HP 10/100VG Selectable PC LAN Adapters

Installation Guide

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October 1997

Applicable Product

HP J2573A
HP J2577A
HP J2585A

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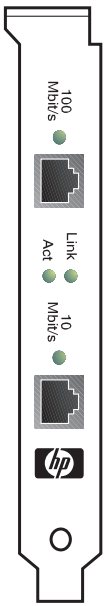
HP 10/100VG Selectable PC LAN Adapters

At A Glance

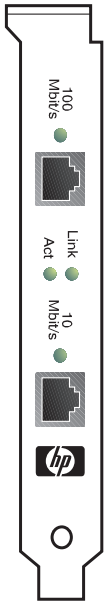
This manual covers the following adapters:

- HP J2573A 10/100VG ISA LAN Adapter
- HP J2577A 10/100VG EISA LAN Adapter
- HP J2585A 10/100VG PCI LAN Adapter

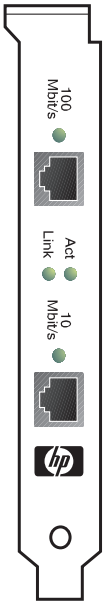
These adapter cards are used in ISA, EISA, and PCI personal computers to connect the computer to a local area network (LAN). The adapters support both the 100-Mbit/s mode, for attachment to a IEEE 802.12/100VG-AnyLAN network, and the 10-Mbit/s mode, for attachment to an IEEE 802.3/Ethernet network. These adapters are referred to throughout this manual as the ISA LAN Adapter, EISA LAN Adapter, and the PCI LAN Adapter respectively.



HP J2573A ISA LAN Adapter



HP J2577A EISA LAN Adapter



HP J2585A PCI LAN Adapter

Features

All LAN Adapters:

- have a highly integrated design for fewer components and lower failure rates
- are fully software configurable; no switches or jumpers
- are compatible with both the IEEE 802.12 100-Mbit/s proposed standard and the IEEE 802.3 and Ethernet standards
- provide two RJ-45 connectors (one for 10-Mbit/s operation, one for 100-Mbit/s operation)
- can automatically detect which LAN port (10-Mbit/s or 100-Mbit/s) is being used when the LAN cable is attached
- come with an easy-to-use configuration and diagnostic program (HPVGSet)
- support multiple data transfer modes to ensure high performance and broad compatibility:
  - the ISA LAN Adapter supports two I/O modes: I/O Mapped and Memory-Mapped;
  - the EISA LAN Adapter supports three I/O modes: I/O Mapped, Memory-Mapped I/O, and BusMaster;
  - the PCI LAN Adapter supports two I/O modes: I/O Mapped and Memory-Mapped I/O.
- ISA and EISA LAN Adapters provide a large number of selectable interrupts: IRQs 3, 4, 5, 6, 7, 9, 10, 11, 12, and 15
- PCI LAN Adapters support PCI interrupt INTA.
- contain large packet buffer memory: 64 KB on the ISA adapter; 128 KB on the EISA and PCI adapter
- driver support for all major network operating systems
- manageable in an HP Net Server running Novell (use HP D2333C Net Server Assistant software)
- contain four LEDs for easy monitoring of adapter status
- ISA and EISA LAN Adapters provide boot ROM support

Support is as close as the World Wide Web!

Come see us at this URL: http://www.hp.com/go/network_city

...and follow the links that lead you to Support, Drivers, and Technology. Our Web site has everything you need in one place, around the clock, seven days a week:

- Software, agent firmware, and drivers (see "When Downloading Files", below)
- Troubleshooting information
- Product information
- Support contacts

Your HP Reseller can help, too!

Be sure to talk to your reseller about the support services they offer for your HP networking products.

Other HP Electronic Support Services

If you don't have World Wide Web access, these sources provide firmware, drivers, and technical information.

`ftp ftp.hp.com`	Use your FTP software to ftp to HP's site.
Name: `anonymous`	Log in as "anonymous"
Password: *`john@mycompany.com`*	Enter your email address as your password.
ftp> `bin`	Enter `bin` as the file transfer type
ftp> `cd /pub/networking/software`	Go to the directory that has the files
ftp> `get filename`	Transfer the file you want to your computer
ftp> `quit`	Quit the connection.

HP Bulletin Board Service (BBS)

With your communication/terminal emulation software:

- In the U.S., dial 208-344-1691
- In other countries, contact your reseller or local HP Customer Support Center (see chart on other side) for the BBS telephone number for your country.

Follow the menu system to find and download the latest software, agent firmware, or drivers for your HP networking product.

When Downloading Files

Files are typically named to correspond to the HP product number of the product their intended for. If the file you download has a file extension of ".exe", it is a compressed file. For example, the product HP J3200A may have a file **j3200a.exe** that is extracted by typing **j3200a** Enter.

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 a variety of product and technical information.

To access HP FIRST, dial one of the following telephone numbers:

- In the U.S. and Canada, dial 800-333-1917 from your fax machine or touch-tone phone.
- In other countries, contact your reseller or local HP Customer Support Center (see chart below) for the HP FIRST telephone number for your country.
- To access the U.S./Canada HP FIRST system from another country, dial +1 208 344 4809 from your fax machine.

Enter the number of the document you want to receive. If you're not sure what the number is, you can request an index by following the prompts. The information will be sent to you by return fax.

Additional HP Support Services

Limited free telephone support is offered through the HP Customer Support Center (CSC) in your country:

North America		Portugal	01 441 7199
United States	970-635-1000	Russia	7095 923 50 01
Canada (English)	970-635-1000	Spain	902 321 123
Canada (French)	800-387-3867	Sweden	08 619 2170
Europe, Middle East, and Africa		Switzerland	0848 80 11 11
Africa	+41 22/780 71 11	Turkey	90 1 224 59 25
Austria	0660 6386	United Kingdom	0171 512 52 02
Belgium (Dutch)	02 626 8806	**Asia Pacific**	
Belgium (French)	02 626 8807	Australia	61 3 9272 8000
Czech Republic	42 (2) 471 7321	China	8610 6505 3888
Denmark	3929 4099	Hong Kong	800 96 7729
English (non-UK)	+44 171 512 52 02	India	91 11 682 6035
Finland	0203 47 288	Indonesia	6221 350 3408
France	01 43 62 34 34	Japan	81 3 3335 8333
Germany	0180 52 58 143	Korea	82 2 3270 0700
Hungary	36 (1) 252 4505	Malaysia	03 295 2566
Ireland	01 662 5525	New Zealand	09 356 6640
Italy	02 26410350	Philippines	63 2 867 3551
Middle East	+41 22/780 71 11	Singapore	65 272 5300
Netherlands	020 606 8751	Taiwan	886 2 717 0055
Norway	22 11 6299	Thailand	661 4011
Poland	48 22 37 50 65		

Each CSC takes calls during the normal HP business hours for its location. This service is for basic questions only, relating to installation, general configuration, troubleshooting, and usage. Advanced topics including network design, consultation, performance tuning, and configuration recommendations are not available through this service.

HP has other telephone and onsite services available that provide you with expert HP technical assistance. HP SupportPacks, purchased from your local reseller, provide a variety of services, including advanced technical support and around-the-clock availability. Other services offer network design, consulting, or remote telephone support. Contact your reseller or local HP Sales and Support Office for more information.

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  4. Attach the Network Cable
  5. Install the Network Drivers

Setting Up Your Card and LAN Connection

HP 100VG Network Installation Checklist

Use the following checklist to install, or upgrade to an HP 100VG network:

☐ Verify that the cabling infrastructure meets HP 100VG network specifications.

- If the existing cabling infrastructure meets the IEEE 802.3 Type 10Base-T (twisted-pair) cable specifications, then it will work for your HP 100VG network.
- Be sure that all four pairs of your twisted-pair LAN port cables are available for use by the HP 100VG network. (For example, two pair cannot be used for an integrated phone connection.) For more information on cables, refer to appendix A, “Cables and Connectors”.

☐ Obtain the required HP 100VG network hardware components:

- HP 100VG LAN Adapter card (the product you are now reading about). A LAN adapter is needed for each end node in the 100VG network.
- HP AdvanceStack 100VG hub(s). The number of hubs needed depends on the number of HP 100VG end nodes to be networked and the number of ports per hub. (For example, the HP AdvanceStack 100VG Hub-15 provides 15 end-node ports.)

☐ Install your HP 100VG network hardware using the installation instructions supplied with the hardware. (To install the HP 10/100VG Selectable PC LAN Adapter, continue with this chapter.)

☐ Install the hub.

☐ Connect all network cabling.

☐ Verify that the network operates properly using any available network test or application that allows you to test the communications between end nodes or devices.

Upgrading to 100-Mbit/s Mode

Moving from 10-Mbit/s mode to 100-Mbit/s mode, or vice versa, is simple: just move the network cable from one of the LAN adapter's RJ-45 connectors to the other, ensure the cable is connected to a compatible hub, and reboot the PC or otherwise reload the network driver for the LAN adapter. *Note that neither the network cabling nor the network driver have to be changed.*

Included Parts

These items are included with the LAN product:

- Either:
  - the HP 10/100VG Selectable ISA LAN Adapter (HP J2573A),
  - the HP 10/100VG Selectable EISA LAN Adapter (HP J2577A), or
  - the HP 10/100VG Selectable PCI LAN Adapter (HP J2585A)
- 3.5-inch HP Support Disk

  The disk includes:
  - HPVGSet, the DOS-based configuration and diagnostic utility for the LAN adapters
  - driver files for the major network operating systems (the drivers are listed in the file DRIVERS.TXT in the root directory on the disk)
  - README files that describe how to install the drivers and how to get your LAN adapter operating with your network operating system software
  - Setup, the utility that allows you easy access to the driver setup instructions, and access to HPVGSet
  - a description of what drivers can be used with memory-mapped mode in the file MEMMAP.TXT
- The *HP 10/100VG Selectable PC LAN Adapter Installation Guide* (this manual) - part number 5967-0893
- Warranty and Customer Reply Card

Computer Requirements

Hardware

- an IBM AT-compatible computer (286, 386, 486, or later)
- a 16-bit ISA, 32-bit EISA, or a 32-bit PCI bus expansion slot

Software

DOS 3.1 or later (to run HPVGSet)

Setup Summary

1. **Prepare the computer.**
2. **Install the LAN Adapter.**
3. **Configure the LAN Adapter**.
4. **Install the network cable.**
5. **Install the network drivers.**

The details for these steps are provided in the rest of this chapter.

Note

Your LAN Adapter comes with a set of configuration values already stored in its non-volatile memory. The values are listed under "3. Configure the LAN Adapter" on page 1-11. These values will work on most computer systems.

1. Prepare the Computer

ISA Computers

No special steps are required to prepare ISA computers for installing the LAN Adapters. Proceed to "2. Install the LAN Adapter".

EISA Computers

Proceed to "2. Install the LAN Adapter". Then run the EISA configuration utility supplied with the computer to select values for the LAN Adapter resources. The configuration utility selects the following resources for either an EISA LAN Adapter or an ISA LAN Adapter installed in an EISA computer:

EISA Configuration Utility Parameters

EISA LAN Adapter	ISA LAN Adapter
Interrupt channel (IRQ)	Interrupt channel (IRQ)
Slot number	I/O address range
Boot ROM support	Boot ROM support
I/O mode (I/O-mapped or memory-mapped)	I/O mode (I/O-mapped or memory-mapped)

The EISA utility will guarantee that the above resources allocated to the LAN Adapter will not be given to other adapters.

