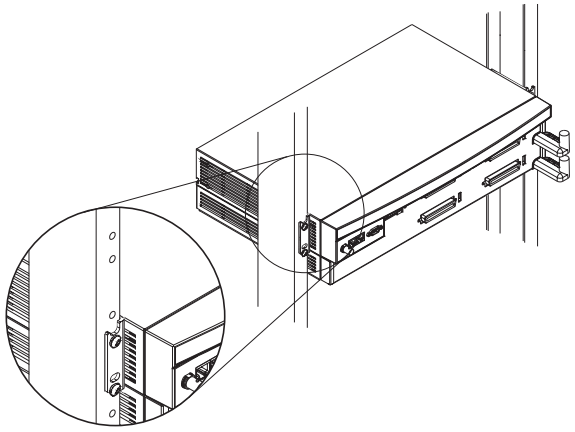


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Notice that for the first hub you mounted, you used the bottom notch and the top hole in the bracket. For the next hub above, you use the bottom hole and the top notch, as show in the illustration below. Continue to alternate “notch and hole, hole and notch” for all hubs to be installed.

To assist you, a single hash mark is located by one notch/hole pair and a double hash mark is located by the other pair on the bracket.



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Mounting the Hub on a Wall

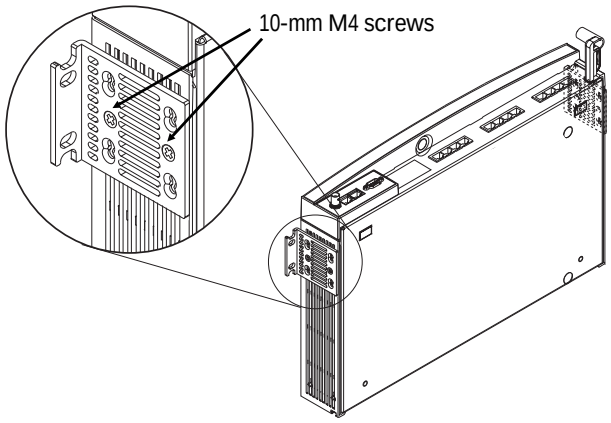
Important

A hub should be mounted only to a wall or wood surface that is at least 1/2-inch plywood or its equivalent.

1. Using a Phillips (cross-head) screwdriver, attach the mounting brackets to the hub in one of the positions shown in the illustrations below with the 10-mm M4 screws included in the Accessory Kit.

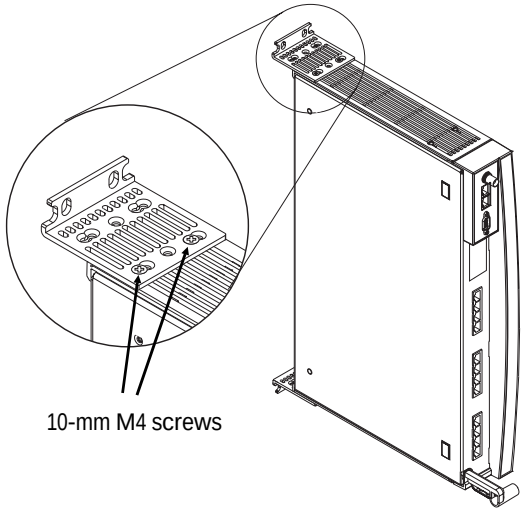
2. Attach the hub to the wall or wood surface with 5/8-inch number 12 wood screws (not included).

Bracket mounting position for flat mounting on a wall.



Bracket mounting position for bookshelf-style mounting on a wall.

Plug the power cord into the hub's power receptacle before mounting the hub. There may not be enough room to do so after the hub is mounted.



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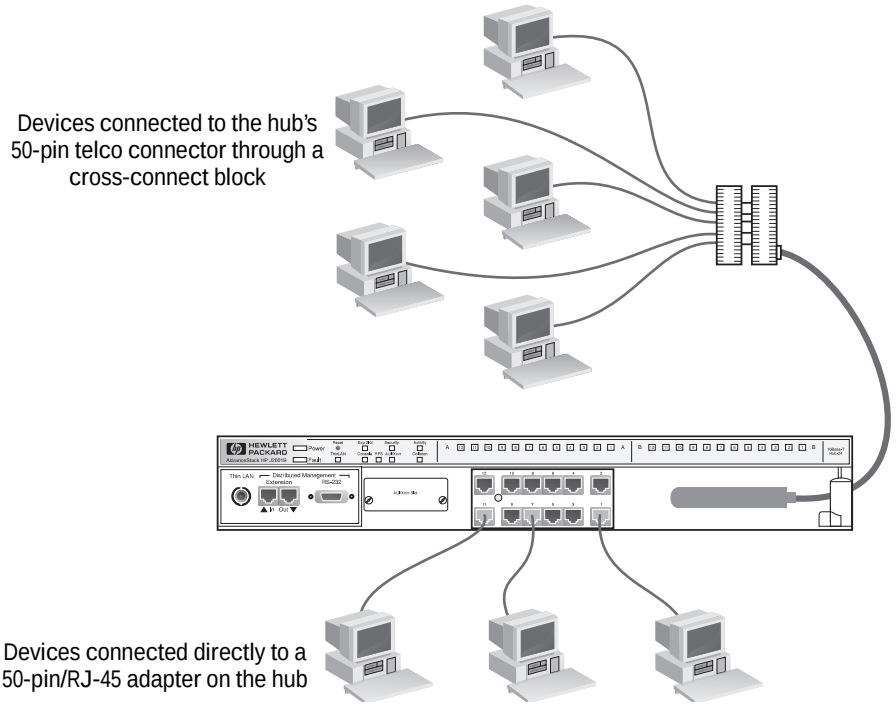
4. Complete the Network Connections to the Hub

Reconnect the hub to the power source and then make the network connections to the hub. (For the Hub-24 and Hub-48, see the documentation accompanying the Redundant Power Supply if you are using redundant power.) Typical hub connections are to:

- network devices such as computers, and printers
- a network backbone
- another HP AdvanceStack 10Base-T Hub, or other Ethernet hub

Some examples of connections that can be made to your hub are shown below. Specific details about connecting your network cabling to the hub's ports are included later in this chapter.

Connecting Computers and Other Devices



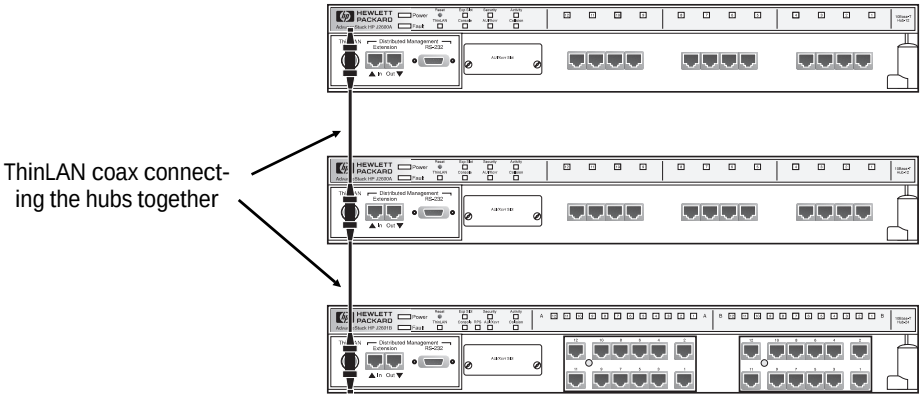
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Hub-to-Hub Network Connections

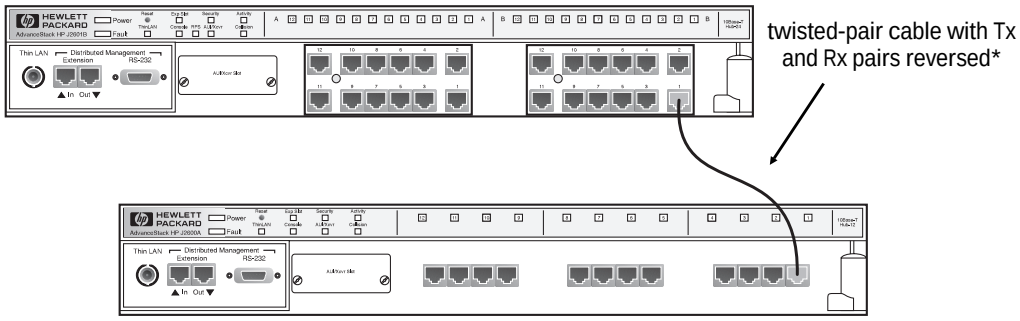
The HP AdvanceStack 10Base-T Hubs can be connected together using any of the hub's network ports. *It is strongly recommended that you use the built-in ThinLAN (BNC) port for connecting hubs together.* By using that port, up to 30 hubs can be connected together on a common ThinLAN segment, and a computer at one end of that segment can communicate with a computer all the way at the other end of the segment. By using the built-in BNC port, the maximum the repeater hop-count increment through the entire segment is only two.

See the *Designing HP AdvanceStack Workgroup Networks* guide for information on valid network topologies.

ThinLAN Port to ThinLAN Port



Twisted-Pair to Twisted-Pair Port – "Cascading"



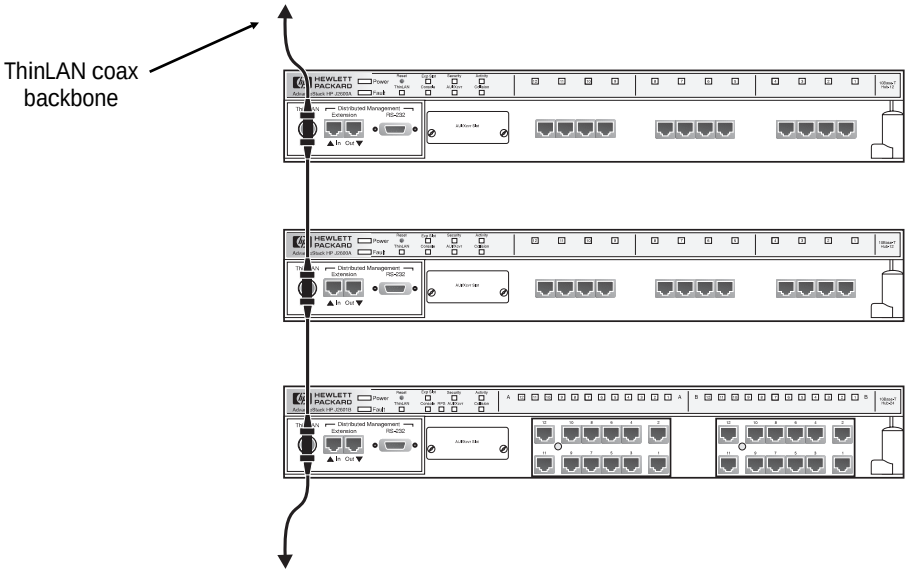
*In a twisted-pair cable connection between hubs, Tx and Rx pairs must be reversed. You can use the HP 92214W Crossover cable with inline adapter to reverse the pairs. See appendix A, "Cables and Connectors", for more information.

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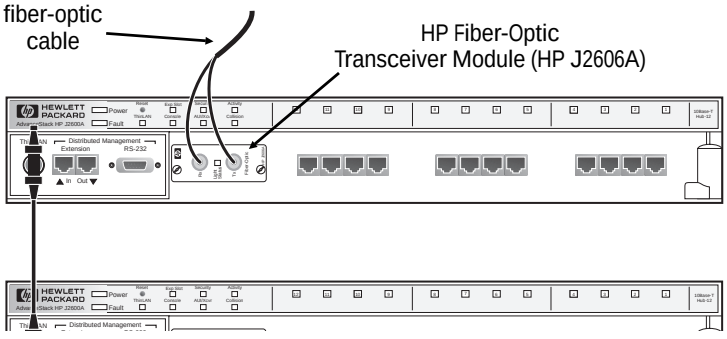
Hub-to-Network Backbone Connections

A single HP AdvanceStack 10Base-T Hub or a stack of hubs can be connected to a network backbone. These examples show connection to ThinLAN and fiber-optic backbones.

Connecting to a ThinLAN Backbone



Connecting to a Fiber-Optic Backbone



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Network Port Connections

The HP AdvanceStack 10Base-T Hubs have the following network ports:

- twisted-pair
- ThinLAN (BNC)
- AUI/Xcvr Slot

This section describes how to connect cables to these ports.

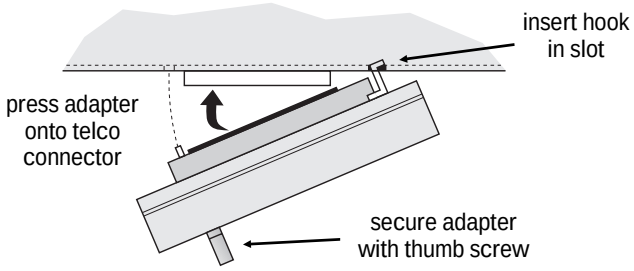
Twisted-pair Connections

Twisted-pair connections can be made through the 12-port hub's built-in RJ-45 jacks and the 24 and 48-port hubs' 50-pin telco connectors, used either directly or with a 50-pin/RJ-45 Adapter (J2605-61001).

Using the 50-pin/RJ-45 Adapter: To install the 50-pin/RJ-45 Adapter (J2605-61001) on the 24 and 48-port hubs' telco connectors:



1. Insert the hook on the back of the adapter into the slot on the hub's face.

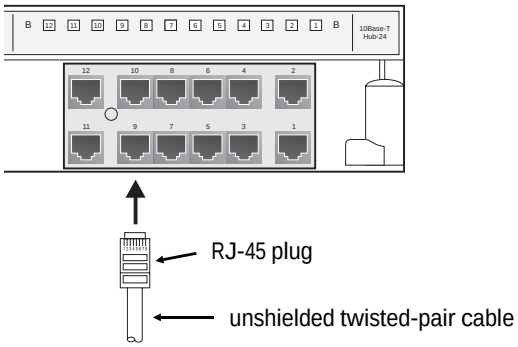


2. Pivot the adapter and press it onto the telco connector.

3. Make sure the hook is in the hub's slot, then secure the adapter to the hub using the thumb screw. *Do not overtighten the screw*.

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Using RJ-45 Connectors: Push the RJ-45 plug into the RJ-45 jack until the tab on the plug clicks into place.

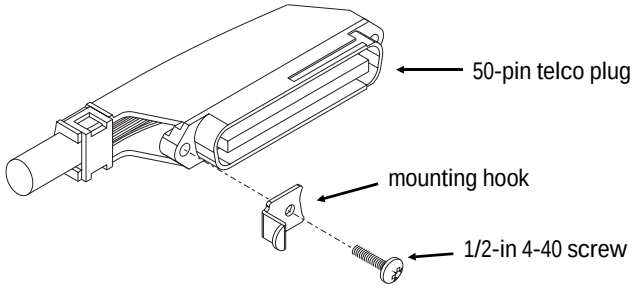


To disconnect an RJ-45 plug, press the small tab on the plug and, holding it up, pull the plug out of the jack.

Using Telco Connectors: If you prefer to make your twisted-pair connections through a cross-connect block, wiring closet, or other intermediary connection, the HP J2601B (24-port) and HP J2602B (48-port) hubs have industry-standard 50-pin telco connectors.

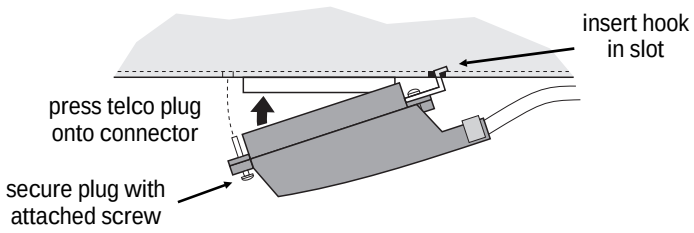
To use a telco connector:

1. Attach the mounting hook included in the Accessory Kit (5063-4252) to the threaded hole on the back of the telco plug. Be careful not to overtighten the screw holding the hook.



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2. Insert the hook into the slot on the hub's face.



3. Pivot the telco plug onto the 50-pin telco connector and press it into place.

4. Make sure the mounting hook is in the hub's slot, then secure the telco plug to the hub by tightening the screw on the telco plug into the hole on the hub. *Be careful not to overtighten the screw*.

To remove a telco connector, reverse this process.

Note

If you are using a mixture of 50-pin/RJ-45 Adapters and right-angle 50-pin connectors on an HP AdvanceStack 10Base-T Hub, position the Adapters to the left of the right-angle 50-pin connectors.

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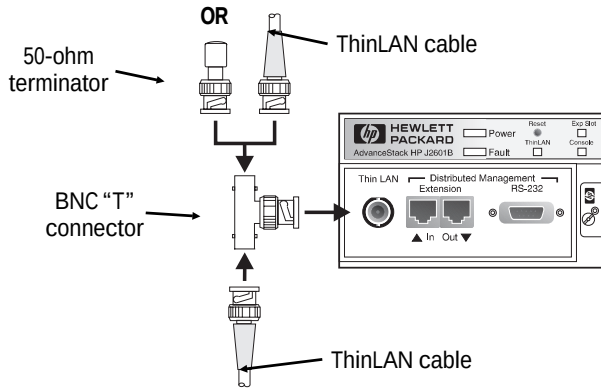
ThinLAN Connections

To connect a ThinLAN cable to the hub's ThinLAN port:

1. Attach a ThinLAN cable section to one side of a BNC "T" connector. (Hewlett-Packard offers BNC "T" connectors with insulating covers. Order product number HP 92227A.)