The EISA configuration files for the LAN Adapter reside in the root directory on the HP Support Disk. Depending on the EISA configuration utility supplied with the computer, there may be a prompt to insert a vendor diskette (the HP Support Disk), or the configuration files may have to be copied to the directory or floppy where the EISA configuration utility expects to find them.

To use the EISA utility to select resources for the LAN Adapter, follow these steps:

1. Run the EISA configuration utility supplied with the computer.

   Follow the steps on the screen to add LAN Adapters to the computer (note that the utility might refer to LAN Adapters as "accessory boards").

2. Insert the Support Disk when the EISA utility asks for the vendor diskette. Select the proper configuration from the selections displayed:

   !HWP1950.CFG — HP 100VG ISA LAN Adapter (HP J2573A)
   !HWP1940.CFG — HP 100VG EISA LAN Adapter (HP J2577A)

Note

If the HP LAN Adapter selections are not displayed and the EISA configuration utility did not prompt for the vendor diskette (the HP Support Disk), exit the EISA configuration utility. Copy the HP EISA configuration files to the directory or diskette containing the EISA configuration utility. For example, if the HP Support Disk is in drive A, with the EISA configuration directory as the working directory, execute the command COPY A:*.CFG

Then restart the EISA configuration from step 1 above.

3. Use the EISA utility to view the adapter configuration details.

   For the ISA LAN Adapter (HP J2573A), if the "I/O Address Range" is not "300 - 31FH (Factory Default)", see the item "Resolving Base I/O Address Conflicts" on page 1-10.

4. Configure the Memory-Mapped Address, if needed.

   If "Memory-Mapped Mode" is desired, select an address range from the choices presented under the "Memory-Mapped I/O" parameter. Refer to the file MEMMAP.TXT on the HP Support Disk for a discussion of memory-mapped mode and the steps necessary to configure the network operating system startup files for memory-mapped mode.

5. Configure Boot ROM address range, if needed.

   If a Boot ROM is to be installed on the LAN Adapter, select an address range from the choices presented under the "Boot ROM" parameter. For more information about vendor-specific boot ROMs, see page 2-7.

6. Save the configuration.

   Follow the instructions given by the EISA utility to save the configuration. When instructed, turn off power to the computer.

PCI Computers

Most PCI computers require no preparation because they automatically configure the PCI LAN Adapter when you turn on your computer.

Proceed to installing the LAN Adapter.

2. Install the LAN Adapter

Warning

To prevent the risk of electrical shock, disconnect the power cord from the computer before installing the LAN Adapter.

Caution

When installing the LAN Adapter in your computer, use antistatic handling procedures:

- Handle the LAN Adapter by the edges and avoid touching the edge connector and the components.
- Equalize any static charge on your body and your computer by using a grounded wrist strap or by touching the chassis of the computer frequently while you are installing the LAN Adapter.

Note

The ISA LAN Adapter can be installed in an ISA or EISA computer.
The EISA LAN Adapter can be installed in an EISA computer only.
The PCI LAN Adapter can be installed in a PCI computer only.

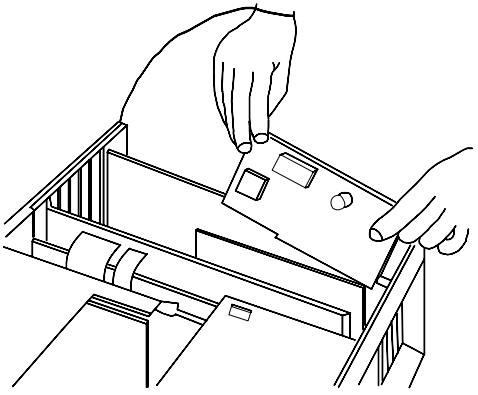


Figure 1-1: Installing a LAN Adapter

The procedures to install the LAN Adapter differs slightly depending on the LAN Adapter. For your LAN Adapter, follow the steps in the table below:

Step Number	PCI	ISA	EISA
1.	If you have not already done so, turn off the computer's power and disconnect the power cord from the computer.		
2.	Remove the computer's cover to access the expansion slots by following your computer documentation for instructions.		
3.	Select a PCI slot. A PCI slot is usually white and shorter than an ISA or EISA slot. On some motherboards, an ISA or EISA slot opening is shared with a PCI slot so that only one card can be installed at a time. If another card is using the slot opening, move that card to another slot. For more information about your motherboard, see your computer manual.	Select a 16-bit ISA slot.	Select a 32-bit EISA slot.
4.	Remove the slot cover. Save the cover's retaining screw.		
5.	Insert the LAN Adapter as shown in Figure 1-1. (PCI cards have their components on the opposite side of the card versus the ISA and EISA cards.) The PCI slot must be configured for PCI interrupt INTA (default).	Insert the LAN Adapter as shown in Figure 1-1.	
6.	Push the LAN Adapter straight into the connector until it is fully seated.		
7.	Reinstall the retaining screw.		
8.	Reassemble the computer if there are no other LAN Adapters to install, plug in the computer's power cord, and restart the computer.		

3. Configure and Verify the LAN Adapter

Use the utility supplied on your LAN Adapter's Support Disk, HPVGSet, to configure and verify the LAN Adapter.

Before Running HPVGSet:

Observe the following conditions before you run HPVGSet to configure the LAN Adapter:

- **Run HPVGSet under DOS.** HPVGSet is designed to run in a native DOS environment, not under Windows or OS/2 or other operating environment.
- **Unload Network Software and Drivers.** Make sure your network software and drivers are not running when you start HPVGSet. For information about removing network software and drivers from your AUTOEXEC.BAT and CONFIG.SYS files, see chapter 3, "Overview of HPVGSet".
- **Resolving Base I/O Address Conflicts for the ISA LAN Adapter.** If any of your computer's peripherals, including any other LAN Adapters already installed, are using I/O addresses in the 300-31Fh range, HPVGSet will not be able to find your ISA LAN Adapter. You must first change the I/O address used by the conflicting peripheral, or configure the ISA LAN Adapter in another system that has no conflict, so that HPVGSet can find it, then transfer the ISA LAN Adapter to your computer.

The procedures differ slightly depending on whether your PC is an ISA, EISA, or PCI system:

- **For an ISA PC:** You can simply use the factory default configuration parameters shown in the table below. Or you can use HPVGSet to modify any of these parameters, as described on the next page under "Configuring the Adapter with HPVGSet".
- **For an EISA PC:** As described earlier, you have already reserved the system resources for the LAN Adapter by adding the adapter to the system configuration with the EISA Configuration Utility. Now you must run HPVGSet to save the selected configuration values to the card's memory. HPVGSet automatically detects the configuration values selected in the EISA Configuration Utility.

Configuration Parameter	Factory Default Setting	
	ISA	EISA
Interrupt channel	IRQ 3	IRQ 3
I/O address range	300 – 31Fh	N/A
Boot ROM	disabled	disabled
Bus-master mode	N/A	disabled
I/O mode	I/O-mapped	I/O-mapped
LAN connector	auto select	auto select

- **For a PCI PC:** The PCI LAN Adapter is automatically configured by the PCI BIOS. Run HPVGSet and verify that the program finds and lists the LAN Adapter. HPVGSet automatically detects the configuration values selected by the PCI BIOS. If HPVGSet does not find the LAN Adapter, follow the steps on the screen or see chapter 4, "Troubleshooting" to see why the LAN Adapter is not recognized.

(Optional) For all LAN Adapter cards, run the Card Test option in HPVGSet to test the configuration.

The above configuration parameters are described in more detail in chapter 3, "Overview of HPVGSet".

Configuring the Adapter in HPVGSet

The two optional procedures for configuring the LAN Adapter are:

- **Run the "Auto configuration" option from HPVGSet (ISA and EISA only)** — The instructions for this option are on page 1-13.
- **Run the "Manual configuration" option from HPVGSet** — The instructions for this option are under "Using Manual Configuration" on page 1-14.

  When you should use manual configuration: Most of the time the auto configuration process should work. There are some specific conditions that require you to use manual configuration. These conditions are listed later in this chapter under "Using Manual Configuration" and described in detail in chapter 2, "Special Setup Tasks".

Using Auto Configuration

Note

Auto configuration is available in the HPVGSet Main Menu only when there is just one ISA or EISA LAN Adapter installed in the computer. When multiple ISA and EISA LAN Adapters are installed or a single PCI LAN Adapter is installed, Auto Configuration is not an available option. Auto configuration is not available for the PCI LAN Adapter because the PCI LAN Adapter is automatically configured by the PCI BIOS.

To automatically configure an ISA or EISA LAN Adapter, follow these steps:

1. Insert the LAN Adapter's Support Disk in the floppy disk drive.
2. Change to the floppy disk drive and, at the prompt, enter `HPVGSET`
3. From HPVGSet's Main Menu, select "Auto configuration".

   An available IRQ is selected and configured on the LAN Adapter, and some basic tests are automatically performed on the LAN Adapter.

   Auto configuration also detects the presence and size of a boot ROM on the LAN Adapter and automatically assigns it a memory address. More information on using a boot ROM is included in chapter 2, "Special Setup Tasks".
4. Auto configuration informs you of its actions:

   If Auto configuration does not have to change the existing configuration, a message is displayed indicating that the LAN Adapter is ready to be used.

   If Auto configuration had to make any changes to the configuration, you will first see a message indicating that changes were made and that those changes were saved to the LAN Adapter.
5. Select "Card test".

   Before exiting the program, it is recommended that you select the "Card test" option for the most complete verification that the LAN Adapter's hardware and configuration are OK. For more information, see "Running the Diagnostics" in chapter 4, "Troubleshooting".

Continued on the next page.

6. Select “Link test”.

   If the network cable is connected at this point, you can test the link by selecting “Link Test”. For more information, see “Running the Diagnostics” in chapter 4, “Troubleshooting”.

7. Select “Exit program”..

   The configuration is complete, so you can exit HPVGSet.

Now you can proceed to “Attach the Network Cable” on page 1-16.

Using Manual Configuration

When you should use manual configuration:

- **For ISA LAN Adapters.** To get maximum performance from your LAN Adapter, use memory-mapped mode;
- **For an EISA LAN Adapter.** To get maximum performance, select bus-master mode;
- **For a PCI LAN Adapter.** For servers, specify Full Duplex to process and serve requests simultaneously.
- You are setting up several LAN Adapters with the identical configuration for use in other computers.
- You are installing more than one LAN Adapter in your computer.

1. Insert the LAN Adapter’s Support Disk in the floppy disk drive.
2. Change to the floppy disk drive and, at the prompt, enter `HPVGSET`.
3. From HPVGSet’s Main Menu, select “Manual configuration”.
4. Select any item on the menu and either a list of options is presented or a prompt for input is presented.
5. When you have completed the configuration changes, exit from the Manual Configuration menu.

Continued on the next page.

6. Select “Card test”.

   It is recommended that at this point you run “Card test” from the Main Menu. This test will provide a complete verification that your configuration changes are OK. For more information, see “Running the Diagnostics” in chapter 4, “Troubleshooting”.

7. If the network cable is connected at this point, you can test the link by selecting “Link Test”.

8. Save the configuration to the LAN Adapter.

   When the card test completes successfully, select “Save configuration to card”.

9. Exit from HPVGSet.

Manual Configuration Options

The manual configuration options are listed and briefly described in chapter 3, “Overview of HPVGSet”, under “Manual Configuration Options”.

Note

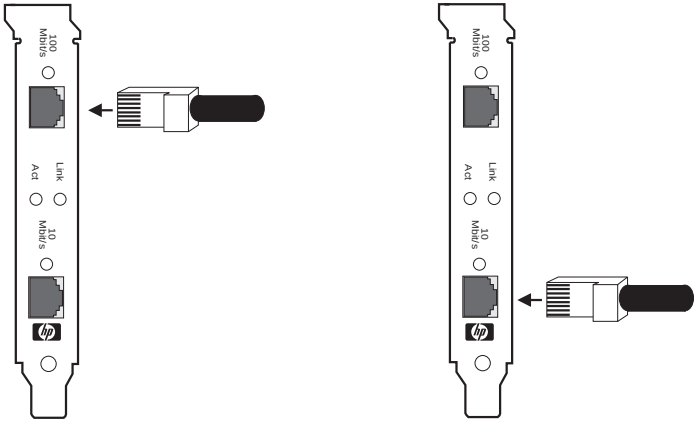
You can get more detailed information on each option from within HPVGSet. While running HPVGSet, use the cursor control keys to highlight the option and press F1. A window pops up with the information you need. F1 help is available throughout the HPVGSet program.

4. Attach the Network Cable

The default configuration allows the LAN Adapter to automatically detect which connector (10-Mbit/s or 100-Mbit/s) is being used. You just have to connect a viable network to the LAN Adapter.

To upgrade from a 10-Mbit/s network to a 100-Mbit/s network, or vice versa, move the cable from one RJ-45 connector to the other, ensure the cable is connected to a compatible hub, and reload the network drivers. See your network operating system manual for details on reloading drivers. Follow the steps below to attach the network cable:

1. Attach the 8-pin (RJ-45) plug on your twisted-pair LAN cable into the 10-Mbit/s or 100-Mbit/s connector on the LAN Adapter as appropriate for your network type. Push the plug into the connector until the plug clicks into place (see below).



2. Attach the other end of the LAN cable to a hub (or into a wall jack that is connected to a hub).

Note

Testing the network connection:
Once the network cable is attached to the LAN Adapter (and before you load your network operating system), you can verify that the LAN Adapter can communicate with another device on the network by running "Link test" from the HPVGSet Main Menu. Link test is described in detail in chapter 4, "Troubleshooting" under "Running the Diagnostics".

5. Install the Network Drivers

The Support Disk that came with your LAN Adapter contains the driver files that allow the LAN Adapter to be used with your network operating system. (To obtain most recent driver files, see page 4-13.)

The Support Disk contains a utility, SETUP.EXE, that allows you to easily view or print out the driver installation instructions. The networking software products currently supported by the LAN Adapters can be viewed by using the SETUP.EXE, utility.

Note

You should not move the network cable from one of the RJ-45 connectors to the other while the network driver is loaded. When the driver is loaded, it senses which connector is being used. See your network operating system manual for details on unloading drivers.

To browse the files on the Support Disk, follow these steps:

1. Insert the HP Support Disk in the floppy disk drive.
2. Change to the floppy disk drive and, at the prompt, enter the command:

   SETUP

3. Follow the directions on the screen. Press F1 to get help information. Press F2 to print any of the readme files that you are viewing.

100VG High-Priority Communications

The IEEE 802.12 100VG-AnyLAN proposed standard provides for normal and high priority traffic. For certain applications running on application servers that require real-time access, or consistent continuous access to the network, for example full-motion video or video conferencing, the network driver can be loaded so that the server operates in high-priority mode.

There are limited conditions under which this option should be used. For more information, refer to appendix C, “Using Priority on HP 100VG Networks”.

2

- Using Bus-Master Mode (EISA LAN Adapter only)
- Using Memory-Mapped Mode
- Setting up a Remote-Boot Client Mode
- Configuring Multiple Cards with the Same Configuration
- Configuring Multiple Cards in the Same Computer

Special Setup Tasks

This chapter contains information on how to configure your LAN Adapter for use in the following situations:

- **Using Bus-Master Mode (EISA only) -** bus mastering allows direct memory access between the LAN controller and system memory.
- **Using Memory-Mapped Mode** – you want to dedicate a block of your computer's memory address space for communication with the LAN Adapter (memory-mapped mode).
- **Setting Up a Remote-boot Client Node (ISA and EISA only)** – you have installed a boot ROM on your LAN Adapter and want to set up your computer to boot from a remote server.
- **Configuring Multiple Cards With the Same Configuration (ISA and EISA only)** – you want to configure several LAN Adapters with the same configuration (a task frequently performed by a network administrator when setting up the network connection for multiple computers) and you are looking for an efficient way to do it.
- **Using Multiple LAN Adapters in the Same Computer** – you want to configure more than one network LAN Adapter to be used in the same computer (usually a server connected to more than one network).

The rest of this chapter provides the details for these setup tasks.

Using Bus-Master Mode (EISA Card Only)

Bus-Master Mode is not available for ISA and PCI LAN Adapters.

Bus mastering allows direct memory access between the LAN controller and system memory. When Bus-Master Mode is used, the LAN Adapter has complete control of the system's address and data control lines. This yields higher performance and lower CPU utilization in EISA computers, compared to I/O-Mapped or Memory-Mapped Modes.

Note

Bus-Master Mode is only available for EISA LAN Adapters, and only certain drivers support Bus-Master Mode. Consult the readme files on the HP Support Disk to determine whether your driver supports Bus-Master Mode.

Configuring Bus-Master Mode

1. Run HPVGSet and select "Manual Configuration".
2. From HPVGSet's Manual Configuration Menu, select "Bus Master".
3. Exit from the Manual Configuration, then run "Card Test" to verify the configuration.
4. When Card Test passes, save the configuration to the LAN Adapter.
5. Exit from the HPVGSet program.

Using Memory-Mapped Mode

The ISA and EISA LAN Adapters are designed to provide outstanding performance using I/O-mapped mode, the default mode of data transfer between the LAN Adapter and the CPU. I/O-mapped mode uses the computer's standard I/O channels for communication.

The PCI LAN Adapter supports both memory-mapped mode and I/O mapped mode. The driver selects the fastest mode for your PCI computer.

For even better performance, you can configure the LAN Adapter to run in memory-mapped mode. In this mode a specific block of the computer's memory address space is dedicated for communicating with the LAN Adapter. *The LAN Adapters use only 8 Kbytes of the computer's memory address space.*

Note

Driver support for memory-mapped mode:
Not all the drivers supplied on the Support Disk with your LAN Adapter support memory-mapped mode. The file MEMMAP.TXT on the HP Support Disk, contains the latest information on driver support for memory-mapped mode.

Configuring Memory-Mapped Mode

The driver selects the fastest mode for your PCI LAN Adapter. To change your ISA or EISA LAN Adapter to memory-mapped mode, follow these steps:

1. From HPVGSet's Manual Configuration Menu, select "I/O or Memory mapped".

2. If you have selected Memory-Mapped, use the up and down cursor controls to highlight the address you want to use, and press Enter. HPVGSet warns you if the address you have selected conflicts with other memory assignments in the computer. Select another address if you get such a warning. If you consistently get a conflict, see the precautions on the next page.

3. Exit from the Manual Configuration Menu, then run "Card test" to verify the configuration.

4. When Card Test passes, save the configuration to the LAN Adapter.

5. Exit from the HPVGSet program.

Precautions

Make sure that the address range you select does not conflict with other memory assignments in your computer. Conflicts can arise, for example, if a memory manager is running, or if memory caching is enabled. You should also know if memory is dedicated for use by other devices in your computer, for example video cards.

Note

For systems with Microsoft Windows 3.x and MS DOS 6.x, use the Microsoft diagnostic utility "MSD", located in the Windows directory or in the MS-DOS 6.x directory, to display the computer's memory map.

If you are using a memory manager:
The block of memory address space that you select for use by the LAN Adapter must be excluded from the memory manager's control. This is usually accomplished in your computer's CONFIG.SYS file in the DEVICE statement for the memory manager. You must add an "exclusion" option that specifies the block of memory that you want to configure for the LAN Adapter. You need to exclude a 8 Kbyte block. *Note that if you modify the CONFIG.SYS file, you must then reboot your computer to activate the changes.*

Examples:
If, for example, you select the address D000 from the HPVGSet list of addresses, the following table shows how, for some commonly used memory managers, you would exclude the 8 Kbyte block starting at address D000:

Memory Manager	Exclusion Statement
EMM386 for DOS	in the CONFIG.SYS file, add the "X" option: DEVICE=EMM386.EXE **X=D000-D1FF**
EMM386 for Microsoft Windows 3.0	in the Windows SYSTEM.INI file, add the statement: **EMMExclude=D000-D1FF**
QEMM386 from Quarterdeck	in the CONFIG.SYS file, add the "EXCLUDE" option: DEVICE=QEMM386.SYS **EXCLUDE=D000-D1FF**

If you are using memory caching:
In a 386, 486, or later computer, blocks of your computer's memory may be allocated to be used for memory caching. You may have to disable caching for a memory block that you want to use for your LAN Adapter in memory-mapped mode. You do not need to turn off all caching, only for the address block used by the LAN Adapter. See your computer's documentation for information on how to disable memory caching.

Note that HPVGSet will automatically detect when the block you attempt to select is cached, and will give you a message indicating that the block you selected is not available.

Setting Up a Remote-Boot Client Node

The PCI LAN Adapter does not support boot ROM capability.

You can configure your computer to boot as a client node from code stored on a network server rather than from code on a floppy disk or hard disk in the computer itself.

Note

About Boot ROMs:
To use the remote boot option, you must first purchase a boot ROM and install it on your LAN Adapter. Boot ROMs are not generic; they are specific to the vendor and model of the LAN Adapter. Contact your HP-authorized LAN dealer for information about boot ROMs for your LAN Adapter.

What to do on the server

To support the clients that will be booting remotely, a boot image file must be created on the server. The boot image file contains information that will be accessed by the remote-boot client (including information usually contained in AUTOEXEC.BAT and CONFIG.SYS files on the client computer). The name of the boot image file and the process for creating it vary between network operating systems. See your network operating system documentation for information on how to create the boot image file.

What to do on the client

The procedures for setting up your client computer for remote boot differ slightly depending on whether or not your computer has a floppy disk drive from which you can run HPVGSet.

If Your Computer Has a Floppy Disk Drive:

1. Install the boot ROM on your LAN Adapter. For details, see the document that comes with the boot ROM.

2. Install the LAN Adapter in your computer. See chapter 1.

3. Run HPVGSet from the LAN Adapter's Support Disk.

4. From the Main Menu, select "Auto configuration".

   HPVGSet automatically detects the presence and size of the boot ROM, and automatically selects a memory address space that will be used by the boot ROM.

5. Optionally, select "Card test" to verify that the hardware (LAN Adapter and boot ROM), and configuration are OK.

6. Exit from the HPVGSet program.

If Your Computer Has No Floppy Disk Drives:

1. Install the boot ROM on the LAN Adapter.

2. Install the LAN Adapter in a substitute computer that has a floppy disk drive.

3. Insert the HP Support Disk in the substitute computer's floppy disk drive, change to that drive, and run HPVGSet.

4. From the Main Menu, select "Manual configuration".

5. Select "Boot ROM" then enable the boot ROM and select an I/O address range and IRQ that you know will not conflict with addresses used by other devices in the computer into which the LAN Adapter will be installed. (HPVGSet warns you if the address you select conflicts with resources in the substitute computer, but allows you to select the address anyway since you are moving the LAN Adapter to another computer.)

6. Optionally, return to the Main Menu and select "Card Test" to verify that the hardware (LAN Adapter and boot ROM), and configuration are OK.

7. When Card Test passes, save the configuration to the LAN Adapter.

8. Exit from the HPVGSet program.

9. Remove the LAN Adapter from the substitute computer and install it in your diskless computer.

Configuring Multiple Cards With the Same Configuration (EISA and ISA only)

A common task for a network administrator is to configure the network ISA and EISA LAN Adapters to be installed in the various computers at the site. To simplify this task, an option in the HPVGSet Manual Configuration Menu allows you to save, to a file, the configuration you have just created. Then you can load that file to a LAN Adapter without having to go through the configuration process again.