2. Attach another ThinLAN cable section **or** a 50-ohm terminator to the other side of the "T" connector.

3. Attach the "T" connector to the ThinLAN port.



4. Cover the BNC connector with an insulating cover.

To remove a ThinLAN cable, reverse this process.

Note

Each ThinLAN cable segment must be terminated using a 50-ohm terminator at each end. In the illustration above, a 50-ohm terminator would be placed on one side of the BNC "T" connector if that connector is at the end of the cable segment.

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AUI/Xcvr Slot

Optional transceiver modules can be installed in the hubs' AUI/Xcvr slot to provide additional connectivity choices, including:

- HP Fiber-Optic Transceiver Module (HP J2606A)—for 10Base-FL
- HP Twisted-Pair Transceiver Module (HP J2607A)—for 10Base-T
- HP ThinLAN Transceiver Module (HP J2608A)—for 10Base2
- HP AUI Port Module (HP J2609A)—to attach external transceivers

See the documentation accompanying the optional transceiver modules for cabling configurations for those modules.

Note

In order to use an external transceiver with an HP AdvanceStack 10Base-T Hub, the SQE Test and Loopback Test options, if present, must be disabled on the transceiver. *Transceivers that cannot disable these tests cannot be used with the HP AdvanceStack 10Base-T Hubs.*

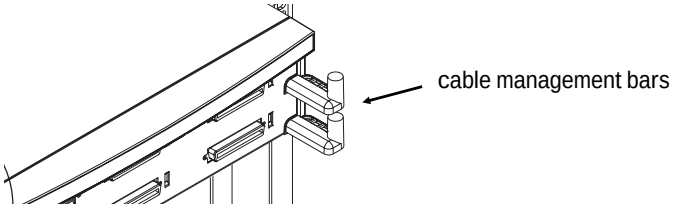
An HP 28641A ThinMAU does not meet this requirement and cannot be used. Use an HP 28641B ThinLAN transceiver instead.

Similarly, an HP 30241A ThickMAU with a date code D-3017 or earlier cannot be used. (The date code is found on a small white sticker on the body of the device. Lower numbers indicate an earlier manufacturing date.) Instead, use an HP 30241A with date code F-3105 or later and follow the instructions included with the ThickMAU for disabling the SQE Test.

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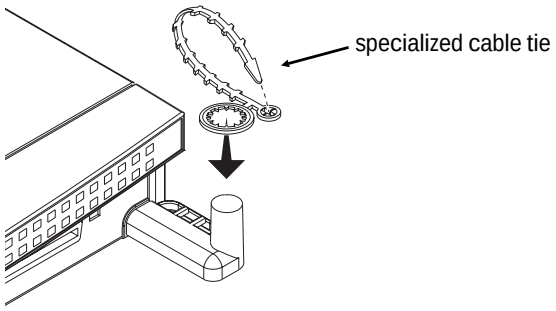
Cable Management

The HP AdvanceStack hubs have been designed to help you with the problem of managing your network cables. On the right side of each hub is a built-in cable management bar.



The bars have slots in them that you can use for tie-wrapping the network cables.

Additionally, included in the hub's accessory kit are some specialized cable ties that allow you to wrap the cables and then attach the bundle to the cable management bar, as shown in the illustration below.



In some instances, all the cables will not fit inside the post on the cable management bar. The specialized cable tie can be used to bundle the extra cables and hang them on the outside of the post.

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5. Connect the Hub to the Distributed Management Console *(optional)*

The HP AdvanceStack hubs can be controlled in two ways:

- from a PC running the HP Stack Manager software that is supplied with the hubs
- from an ASCII terminal or PC running a terminal emulation (requires an HP Ethernet SNMP Module to be installed in the hub or in one of the hubs in the distributed management chain)

The PC serves as a console for an out-of-band management session that enables you to configure, monitor, and diagnose one hub or a stack of up to 16 hubs that are chained together. The HP Stack Manager software is described in chapter 2, “Installing and Using HP Stack Manager”.

With the HP Ethernet SNMP Module, the module’s console is also used to configure, monitor, and diagnose one hub or a stack of up to 16 hubs that are chained together. You can access the console through a terminal emulator on your PC or through a terminal.

There are three ways to access a hub:

- through a direct serial connection
- through a modem connection (available for HP Stack Manager or ASCII terminal only if an HP J6203 Ethernet SNMP Module is installed in the hub to which the modem is connected)
- through the distributed management chain

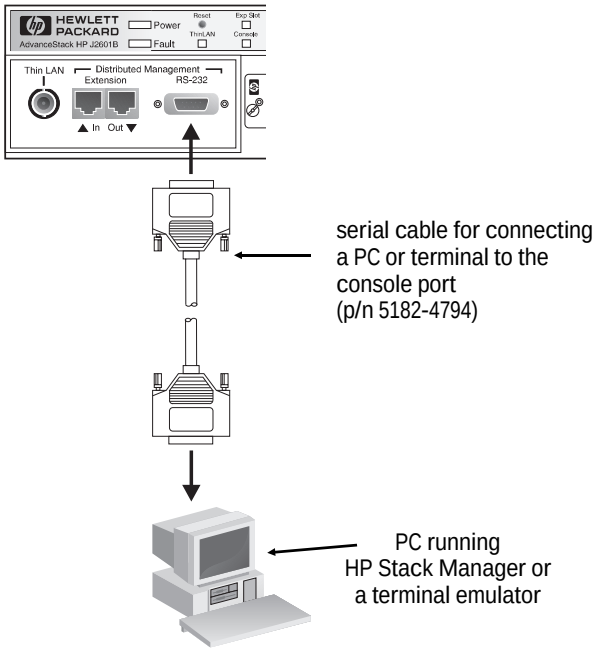
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Using a Direct Serial Connection

The out-of-band management port on the hub is a 9-pin serial (RS-232-C) port used to connect the hub to the personal computer or terminal. *Note that you must have an HP Ethernet SNMP Module installed in the hub to use the ASCII console.*

To connect to the PC or terminal through the out-of-band management port:

1. Attach the console cable (5182-4794) supplied with the hub to the out-of-band management port on the front of the hub. Attach the other end of the serial cable to an available 9-pin serial port on the personal computer or 25-pin serial port on the terminal. If only a 25-pin serial port is available, use a 9-pin-to-25-pin port adapter (not supplied).



2. For HP Stack Manager, define the out-of-band port's data communication settings using the "Communications Settings" function in HP Stack Manager. See the HP Stack Manager online help for more information.

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3. For a hub with an SNMP module and the RS-232 cable connected to a terminal, switch on the terminal's power (or switch on the PC's power and start the terminal emulation program). Configure the terminal for 8 bits per character, 1 stop bit, no parity, Xon/Xoff handshaking, and a baud rate of 38400, 19200, 9600, 4800, 2400, or 1200.

4. For a terminal, press return several times for the prompt, =>. The baud rate for communication between the hub and the terminal is set automatically when you press Return.

Using a Modem Connection with HP Stack Manager

(To set up a modem connection with the ASCII console, see chapter 2 in the manual accompanying the Ethernet SNMP Module.)

Note

This option requires that an HP Ethernet SNMP Module (HP J2603A or B) be installed in the hub to which you are connecting the modem.

You will need two modems, one connected to the hub (the "remote modem") and the other to the PC (the "local modem").

The modems that have been tested for use with the HP AdvanceStack hubs are all listed in the modem configuration screens in HP Stack Manager. You just have to select the modem you are using from the list and HP Stack Manager automatically provides the correct initialization string.

The basic steps to connect the hub to HP Stack Manager with a modem link are:

1. Connect the modem that will be used on the hub to your PC's serial port and configure the modem by using the "Remote Modem" initialization screen from the "Settings" menu in HP Stack Manager.

2. Connect the remote modem to the RS-232 port on the front of the hub using a standard "straight-through" modem cable. For pinouts and recommended cables, see appendix A, "Cables and Connectors".) The cable included with the hub will not work for connecting a modem to the hub.

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3. Connect the "local modem" to the serial port on your PC or install it in the PC if it is an internal modem, and configure that modem by using the "Local Modem" initialization screen in HP Stack Manager.

4. From the "Communications" screen under the "Settings" menu, click on the Modem button and enter the phone number of the remote modem.

5. From the main screen click on the "Connect" button to establish the communication connection between the two modems. Once the connection is established, the hub or stack of hubs will be displayed on the HP Stack Manager's main screen.

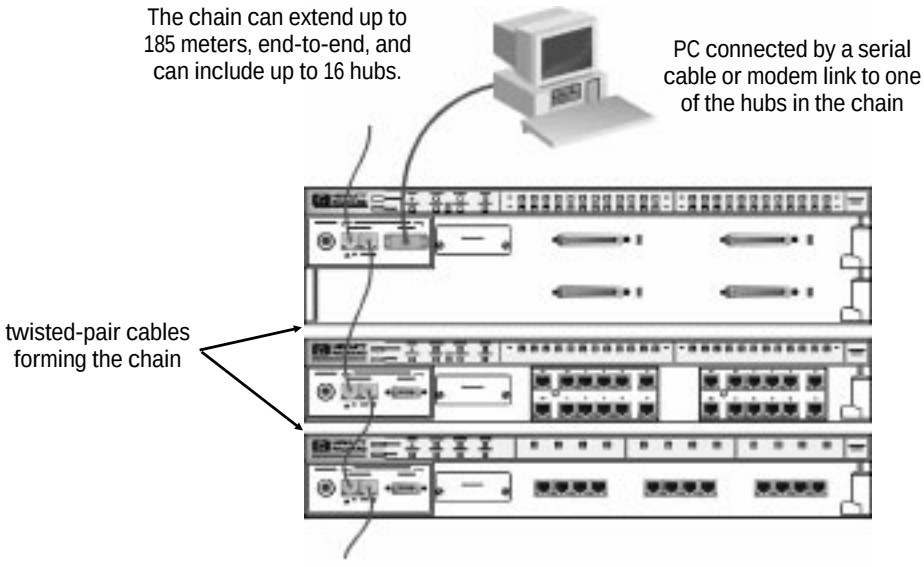
See the HP Stack Manager online help for more specific instructions.

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Using the Distributed Management Chain

It is not necessary for each hub in a chain to be connected to the computer that is running HP Stack Manager or an ASCII terminal. When you have "chained" several hubs together through their Extension ports, only one of the chained hubs needs to have a connection to the computer. As described earlier, the connection can be either directly through a serial cable, or remotely through a modem link.

Once the HP Stack Manager program or the ASCII terminal is started and the connection is made to the stack, all the hubs in the chain are automatically discovered and displayed by the HP Stack Manager. On the ASCII console, the list of hubs is displayed by the CHainlist command. You are then able to use either interface program to configure, monitor, and diagnose other hubs in the chain.



Hubs are chained together by connecting them through the Extension ports on the front of the hub using standard "straight-through" 10Base-T twisted-pair cables.

This "chained" connection is independent of any network connections between hubs.

A maximum of 16 hubs can be chained together in a single chain. The maximum total length of the twisted-pair cable segments in the chain should not exceed 185 meters.

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2

- Software Description
- Computer Requirements
- Installing and Starting HP Stack Manager
- HP Stack Manager Basic Features
- HP Stack Manager Advanced Features

Installing and Using HP Stack Manager

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This chapter describes how to install and use the HP Stack Manager software and lists the program's basic and extended features.

The HP AdvanceStack hubs can be controlled from an ASCII terminal or terminal emulation program but this requires that the hub (or one of the hubs in the stack) have an HP Ethernet SNMP Module installed. See the HP Ethernet SNMP Module manual for more information on using the ASCII console.

Software Description

The HP Stack Manager is a Windows-based software application, included with each HP AdvanceStack hub, that serves as the console for the hubs. It is included with the hubs. It enables you to configure, monitor, and diagnose your hub from a PC connected to the hub through a direct serial link or a remote modem link. With the HP Stack Manager software, you can also configure and monitor any HP AdvanceStack hub that is "chained" to that hub via the Distributed Management Extension (In/Out) ports.

(Connecting a hub to a console and "chaining" the hubs is described in chapter 1, "Installing the HP AdvanceStack 10Base-T Hubs".)

HP Stack Manager provides basic management functions for all the HP AdvanceStack hubs. If a hub has an HP Ethernet SNMP Module installed, the advanced features, described later in this chapter, are available for that hub.

For extended management capabilities, HP Interconnect Manager is an SNMP-compliant network management program that can manage HP AdvanceStack hubs from any network management station on the network.

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Computer Requirements

The HP Stack Manager software runs on IBM-compatible personal computers with the following minimum configuration:

- Microsoft Windows version 3.1 (or later)
- 80386 (or higher) processor
- 4 Mbytes of RAM
- 2 Mbytes of available hard disk space
- a 3-1/2" 1.44 Mbyte floppy disk drive
- an available RS-232 (serial) port or modem
- a VGA monitor

You will also need the following equipment to connect the PC to the hub:

- a serial cable (included with hub) to connect the PC directly to the hub, or two modems (if connecting through a modem link) and a standard modem cable to connect the modem to the hub. The cable included with the hub will not work as a modem cable.

  See appendix A, “Cables and Connectors” for details on appropriate cables. Connecting the hub and the PC (or modem) is described in detail in chapter 1, “Installing the HP AdvanceStack 10Base-T Hubs”.

- 10Base-T twisted-pair cables (if you have multiple hubs that you are chaining together).

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Installing and Starting HP Stack Manager

To install the HP Stack Manager software:

1. With Windows running, insert the floppy diskette into your computer's diskette drive.

2. Select the **Run** option from the Program Manager **File** menu.

3. Type the following into the command line entry field:

   [drive] :\setup

   where [drive] is the letter designating your diskette drive. For example, "b:\setup".

   The HP Stack Manager installation program will start.

4. Select the directory where you want to store your HP Stack Manager files by accepting the default directory that is displayed for you or typing over the default entry with the name of the directory you desire.

   The installation program will install the software in the specified directory and create an HP Stack Manager program group and icon in Windows Program Manager.

5. To start the HP Stack Manager, open the HP Stack Manager group in the Program Manager and double-click the HP Stack Manager icon. The Main window of the HP Stack Manager is displayed.

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Using Windows

The HP Stack Manager software uses the standard features of the Microsoft Windows user interface. If you are unfamiliar with using Windows, consult your Windows documentation for more details on using a mouse, menus, icons, buttons, online help, and other Windows features.

Using Online Help

Specific information about the HP Stack Manager software is included in the online help that accompanies the software. This chapter describes the general capabilities of the HP Stack Manager software. For step-by-step instructions on how to use the HP Stack Manager, refer to the online help system.

To access the HP Stack Manager online help, either select Help from the menu bar, or click the Help button on each of the screens where help is available.

HP Stack Manager Basic Features

The HP Stack Manager's basic features are available on each of the three AdvanceStack 10Base-T Hubs. They include:

- Communications settings
- Connect/disconnect
- Automatic chain display
- Online help
- Port status display
- LAN traffic statistics
- Hub identification
- Port counters

(continued on next page)

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- Port enable/disable
- Reset
- Redundant Power Supply (RPS) status (for the Hub-24 and Hub-48)

There is also an extended set of features available only to hubs that have an HP J2603A or B Ethernet SNMP Module installed. These are described later in this chapter under “Advanced Features”. Features not available to your hub will be “grayed out” on the HP Stack Manager menus and/or any associated buttons will not be displayed.

A description of each basic feature follows. For specific information about how to use a feature, consult the online help system.

Communications Settings

This function is accessed through the “Settings” menu on the HP Stack Manager main screen. Use this function to define the settings for the serial communication between the hub and the PC running HP Stack Manager.

If the hub to which the serial connection is being made does not have the HP Ethernet SNMP Module installed, this connection can be only a direct connection at 9600 baud. If the hub has the module installed, the connection can be direct or through a modem and at a wide range of baud rates. These expanded connection capabilities are described later under “HP Stack Manager Advanced Features”. The communications settings can be stored in an individual file for each serial connection. See the HP Stack Manager online help for more information.

Connect/Disconnect

These functions are accessed through the “Connect” and “Disconnect” buttons on the HP Stack Manager main screen. Use this function to establish a connection to the hub from the PC as defined by the current communications settings.

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Automatic Chain Display

The Chain Display window displays a list of HP AdvanceStack hubs that HP Stack Manager detects in the chain to which you have connected. Information about each hub is shown including the hub model and its station address. From this window you can access any of the hubs in the chain and, if you so desire, monitor it and/or change its configuration.

Online Help

HP Stack Manager provides an online help system that has step-by-step instructions for using the program's features. The help system can be accessed from the main menu, or from a Help button on each of the function screens.

Port Status Display

The Port Status display is a graphical representation of the front of the hub. This display is accessed when you "double-click" on the hub listed in the Chain Display window, or when you click on the hub and then click on the Access button. In the display, the colors and symbols for each port indicate its status. You can select the port you wish to monitor or control by clicking on the symbol for that port.

LAN Traffic Statistics

The graphical hub display includes two bar graphs that indicate network activity and collision levels that the hub is experiencing.

Hub Identification

The Identify function displays general information about the currently selected hub. Access this information by clicking on the ID icon.

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Port Enable/Disable

This function turns the port selected on the Port Status display on or off.

Port Counters

The Port Counters function displays summary tables of several counters that are useful in diagnosing problem conditions on the hub's ports. Counter values are displayed for each of the hub's network ports. See the HP Stack Manager online help for counter descriptions.

Reset

The Reset function performs the start-up self-test on the hub. The process resets and tests the hub hardware, and changes the port counter values to zero. The hub's configuration information remains unchanged.

This function temporarily (approximately 3 seconds) interrupts the hub's repeater operation, but this will normally not have an effect on the network connections or operation. (This option has the same effect as pressing the Reset button on the front of the hub or cycling power on the hub.)

Note

When you perform a reset, your HP Stack Manager session with that hub will be terminated. If you reset the hub to which the serial connection (direct cable or modem link) is made, the connection between the PC running HP Stack Manager and the hub will be terminated; you will have to reestablish the connection to access the hub or stack of hubs. If you reset one of the other hubs in the chain (not the one connected to the serial connection), the HP Stack Manager session will continue but access to that hub will be lost. You will have to click on the Refresh button so that HP Stack Manager can "rediscover" that hub before you can access that hub again.

Redundant Power Supply (RPS)

For the Hub-24 and Hub-48, the status of the Redundant Power Supply is shown in the lower right corner of HP Stack Manager. The Redundant Power Supply is either connected, disconnected, or has an internal error.

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HP Stack Manager Advanced Features

In addition to the basic features described earlier in this chapter, the following HP Stack Manager advanced features are available on hubs that have an HP J2603A or B Ethernet SNMP Module installed:

- Higher-speed serial access
- Modem access for HP Stack Manager
- IP configuration
- Password
- Authorized managers
- Backup link
- Robust Capabilities
- Network test
- Factory default reset

A description of each extended feature follows below. For specific information about how to use a feature, consult the online Help system.

Higher-Speed Serial Access

When you install an HP Ethernet SNMP Module in your hub, additional baud rates that are higher than the default of 9600 can be used to connect the PC running HP Stack Manager to the hub. See the HP Stack Manager online help for more information.

Modem Access for HP Stack Manager

When you install an HP Ethernet SNMP Module in your hub, the serial connection between the PC running HP Stack Manager and the hub can be through a modem connection. HP Stack Manager helps you automatically configure the two modems that will be attached to the hub and to your PC. See the HP Stack Manager online help for more information.

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IP Configuration

The IP Configuration window is used to define the parameters necessary for the hub to communicate with a network management station using the TCP/IP network protocol.

The hub's default configuration causes the hub to retrieve this information automatically from an IP server using the Bootstrap Protocol (BOOTP). The Novell NetWare IPX protocol is also enabled on the hub by default, so the hub can automatically communicate with a network management station using IPX/SNX.

If you are configuring your hub to communicate with a network management station using TCP/IP and you do not have a BOOTP server set up, use this screen to manually configure the hub's IP address and other IP configuration parameters.

See appendix C, “Network Addressing”, for more information.

Password

The Password function is used to establish password protection for access to the hub from the serial port and from SNMP management stations. Once a password is configured, it is also used as the SNMP community name for network management access to the hub.

Note

The password is stored on the hub that has the HP Ethernet SNMP Module installed in it. For password protection on the serial connection to your hub or stack of hubs, you must connect the serial cable or modem to the hub that has the SNMP Module installed. If the serial connection is to one of the hubs in the stack that does not have the SNMP Module installed, the password does not prevent access through that serial connection; although, network management access is still password protected. To provide optimal security, you should also install your hub(s) in a locked space.

It is possible to clear the password if you forget it. See “Clearing the Password” in chapter 4, “Troubleshooting”.

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Authorized Managers

The Authorized Managers window is used to specify the IP or IPX network addresses of SNMP management stations authorized to manage this hub and which of the stations should receive SNMP event alarms.

Backup Link

The Backup Link window is used to specify two of the hub's network ports (AUI, ThinLAN, or twisted-pair) to be used in a backup (redundant) connection to another hub. It enables you to connect a second physical link between hubs that will work if the first link fails. The backup link is used only in the event of primary link failure, thus eliminating the possibility of loops in the network.

See appendix D, "Backup Links" for more information.

Robust Port Control

The Robust Port Control window allows you to invoke options to improve the hub's ability to tolerate network problems resulting from excessive collisions. The configurable options are:

- Intelligent Segmentation Recovery
- Late Collision Monitoring

These features are described in chapter 3, "Hub Reference", under "Auto-Segmentation". See the HP Stack Manager online help for information on how to invoke these features, and when it is appropriate to do so.

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Network Tests

The Network Tests window enables you to perform Ping, IPX, and Link network tests. These tests are used to verify the connection between the hub and a specified network device. The devices tested must support the test(s) by being able to send the appropriate response packets. HP AdvanceStack 10Base-T hubs support all of these tests.

The Ping test sends Internet Control Message Protocol (ICMP) Echo Request ("ping") packets to another node with the specified IP address and waits for Echo Response packets in return.

The IPX test sends IPX test packets to the specified IPX device and waits for an IPX test packet in return.

The Link test sends IEEE 802.2 Test command packets and waits for an IEEE 802.2 Test response packet in return.

Factory Reset

When you install an HP Ethernet SNMP Module in your hub, the Reset function in HP Stack Manager offers an additional reset option, Factory Reset. A factory reset resets the hub's configuration, except the IP configuration, to the factory default values. The factory reset also causes the hub to perform its self-test, and then causes the results listed below:

- all network ports are enabled
- link beat is enabled for all the 10Base-T twisted-pair ports
- hub counters are reset to zero
- a configured password is deleted
- the system name, system location, and system contact are deleted
- Thinwatch is disabled
- the authorized managers list is cleared and the configuration is reset to "Allow management from any address"
- any backup link configuration is cleared; both ports are returned to the enabled state
- the Robust Port Control features are disabled
- the IP configuration is not changed
- any security configuration is cleared

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3

- Front and Back Panel Descriptions
- How the Hubs Work
- Managing Your Hub — HP Distributed Management
- Optional Accessories
- Firmware Enhancements

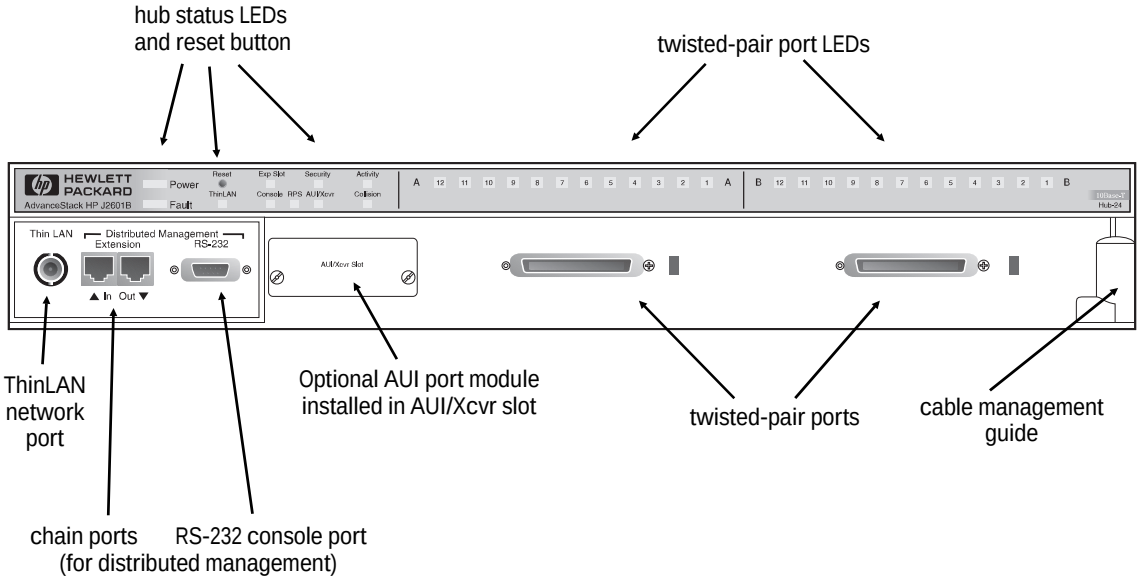
Hub Reference

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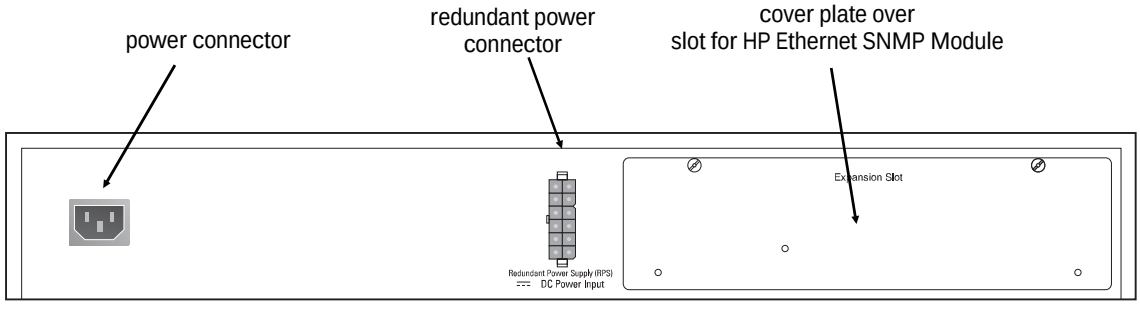
Front and Back Panel Descriptions

Front Panel

The 24-port hub is shown; the 12-port and 48-port hubs are essentially the same.



Back Panel



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Front of the hub

Status LEDs The Status LEDs indicate whether the hub is functioning properly or not. For further details on error conditions indicated by the Status LEDs, see chapter 4, "Troubleshooting".

LED	State	Meaning
Power (green)	On	The hub is receiving power.
	Off	The hub is not receiving power.
ExpSlot (green)	On	An optional HP SNMP Module is properly installed in the hub's back panel slot.
	Off	An SNMP Module is not installed.
	Flashing slowly	The SNMP Module is being self-tested (after hub power on or a reset). If this state continues for more than 25 seconds, see chapter 4, "Troubleshooting".
Security (orange)	Off	The normal state.
(functional only if an HP Ethernet SNMP Module is installed in the hub)	Flashing rapidly	A security violation has occurred on one or more of the network ports, or an unauthorized network management station has attempted to access the hub. If a port security violation has occurred, the corresponding port LED will flash at the same time and rate as the Security LED. Network management authorization is performed through the Authorized Managers function of HP Stack Manager, and the port security configuration is performed through HP Interconnect Manager. See "Security Features" later in this chapter.
Activity (green)	Flickering	ON while a packet is being transmitted. Normally, the LED appears to flicker. In heavy traffic, it may appear on all the time.
Fault (orange)	Off	The normal state. Indicates that there are no fault conditions on the hub.
	On	The hub has failed its self-test after being powered on or reset.
	Flashing slowly	A port has been auto-segmented or the Redundant Power Supply has experienced a failure. The corresponding port or RPS LED will also be flashing slowly.
Console (green)	On	This hub is currently being accessed by HP Stack Manager, ASCII terminal, or Telnet.
RPS (green)	On	This hub is receiving power from the connected HP J2962A Redundant Power Supply or RPS (available at the end of 1995).
	Off	This hub is not receiving power from the RPS.
	Flashing Slowly	An error has occurred on the RPS connected to the hub. See the documentation provided with the RPS for troubleshooting.
Collision (orange)	Flickering	This LED is on while a collision is detected on any of the attached cable segments. If collisions are infrequent (which is normal) the light may be imperceptible. In a network with heavy traffic, the LED will glow and flicker dimly, indicating collisions are occurring. If it appears on continuously (with no flicker), it is a possible indicator of a network fault. See chapter 4, "Troubleshooting".

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Port LEDs (green) There is an LED associated with each network port on the hub, twisted-pair, the AUI/Xcvr port, and the ThinLAN port. Each port LED indicates the status of the port associated with it.

Port Type	LED State	Meaning
Twisted-pair	On	Link beat is detected from the attached node.
	Off	The port is not receiving the link beat signal from the attached node.
	Flashing Slowly *	The port has been auto-segmented. The Fault LED will also be flashing at the same rate. See "Auto-Segmentation" later in this chapter.
	Flashing Rapidly **	The port has experienced a security violation. The Security LED will also be flashing at the same rate. See "Security Features" later in this chapter.
ThinLAN	On	– The port is enabled and it is not auto-segmented.
	Off	EITHER: – The port has been disabled through HP Stack Manager or a network management station, OR, – Thinwatch is disabled (the default setting) and the port is auto-segmented because of an excessive collision condition. *The default setting for Thinwatch is "disabled"–Thinwatch can be enabled through HP Interconnect Manager or the ASCII console interface with the HP Ethernet SNMP Module.*
	Flashing slowly *	The port has been auto-segmented and Thinwatch is enabled. The Fault LED will also be flashing at the same rate. See "Auto-Segmentation" later in this chapter.
	Flashing Rapidly **	The port has experienced a security violation. The Security LED will also be flashing at the same rate. See "Security Features" later in this chapter.
AUI / Xcvr	On	The AUI/Xcvr port is enabled and not segmented. (This LED will always be on under these conditions, even if this port is not being used.)
	Off	The port has been disabled through HP Stack Manager or a network management station.
	Flashing slowly *	The port has been auto-segmented. The Fault LED will also be flashing at the same rate. See "Auto-Segmentation" later in this chapter.
	Flashing Rapidly **	The port has experienced a security violation. The Security LED will also be flashing at the same rate. See "Security Features" later in this chapter.

* The slow flash rate is approximately once each 1.5 seconds.
** The rapid flash rate is approximately 3 times each second. This condition can exist only if an SNMP Module is installed in the hub.

Reset Button The Reset button resets the hub and performs the power-on self-test. It is recessed to prevent accidental resets. Use a pen point or straightened paper clip to depress the button. For a description of the effect of this reset, see "Resetting the Hub" in chapter 4, "Troubleshooting".

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Back of the Hub

Expansion Slot

The Expansion Slot is used to add an HP Ethernet SNMP Module (HP J2603A or B). See the “Optional Accessories” section later in this chapter for more information on the HP Ethernet SNMP Module.

Redundant Power Supply Connector

The back of the Hub-24 and Hub-48 has a Redundant Power Supply (RPS) connector to add the HP J2962A Redundant Power Supply.

How the Hubs Work

The HP AdvanceStack 10Base-T Hubs are multiport repeaters that conform to the IEEE 802.3 repeater specification. Data signals coming into the hub from any of its ports are automatically regenerated and transmitted to all the other hub network ports. The hub regenerates the data without interpreting the contents, so it can be used in either IEEE 802.3 or Ethernet networks and with any upper-level protocol.

Collision Detection

The hub also performs collision detection. A collision occurs when two nodes try to transmit at the same time. When the hub detects this, it stops repeating the colliding transmissions and starts transmitting a jamming signal. The jamming signal tells the transmitting nodes that a collision has occurred. The colliding nodes then stop transmitting for a random amount of time before attempting to retransmit the data. Once the collision condition is removed, the hub stops transmitting the jamming signal and normal operation is resumed.

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Auto-Segmentation

The Basic Feature

The hub will automatically segment (temporarily disable) a network port if a collision condition exists for an excessive duration (between 1024 and 2048 bit times) or occurs during each of 32 consecutive attempts to transmit. The hub monitors the segmented port and automatically re-enables the port when a minimum length packet can be successfully transmitted or received without a collision occurring.

Excessive collisions may be caused by faulty wiring. If a port's transmit (Tx +/-) wires have been shorted to the receive (Rx +/-) wires of any port, a collision will be detected when that port attempts to transmit. If a port's receive (Rx +/-) wires are not connected properly, collisions may occur because the hub cannot detect the presence of network traffic on that port and may thus transmit at inappropriate times.

A port may occasionally also become segmented when network traffic is extremely heavy causing an abnormally high collision rate.

Intelligent Segmentation Recovery (Available on hubs with the HP Ethernet SNMP Module)

Intelligent Segmentation Recovery makes it more difficult for a problem port to automatically re-enable itself to send traffic on the network. For a port configured with Intelligent Segmentation Recovery, once it has been disabled due to extended or excessive collisions, it will be automatically re-enabled only when it is able to *transmit* a minimum length packet without a collision condition occurring. This feature prevents a port from re-enabling itself when it just receives traffic from the attached node or when it receives reflected noise or crosstalk caused by faulty wiring.

The Intelligent Segmentation Recovery feature is enabled through the "Robust" function in HP Stack Manager or the RObustness command in the ASCII console interface. The default setting is OFF.