Note

The PCI BIOS configures each PCI LAN Adapter installed in a computer. If you configure a PCI LAN Adapter in one computer and move it into another computer, the Plug-n-Play configuration is not guaranteed to be the same in the destination computer.

Creating a Configuration File

To configure an ISA or EISA LAN Adapter, follow these steps:

1. Configure the LAN Adapter that is in your computer by following the procedures on page 1- 10.

2. While still in the HPVGSet program, select “Manual configuration” from the Main Menu, then from the Manual Configuration Menu, select “Write configuration to disk file”.

   You can save the configuration to a floppy disk so that you can take the configuration between ISA and EISA computers. It may be most convenient to save it to the same floppy from which you are running HPVGSet. Note, though that the HP Support Disk is write protected. You will need to make a work copy of the HP Support Disk in order to save the configuration to a disk that also contains HPVGSet and the drivers.

3. You will be prompted for the name of the file. Enter the full path and name of the file. The extension .SET will automatically be added to the file name unless you specify a different extension.

Using a Saved File to Configure a Card

There are two ways you can load a configuration onto a LAN Adapter from a configuration file that you have saved:

- from the HPVGSet command line using the /C option
- from the HPVGSet Manual Configuration Menu

From the HPVGSet command line, using the /C option:

1. Insert the HP Support Disk that came with your LAN Adapter into the floppy disk drive and change to that drive.

2. From the DOS prompt, enter the command:

   ```
   hpvgset /c config_name [i/o_base_address]
   ```

where:

- *config_name* is the name of the file that you previously saved, and
- *i/o_base_address* is an optional parameter that you would use only if there are multiple LAN Adapters in your computer. Use this parameter to specify the I/O base address of the LAN Adapter you want to configure. (I/O base address is required for ISA LAN Adapters only.)

The configuration stored in the specified file is automatically loaded onto the LAN Adapter.

From the HPVGSet Manual Configuration Menu:

1. Run HPVGSet, and from the Main Menu, select “Manual configuration”.

2. From the Manual Configuration Menu, select the option “Read configuration from disk file”.

3. In the space provided, enter the name of the file you previously saved and press Enter. The configuration is read from the file and saved to the LAN Adapter.

4. Optionally, run “Card test” from the Main Menu. If all tests pass, the LAN Adapter is ready to use. If any test fails, follow the instructions on the error message to resolve the problem.

5. When Card Test passes, save the configuration to the LAN Adapter.

6. Exit from the HPVGSet program.

Configuring Multiple Cards in the Same Computer

Computers that are functioning as network servers often need to be connected to multiple networks. For each network, a separate LAN Adapter must be installed in the computer. The procedures differ between ISA, EISA, and PCI computers, as described below.

For ISA Computers

Unique Configuration Needed for Each Card

Because the LAN Adapters all come with the same factory default configuration, a conflict for computer resources will exist if two or more of these LAN Adapters are installed without configuration change. The following configuration items must be unique for each LAN Adapter:

- **The I/O address range.** If two or more ISA LAN Adapters have the same I/O address, or I/O addresses that conflict with any other card in the computer, HPVGSet cannot communicate with them.
- **The interrupt channel.** (IRQ) Each card in the system must have a unique IRQ.

The Procedure

In order for HPVGSet to communicate with the ISA LAN Adapters, you must install and configure one ISA LAN Adapter at a time.

1. Turn off the computer's power and install a ISA LAN Adapter. (See chapter 1 for the installation details).

2. Turn the computer's power back on and run HPVGSet from the HP Support Disk.

3. From the Main Menu, select “Manual configuration”. Then from the Manual Configuration Menu:
   - Select “I/O Address range” and choose a range that is different than 300-31Fh.
   - Select “Interrupt channel” and choose a unique IRQ.
   - Complete any other configuration changes that you wish to make from the Manual Configuration menu.
4. Exit from the Manual Configuration menu, and then select “Card test” from the Main menu to verify that the configuration causes no conflicts.
5. When Card Test passes, save the configuration to the ISA LAN Adapter.
6. If there are more ISA LAN Adapters to install, return to step 1. Otherwise, you can proceed to installing the network cables and network drivers for all the ISA LAN Adapters. See chapter 1 for details.

Note

If you are using memory-mapped mode for two or more LAN Adapters, one of the features of these LAN Adapters is that they can all share the same 8-Kbyte memory address space assignment.

For EISA Computers

1. Prepare the computer by running the EISA Configuration utility supplied with your computer as described on page 1-5.

   a. Repeat the procedures to add as many EISA LAN Adapters to the computer's configuration as you will be installing.

      The utility will select a value for the Interrupt Channel (IRQ), and an available slot for each adapter.

      Note: Some server drivers, for example for Novell NetWare, support sharing the same IRQ among multiple EISA LAN Adapters. See "Note on Sharing Interrupts" later in this chapter.

   b. Use the "View or edit details" selection to view which interrupt channel was chosen for each LAN Adapter you will install. In this screen you can modify the configuration values. For example, you can select values for the memory-mapped address and/or boot ROM address for each of the LAN Adapters, as needed.

      You need to remember the configuration values for each of the LAN Adapters, for use with HPVGSet in step 3 below. You can use the slot number to help you remember which interrupt channel is associated with each of the adapters.

2. Install the LAN Adapters into the computer.

   See chapter 1 for the installation procedures. Make sure that the power has been disconnected from the computer before opening the computer's case.

3. Configure and test the LAN Adapters by using HPVGSet.

   a. Reconnect power to the computer and boot DOS.

   b. Run the HPVGSet from the HP Support Disk. Make sure that your network drivers are not loaded when you run HPVGSet.

Continued on the next page.

c. Because multiple LAN Adapters have been installed in the computer, use the "Select Card" option to choose each LAN Adapter and then repeat steps d, e, and f below for each LAN Adapter.

d. From the Main Menu, select "Manual Configuration". Then from the Manual Configuration Menu:

   – Select "Interrupt channel", and then select the IRQ that was reserved for the LAN Adapter in step 1b above.

   – If desired, select the "Bus mastering" option, and then press Enter to enable bus mastering for the EISA LAN Adapter.

     Note: A bus master-capable driver must be loaded to use the bus master feature of the adapter.

   – Complete any other configuration changes that you wish to make from the Manual Configuration menu. These configuration values must match the values that were selected in the EISA Configuration utility. When the configuration changes are complete, select "Exit menu".

e. From the Main Menu, select "Card test" to verify the EISA LAN Adapter. After Card Test passes, select "Save configuration to card".

f. When you have configured and tested the last EISA LAN Adapter, select "Exit program" to leave HPVGSet.

4. Proceed to installing the network cables and network drivers for all the LAN Adapters as described on page 1-16 through 1-18.

Note on Sharing Interrupts

Some PCI computers require sharing interrupts while others do not.

For EISA computers, some network drivers support sharing the same interrupt channel between multiple LAN Adapters. For example, the Novell NetWare server driver supports a maximum of four HP EISA adapters. All the EISA LAN Adapters can be configured to use the same interrupt channel (IRQ). This saves scarce interrupt channels for other LAN Adapters. If your network driver supports this sharing feature, follow the procedures on the next page to utilize it.

Continued on the next page.

1. In the EISA Configuration utility, after adding all the HP EISA LAN Adapters, select "View or edit details". For each adapter, select the Interrupt (IRQ) item and press Enter. Then select the IRQ value. Select the same value for all the HP EISA LAN Adapters. Save the configuration, and reboot the computer when prompted.

2. In HPVGSet, use "Select Card" to choose each HP EISA LAN Adapter. For each adapter, select the same interrupt channel value under the Manual Configuration Menu.

   Note: When performing "Card test" on these adapters, the first LAN Adapter will pass the "Interrupt test", but subsequent adapters will fail this test. This is not a problem. HPVGSet is indicating correctly that another device (for example, the first LAN Adapter) is also using the same IRQ. Press the K key to keep this same IRQ value.

When loading the Novell NetWare server driver, for each HP EISA LAN Adapter the driver will automatically share the interrupt channel among all these adapters.

Note

This feature only works on the HP J2577A 10/100VG EISA LAN Adapters. Interrupts cannot be shared with the HP J2573A 10/100VG ISA LAN Adapters.

For PCI Computers

In most PCI computers, the PCI LAN Adapters are automatically configured by the computer. However, some PCI computers require that you move a jumper on the motherboard or run the CMOS SETUP utility to aid in the configuration of any PCI card. For details on PCI card installation, check the documentation supplied with your computer.

3

- Running HPVGSet
- HPVGSet Screen Features
- What You Can Do With HPVGSet
- Manual Configuration Options

Overview of HPVGSet

Running HPVGSet

After you have installed the LAN Adapter in your computer, you are ready to run HPVGSet. HPVGSet is an interactive configuration and diagnostics program on the HP Support Disk that came with your LAN Adapter.

The LAN Adapters have no switches or jumpers to configure; all the configuration information is stored in non-volatile memory (EEPROM) on the LAN Adapter. Additionally, HPVGSet includes easy to run diagnostics for testing the LAN Adapter and the network links to other devices.

Note

Before running HPVGSet, verify the following is true:

- **Your network software and drivers are not running.** You can do this step by booting your system from a DOS diskette that does not have either a CONFIG.SYS or an AUTOEXEC.BAT file on it, or, if booting from MS DOS 6.0 or later, press F5 when you see the text 'Starting MS-DOS . . .'.

  Alternatively, if you understand how your network software and drivers are activated, you can modify the CONFIG.SYS and AUTOEXEC.BAT files in your computer so the software and drivers do not execute. If you are configuring Boot ROMS, skip EMM386.EXE (or your memory manager) too.

- **You are running MS-DOS.**
  You must have booted the computer under DOS; HPVGSet will not run under another operating system, or in a DOS session under another operating system. If you are running Microsoft Windows, you must exit to DOS before running HPVGSet. Do *not* attempt to run HPVGSet from a DOS window within Microsoft Windows. If you are running OS/2, you can run HPVGSet to configure your LAN Adapter by booting your computer from a DOS floppy disk and then run HPVGSet under DOS. After completing the configuration, reboot your computer under OS/2.

After you have installed the LAN Adapter in your computer, run HPVGSet by following these steps.

1. Insert the Support Disk that came with your LAN Adapter into your computer's floppy-disk drive.

2. Change to that drive, and from the prompt, enter:

   HPVGSET

HPVGSet automatically detects the presence of the LAN Adapter and its current configuration, and then presents a screen like figure 3-1.