Late Collision Monitoring (Available on hubs with the HP Ethernet SNMP Module)

When this feature is enabled, the hub will automatically disable (turn off) a network port when persistent late collisions are detected on that port.

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Late collisions occur when a node starts transmitting after another node has already transmitted at least 512 bits. They are usually caused when network topology rules (such as cable length limitations or hub hop counts) do not meet the IEEE 802.3 specifications. Late collisions may also be caused by faulty wiring that prevents a hub from being able to detect traffic on a network port.

Note

Because failures due to late collisions are the result of critical network design errors or cabling errors, the hub will *not* automatically re-enable the port. You must manually re-enable the port (after the problem is re-solved) either through the HP Stack Manager's "Port" function or an SNMP network management station.

Late Collision Monitoring is configurable for either single node connections—to isolate problem nodes, or multiple node connections (cascaded ports or backbone connections)—to isolate parts of the network. The Late Collision Monitoring feature is enabled through the "Robust" function in HP Stack Manager or the RObustness command in the ASCII console. The default setting is OFF.

Link Beat

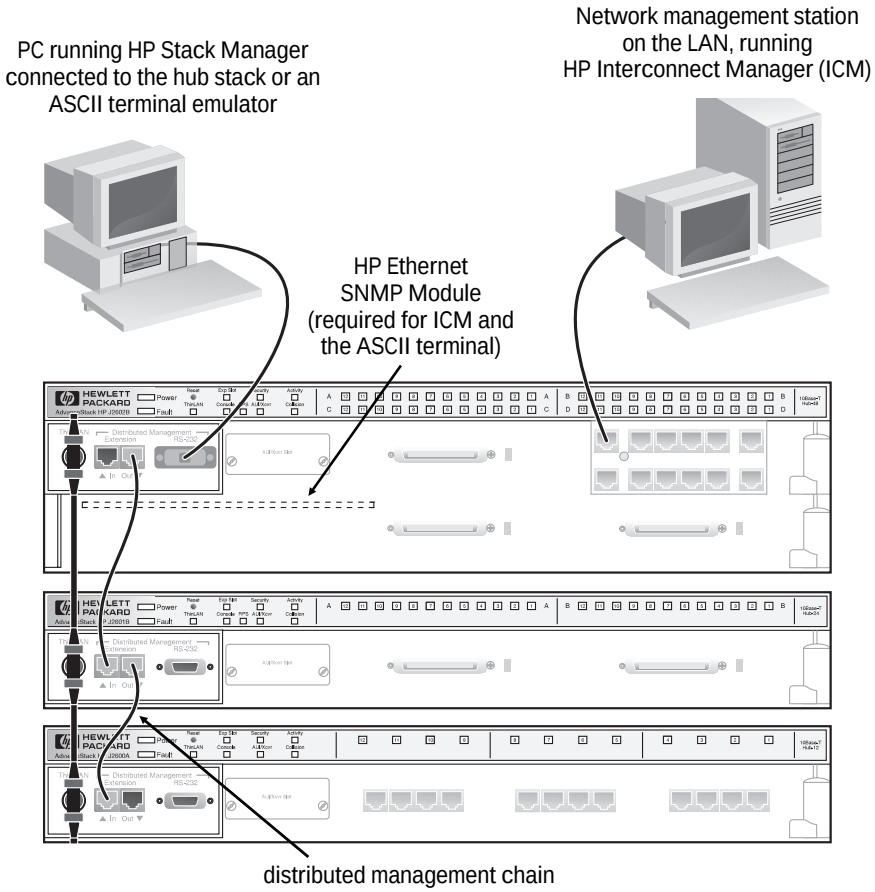
Type 10Base-T devices use a signal called link beat (also called link test pulse). This signal informs the hub of the presence of a device connected to it over twisted-pair cable and of the integrity of the twisted-pair link between them. The hub will not transmit packets out of twisted-pair ports that do not sense the link beat signal.

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Managing Your Hub — HP Distributed Management

One of the key features of the HP AdvanceStack family of hubs is the ease with which a hub can be managed. There are two main management options:

- **Out-of-band management** from a PC running HP Stack Manager connected to the RS-232 console port of any of the hubs in the stack.
- **In-band management** from a network management station running HP Interconnect Manager anywhere on the network that the hubs are in.



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Chaining the Hubs

The HP AdvanceStack hubs can be easily connected together with standard unshielded twisted-pair cable through their Extension (In/Out) ports to form a distributed management chain. When hubs are “chained” together, any hub in the stack can be managed from a single PC running HP Stack Manager, or, if one hub in the stack has the HP Ethernet SNMP Module installed, the entire stack can be managed from an SNMP network management station or from an ASCII terminal or PC terminal emulator. The chain can extend up to 185 meters (end-to-end) so multiple wiring closets can be managed from a single location. *Note that this is not a network connection, it is only a management connection between the hubs.*

Refer to chapter 1, “Installing the HP AdvanceStack 10Base-T Hubs” for information about chaining and network connections.

Out-of-Band Management

The basic management program included with your hub, HP Stack Manager, is a Windows-based graphical user interface that serves as the console for the HP AdvanceStack hubs. With this program you can configure, monitor, and diagnose your hub or a chain of hubs. Refer to chapter 2, “Installing and Using HP Stack Manager”, for more details about out-of-band management.

Included with the HP J2603A or B Ethernet SNMP Module is an ASCII console interface that can also be used to configure, monitor, and diagnose your hub or a chain of hubs. The SNMP Module must have firmware agent A.03.00 or later. Refer to the *HP Ethernet SNMP Module Installation and Reference Guide* for more information.

In-Band (Network) Management

When an HP Ethernet SNMP Module is installed in your HP AdvanceStack 10Base-T Hub, the hub can be managed remotely by any network management product that complies with the Simple Network Management Protocol (SNMP) standard.

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MIB (Management Information Base) Support

The HP AdvanceStack 10Base-T Hub with an installed HP Ethernet SNMP Module supports the following MIB standards: MIB-II (RFC 1213), IEEE 802.3 Repeater MIB (RFC 1516), and IEEE 802.3 MAU MIB (RFC 1515).

In addition, the hub implements HP MIB extensions that are available on request. Contact your HP-authorized LAN dealer or local HP sales office.

Using HP Network Management

HP offers an SNMP-compliant network management product that can manage your HP AdvanceStack hub (HP Interconnect Manager). This product uses a windowing interface to:

- manage multiple HP hubs and other HP network devices, including a “chain” of HP AdvanceStack hubs
- automatically generate a graphic display of the network map
- gather network traffic statistics
- enable and disable ports
- configure port security and other security features on the hub
- run tests of the hub
- test network links to other devices

Using Non-HP Network Management

To manage an HP AdvanceStack hub from a non-HP network management product, you must first obtain HP’s MIB extensions. Contact your HP-authorized LAN dealer or local HP sales office for more information.

Security Features

If you have installed an HP Ethernet SNMP Module in your HP AdvanceStack 10Base-T Hub, your hub has these security features:

- port security
- authorized managers list
- password protection

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Port Security

Note

This feature is configurable over the network from a network management station running HP Interconnect Manager, or out-of-band from an ASCII terminal or terminal emulator.

The HP AdvanceStack 10Base-T Hub with HP Ethernet SNMP Module provides two main types of security on each of its network ports.

- *Intruder Prevention* for inbound data (from the end user to the hub)
- *Eavesdrop Prevention* for outbound data (from the hub to the end user)

Both of these types of security can be configured on each network port individually (the twisted-pair ports, the ThinLAN port, and the AUI/Xcvr port) and are enabled by comparing the source and destination address of each packet received or transmitted by the hub to each port's *Authorized Station Address—the station address of the device that you configure to be authorized to communicate through that hub port.*

See the HP Interconnect Manager documentation for more information on the Interconnect Manager control of this feature; see the HP Ethernet SNMP Module documentation for description of the ASCII terminal SEcure command.

Authorized Managers List

The HP AdvanceStack 10Base-T Hub with an HP Ethernet SNMP Module installed can be configured with a list of up to ten network management stations that are authorized to manage the hub. This list is configured through the "Authorized Managers" function in the HP Stack Manager program, the MAnagers command from an ASCII terminal, and through HP Interconnect Manager. See chapter 2, "Installing and Using HP Stack Manager", for more information on the HP Stack Manager command; see the HP Ethernet SNMP Module manual for the MAnagers command; see the Security chapter in the HP Interconnect Manager documentation.

If an unauthorized management station attempts to access the hub (especially to perform SNMP "set" commands), the Security LED on the hub's front panel will flash.

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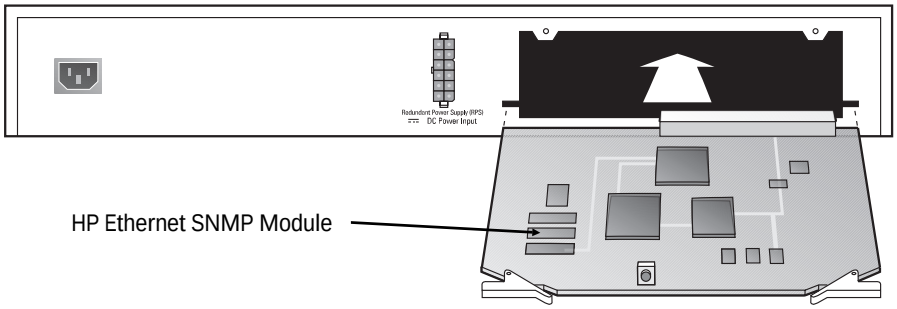
Password Protection

The hub can be assigned a password to restrict access to the hub's console interface and to the hub's configuration from network management stations. The password also acts as the SNMP community name. The password is configured through the "Password" function in the HP Stack Manager program. See chapter 2, "Installing and Using HP Stack Manager", for more information; see the HP Ethernet SNMP Module manual for the PAssword command.

Optional Modules

HP Ethernet SNMP Module

The HP Ethernet SNMP Module (HP J2603A or B) is an optional component that can be added to an HP AdvanceStack 10Base-T Hub to provide extended hub functions and management capabilities.



If the optional HP Ethernet SNMP Module is installed in the hub, you have these additional features:

- Advanced embedded agent code enabling the hub to be managed remotely from a network management station that supports SNMP over IP (using the configured IP address) or Novell NetWare (IPX). The agent code also provides HP EASE (Embedded Advanced Sampling Environment) for enhanced network diagnostics from a network management station.

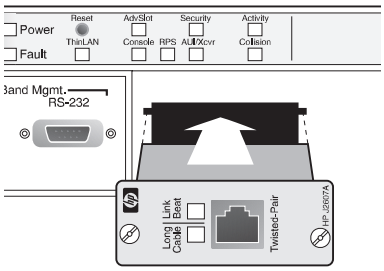
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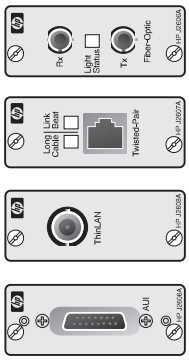
- Automatic sensing of the baud rate on the out-of-band management port, and support for higher port baud rates beyond the default 9600 baud.
- Full V.22bis modem line control for remote out-of-band management access to the hub or stack of hubs.
- Capability to manage up to 16 hubs in a chain, even if the other hubs do not have management modules.
- Security features including port security, network management authorization, and hub access password protection. See “Security Features” in this chapter for more information.
- Support for a redundant backup link to another hub to enhance network fault tolerance.
- An Intel i960 RISC processor, 1 megabyte RAM, 8 kilobytes EEPROM for configuration data, and 256 kilobytes flash EEPROM for additional processing power and future upgrade capabilities.
- Updatable firmware that enables enhancements to be downloaded either from a computer attached to the out-of-band management port or over the network. (See “Firmware Enhancements” later in this chapter.)
- With firmware version A.03.00 or later, the agent code provides an ASCII terminal interface for configuring, monitoring, and troubleshooting the hub (a similar set of features to the Windows-based HP Stack Manager interface.) To obtain the latest firmware, see the end of chapter 4, “Troubleshooting” for information on how to download the latest agent code.

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HP Transceiver Modules

The HP Transceiver Modules are optional modules that can be added to an HP AdvanceStack hub. They provide extended connectivity choices from the hub to Ethernet networks. You have a choice of using any of these modules:





HP J2606A Fiber-Optic
Transceiver Module for 10Base-FL

HP J2607A Twisted-Pair
Transceiver Module for 10Base-T

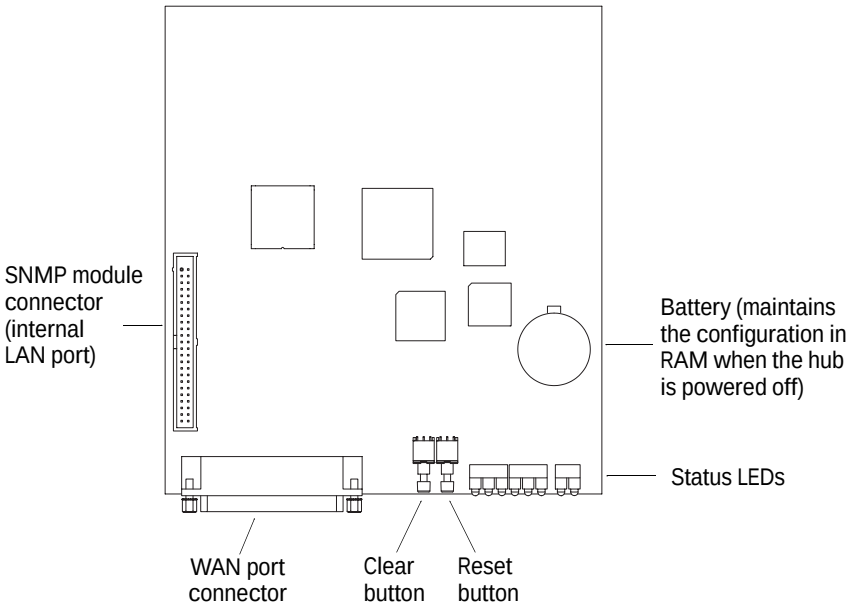
HP J2608A ThinLAN
Transceiver Module for 10Base2

HP J2609A AUI
Port Module for external transceivers

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HP Router Module

The HP J2628A Router 210 Module is an auxiliary module for the HP AdvanceStack 10Base-T Hub. The Router 210 Module attaches to the HP J2603B Ethernet SNMP Module and is then installed in the hub's expansion slot.



The router module includes two ports:

- An external synchronous WAN port supporting RS-232/V.24/V.28, V.35, X.21, or RS-422/RS-449/V.36 interfaces at speeds of 9.6 Kbit/s to 2.048 Mbit/s. This port allows HP Point-to-Point, PPP, V.25 bis (dial-up/ISDN), SMDS, frame relay, and LAPB (X.25) connections to other routers, over point-to-point or switched circuits
- An internal Ethernet/802.3 LAN port, through which the router module communicates with the hub

The router provides both bridging and routing capabilities and supports the following routing services:

- Internet Protocol (TCP/IP protocol suite)
- DECnet Phase IV
- Xerox XNS
- Novell IPX

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- AppleTalk Phase 2
- Transparent bridging with support for the Spanning Tree Protocol

The router module can be configured and managed in various ways:

- Through the hub's RS-232 Distributed Management port, connected (locally, or through a modem) to a PC running the HP Stack Manager software supplied with the router module (HP Stack Manager runs the router module's VT-100 terminal interface)
- Through any standard SNMP network management software, such as HP Interconnect Manager in HP-UX
- Through Telnet access over the network

Additional features include:

- "SmartBoot", which allows another HP router or a BOOTP server on the network to automatically configure the router module when it is first booted after installation. This eliminates the need for expert personnel at the site where the router module is installed
- HP EASE (Embedded Advanced Sampling Environment)
- The ability to download enhancements to the router module's operating system. The download is conducted through the hub's RS-232 Distributed Management port.

For more information about the HP Router 210 Module, see its accompanying documentation.

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HP Dial-a-LAN Remote Access Server

The two HP AdvanceStack Dial-A-LAN auxiliary modules are remote access servers for Ethernet networks. These products serve remote PCs, Macintoshes, and UNIX workstations by allowing users to dial in to a 12, 24, or 48-port AdvanceStack hub.

The two models are:

- a two-port version: HP J2623A AdvanceStack Dial-A-LAN 2A/Plus V.34
- a four-port version: HP J2624A AdvanceStack Dial-A-LAN 4A

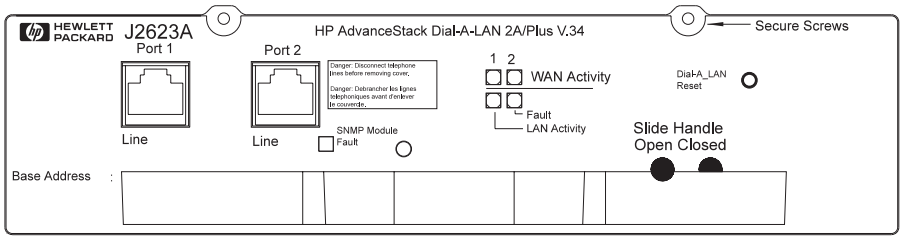
Each module requires an Ethernet SNMP Module (J2603B) for installation into the Expansion Slot of an HP AdvanceStack hub.

If you do not have a J2603B SNMP Module already, you can purchase the Dial-A-LAN and SNMP modules together in either of the following bundles:

- HP J2633A Dial-A-LAN 2A/Plus V.34 and HP Ethernet SNMP Module
- HP J2634A Dial-A-LAN 4A with the HP Ethernet SNMP Module

HP J2623A Dial-A-LAN 2A/Plus V.34

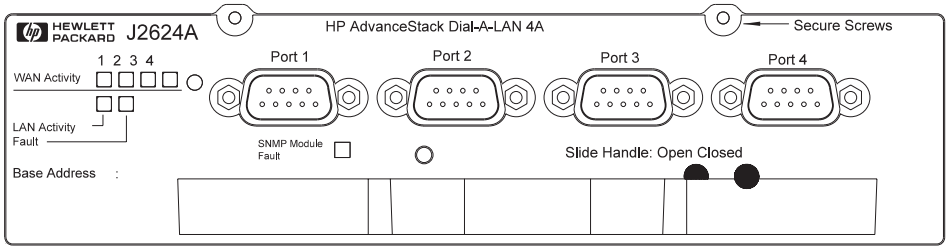
The HP Dial-A-LAN 2A/Plus has two RJ-11 connectors and two built-in V.34 modems. The V.34 modems support V.34, V.FC, V.32bis, V.32, V.22, V.22bis, V.22A/B, V.23, V.21, Bell 212A, and Bell 103. They also support compression and error correction as specified V.42, V.42bis, MNP 2-5, and LAP-M.



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HP J2624A Dial-A-LAN 4A

If you need more than two ports, the HP Dial-A-LAN 4A has four RS-232 ports for connecting up to four external modems. This module can also be used in an ISDN environment.



Both the 2-Port and 4-Port modules support these features:

- Access speeds available to 115 Kbps. Throughput speeds available are dependent on line quality, type of data transmitted, and the remote node's ability to function at this sustained rate.
- Configurable through HP Stack Manager and from the Dial-A-LAN Manager. Dial-A-LAN Manager can be run under OpenView DOS/Windows and Windows.
- PC and workstation dial-in access with PPP (default), SLIP, and CSLIP. IP, IPX, NetBEUI, and LLC dial-in are also supported.
- PPP Stacker Compression available for dial-in and LAN-to-LAN connections.
- DHCP support for dial-in client address assignment.
- Macintosh dial-in access for IP networks with ARPA 2.0. MacTCP supported for IP connections.
- Windows support and DOS-based dial-out access through NASI and Int 14 for IPX networks to remote BBS services. No file transfer capability is available in IP dial-out mode.
- UNIX workstation dial-in access with SLIP or PPP for IP networks.
- LAN-to-LAN routing for IP and IPX.

For more information about the HP Dial-A-LAN modules, see the accompanying documentation.

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Firmware Enhancements

Hewlett-Packard continually tests and improves its products. When firmware enhancements are made to the HP AdvanceStack hubs that have an optional HP Ethernet SNMP Module installed, you will be able to easily update them with the new code. The updated code can be loaded from a PC attached to the hub's out-of-band management port or downloaded over the network. See the end of chapter 4, "Troubleshooting" for information on how to download the latest agent code.

The update procedure is described in the file that comes with the latest SNMP Module firmware for your HP AdvanceStack hub.

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4

- Troubleshooting Approaches
- Diagnosing with the LEDs
- Installation Problems
- Cabling Problems
- Unusual Network Activity
- IP Configuration Errors
- Diagnostic Tests
- Customer Support Services

Troubleshooting

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This chapter describes how to diagnose and resolve operating problems with the HP AdvanceStack 10Base-T Hubs.

This chapter describes these topics:

- basic troubleshooting approaches
- diagnosing with the LEDs
- installation, cabling, and unusual network activity problems
- diagnostics tests

Additionally, certain diagnostic functions useful for troubleshooting are contained in the HP Stack Manager software. These functions are described in chapter 1, “Installing and Using HP Stack Manager” and in the software’s online help system. Some of these diagnostic functions are available only to hubs that have an HP Ethernet SNMP Module (HP J2603A or B) installed.

Troubleshooting Approaches

There are three primary ways to diagnose hub problems:

- By checking the LEDs on the front of the hub as described in “Diagnosing with the LEDs” later in this chapter.
- By visually inspecting the unit and all its connections as described in the “Installation Problems” and “Cabling Problems” sections later in this chapter.
- By using the HP Stack Manager’s diagnostic functions described in chapter 2, “Installing and Using HP Stack Manager”, and in the software’s online help system.
- Alternatively, if you don’t have a Windows-capable PC, you can use an ASCII terminal or PC running a terminal emulator to monitor hub status and run diagnostic tests. For this operation, the hub, or one of the hubs in the stack, must have an HP Ethernet SNMP Module installed. See the module’s documentation for more information on the ASCII terminal interface.

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Diagnosing with the LEDs

Most problems with the hub can be diagnosed using the LEDs on its front panel. This section describes the normal LED pattern when the hub is being self-tested, and LED patterns that indicate error conditions on the hub.

LED Pattern During Self-Test

When the hub is first turned on and whenever it is reset, it performs a self-diagnostic test during which time all the LEDs should be lit. The LED pattern varies during the self-test depending on whether the hub has an optional HP Ethernet SNMP Module installed.

- For a hub without an SNMP Module, the self-test takes approximately 3 seconds during which time all the LEDs (except the RPS LED) are lit.
- For a hub with an SNMP Module, the 3-second hub test takes place first (all the LEDs are lit), followed by the SNMP Module self-test, which lasts approximately an additional 57 seconds. While the SNMP Module is being tested, the Activity, Collision, and RPS LEDs are not lit (or are flickering if there is network traffic on the hub), and the Exp Slot LED flashes slowly.

When the self-test completes, the LEDs then go into their normal operational state or indicate an error condition.

The tables on the following two pages list the hub's LEDs, their possible states, and diagnostic tips to resolve any error conditions.

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LED Error Indications

The tables on the next two pages describe LED patterns that indicate error conditions.

LED patterns indicating problems							Diagnostic Tips
Power	**Collision**	**Fault**	**Security**	**RPS**	**Exp Slot**	**Port**	
OFF	*	*	*	*	*	*	Check power cord and power source. If OK, replace hub.
ON	*	**OFF**	**OFF**	*	*	**OFF or flashing intermit-tently for a port in use.**	Check cabling on indicated port. Use HP Stack Manager or the ASCII console STatus command to determine the state of the port. For HP Stack Manager, review the graphical image of your hub to determine whether: – the port was disabled by the Port function. Re-enable if desired. A disabled port is grayed-out with a black bar through it. – For a twisted-pair port, link beat is not detected. In this condition, the link beat bar (below the port symbol on the graphic display) will be red. Be sure the cable is properly connected. – For the ThinLAN port, Thinwatch is disabled (the default value) and the port is auto-segmented (the port symbol will be red). Thinwatch improves diagnosis of a faulty ThinLAN port. Configure Thinwatch from HP Interconnect Manager or from the ASCII terminal.
ON	**Appears solidly ON**	*	*	*	*	*	Very frequent collisions could indicate a network fault or improperly terminated cable. A transceiver attached to the AUI port may not have the SQE test disabled.

***This LED is not important for the diagnosis.**

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LED patterns indicating problems							Diagnostic Tips
Power	**Collision**	**Fault**	**Security**	**RPS**	**Exp Slot**	**Port**	
ON	*	**Slow Flash**	**OFF**	*	*	**Slow Flash**	The port has been auto-segmented because of too many collisions. Check cable terminations, connections, SQE setting on any external transceivers, and status of attached network devices for causes of the excess collisions.
ON	*	**Slow Flash**	*	**Slow Flash**	*	*	The redundant power supply (RPS) may no longer be providing redundant power. See the documentation provided with the RPS for troubleshooting.
OFF	*	*	*	**OFF**	*	*	The hub is not receiving power from the redundant power supply (RPS) or the cable connection is loose. If you have an RPS connected, check the cable connections.
ON	*	*	**Rapid Flash**	*	**ON**	**Rapid Flash**	A port security violation has occurred on a hub with an HP Ethernet SNMP Module. The port is disabled. Port security parameters are configurable from HP Interconnect Manager. See the documentation for that program for more information.
ON	*	*	**Rapid Flash**	*	**ON**	**Not Flashing**	An unauthorized network management station has attempted to access a hub with an HP Ethernet SNMP Module.
ON	*	**ON**	**ON**	*	**Slow Flash (for more than 60 sec. after a reset or power on)**	**All ON**	The HP Ethernet SNMP Module has failed self-test and/or its firmware code has become corrupted. This is frequently the result of a failure during downloading of new code. Repeat the download process. If the hub self-test fails again, contact your HP-authorized LAN dealer or HP representative for assistance. Under this condition, the hub will continue its normal repeater function, but the console and control capabilities will be limited.
ON	*	**ON**	**ON**	*	**ON**	**Variable; all may be ON**	A hub hardware failure was detected during self-test. Self-test does not complete so the LEDs will stay on longer than 60 seconds. Power cycle the hub. If this condition persists, the hub may have to be replaced. Contact your HP-authorized LAN dealer or HP representative for assistance.

*** This LED is not important for the diagnosis**

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Installation Problems

By carefully following the installation procedures described in chapter 1, “Installing the HP AdvanceStack 10Base-T Hubs”, you can avoid most problems caused by improper installation of the hub or one of its components.

Incorrect Installation

Incorrectly installing the hub, the HP Ethernet SNMP Module, or a transceiver module can result in one or all of these components malfunctioning or not functioning at all. If one or all of these components appear to not be functioning, re-check the installation procedure and, if necessary, re-install the component correctly.

If no power appears to be getting to the hub unit, check the power cord at both the back of the hub and the ac power outlet to be certain the cord is properly connected.

ASCII Console Connection Problems

The ASCII console was added to the HP J2603B Ethernet SNMP Module firmware versions A.03.00 or later. If your EEPROM is older, you do not have the ASCII console. See chapter 3, “Hub Reference” for information on how to update your HP J2603A or B Ethernet SNMP Module with the latest firmware.

You can determine your firmware version with HP Stack Manager or HPInterconnect Manager. To determine your firmware version, follow these steps:

1. In HP Stack Manager, double click on a hub that has an SNMP Module.
2. Click on the Identify icon.
3. Scroll through the list until you see **SNMP Agent EEPROM Vers.**

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Cabling Problems

A high percentage of network problems are due to faulty cabling. Cabling problems usually result in the failure of a hub to connect to a network, another hub, or the console.

Connections

All cables attached to the hub should be checked to see that they are properly connected. Proper network and out-of-band management connections are described in chapter 1, “Installing the HP AdvanceStack 10Base-T Hubs”.

Properly connecting cables to the transceiver modules is described in the documentation that accompanies those modules.

If the ThinLAN port is being used, be certain the ThinLAN cable segment attached to the port is properly terminated with a 50-ohm terminator at both ends, as described in chapter 1, “Installing the HP AdvanceStack 10Base-T Hubs”.

Non-standard Cables

Mis-wired cables may cause numerous network collisions, and can seriously impair network performance. Before connecting cables into your network, you should verify that they comply with the applicable standards. For a list of compatible cables and a description of the pinouts for each port on the hub (which can be used to confirm the compatibility of unlisted cables), see appendix A, “Cables and Connectors”.

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Topology

It is important to make sure you have a valid network topology. Common topology faults include excessive cable length and excessive repeater delays between nodes. If you have trouble after recent changes to a network, switch back to the previous topology. If you no longer have any trouble, the new topology is probably at fault. Refer to the guide entitled *Designing HP AdvanceStack Workgroup Networks* for topology configuration guidelines. Contact your HP-authorized LAN dealer or local HP sales office to get a copy of this guide.

Unusual Network Activity

Network activity that exceeds accepted norms often indicates a hardware problem with one or more of the network components, including, possibly, the hub. Unusual network activity is usually indicated by the LEDs on the front of the hub or measured with one of the diagnostic tools in the HP Stack Manager. Refer to “Diagnosing with LEDs” earlier in this chapter for information on using LEDs to identify unusual network activity.

IP Configuration Errors

If you are using IP communications, make sure your IP configuration parameters are set properly. Use the HP Stack Manager’s IP Configuration function. (This function is available only on hubs that have an installed HP Ethernet SNMP Module.) Incorrect IP configuration on the hub will prevent it from communicating with the network management station, and may cause other network problems.

In particular, make sure you provide the hub with a unique IP address, and that you use the correct subnet mask for your network. See appendix D, “Network Addressing”, for more information.

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Diagnostic Tests

The HP Stack Manager software provides tests and indicators that can be used to monitor the hub and its network connections. See chapter 2, "Installing and Using HP Stack Manager", and the software's online Help system for more details about these tests and indicators.

Testing the Hub Only

If you believe that the hub is not operating correctly, you can test the hub's circuitry by resetting the hub through one of these procedures:

- Press the Reset button.
- Select the "Power-on Reset" option from HP Stack Manager's Reset function or select type the REset command using the ASCII console.
- Select the "Power-on Reset" option from the HP Interconnect Manager interface.

Each of these procedures will cause the hub to complete its power-on self-test. If any error conditions exist in the hub, the LEDs should display the condition. See "Diagnosing with the LEDs" earlier in this chapter to interpret the LED display.

Testing the Hub's Ports and the Links

These tests are available only on hubs that have an HP Ethernet SNMP Module installed.

To test the hub's ports and the attached network links, choose one of the following ways to run a test between the hub and an addressable device connected at the remote end of each of the cables you wish to test:

- Select **Link Test** from HP Stack Manager's Network Test function. This causes the hub to send IEEE 802.2 Test command packets to a specified network device. The device must be able to send an IEEE 802.2 Test response packet upon receipt of a Test command packet. You specify the remote device by its 12-digit hexadecimal station address.

Continued on the next page.

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- Select **Ping Test** from HP Stack Manager's Network Test function or type the PIng command at the ASCII terminal. This is a network layer test that you can run on TCP/IP networks. The hub sends IP Echo Request packets to a specified network device. This works with devices that have an IP address and are able to respond to an ICMP Echo Request packet. You specify the remote device by its IP address.
- Select **IPX Test** from HP Stack Manager's Network Test function. This is a network layer test that you can run on Novell NetWare IPX networks. The hub sends IPX test packets to a specified network device. This works with devices that have an IPX address and are able to respond to an IPX test packet. You specify the remote device by its IPX address.

If the test passes, the hub's port, the network link, and the remote device are all working properly. If you are testing the AUI port, this also tests the transceiver that is attached to the port.

If the test fails, you can test the hub using the "Testing the Hub Only" procedures on the previous page. You should also verify that the remote device is powered on and functioning properly, and that the cable is good.

If the hub passes its tests, but the network test (link test, Ping test, or IPX test) fails, the problem is in the cabling, the remote device, or possibly the output circuitry of the hub's port.

See the HP Stack Manager online help for more information on how to execute these tests.

Testing Twisted-Pair Cabling

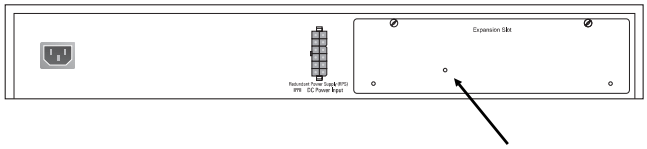
The twisted-pair cable attached to the HP AdvanceStack 10Base-T Hub must be compatible with the IEEE 802.3 Type 10Base-T standard. To verify that your cable is compatible with this standard, you can use the HP J2263A Cable Test Set. The older HP 28687A Wire Test Instrument can also be used. HP also offers a wire testing service. Contact your HP-authorized LAN dealer or your local HP sales office for more information.

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Clearing a Password

There is a Password Clear button on the HP Ethernet SNMP Module that is accessed through a hole in the hub's Expansion Slot cover plate. You can use this button to clear a forgotten password that was previously configured on the hub. The password is configured from either:

- HP Stack Manager
- HP Interconnect Manager, or
- ASCII terminal interface



Press the Password Clear button with a pen or other pointed object.

To clear the password, press and hold the button for approximately five seconds.

As an indication that the password has been cleared, the Security LED on the front of the hub will come on and stay on until the button is released.

Note

After the password has been cleared, access to the hub from the HP Stack Manager and from SNMP management stations will no longer be password protected.