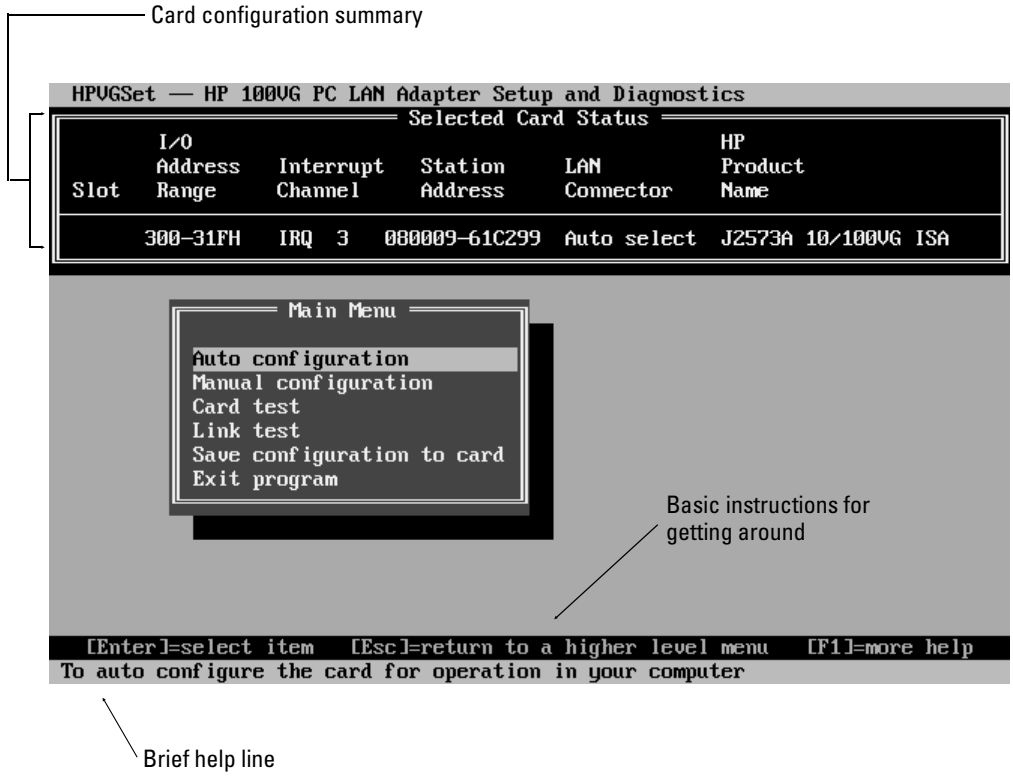


Figure 3-1. HPVGSet Main Menu Screen

HPVGSet Screen Features

- **Card configuration summary** – is found in the area at the top of the screen labeled "Selected Card Status". It displays the current configuration of a LAN Adapter installed in the computer. If you make changes to the configuration, the changes will be reflected in this area.

  If you have more than one LAN Adapter installed, this window displays the status of the LAN Adapter you have selected using the "select card" option from HPVGSet's Main Menu. The "select card" option is only displayed if there is more than one LAN Adapter installed in your computer.

- **Basic instructions for getting around** – are always displayed near the bottom of the screen to help you remember how to get around in the program:
  - press Enter to select the highlighted item,
  - press Esc to return to the previous menu,
  - press F1 to get detailed help information on the highlighted item.

- **Brief help line** – is the bottom line of the screen. It contains a brief help message about the item that is highlighted in the forward-most window.

- **Selecting an item** – is performed by using the up and down arrow keys to highlight the item, then pressing Enter; by clicking on the item with the mouse; or by just pressing the hot key for that item. On a color screen, the hot key is the yellow upper-case letter.

What You Can Do With HPVGSet

The main functions of HPVGSet are all listed on the Main Menu shown in figure 3-1. The functionality of HPVGSet depends on your LAN Adapter.

The options are listed and described in the table below. For each of the options, the "hot key", which can be pressed to select the item, is shown in the table.

Note

You can get more detailed information on each option from within HPVGSet. From the Main Menu, just highlight the option and press F1. A help window pops up with the information you need. F1 help is available throughout the HPVGSet program.

Main Menu Operation	Hot Key	Description
Auto configuration*	A	(ISA and EISA only) Automatically selects an available IRQ for the LAN Adapter, detects the presence and size of a boot ROM if one is installed, and selects an available memory location for the boot ROM. This option is not available on the Main Menu when there is more than one LAN Adapter installed.
select carD	D	When you have multiple LAN Adapters installed in your computer, use this option to select the LAN Adapter you want to configure or test. This option is displayed only if you have multiple LAN Adapters installed.
Manual configuration	M	Allows you to change every configuration option on the LAN Adapter. See "Manual Configuration Options" on the next page for more information.
Card test	C	Quickly tests the LAN Adapter's hardware and configuration. Does not send packets on the network, so the network cable should not be attached.
Link test	L	Tests the LAN Adapter's ability to send and receive packets over the network. The LAN Adapter can be designated as either the initiator of the test packets, or the responder. HPVGSet can automatically find a responder on the network.
Save configuration to card	S	Causes the configuration that you see on the HPVGSet screen to be written to the LAN Adapter's non-volatile memory.
Exit program	E	Terminates the HPVGSet session.
* The auto configuration option is not available for PCI LAN Adapters because the PCI BIOS automatically configures all PCI cards.		

Manual Configuration Options

The manual configuration options depend on the LAN Adapter installed in the computer. The manual configuration options for the LAN Adapters that are accessible from HPVGSet's Manual Configuration Menu are shown in the following figures:

- ISA LAN Adapter: figure 3-2
- EISA LAN Adapter: figure 3-3
- PCI LAN Adapter: figure 3-4

The configurations shown in the figures are the factory defaults. The options are listed and described in the table on page 3-8. For each of the options, the "hot key", which can be pressed to select the item, is shown in the table.

Note

You can get more detailed information on each option from within HPVGSet. From the Manual Configuration Menu, just highlight the option and press F1. A help window pops up with the information you need. F1 help is available throughout the HPVGSet program.

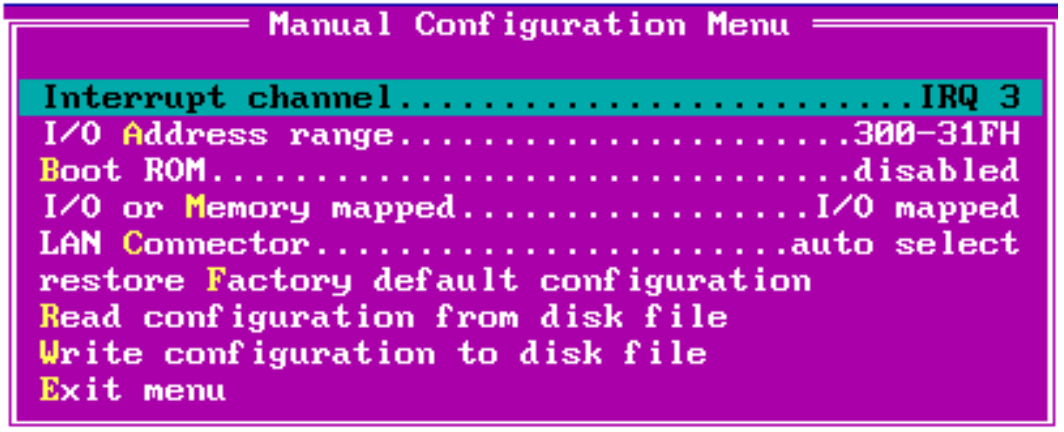


Figure 3-2. HPVGSet ISA Manual Configuration Menu

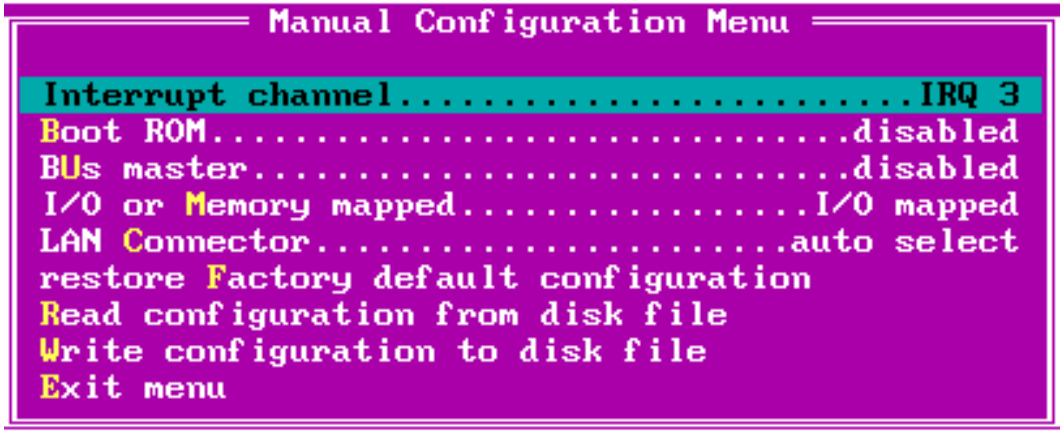


Figure 3-3. HPVGSet EISA Manual Configuration Menu

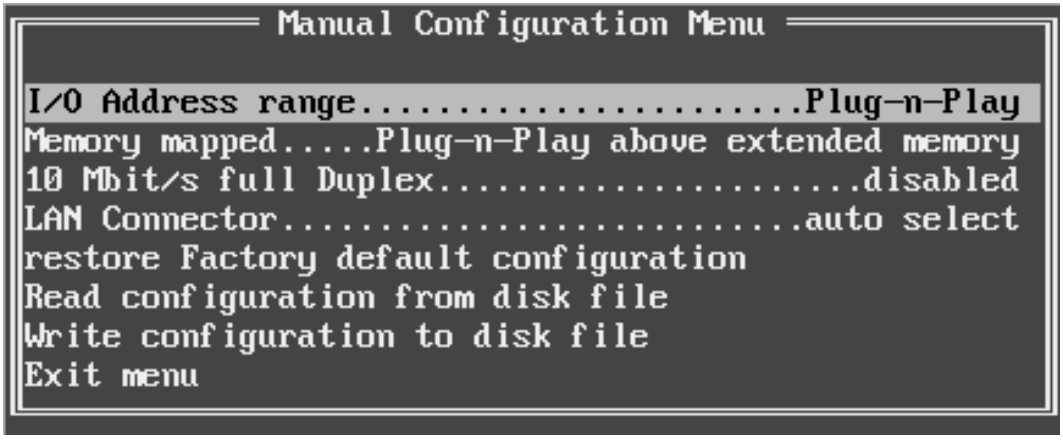


Figure 3-4. HPVGSet PCI Manual Configuration Menu

Manual Configuration Option	Hot Key	Description
Interrupt channel	I	(ISA and EISA adapters only) Specifies an IRQ if needed. You can instead select "Auto configuration" from the Main Menu and an available IRQ is automatically selected for your LAN Adapter. HPVGSet automatically verifies that your selection does not conflict with any other IRQ assignment in your computer.
I/O Address range	A	Specifies an I/O address range for a LAN Adapter card. For the ISA and EISA LAN Adapter card, use this option if the factory default, 300-31Fh, cannot be used. HPVGSet automatically verifies that your selection does not conflict with any other I/O address assignment in your computer. For the PCI LAN Adapter card, Plug-n-Play is the default value but you can select an ISA address if desired.
Boot ROM	B	(ISA and EISA adapters only) Specifies an address for a boot ROM installed on the LAN Adapter, if needed, or disables the boot ROM if needed. You can instead select "Auto configuration" from the Main Menu to automatically detect the presence and size of the boot ROM and assign an available address range for its use.
bUs master	U	(EISA adapter only) Bus master allows direct memory access between the LAN controller and system memory. When Bus master mode is selected, the network interface controller has complete control of the system's address, data, and control lines. This yields higher performance.
I/O or Memory Mapped	M	(ISA and EISA adapter only) Selects the method by which data is transferred between the network and the CPU through the LAN Adapter, either I/O mapped or memory mapped. See "Using Memory-Mapped Mode" in chapter 2 for more information.
10 Mbit/s Full Duplex	D	(PCI adapter only) Specifies whether to disable (default) or enable full duplex for 10 Mbit/s networks. Enable full duplex for servers to accept requests while servicing requests.
LAN Connector	C	Specifies which LAN connector the LAN Adapter is to use, or, if you choose "auto select", the LAN Adapter automatically detects which connector has the network cable attached to it.
Memory mapped	M	(PCI adapter only) Specifies where the mem,ory-mapped region is located. Select above extended memory (default) or upper memory area. Select above extended memory if you are using an advanced operating system such as Windows NT and some versions of Windows for Workgroups. Select an address in the upper memory area if you are using mostly DOS applications and need to leave room in conventional memory for DOS programs.