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Customer Support Services

Hewlett-Packard offers support 24 hours a day, seven days a week through the use of automated electronic services including:

- Hewlett-Packard BBS and World Wide Web
- Hewlett-Packard FTP Library Service on the Internet
- CompuServe
- HP FIRST FAX Retrieval Service

HP Interconnect Manager (icmupdt.exe), HP Stack Manager (stkmgr.exe) and SNMP firmware for your AdvanceStack hubs (asfw.exe) are available through the HP BBS, World Wide Web, CompuServe, and the HP FTP Library Service. After you download the file(s) from one of these sources, you type *filename* /x. For example, icmupdt /x

HP BBS and World Wide Web

The HP BBS phone number is (208) 344-1691. Set your modem communication settings to:

- parity = N
- data bits = 8
- stop bits = 1
- baud rates = 300, 1200, 2400, 4800, 9600, or 14400

The URL address for the World Wide Web is:

http://www.hp.com/go/network_city

From this web site, you can download files and learn about HP networking products. After you download the file, extract the file (e.g., icmupdt /x)

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Hewlett-Packard FTP Library Service

To access the HP FTP Library, follow these steps:

1. Enter the command:
   ftp ftp-boi.external.hp.com
   The ftp> prompt appears.
2. At the ftp > prompt, enter:
   anonymous
3. At the password prompt, enter your internet e-mail address.
4. At the ftp > prompt, set the transfer type to binary:
   bin
5. Change directories:
   cd pub/networking/software
6. Retrieve the file by entering:
   get *filename* (e.g., get asfw.exe)
7. Quit the FTP session by entering:
   quit
8. Extract the file (e.g., asfw /x)

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CompuServe

CompuServe is an electronic information and communication service run by an independent company. The service is typically accessed with a computer and modem and uses standard voice telephone lines for transmitting and receiving data. CompuServe is available 24 hours-a-day, seven days per week. The participants pay a monthly fee as well as an hourly connect charge for this service. To get the latest agent firmware from CompuServe, follow these steps:

1. Login to CompuServe.
2. Type: go hpsys
3. Type: lib 7
4. Type: download *filename* (e.g., download icmupdt.exe)
5. Log off CompuServe.
6. Extract the file (e.g., icmupdt /x)

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HP FIRST Fax Retrieval Service

HP FIRST is an automated fax retrieval service that is available 24 hours a day, seven days a week. HP FIRST provides information on the following topics:

- Product information
- Troubleshooting instructions
- Technical reviews and articles
- Configuration information

To access HP FIRST, dial one of the following phone numbers from your touch-tone telephone:

Location	Phone Number
U.S. and Canada Only	(800) 333-1917 and press 1 for HP FIRST
Outside the U.S. and Canada	(208) 344-4809 and press 9 for HP FIRST

To receive a list of currently available documents, enter document number 19941. The information you requested will be sent to you by return fax.

HP Network Phone-In Support (NPS)

Call your HP Authorized Dealer or the nearest HP Sales and Support Office. In addition, the HP Network Phone-In Support (NPS) service provides expert technical assistance for U.S.A. customers through an NPS contract or at an hourly rate (1-800-790-5544) Monday through Friday, 5 am to 6 pm.

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A

- Recommended Cables
- Twisted-Pair Cable/Connector Pin-Outs
- ThinLAN Cable Requirements
- AUI Cable Minimum Pin-Out
- Distributed Management Connector/Cable Pin-Outs

Cables and Connectors

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This appendix lists cables that have been tested and verified for use with the HP AdvanceStack 10Base-T Hubs. It also includes minimum pin-out information so, if you wish to use an unlisted cable, you can verify that the cables used in your installation are correctly wired. Note that each pin-out does not necessarily match the pin-out for the corresponding HP cable, but cables manufactured to follow the minimum pin-out will function correctly.

Note

Incorrectly wired cabling is the most common cause of problems for LAN communications. HP recommends that you work with a qualified LAN cable installer for assistance with your cabling requirements.

These topics are discussed:

- Recommended HP cables
- Twisted-pair cable/connector pin-outs
- ThinLAN cable requirements
- AUI cable
- Console connector and cable pin-outs

For information about the cable used for the Redundant Power Supply (RPS), see the documentation accompanying the RPS.

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Recommended Cables

Cable Function	Port Type on PC, or Modem	Cable Type	HP Product Number
Network connections to the hub:			
Hub to end node connection	—	Twisted-pair "straight-through" cable	92268A, B, C, D, or N (4-pair) 92214R, S, or T (25-pair)
Hub to hub "cascade" connection	—	Twisted-pair "crossover" cable	92214W (6-inch Crossover Cable)
Hub to hub ThinLAN backbone connection	—	IEEE Type 10Base2 Thin coaxial cable	92214U (0.5 meter), includes a BNC "T" connector and one 50-ohm terminator
Transceiver connection to the AUI Port Module *	—	AUI cable	92264D (1 meter) 92254A through H (6–48 meters) 92254J (5 meters)
Console PC connection to the hub's RS-232 port:			
Connecting the PC directly to the hub's RS-232 port	9-pin male	RS-232-C 9-pin female to 9-pin female null modem or "crossover" cable	RS-232-C cable provided with the hub (HP p/n 5182-4794)
	25-pin male	RS-232-C 9-pin female to 25-pin female null modem or "crossover" cable	HP 24542H
Connecting a modem to the hub's RS-232 port	25-pin female	RS-232-C 9-pin female to 25-pin male standard modem or "straight-through" cable	HP 24542M
Hub to hub connections for distributed management			
Distributed management extension connections	—	Twisted-pair "straight-through" cable	92268A, B, C, D, or N (4-pair)

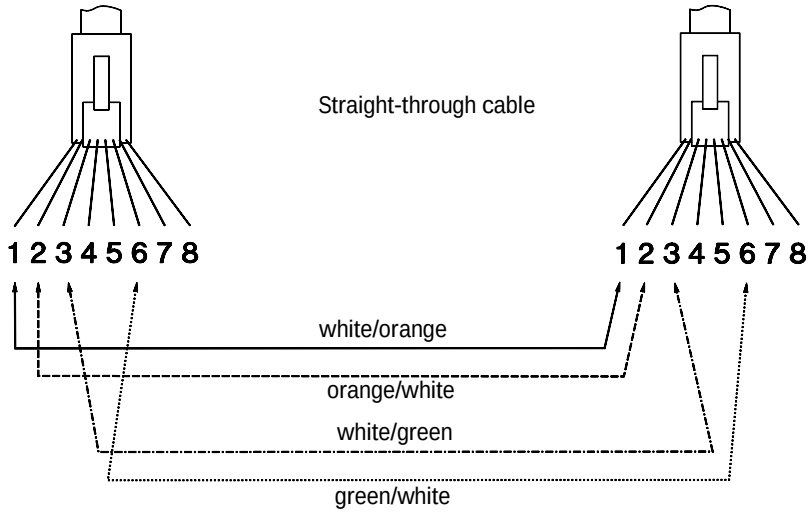
* An AUI cable is not necessary with some transceivers such as the HP 28685B EtherTwist Transceiver, the HP 28641B ThinLAN Transceiver, and the HP 28683A Fiber-Optic Transceiver. These transceivers can be attached directly to the AUI connector on the AUI Port Module.

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Twisted-Pair Cable/Connector Pin-Outs

Twisted-Pair Cable for Hub-to-Computer Network Connection

To connect PCs or other network devices to the hub, use a "straight-through" 10Base-T cable. The twisted-pair wires must be twisted through the entire length of the cable. The wiring sequence must conform to AT&T 258A (not USOC). See "Twisted-Pair Cable Pin Assignments" later in this chapter for a listing of the signals used on each pin.



Note

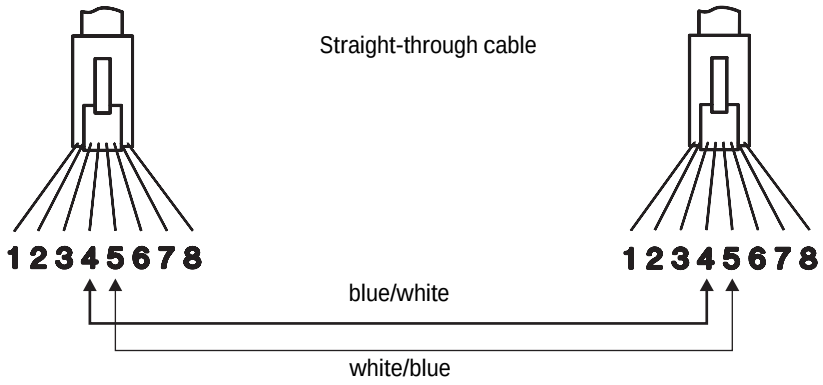
Pins 1 and 2 *must* be wired to a twisted pair.
Pins 3 and 6 *must* be wired to a twisted pair.

Pins 4, 5, 7, and 8 are not used in this application, although they may be wired in the cable.

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Twisted-Pair Cable for Hub-to-Hub Distributed Management Chaining (not a network connection)

To connect hubs to each other through the Extension (In/Out) Ports to form a distributed management chain, use a “straight-through” 10Base-T cable. The twisted-pair wires must be twisted through the entire length of the cable. The wiring sequence must conform to AT&T 258A (not USOC). See “Twisted-Pair Cable Pin Assignments” later in this chapter for a listing of the signals used on each pin.



Note

Pins 4 and 5 *must* be wired to a twisted pair.

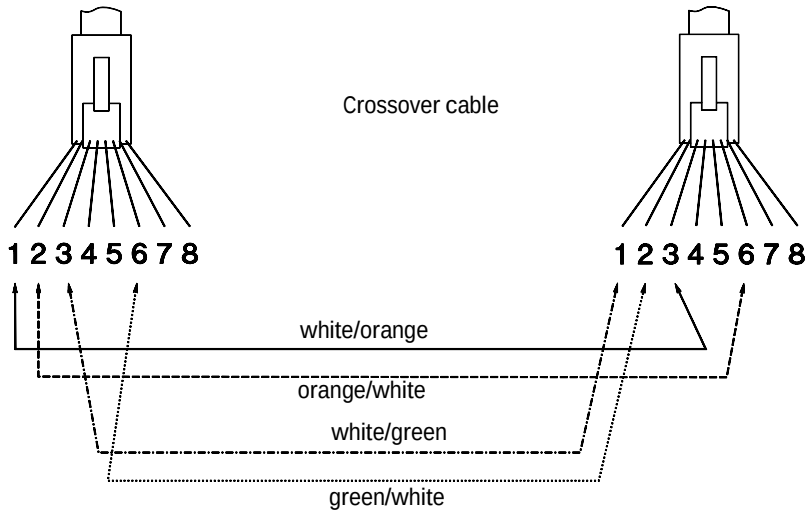
Pins 1 ,2, 3, 6, 7, and 8 are not used in this application, although they may be wired in the cable.

The maximum total length of all the extension cables in a chain is 185 meters.

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Twisted-Pair "Crossover" Cable for Hub-to-Hub Network Connection

For wiring between two hubs for data communications, the transmit and receive pairs must be reversed. The twisted-pair wires must be twisted through the entire length of the cable. See "Twisted-Pair Cable Pin Assignments" later in this chapter for a listing of the signals used on each pin.

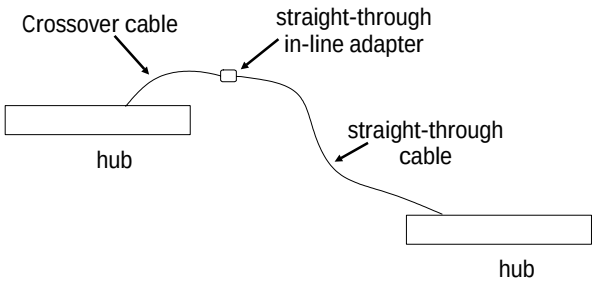


Note

Pins 1 and 2 on the hub 1 end *must* be wired through a twisted pair to pins 3 and 6 on the hub 2 end. Pins 3 and 6 on the hub 1 end *must* be wired through a twisted pair to pins 1 and 2 on the hub 2 end.

Pins 4, 5, 7, and 8 are not used in this application, although they may be wired in the cable.

A short crossover cable (like the HP 92214W) can be used to adapt a straight-through twisted-pair cable for "cascading" hubs through the twisted-pair ports.



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Twisted-Pair Cable Pin Assignments

Twisted-Pair Straight-Through Cable

Hub End		Computer or Transceiver End	
Signal	**Pins**	**Pins**	**Signal**
(receive +)	1 ←	1	(transmit +)
(receive –)	2 ←	2	(transmit –)
(transmit +)	3 →	3	(receive +)
(transmit –)	6 →	6	(receive –)

Twisted-Pair Crossover Cable

Hub 1-end		Hub 2-end	
Signal	**Pins**	**Pins**	**Signal**
(receive +)	1 ←	6	(transmit –)
(receive –)	2 ←	3	(transmit +)
(transmit +)	3 →	2	(receive –)
(transmit –)	6 →	1	(receive +)

ThinLAN Cable Requirements

The thin coaxial cables used with the HP AdvanceStack 10Base-T Hubs must comply with the IEEE 802.3 Type 10Base2 requirements. Some RG-58 A/U or RG-58 C/U cables meet these requirements.

The maximum length of a single thin coaxial cable segment is 185 meters. The minimum length (for example, to connect adjacent hubs in a rack) is 0.5 meter.

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AUI Cable Minimum Pin-Out

Transceiver end 15-pin female	Hub end 15-pin male	Signal
2	2	Control In circuit A
3	3	Data Out circuit A
4	4	Data In circuit Shield (common drain)
5	5	Data In circuit A
6	6	Voltage Common
9	9	Control In circuit B
10	10	Data Out circuit B
12	12	Data In circuit B
13	13	Voltage Plus

For this connection, you can use:

- HP 92264D (1-meter thin AUI extension, pin 4 not connected)
- HP 92254A through H (6-meter through 48-meter thick AUI cables)
- HP 92254J (5-meter thin AUI cable, pin 4 not connected)

Some longer cables may have all 15 pins wired. See the IEEE 802.3 standards document for definitions of the pins not shown here.

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Distributed Management RS-232 Connector and Cable Pin-Outs

The hub's console connector is wired as if it is a terminal (DTE), ready to be connected to a modem (DCE). The HP AdvanceStack 10Base-T Hubs include a null modem cable that can be used to directly connect a PC to be used as the console. To connect a modem to the hub, use a standard RS-232-C modem cable.

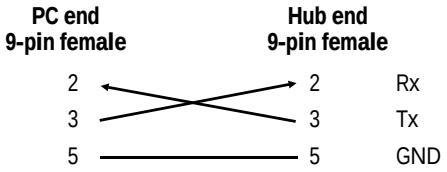
This section provides pin assignment information for the cables you can use on the hub's Distributed Management RS-232 port.

Pin-Out for Hub's RS-232 Port Connector

PIN	US	CCITT	DIN
1	DCD	109	M5
2	Rx	104	D2
3	Tx	103	D1
4	DTR	108	S1
5	GND	102	-
6	DSR	107	M1
7	RTS	105	S2
8	CTS	106	M2
9	RI	125	M3

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RS-232-C "Null Modem" Cable for Direct Console Connection (supplied with the hub)



RS-232-C Modem Cable

Modem end 25-pin male		Hub end 9-pin female	Signal
2	←	3	Tx
3	→	2	Rx
4	←	7	RTS
5	→	8	CTS
6	→	6	DSR
7	—	5	GND
8	→	1	CD OR DCD
20	←	4	DTR
22	→	9	RI
23	←		DRS – typically on V.24 (European) modems (not connected)

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B

Specifications

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Physical

	HP J2600A 12-Port Hub HP J2601B 24-Port Hub	HP J2602B 48-Port Hub
Width:	44.2 cm (17.4 in)	44.2 cm (17.4 in)
Depth:	29.8 cm (11.7 in)	29.8 cm (11.7 in)
Height:	6.6 cm (2.6 in)	11.0 cm (4.3 in)
Weight:	4.1 kg (9.0 lb)	5.0 kg (11.0 lb)

Electrical

(The HP AdvanceStack hubs automatically adjust to any voltage between 100 and 240 volts and any frequency between 50 and 60 Hz.)

ac voltage:	100-127 volts Voltage tolerance of +/- 10%	200-240 volts Voltage tolerance of +/- 10%
Typical current:	0.6 A (HP J2600A, J2601B) 0.8 A (HP J2602B)	0.3 A (HP J2600A, J2601B) 0.4 A (HP J2602B)
Maximum current:	1.0 A	0.6 A
Frequency range:	50/60 Hz	50/60 Hz

The maximum current ratings represent the current that could be drawn with a fully loaded expansion slot and external MAU's.

Environmental

	Operating	**Non-Operating**
Temperature:	0°C to 55°C (32°F to 131°F)	-40°C to 70°C (-40°F to 158°F)
Relative humidity: (non-condensing)	15% to 95% at 40°C (104°F)	15% to 90% at 65°C (149°F)
Maximum altitude:	4.6 km (15,000 ft)	4.6 km (15,000 ft)

Connectors

- The 50-pin and RJ-45 twisted-pair ports are compatible with the IEEE 802.3 Type 10Base-T standard.
- The ThinLAN port is compatible with the IEEE 802.3 Type 10Base2 standard.
- The RS-232-C console port conforms to V.22 bis. (Modem use requires HP J2603A or B Ethernet SNMP Module.)