Table continued on next page.

Manual Configuration Option	Hot Key	Description
restore Factory default configuration	F	Restores the LAN Adapter's configuration to the values it had when shipped from the factory. These values are shown on page 1-11.
Read configuration from disk file	R	Brings a configuration into HPVGSet from a disk file. The configuration can then be saved to the LAN Adapter that you are configuring.
Write configuration to disk file	W	Writes the displayed configuration to a disk file that you can subsequently use to configure LAN Adapters. See "Configuring Multiple Cards With the Same Configuration" in chapter 2.
Exit menu	E	Exits the Manual Configuration Menu and returns to the Main window.

4

- Gathering data
- Basic Troubleshooting Tips
- Interpreting the LEDs
- Running the Diagnostics
- Symptoms
- Solutions
- Before Calling for Help

Troubleshooting

Gathering Data

To resolve any problems you are having with your LAN Adapter, you first need to gather some symptomatic data:

1. First, check the basic items listed under “Basic Troubleshooting Tips” on the next page.

2. Then if necessary, run the diagnostic tests of the LAN Adapter and the network that are available in the HPVGSet program.

3. The data that you collect from these observations and diagnostic tests can then be compared with the symptom table in this chapter. Once you find the symptom that matches what you have observed, go to the solutions table to find how to resolve the problem.

Basic Troubleshooting Tips

- **Check the LEDs** – the four LEDs on the LAN Adapter bulkhead, see figure 4-1 and figure 4-2, can be used to help identify the problem. Use the tables on page 4-5 to interpret the LED display.

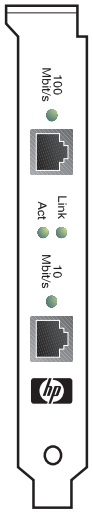


Figure 4-1. ISA or EISA Bulkhead LEDs

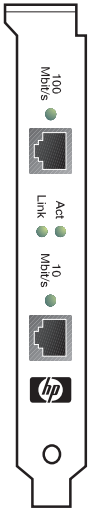


Figure 4-2. PCI Bulkhead LEDs

- **Check the network cables** – make sure the network cable connections are secure and that the cables are not damaged. If you find any connections that are loose, or cables that are damaged, fix the problem and then see if your computer can communicate on the network.
- **Check for I/O address conflicts** (ISA only) – make sure the I/O address range configured on your LAN Adapter does not conflict with the address used by any other card in your computer. The default I/O address range is 300-31Fh. Run HPVGSet and select "Manual configuration" to configure the I/O address.

- **Check for IRQ conflicts** – make sure the IRQ configured on your LAN Adapter does not conflict with the IRQ used for any other card in your computer. See “Interrupt Channel” on page 3-11. The default interrupt is IRQ 3. Run HPVGSet and select “Manual configuration” to configure the IRQ.

If the problem is not resolved by these basic steps, run the diagnostic tests described below and use the symptom and solution tables later in this chapter to help guide you. If the more thorough testing does not resolve the problem, contact your HP-authorized LAN dealer or HP representative for assistance. See “Before Calling for Help” at the end of this chapter.

Interpreting the LEDs

100-Mbit/s operation

During normal operation, the LEDs for 100-Mbit/s are:

- 100-Mbit/s port LED is ON
- 10-Mbit/s port LED is OFF
- Link Status LED is ON

If your LED pattern differs, check the table below:

Link LED	10 Mbit/s LED	100 Mbit/s LED	Causes
OFF	OFF	ON	EITHER: Cable not connected to active 100VG network. Defective cable. Defective LAN Adapter.

10-Mbit/s operation

During normal operation, the LEDs for 10-Mbit/s are:

- 100-Mbit/s port LED is OFF
- 10-Mbit/s port LED is ON
- Link Status LED is ON

If your LED pattern differs, check the table below:

Link LED	10 Mbit/s LED	100 Mbit/s LED	Causes
OFF	OFF	ON	EITHER: Cable not connected to active 10Base-T network. Defective cable. Defective LAN Adapter.

Running the Diagnostics

The Card test and Link test diagnostic tests are run from the HPVGSet Main Menu. The procedures are:

1. **Make sure your network drivers are not running.** You can do this step by booting your system from a DOS diskette that does not have either a CONFIG.SYS or an AUTOEXEC.BAT file on it, or, if booting from MS-DOS 6.0 or later, press F5 when you see the text 'Starting MS-DOS...'

   Alternatively, if you understand how your network drivers are activated, you can modify the CONFIG.SYS and AUTOEXEC.BAT files in your computer so the drivers do not execute.

2. Insert the HP Support Disk that came with your LAN Adapter into the floppy disk drive.

3. Change to that drive and enter `HPVGSET` .

4. From the Main Menu, select "Card test" or "Link test". These tests are described next.

Card test

This tests the LAN Adapter's circuitry all the way out to the LAN connectors. Do not attach cables for this test.

The list of tests is displayed, followed by a pass or fail indication as each test is completed. If any of the tests fails, the testing process stops at that test. Press F1 (help) to get more information on what you can do to correct the problem.

We recommend that you run card test the first time you run HPVGSet and any time you change the LAN Adapter's configuration. The test takes very little time to run and provides a complete verification that the LAN Adapter's hardware and configuration are OK.

Link test

This option tests the LAN Adapter's ability to send and receive packets over the network. For this test, the cable from the network must be attached to the LAN Adapter. The test sends test packets out on the network.

Overview — a quick test

HPVGSet makes the link test an easy process because it can automatically find a responder to the test packets. To quickly test the LAN Adapter's ability to communicate on the network:

1. Press [L] from HPVGSet's Main Menu to select "Link test".
2. Press [Enter] to select "Initiate test packets" as the role for the LAN Adapter.
3. From the Link Test Initiator Menu, press [Enter] to automatically find a responder. This usually takes less than three seconds.
4. When the responder's station address is displayed (and "Start test" is highlighted), press [Enter] to start the test. The window labeled Link Test Statistics (Initiator) pops up showing you the test counters. The test runs continually until you stop it.
5. Press [Enter] again (or any other key) to stop the test.
6. Interpret the results as described on the next page under "Interpreting the Results".

Some Details on Link Test

The LAN Adapter can either be designated as the initiator of the test packets, or the responder. You are prompted to pick the role for your LAN Adapter.

Setting Up the Card as an Initiator: Select "Initiate test packets" and your LAN Adapter will send the Test packets. Another node on the network must then act as the responder.

Finding a responder: To be a responder, the node must be able to respond to the IEEE 802.2 Test packets with IEEE 802.2 Test Response packets. You can easily set up a computer that has an HP 10/100VG LAN Adapter as a responder.

HPVGSet offers two ways to select a responder:

- **Automatic responder selection** – from the Link Test Initiator Menu, select "Find a responder" and HPVGSet will automatically find a responder on the network.
- **Manual responder selection** – if HPVGSet cannot find a responder, or if you want to test a particular path, you can enter the station address of a specific responder. Select "Manually enter responder address" and you will be prompted to enter the 12-digit hexadecimal station address of the responder.

Running the test: When the responder has been found, select "Start test". A window is displayed showing the test statistics. You can stop the test by pressing any key.

Setting Up the Card as a Responder: Select "Respond to test packets" and your LAN Adapter will return an IEEE 802.2 Response packet for each Test packet it sees from a network node that is acting as the initiator. A window is displayed showing the test statistics. When the initiator node starts the test, you can see the counters change on your screen.

Interpreting the Results

It is easiest to interpret the test results under the two extreme conditions—when the test runs perfectly, and when the test absolutely fails:

- **when the test runs perfectly** – two of the counters increment the same: "Test packets transmitted" and "Good test packets received". "Packets received" will also have the same value (or higher).
- **when the test absolutely fails** – only the "Test packets transmitted" counter increments, and it does so very slowly. In this case, when you stop the test, you get an error message. Press F1 to get help on the possible causes for the test failure.

Other combinations of counter values are open to interpretation. If you get other results, you may want to contact your HP-authorized LAN dealer or HP representative for help.

Symptoms

In the table below, find the symptom you are noticing and then check the corresponding solutions in the table on the next page. Notice that the solution numbers are listed in the suggested sequence of what to check first.

Symptom	Solution Numbers
When you run HPVGSet, no LAN Adapters are detected.	1, 2, 3, 4, or 5
When you run Card test from HPVGSet, one or more of the tests fail.	11, 2, or 5
Card test passes but Link test fails.	6, 7, 8, 12, or 18
Both of the diagnostic tests pass but the computer will still not communicate on the network.	9, 10, or 11
The LAN Adapter stopped working when another card was added to the computer.	2, 6, 11, 13, 14, or 15
The LAN Adapter stopped working for no apparent cause.	6, 15, or 5
NOS software/driver will not start, does not find the LAN Adapter, or gives start-up error messages.	9, 2, or 11
NOS software/driver is initially unable to connect or communicate with a remote node.	9, 2, 6, 12, or 11
NOS communication with a remote node fails after working previously.	6, 12, 15, or 5
Network cable is attached to the 10-Mbit port but the 100-Mbit port LED is On and the Link Status LED is Off.	16 or 17
(PCI only) HPVGSet does not find the LAN Adapter.	1, 19, 20, 21, 22

Solutions

1	Check to make sure the LAN Adapter is installed in your computer.
2	There could be an I/O address conflict with another card in your computer. The default I/O address range for the ISA LAN Adapter is 300-31Fh. Either remove the other card that conflicts, then run HPVGSet to select a different I/O address range for the LAN Adapter, and then reinstall the other card, or move the LAN Adapter to another system and run HPVGSet on that system to select a different I/O address range for the LAN Adapter. If you change the I/O address on the LAN Adapter, make sure you also change the value in your network driver configuration.
3	The LAN Adapter may not be completely seated in the expansion slot. Try re-seating the LAN Adapter and running HPVGSet again.
4	The expansion slot may be defective. Try a different slot.
5	The LAN Adapter may be defective. Try a different one.
6	Verify that the network cable is firmly attached to the LAN Adapter and that the other end of the cable is firmly attached to the hub or other network device.
7	Verify that the LAN Adapter has been configured with the correct connector type by running HPVGSet.
8	Verify the network cable is attached to the correct LAN Adapter.
9	Make sure that the network drivers are loaded, and that the driver parameters match the configuration on your LAN Adapter.
10	Make sure that the LAN Adapter has been configured for your computer. If not, run HPVGSet on your computer and make the necessary configuration changes.
11	The LAN Adapter's interrupt channel or memory may overlap another card's configured values. This is especially likely if the other card was installed after the LAN Adapter you are testing. Run HPVGSet and reconfigure your LAN Adapter to resolve the conflict.

More solutions on the next page.

Solutions (continued)

12	Verify the integrity of the network cable and the connectors on both ends of the cable.
13	Verify that LAN Adapter's drivers were not accidentally deleted when the drivers for the new LAN Adapter were installed.
14	Make sure that the LAN Adapter was not nudged from its expansion slot when the new LAN Adapter was installed.
15	The files containing the network drivers may have become corrupted. Re-install the network drivers from the Support Disk and try again.
16	Link beat not detected on the 10-Mbit cable.
17	Hub is off or malfunctioning, or link beat has been disabled on the hub port for this connection.
18	Verify network cable is properly wired. For the 100-Mbit connection, all four twisted pairs must be wired straight through to the other end. See Appendix A for cabling pinout information.
19	Run the CMOS SETUP utility for your PCI computer and verify the PCI slot is enabled.
20	Some EISA configuration utilities allow you to disable a PCI slot. If you have an EISA computer, run the EISA configuration utility and enable the PCI slot.
21	Ensure PCI interrupt INTA is assigned to an IRQ. Run your computer's configuration utility or set a jumper on the motherboard to set the slot to INTA. See your computer manual for details.
22	Your BIOS may not support the most current PCI specification and may need to be upgraded. See your computer documentation to determine if your BIOS correctly supports the features of the PCI Local Bus Specification (v2.0).