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Electromagnetic

Emissions

FCC part 15 Class A
CISPR-22 Class A
EN 55022 Class A
VCCI Level I

Immunity

ESD	IEC 801-2 (1991) (4 kV CD, 8 kV AD)	
Radiated (Immunity)	IEC 801-3 (1984) (3 V/m)	
Electrical Fast Transient	IEC 801-4 (1988)	0.5kV signal lines 1.0kV power lines

Safety

IEC 950: (1991)+A1,A2/.EN60950 I(1992)+A1,A2
UL1950
CSA 950
NOM-019-SCFI-1993

Accoustic Noise

Not applicable

SNMP Network Management Agent Support (with HP J2603A or B Ethernet SNMP Module)

- RFC 1213 – MIB-II
- RFC 1516 – IEEE 802.3 Repeater MIB
- RFC 1515 – IEEE 802.3 MAU MIB
- HP Enterprise-Specific Extensions

Warranty

See the warranty card that is shrink-wrapped with this manual.

Datacomm Declarations

United Kingdom:
The HP J2600A, J2601B, and J2602B hubs are approved under Approval Number NS/G/1234/J/100003 for indirect connection to public telecommunications systems within the United Kingdom.

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C

- Communications Between Hub and Network Management Station
- IPX Addressing for Novell NetWare
- IP Addressing for IP and non-IP Networks
- Using BOOTP

Network Addressing

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Communication Between the Hub and Network Management Station

The HP AdvanceStack 10Base-T Hubs that have an HP Ethernet SNMP Module (HP J2603A or B) installed in them can be managed over the network by HP network management products, for example HP Interconnect Manager. These hubs can also be managed by any other network management products that comply with the Simple Network Management Protocol (SNMP) standard and have standard SNMP MIB-browser functionality.

The communication between the SNMP network management station and the hub takes place using the network layer protocols, IPX for Novell networks, or IP for TCP/IP networks.

Which protocol you use depends on the protocol being used by the network management station. Additionally, if the network management station is on the other side of a router from your hub, the protocol you run on both the hub and the network management station depends on which protocol the router can handle.

The network layer communications require that the hub have a network layer address. This appendix provides some background information on IPX and IP addressing.

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IPX Addressing for Novell NetWare

The Novell NetWare network operating system uses a proprietary protocol called Internetwork Packet Exchange (IPX). The IPX protocol firmware is always available on an HP AdvanceStack 10Base-T Hub; it becomes active when the hub gets an IPX address. The IPX address consists of a network number and a device identification. The address is automatically assigned to the hub as follows (no IPX configuration of the hub is necessary):

- The network number is automatically assigned by a router or file server on the network that is running the IPX protocol.
- The device identification is usually the hub's station address (also known as the MAC address, Ethernet address, or physical address). This address is a unique 12-digit hexadecimal number assigned to the hub at the factory.

IPX Addressing Notes:

- Because the IPX address is assigned automatically, no IPX configuration is necessary; therefore no IPX configuration is provided on the hub console interface. By default, the hub is ready to be managed by an SNMP network management station that is configured for IPX communications.
- If your hub is part of a network that is running IPX only, you do not need to perform the IP configuration.

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IP Addresses for IP and Non-IP Networks

If you have chosen to manage your hub with an SNMP/IP network manager, your hub must be configured with an IP address. If your network will be connected with other networks that use IP addresses, you must use *assigned* IP addresses. Otherwise, you can build your own IP addressing scheme (described on the next page).

Using Assigned IP Addresses

Hewlett-Packard strongly recommends that if you intend to expand, integrate, or connect your network to other networks, you use an assigned IP address (globally administered addresses). There is a formal process to assign unique IP addresses to networks worldwide. Government Systems, Incorporated (GSI) is in charge of assigning IP addresses. You must fill out and submit an application form to GSI. You can get this form by either sending an electronic mail message to hostmaster@nic.ddn.mil or by writing GSI at the following address:

Mailing Address	Government Systems, Inc. Attn: Network Information Center 14200 Park Meadow Drive, Suite 200 Chantilly, VA 22021	
Telephone	in U.S. only: worldwide: FAX:	1-800-365-3642 1-703-802-4535 1-703-802-8376

Allow at least eight working days for GSI to process an IP address request.

Building Your Own IP Addressing Scheme

If your network is isolated and will not be connected to any other networks that use IP addressing, you can build your own IP addressing scheme (locally administered addresses). If you use your own addressing scheme, be aware that any connection to another IP network could cause communication problems on both networks. The IP addresses on the two networks must be compatible. Each address must be unique.

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The following documents have detailed descriptions on how to build your own IP addressing scheme:

- *HP Interconnect Manager Getting Started Guide*:
  (OpenView/Windows: HP part number 5963-2619)
  (OpenView/HP-UX: HP part number 5963-2687)
- Internetworking With TCP/IP: Principles, Protocols, and Architecture

  Author: Douglas E. Comer
  Publisher: Prentice-Hall, Inc.

Example Addressing Scheme

On the next page is an example of a class C addressing scheme. Class C addresses allow up to 254 devices to be configured. If you have 254 or fewer devices to be managed on your network, you can use the addressing scheme shown below. If you have more than 254 devices to configure, see the referenced documents and use a class B addressing scheme. Class B allows 65534 devices to be configured.

The IP address format is X.X.X.X, where each X is an integer between 1 and 255. The integers are separated by decimal points. For a given network with its own class C addressing scheme, the first three integers of each address must be the same. The fourth integer must be unique for each addressed device. *Do not use 0 or 255 as the value in the last position on the right. They are reserved integers.*

For three hubs and an HP network management station on the network, the class C addresses might be:

management station	192.1.1.1
first hub	192.1.1.10
second hub	192.1.1.11
third hub	192.1.1.12
…	…

The IP Configuration function in the HP Stack Manager software enables you to specify IP addresses. See chapter 2, “Installing and Using HP Stack Manager”, and the software’s online help system for details.

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Using BOOTP

BOOTP (Bootstrap Protocol) is used to download network configuration data from a server (the BOOTP server) to the hub. The configuration data the hub retrieves from the BOOTP server is:

- the IP address for the hub
- the subnet mask for the subnet on which the hub is installed
- the default router

If you have configured the hub's IP parameters on a BOOTP server, you do not need to use the IP Configuration function in HP Stack Manager. As shipped from the factory, the hub is configured to use BOOTP to retrieve the IP configuration information.

The BOOTP Process

When the hub is powered on, it broadcasts BOOTP requests that contain the hub's station address. The BOOTP server receives the request and searches its BOOTP table file for an entry that matches the hub's station address. If a match is found, the configuration data in the associated file entry is returned to the hub as a BOOTP reply. For most UNIX systems, the BOOTP table is contained in the `/etc/bootptab` file. The example below applies to the BOOTP table for UNIX systems.

BOOTP Table File Entries

An entry in the BOOTP table file `/etc/bootptab` for an HP AdvanceStack 10Base-T hub would be similar to the following:

```
hphub24:\
  :ht=ether:\
  :ha=080009123456:\
  :ip=190.40.101.22:\
  :sm=255.255.255.0:\
  :gw=190.40.101.1:\
  :vm=rfc1048:
```


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Definitions of the table entry fields:

hphub24	is a user-defined symbolic name to help you find the correct section of the bootptab file. If you have multiple hubs that will be using BOOTP to get their IP configuration, you should use a unique symbolic name for each hub.
ht	is the "hardware type" tag. For the HP AdvanceStack 10Base-T hubs, set this to **ether** (for Ethernet). *This tag must precede the* ha *tag.*
ha	is the "hardware address" tag. Use the hub's 12-digit station address.
ip	is the IP address to be assigned to the hub. Enter the address in the dotted-decimal format as shown in the example on the previous page.
sm	is the subnet mask of the subnet in which the hub is installed.
gw	is the IP address of the default router (or gateway) that allows the hub to communicate with systems that are not on the local network segment. If there is no default router, do not include this tag.
vm	is a required entry that specifies the BOOTP report format. *For the HP AdvanceStack 10Base-T hubs, you must set this parameter to* **rfc1048** .

Notes for the bootptab file:

- Blank lines and lines beginning with the pound sign (#) are ignored.
- Make sure you include a colon (:) and a backslash (\) as a continuation indication at the end of each line except the last one. The last line should end with just a colon (:).
- Spaces are not allowed between the characters on a line.
- Names, such as hphub24 must begin with a letter and can only contain letters, numbers, periods, or hyphens.

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D

- Description
- Configuring a Backup Link
- Identifying the Backup Link
- Indications of Backup Link Activation
- Reactivating the Primary Link
- Example Topologies

Backup Links

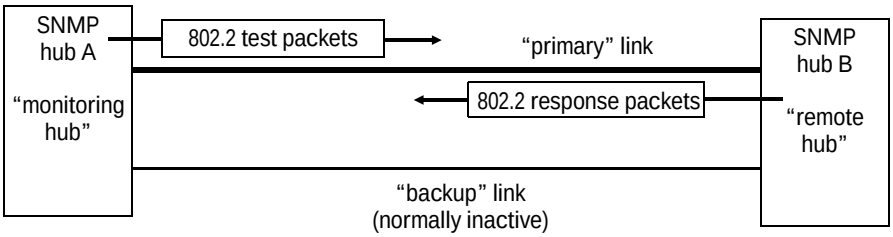
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Description

Note

The Backup Link function is available only for HP AdvanceStack 10Base-T Hubs in which an HP Ethernet SNMP Module (HP J2603A or B) is installed.

In some network configurations a critical link exists, for example between two workgroups that regularly share or exchange data over the network. To maintain the integrity of such a critical link, the HP AdvanceStack 10Base-T Hubs offer a backup link feature. A backup link is a separate cable run between two hubs that is automatically enabled if the connection designated as the primary link fails.



The hub on which the redundant link is configured (hub A in the illustration—the "Monitoring Hub"), is responsible for monitoring the link. It sends IEEE 802.2 Test packets to the hub at the other end of the link (hub B in the illustration—the "Remote Hub") and looks for response packets from that hub. If the response packets fail to come back, the primary link is considered as having failed and the backup link, which had not been carrying any traffic, is enabled automatically. If the primary link does fail, it is automatically disabled until it can be repaired and re-enabled.

When the primary link is repaired, you must re-enable the primary port. It is not re-enabled automatically. When the primary port is enabled, the backup port is automatically disabled and returned to backup mode. See "Reactivating the Primary Link" later in this appendix.

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Limitations

- *The hubs at both ends of the redundant link must have an HP Ethernet SNMP Module installed.*
- Each hub can monitor a single backup link (only one backup link can be configured on each hub). But, the hub may be at the remote end of one backup link and at the monitoring end of a backup link to a different hub.
- A given hub should be connected to the remote end of no more than two backup links. If it is functioning as the remote hub in more than two backup links, it may not be able to respond to the test packets fast enough when there is a high level of data traffic on the network segments.

  This ability to respond may be improved by increasing the time between test packet transmissions on the monitoring hubs. For *all* the backup links in which the remote hub is involved, the time configured on the monitoring hubs for those links should be increased by one second for each additional backup link beyond two links. Add one to this count if the remote hub is also functioning as a primary (monitoring) hub in a different link.

Additional Notes

- Any port on the hub can be used for either the primary link or the backup link.
- Any combination of media types can be used. For example, a thin coax link from the ThinLAN port can act as a backup link to a twisted-pair link using one of the hub's twisted-pair ports. A transceiver installed in the hub's AUI/Xcvr slot, or externally attached to an AUI Port Module in the AUI/Xcvr slot, can provide a primary or backup link over any type medium (twisted-pair, coax, or fiber-optic cable). (See "Sample Topologies" later in this appendix.)
- The primary link and the backup link cabling should be run over different paths (through different conduits, for example) to reduce the possibility that damage will occur to both cables simultaneously.

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Configuring a Backup Link

Configure the Monitoring Hub Only. All configuration of the backup link is performed from the HP Stack Manager program, and you perform the complete backup link configuration on the "monitoring" hub. On the "remote" hub, you only need to make sure the ports used in the primary and backup links are both enabled.

Use the HP Stack Manager's Backup Function. To configure this link, you use the Backup function in the HP Stack Manager. In the screen, you provide the following information:

- the port to be used for the backup link
- the port to be used for the primary link
- the station address of the hub at the remote end of the link
- how frequently (in seconds) test packets (used to check the status of the primary link) should be sent to the remote hub
- how many consecutive response failures will trigger activation of the backup link

(You can also use the equivalent ASCII console BAckup command.)

Follow this Configuration/Installation Sequence. If a hub is installed in a network that includes two connections to another hub, and the backup link has not yet been configured, a loop in the network exists causing some network performance degradation. For this reason, it is better to configure the backup link on the hub before the hub is installed in the network. It is best to follow these steps:

1. Attach a PC running HP Stack Manager to the hub's RS-232 port, or to the RS-232 port of any of the hubs in the chain containing the hub you want to configure, and start HP Stack Manager.

2. Access the hub you want to configure. (Remember that this hub must have an HP Ethernet SNMP Module installed.)

3. Use the Backup function to configure the backup link. (See the Backup function description in chapter 2, "Installing and Using HP Stack Manager", or the software's online help).

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4. Complete the network cable connections between the monitoring hub and the remote hub. (For instructions, see “Port Connections” in chapter 1, “Installing the HP AdvanceStack 10Base-T Hubs”.)

5. Enable the primary port with the HP Stack Manager’s Port function. This step is necessary because until you have completed step 3 (connecting the cables), the test packets cannot be successfully sent through the primary port. The primary port will therefore be disabled and the backup port will be activated. Once you enable the primary port, it assumes the active role.

6. On the remote hub, make sure that the ports connected to both the primary and backup links are enabled. On the monitoring hub, the status of the primary and backup ports is controlled by the hub’s firmware; you do not need to explicitly enable the monitoring hub’s ports.

Identifying the Backup Link

The ports designated as the primary and backup ports are identified in:

- the HP Stack Manager’s Backup function window.
- HP Interconnect Manager. (See the that product’s documentation for more information.)
- ASCII console interface by using the BAckup command

The primary port is identified by (pri), the backup port by (bkup).

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Indications of Backup Link Activation

When the primary link fails ("n" consecutive test packet responses were not received on the primary port from the other hub), the backup link is automatically enabled. The effect of this change is displayed on the monitoring hub's LEDs and management interface. Activation of the backup link does not change the status of any of the ports on the remote hub.

On the hub's LEDs, the primary port LED goes off, and the backup port LED goes on.

On the HP Stack Manager's front panel display for the hub, the status of the primary port changes from ON to OFF, and the backup port changes from OFF to ON.

On HP Interconnect Manager, you can automatically monitor the status of the backup link from the network management station. See your HP Interconnect Manager documentation for more information.

On the ASCII terminal STatus command display, the primary port (labeled pri) changes from ON to OFF, and the backup port (labeled bkup) changes from OFF to ON.

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Reactivating the Primary Link

When the primary link is repaired, you can use any of the following methods to re-enable the primary port:

- From HP Stack Manager click on the primary port on the Port Status display and use the Port function to enable that port.
- From HP Stack Manager, use the Reset function to perform a Power-on reset. This will restore the primary port's active status.
- From the ASCII terminal, use the POrt command to enable the primary port.
- From the ASCII terminal, use the REset command to reset the hub. This will restore the primary port's active status.
- Press the Reset button on the front of the hub, or cycle power on the hub. These processes will reset the hub and restore the primary port's active status. These techniques are useful if you do not have access to HP Stack Manager (for example, because the hub is in a wiring closet and a console is not connected).
- From an HP network management station, re-enable the primary port. See the network management product documentation for details on how to enable a port.

When the primary port is re-enabled, the backup port is automatically disabled and returned to backup mode.

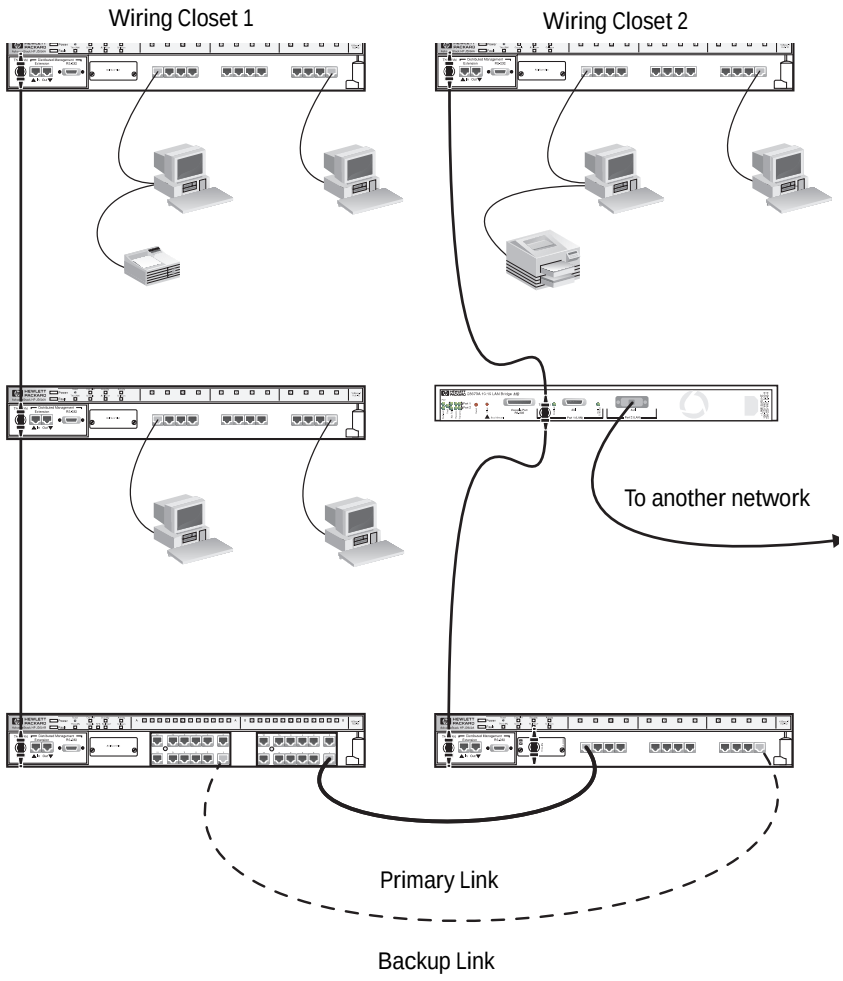
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Example Topologies

Following are two simple example topologies that may give you some ideas on how a backup link could be used in your network.