Before Calling for Help

Before you contact your HP-authorized LAN dealer or HP representative, collecting the data listed below will help get your problem resolved quickly.

History of the problem:

- What symptoms did you notice?
- When did the symptoms appear; when the LAN Adapter was first installed, or after it was working for a while?
- Did you change the LAN Adapter's configuration just before the symptoms appeared?
- If you changed the LAN Adapter's configuration, did you also change the driver parameters to match?

Card configuration information:

- Run HPVGSet and select "Manual configuration". The LAN Adapter's complete configuration is displayed; write down the values for all the parameters.

Computer information:

- What kind of computer are you using (what vendor and model)?
- What is the bus speed?
- What operating system, and version are you using?
- What network operating system, and version are you using?
- What other cards are installed in your computer and how are they configured?
- What applications are you running on the computer?
- If you are using memory-mapped mode, are you also running an expanded memory manager or memory caching on your computer? Get a copy of the computer's memory map if you can. Most memory managers have that capability.
- List the contents of some key files: especially AUTOEXEC.BAT, AUTOEXEC.NCF, CONFIG.SYS, NET.CFG, PROTOCOL.INI, LANMAN.INI, and SYSTEM.INI.

Hewlett-Packard offers a variety of support services. See the card at the front of this manual for details.

A

- 10-Mbit/s Twisted-Pair Connector
- 100-Mbit/s Twisted-Pair Connector

Cables and Connectors

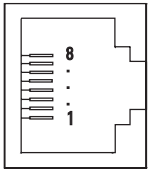
This appendix includes minimum pin-out information for the twisted-pair connectors on the LAN Adapters. Also included are lists of cables that are available from HP. Because the connectors on the LAN Adapters adhere to the appropriate standards, you can also purchase cables from vendors such as Black Box and Anixter.

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.

10-Mbit/s Twisted-Pair Connector

Use unshielded twisted-pair cables that comply with the IEEE 802.3 Type 10Base-T standard.



Pins	Signal
1	(transmit +)
2 (pair 2)	(transmit –)
3	(receive +)
6 (pair 3)	(receive –)

Available HP Cables

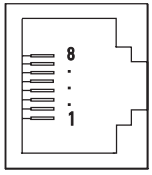
- HP 92268A – 4-meter with attached 8-pin connectors
- HP 92268B – 8-meter with attached 8-pin connectors
- HP 92268C – 16-meter with attached 8-pin connectors
- HP 92268D – 32-meter with attached 8-pin connectors
- HP 92268N – 300-meter (no connectors supplied)*

*The Ethernet 802.3 standard supports up to 100 meters only.

100-Mbit/s Twisted-Pair Connector

Use unshielded twisted-pair cables that comply with the IEEE 802.12 100-Mbit/s proposed standard.

Note In the following table, TPIO stands for twisted-pair input/output.



Pins	Signal	
	Hub	**End Node**
1	TPIO:3+	TPIO:0+
2 (pair 2)	TPIO:3-	TPIO:0-
3	TPIO:2+	TPIO:1+
6 (pair 3)	TPIO:1+	TPIO:2+
4	TPIO:1-	TPIO:2-
5 (pair 1)	TPIO:2-	TPIO:1-
7	TPIO:0+	TPIO:3+
8 (pair 4)	TPIO:0-	TPIO:3-

Available HP Cables

- HP 92268A – 4-meter with attached 8-pin connectors
- HP 92268B – 8-meter with attached 8-pin connectors
- HP 92268C – 16-meter with attached 8-pin connectors
- HP 92268D – 32-meter with attached 8-pin connectors
- HP 92268N – 300-meter (no connectors supplied)*

*The Ethernet 802.12 proposed standard supports up to 100 meters only.

B

- HP J2573A ISA LAN Adapter
- HP J2577A EISA LAN Adapter
- HP J2585A PCI LAN Adapter

Specifications

HP J2573A, HP J2577A, HP J2585A LAN Adapter Specifications

Physical

	HP J2573A	HP J2577A	HP J2585A
Dimensions:	8.9 cm by 18.0 cm (3.5 in by 7.4 in)	8.9 cm by 18.0 cm (3.5 in by 7.4 in)	8.9 cm by 18.0 cm (3.5 in by 7.4 in)
Weight:	127 g (4.5 oz)	127 g (4.5 oz)	127 g (4.5 oz)

Electrical

0.3 A @ 5 V typical; 0.50 A @ 5 V maximum

Environmental

Operating temperature:	0°C to 55°C (32°F to 131°F)
Nonoperating temperature	-40°C to 70°C (-40°F to 158°F)
Relative humidity:	15% to 95% at 40°C (104°F) non-condensing
Maximum altitude:	4.6 km (15,000 feet)

Cable Interfaces

- The 10-Mbit/s twisted-pair port is compliant with IEEE 802.3 Type 10Base-T.
- The 100-Mbit/s twisted-pair port is compatible with IEEE 802.12 proposed standard.

Communications Standards

- IEEE 802.3 Type 10Base-T
- IEEE 802.12 proposed standard (100-Mbit/s)

Electromagnetic

Emissions
FCC part 15 Class A
EN 55022 / CISPR-22 Class A
VCCI Level 1

Immunity

See Declaration of Conformity under “Regulatory Statements” at the end of this guide.

Acoustic Noise

Not applicable

C

- Demand Priority Protocol: Overview
- Enabling High-Priority Transmissions on an End Node
- Designing Networks That Use High-Priority Traffic

Using Priority on HP 100VG Networks

A key benefit of an HP 100VG LAN is its ability to guarantee access to any end node that requests to transmit, while ensuring priority access to end nodes that require consistent, continuous access for applications such as full-motion video or video conferencing.

In the future, network operating systems and applications will be developed that will automatically configure the network to accommodate network access requirements. Such configuration will be transparent to users and may include, for example, the allocation of network bandwidth or the use of priority channels through the network infrastructure. A single end node running multiple applications will have its network access priority automatically adjusted depending on needs of the particular application that requests access.

Presently, however, few "network-aware" applications for HP 100VG LANs are available. In many cases, an end node with applications that require high-priority access will need to be manually configured by the network administrator. Once an end node has been manually configured for high-priority access, then all applications on that end node will be constrained to use high-priority access. In these cases, network administrators should carefully plan the applications that run on the end nodes.

This appendix describes HP 100VG network access priorities, and some information about when high-priority access may be appropriate. For more detailed information on operation of an HP 100VG network, refer to *Planning and Designing High Speed Networks Using 100VG-AnyLAN* published by HP (part number 5962-9420E) and by Prentice Hall. If you have purchased an HP 100VG hub, you can also find a chapter on 100VG networking concepts in the installation and reference manual for your hub.

Demand Priority Protocol: Overview

An HP 100VG LAN uses a centrally controlled access method referred to as the Demand Priority Protocol (DPP), which is fully defined by the IEEE 802.12 100VG-AnyLAN proposed standard. The Demand Priority Protocol is a request-based protocol and is deterministic—a network end node connected to a 100VG hub makes a request (or "demand") to transmit, and then can transmit only when authorized by the hub. Under hub control, the Demand Priority Protocol guarantees network access for any end node that requests to transmit data.

Associated with each request to transmit is a priority, either *normal* priority or *high* priority:

- **Normal-priority requests** are intended for typical data transfers and are serviced after high-priority requests. However, normal-priority requests that remain pending for an excessive period of time are automatically elevated to high priority—this is referred to as *priority promotions*.
- **High-priority requests** are serviced before normal-priority requests and are intended for time-critical applications, such as full motion video, where the delay in network access could degrade or impair operation.

When multiple end nodes request to transmit, the priority of each request is used by the hub to determine the sequence in which the requests are serviced. In general, the hub services requests in port order (see figure C-1). If there are multiple high-priority requests, the hub will service the high-priority requests in port order before servicing the normal-priority requests.

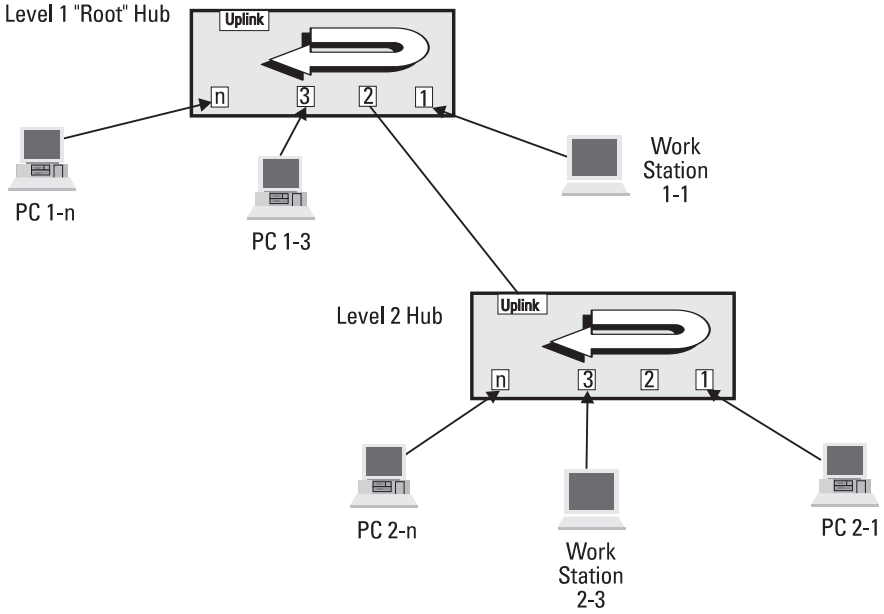


Figure C-1

Enabling High-Priority Transmissions on an End Node

Presently, there are few network operating systems and applications available that automatically and transparently control network-access priorities. When being used in a 100VG network, your HP 100VG LAN adapters provide the ability to manually configure high-priority operation on those end-node PCs and servers that require it. Refer to the PRIORITY.TXT file on the Support Disk supplied with your LAN adapter.

Note

Normal-priority operation on an HP 100VG network provides an end node with high performance. Only specific types of applications need to be set to high-priority operation.

Before setting your end node to use high-priority bandwidth, you should first obtain authorization from your network administrator who should have an understanding of the overall bandwidth utilization on the network. The 100VG hub to which your end node is attached may also have to be reconfigured to allow high-priority communications from your end node.

Designing Networks That Use High-Priority Traffic

When manually configuring end nodes for high-priority transmissions, you may also need to manually allocate the bandwidth needed for high-priority traffic. You should consider the following in the design and configuration of your network:

- End nodes (including servers) that transmit bursts of network traffic, such as file transfers, should be configured for normal priority. End nodes with applications that require real-time access, or consistent continuous access, may be configured for high priority. If you configure "bursty" end nodes for high-priority operation, you may degrade the access requirements of end nodes that need high-priority access.
- An upper limit on the amount of bandwidth that can be high-priority should be ascertained to prevent degradation of high-priority applications, and to reserve some bandwidth for normal-priority nodes. Although 70% high-priority bandwidth is a reasonable limit, it depends on your particular applications.
- End nodes that are manually configured for high-priority operation will always request high-priority access to the LAN regardless of the application. You should plan the applications that run on your end nodes accordingly.