Example 1: Hub-to-Hub

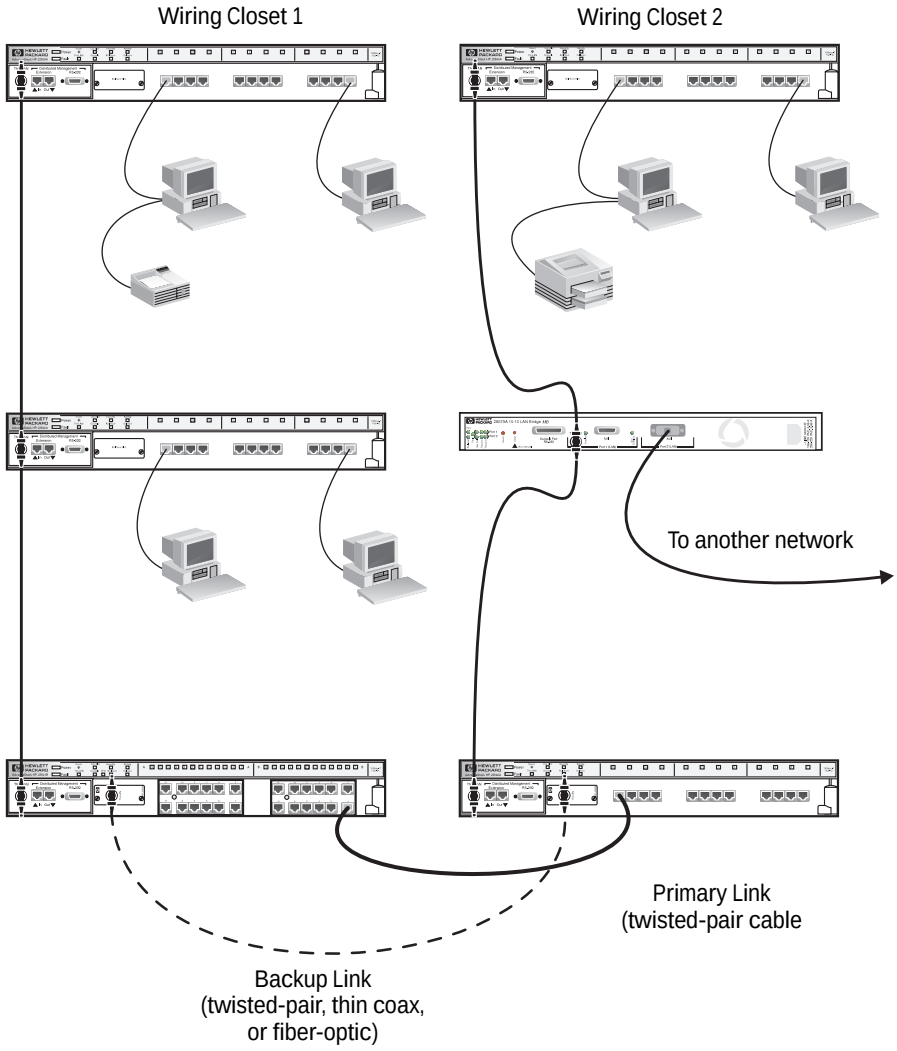
In this example topology, the primary and backup links consist of twisted-pair cable segments between two HP AdvanceStack hubs.



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Example 2: Backup Link Using Alternative Medium

In this topology, the primary link consists of a twisted-pair cable between twisted-pair ports on two HP AdvanceStack hubs; the backup link is from AUI port to AUI port on the two hubs. Depending on the type of transceivers used, the backup link could use thin coax, fiber-optic cable, or even twisted-pair cable. *Note that any of the network ports on these hubs can function as a backup to any other port.*



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Safety and Regulatory Statements

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Safety Information

Safety Symbols



Documentation reference symbol. If the product is marked with this symbol, refer to the product documentation to get more information about the product.

WARNING A WARNING in the manual denotes a hazard that can cause injury or death.

CAUTION A CAUTION in the manual denotes a hazard that can damage equipment.

Do not proceed beyond a WARNING or CAUTION notice until you have understood the hazardous conditions and have taken appropriate steps.

Grounding

These are safety class I products and have protective earthing terminals. There must be an uninterruptible safety earth ground from the main power source to the product's input wiring terminals, power cord, or supplied power cord set. Whenever it is likely that the protection has been impaired, disconnect the power cord until the ground has been restored.

For LAN cable grounding:

- If your LAN covers an area served by more than one power distribution system, be sure their safety grounds are securely interconnected.
- LAN cables may occasionally be subject to hazardous transient voltages (such as lightning or disturbances in the electrical utilities power grid). Handle exposed metal components of the network with caution.

Servicing

There are no user-serviceable parts inside these products. Any servicing, adjustment, maintenance, or repair must be performed only by service-trained personnel.

These products do not have a power switch; they are powered on when the power cord is plugged in.

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Informations concernant la sécurité

Symboles de sécurité



Symbole de référence à la documentation. Si le produit est marqué de ce symbole, reportez-vous à la documentation du produit afin d'obtenir des informations plus détaillées.

WARNING Dans la documentation, un WARNING indique un danger susceptible d'entraîner des dommages corporels ou la mort.

CAUTION Un texte de mise en garde intitulé CAUTION indique un danger susceptible de causer des dommages à l'équipement.

Ne continuez pas au-delà d'une rubrique WARNING ou CAUTION avant d'avoir bien compris les conditions présentant un danger et pris les mesures appropriées.

Cet appareil est un produit de classe I et possède une borne de mise à la terre. La source d'alimentation principale doit être munie d'une prise de terre de sécurité installée aux bornes du câblage d'entrée, sur le cordon d'alimentation ou le cordon de raccordement fourni avec le produit. Lorsque cette protection semble avoir été endommagée, débrancher le cordon d'alimentation jusqu'à ce que la mise à la terre ait été réparée.

Mise à la terre du câble de réseau local:

- si votre réseau local s'étend sur une zone desservie par plus d'un système de distribution de puissance, assurez-vous que les prises de terre de sécurité soient convenablement interconnectées.
- Les câbles de réseaux locaux peuvent occasionnellement être soumis à des surtensions transitoires dangereuses (telles que la foudre ou des perturbations dans le réseau d'alimentation public). Manipulez les composants métalliques du réseau avec précautions.

Aucune pièce contenue à l'intérieur de ce produit ne peut être réparée par l'utilisateur. Tout dépannage, réglage, entretien ou réparation devra être confié exclusivement à un personnel qualifié.

Cet appareil ne comporte pas de commutateur principal ; la mise sous tension est effectuée par branchement du cordon d'alimentation.

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Hinweise zur Sicherheit

Sicherheitssymbole



Symbol für Dokumentationsverweis. Wenn das Produkt mit diesem Symbol markiert ist, schlagen Sie bitte in der Produktdokumentation nach, um mehr Informationen über das Produkt zu erhalten.

WARNING Eine WARNING in der Dokumentation symbolisiert eine Gefahr, die Verletzungen oder sogar Todesfälle verursachen kann.

CAUTION CAUTION in der Dokumentation symbolisiert eine Gefahr, die das Gerät beschädigen kann.

Fahren Sie nach dem Hinweis WARNING oder CAUTION erst fort, nachdem Sie den Gefahrenzustand verstanden und die entsprechenden Maßnahmen ergriffen haben.

Dies ist ein Gerät der Sicherheitsklasse I und verfügt über einen schützenden Erdungsterminal. Der Betrieb des Geräts erfordert eine ununterbrochene Sicherheitserdung von der Hauptstromquelle zu den Geräteingabeterminals, den Netzkabeln oder dem mit Strom belieferten Netzkabelsatz voraus. Sobald Grund zur Annahme besteht, daß der Schutz beeinträchtigt worden ist, das Netzkabel aus der Wandsteckdose herausziehen, bis die Erdung wiederhergestellt ist.

Für LAN-Kabelerdung:

- Wenn Ihr LAN ein Gebiet umfaßt, das von mehr als einem Stromverteilungssystem beliefert wird, müssen Sie sich vergewissern, daß die Sicherheitserdungen fest untereinander verbunden sind.
- LAN-Kabel können gelegentlich gefährlichen Übergangsspannungen ausgesetzt werden (beispielsweise durch Blitz oder Störungen in dem Starkstromnetz des Elektrizitätswerks). Bei der Handhabung exponierter Metallbestandteile des Netzwerkes Vorsicht walten lassen.

Dieses Gerät enthält innen keine durch den Benutzer zu wartenden Teile. Wartungs-, Anpassungs-, Instandhaltungs- oder Reparaturarbeiten dürfen nur von geschultem Bedienungspersonal durchgeführt werden.

Dieses Gerät hat keinen Netzschalter; es wird beim Anschließen des Netzkabels eingeschaltet.

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Considerazioni sulla sicurezza

Simboli di sicurezza



Simbolo di riferimento alla documentazione. Se il prodotto è contrassegnato da questo simbolo, fare riferimento alla documentazione sul prodotto per ulteriori informazioni su di esso.

WARNING La dicitura WARNING denota un pericolo che può causare lesioni o morte.

CAUTION La dicitura CAUTION denota un pericolo che può danneggiare le attrezzature.

Non procedere oltre un avviso di WARNING o di CAUTION prima di aver compreso le condizioni di rischio e aver provveduto alle misure del caso.

Questo prodotto è omologato nella classe di sicurezza I ed ha un terminale protettivo di collegamento a terra. Dev'essere installato un collegamento a terra di sicurezza, non interrompibile che vada dalla fonte d'alimentazione principale ai terminali d'entrata, al cavo d'alimentazione oppure al set cavo d'alimentazione fornito con il prodotto. Ogniqualvolta vi sia probabilità di danneggiamento della protezione, disinserite il cavo d'alimentazione fino a quando il collegamento a terra non sia stato ripristinato.

Per la messa a terra dei cavi LAN:

- se la vostra LAN copre un'area servita da più di un sistema di distribuzione elettrica, accertatevi che i collegamenti a terra di sicurezza siano ben collegati fra loro;
- i cavi LAN possono occasionalmente andare soggetti a pericolose tensioni transitorie (ad esempio, provocate da lampi o disturbi nella griglia d'alimentazione della società elettrica); siate cauti nel toccare parti esposte in metallo della rete.

Nessun componente di questo prodotto può essere riparato dall'utente. Qualsiasi lavoro di riparazione, messa a punto, manutenzione o assistenza va effettuato esclusivamente da personale specializzato.

Questo apparato non possiede un commutatore principale; si mette scotto tensione all'inserirsi il cavo d'alimentazione.

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Consideraciones sobre seguridad

Símbolos de seguridad

	Símbolo de referencia a la documentación. Si el producto va marcado con este símbolo, consultar la documentación del producto a fin de obtener mayor información sobre el producto.
WARNING	Una WARNING en la documentación señala un riesgo que podría resultar en lesiones o la muerte.
CAUTION	Una CAUTION en la documentación señala un riesgo que podría resultar en averías al equipo. No proseguir después de un símbolo de WARNING o CAUTION hasta no haber entendido las condiciones peligrosas y haber tomado las medidas apropiadas.

Este aparato se enmarca dentro de la clase I de seguridad y se encuentra protegido por una borna de puesta a tierra. Es preciso que exista una puesta a tierra continua desde la toma de alimentación eléctrica hasta las bornas de los cables de entrada del aparato, el cable de alimentación o el juego de cable de alimentación suministrado. Si existe la probabilidad de que la protección a tierra haya sufrido desperfectos, desenchufar el cable de alimentación hasta haberse subsanado el problema.

Puesta a tierra del cable de la red local (LAN):

- Si la LAN abarca un área cuyo suministro eléctrico proviene de más de una red de distribución de electricidad, cerciorarse de que las puestas a tierra estén conectadas entre sí de modo seguro.
- Es posible que los cables de la LAN se vean sometidos de vez en cuando a voltajes momentáneos que entrañen peligro (rayos o alteraciones en la red de energía eléctrica). Manejar con precaución los componentes de metal de la LAN que estén al descubierto.

Este aparato no contiene pieza alguna susceptible de reparación por parte del usuario. Todas las reparaciones, ajustes o servicio de mantenimiento debe realizarlos solamente el técnico.

Este producto no tiene interruptor de potencia; se activa cuando se enchufa el cable de alimentación.

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Safety Information

安全性の考慮

安全記号



マニュアル参照記号。製品にこの記号がついている場合はマニュアルを参照し、注意事項等をご確認ください。

警告　　マニュアル中の「警告」は人身事故の原因となる危険を示します。

注意　　マニュアル中の「注意」は装置破損の原因となる危険を示します。

「警告」や「注意」の項は飛ばさないで必ずお読みください。危険性に関する記載事項をよく読み、正しい手順に従った上で次の事項に進んでください。

これは安全性クラスIの製品で保護用接地端子を備えています。主電源から製品の入力配線端子、電源コード、または添付の電源コード・セットまでの間、切れ目のない安全接地が存在することが必要です。もしこの保護回路が損なわれたことが推測されるときは、接地が修復されるまで電源コードを外しておいてください。

LANケーブルの接地に関して:

- もし貴社のLANが複数の配電システムにより電力を受けている領域をカバーしている場合には、それらのシステムの安全接地が確実に相互に結合されていることを確認してください。
- LANケーブルは時として危険な過度電圧(例えば雷や、配電設備の電力網での障害)にさらされることがあります。露出した金属部分の取扱には十分な注意をはらってください。

本製品の内部にはユーザーが修理できる部品はありません。サービス、調整、保守および修理はサービス訓練を受けた専門家におまかせください。

本製品には電源スイッチがありません。電源コードを接続したとき電源入となります。

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Regulatory Statements

FCC Statement (For U.S.A. Only)
Federal Communications Commission Radio Frequency Interference Statement

Warning: 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 interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

If this equipment causes interference to radio reception (which can be determined by unplugging the power cord from the equipment) try these measures: Re-orient the receiving antenna. Relocate the equipment with respect to the receiver. Plug the equipment and receiver into different branch circuits. Consult your dealer or an experienced technician for additional suggestions.

VCCI Class 1 (For Japan Only)

この装置は，第一種情報装置（商工業地域において使用されるべき情報装置）で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）基準に適合しております。

従って，住宅地域またはその隣接した地域で使用すると，ラジオ，テレビジョン受信機等に受信障害を与えることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

Note

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 adequate measures.

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Declaration of Conformity

The following Declaration of Conformity for the HP AdvanceStack 10Base-T Hubs complies with ISO/IEC Guide 22 and EN 45014. The declaration identifies the product, the manufacturer's name and address, and the applicable specifications that are recognized in the European community.

DECLARATION OF CONFORMITY
according to ISO/IEC Guide 22 and EN45014

Manufacturer's Name: Hewlett-Packard Company

Manufacturer's Address: 8000 Foothills Blvd.
Roseville, CA 95747
U.S.A.

declares that the product:

Product Name: HP AdvanceStack Network Hubs

Model Number: HP J2600A, HP J2601B, HP J2602B

Accessories covered:
HP J2603B, HP J2606A, HP J2607A,
HP J2608A, HP J2609A

conforms to the following Product Specifications:

Safety: IEC 950:1991+A1,A2/EN60950 (1992)+A1,A2

EMC: EN 55022 (1992) / CISPR-22 (1985) class A
EN50082-1 (1992)
prEN 55024-2 (1990) / IEC 801-2 (1991) 4 kV CD, 8 kV AD
prEN 55024-3 (1991) / IEC 801-3 (1984), 3 V/m
prEN 55024-4 (1992) / IEC 801-4 (1988): 1 kV-(power line)
0.5 kV-(signal line)

Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC and carries the CE marking accordingly.

Tested with Hewlett-Packard Co. products only.

Roseville, May 30, 1995

Sandra L. Sheehan

Sandra L. Sheehan, Quality Manager

European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department TRE, Herrenberger Strasse 130, D-71034 Böblingen (FAX:+49-7031-14-3143)

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Hewlett-Packard Company
Printed in Singapore 10/95

Manual Part Number
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