For example, consider the 100VG network illustrated in figure C-2. A video server is used for full-motion video training classes that can be accessed at specified PC stations. In addition, a file server is used for standard burst-mode traffic, such as file transfers or edits. In this case, you can manually configure the video server and video PC stations for high-priority operation, and configure the file server and non-video PC stations for normal priority.

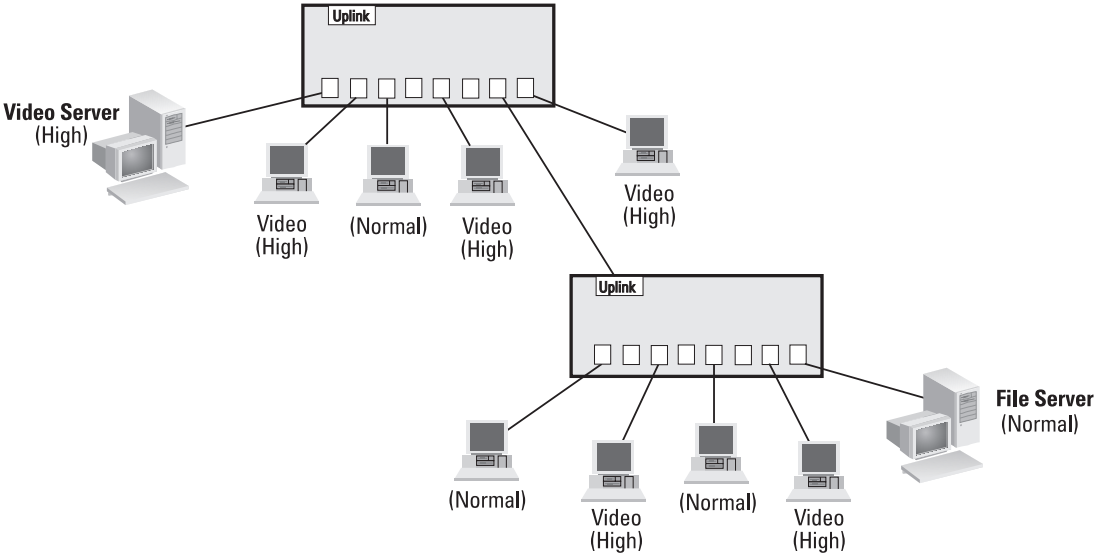

Uplink
Video Server
(High)
Video
(High)
(Normal)
Video
(High)
Video
(High)
Uplink
File Server
(Normal)
(Normal)
Video
(High)
(Normal)
Video
(High)

Figure C-2

Glossary

100VG-AnyLAN Refers to the 100 Mbit/s network technology over voice grade cable that is compatible with the proposed IEEE 802.12 standard. This technology guarantees access to any end node that requests to transmit, while ensuring priority access to end nodes that require consistent, continuous access for applications such as full-motion video or video conferencing. *See also* Demand Priority Protocol.

AUI cable An attachment unit interface (AUI) cable. This cable connects the AUI port of a LAN adapter to a transceiver. Some transceivers have a cable permanently attached, others require a separate cable. HP offers a set of compact transceivers that attach directly to the LAN adapter's AUI port.

AUI port The attachment unit interface (AUI) port on the LAN adapter. The AUI port connects to a LAN cable through a transceiver. Often there is an AUI cable, although some transceivers attach directly to the AUI port.

BNC connector Any of several connectors used for ThinLAN cable. There are male and female connectors used to connect sections of a LAN and the "T" connector used for attaching devices to the cable.

boot ROM Read Only Memory (ROM), installed either on a LAN adapter or elsewhere in the computer, that implements a simple program to identify a server on the network from which the computer can get its boot information.

buffer RAM Random Access Memory (RAM) on the LAN adapter that is used for temporary storage of data coming from and going to the LAN. The LAN Adapter have 32 Kbytes of buffer RAM.

cache A high-speed memory between the CPU and system memory. The cache speeds up processing by keeping a copy of the most recently executed code or data.

collision The result of two or more nodes on a LAN transmitting at the same time, producing a garbled transmission.

Demand Priority Protocol A request-based protocol and is deterministic—a network end node connected to a 100VG hub makes a request (or "demand") to transmit, and then can transmit only when authorized by the hub. Under hub control, the Demand Priority Protocol guarantees network access for any end node that requests to transmit data.

driver A program that allows the LAN adapter to communicate with the network operating system.

EEPROM Electrically Erasable Programmable Read Only Memory. This type of chip provides non-volatile memory that can be erased and rewritten by the computer. The LAN Adapter/16 s' configuration is stored in an onboard EEPROM.

Ethernet A LAN developed by Xerox Corp., Digital Equipment Corp., and Intel Corp. It uses the CSMA/CD method of access and transmits at 10 Mbit/s on a bus topology. The IEEE 802.3 standard evolved from Ethernet, but they are not exactly the same. Network devices based on both standards can co-exist on the same medium, but they cannot exchange data directly without special "bilingual" software that can decode packets of both types.

Ethernet address *See* station address

factory default configuration The configuration values stored in the card's non-volatile memory (EEPROM) at the factory.

50-ohm terminator A connector containing a 50-ohm resistor used to terminate the end of an IEEE 802.3 LAN coaxial cable segment. One is required on each end of the segment.

IEEE 802.3 standard Part of the Institute of Electrical and Electronics Engineers 802 family of LAN standards. The 802.3 standard defines the physical layer (layer 1) and part of the data link layer (layer 2) of the ISO OSI reference model for a CSMA/CD LAN. The IEEE 802.3 standard evolved from Ethernet, but the two networks are not fully compatible with each other.

Interrupt channel Also called an IRQ. An identity assigned to each peripheral device, such as a LAN adapter, in a PC. Each peripheral is assigned a unique interrupt level so that the computer knows which peripheral is requesting services. The factory default interrupt level for the ISA, EISA, and PCI LAN Adapter cards is IRQ 3.

I/O base address The starting address of where the computer can find the card on its I/O bus. The values are depicted as a hexadecimal number. The LAN Adapter/16 Plus cards require 32 bytes of I/O address space. The factory default I/O base address for the LAN Adapter/16 Plus cards is 300h.

I/O mode The type of data transfer between the LAN adapter and the computer. For ISA and EISA LAN Adapters, you can select either I/O mapped or memory-mapped. The PCI LAN Adapter is memory-mapped. *See also* I/O mapped and memory-mapped.

I/O mapped — A mode of data transfer in which the computer moves data to and from the LAN adapter over the computer's I/O channel. This mode is the default mode for the LAN Adapter/16 Plus cards. *See also* I/O mode.

IRQ — *See* interrupt channel.

LAN local area network — A general-purpose communications network that interconnects a variety of devices within a limited geographical area. Two common LANs, IEEE 802.3 and Ethernet, have compatible cabling requirements, and can co-exist on a common installation, but have different protocols. A new LAN technology, 100VG-AnyLAN has the same cabling and topology requirements and can be easily bridged to IEEE 802.3/Ethernet LANs. A LAN might connect computers on adjacent desks, within a building, or within several buildings of a campus.

LAN cable — The medium through which data moves in a LAN. LAN cables come in many types. For example, thick (10 mm) coaxial cable, thin (5 mm) coaxial cable, fiber-optic cable, and twisted-pair cable.

LED light emitting diode — A small light on a device that is often used to provide status information.

link beat — A periodic signal transmitted in Ethernet and IEEE 802.3 Type 10Base-T networks to inform one station or device of the presence of another. It also helps verify the integrity of the network link between them. (Also called "link test pulse".)

link test — A test of the connection between two nodes on a network. It tests the network cabling between the two nodes, the connections from the nodes to the cabling, and the ability of the nodes to communicate on the network.

MAC address — *See* station address.

Mbit/s — Megabits per second (1,000,000 bits per second).

medium, media — The transmission connection between nodes. Most current LANs use cables (fiber-optic or copper), although radio and other broadcast media are possible.

memory manager — A program that provides and controls access to a particular type of memory in your computer; upper memory (between 640 Kbytes and one Mbyte), extended memory, or expanded memory.

memory mapped A mode of data transfer in which the computer moves data to and from the LAN adapter using standard memory cycles. Memory cycles are faster than I/O cycles and therefore, using memory-mapped mode should improve the performance of a LAN adapter. *See also* I/O mode and I/O mapped.

network operating system (NOS) A control program that resides in a file server somewhere in the local area network. The NOS handles the requests for communication between all the stations on the network. A portion of the NOS must also reside on each of the client stations.

node A computer or other addressable device on a network, including PCs, terminals, bridges, routers, and mainframes. Usually, a node has a station address.

non-volatile memory The memory on the card that keeps its contents intact even when power is removed from the card (the computer's power is switched off). On the LAN Adapter/16 cards, the non-volatile memory is an EEPROM so the configuration data it contains can be changed.

packet A bit stream consisting of predefined fields that contain data, addresses, and control information. In the IEEE 802.3 environment, this structure is often referred to as the *MAC frame*. Packet is used in the Ethernet environment and is used in this guide because it is the more commonly understood term. Different protocols have different packet and frame specifications.

protocol A set of rules that governs data transfer among devices on a network. A protocol identifies the handshake type, packet size and format, timing, error recovery scheme, word size or other characteristics of each transfer, depending on the system of which it is a part.

remote boot client A node on the network that has a boot ROM installed and which receives its boot information over the network from a remote file server.

RJ-45 A standard defining the pin assignments for an 8-pin modular plug for 4-wire, twisted-pair network cable.

station address A 12-digit hexadecimal number that identifies a specific network node and allows messages to be directed to that node only. These numbers are permanently coded in the circuitry of the node's hardware. Because the IEEE has assigned identifiers for each hardware manufacturer, no two pieces of equipment have the same address. The address assigned according to the IEEE plan is referred to as a device's globally-administered station address.

Some drivers (such as Novell and SCO) provide an option for the user to assign a different station address that will override the original. This type of address is referred to as a locally-administered station address. By default, the ISA, EISA, and PCI LAN Adapter card use a globally-administered station address unless it is overwritten. The station address is also called a MAC address, Ethernet address, physical address, and by other names.

thick LAN A local area network (LAN) operating over 10-mm diameter coaxial cable. HP thick LAN networks are compatible with the IEEE 802.3 Type 10Base5 standard.

thin LAN A LAN operating over 5-mm diameter coaxial cable. HP thin LAN networks are compatible with the Type 10Base2 standard.

transceiver The assembly used to provide the physical connection and access to a LAN. It is the device on the LAN that detects collisions. (A transceiver is also called a medium attachment unit or MAU in the IEEE 802.3 standard.)

wiring closet An enclosed, central point for cabling to meet and where signal routing occurs. It is also called a telecommunications closet.

VG *See* 100VG-AnyLAN.

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 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。

Korea

사용자 안내문 : A 급기기

이기기는 업무용으로 전자파 적합등록을 받은 기기
이오니, 판매자 또는 사용자는 이점을 주의하시기
바라며, 만약 잘못 구입하셨을 때에는 구입한 곳에
서 비업무용으로 교환하시기 바랍니다.

European Community

Note

This is a class A product. In a domestic environment, this product may cause radio interference, in which case you may be required to take adequate measures.

Declarations of Conformity

The following Declarations of Conformity comply with ISO/IEC Guide 22 and EN 45014. They identify the product, the manufacturer's name and address, and the applicable specifications that are recognized in the European community. (See Declaration of Conformity letter on next page).

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 95747-5502
U.S.A.

declares that the product:

Product Name: HP 10/100VG Selectable ISA Adapter
HP 10/100VG Selectable EISA Adapter
HP 10/100VG Selectable PCI Adapter

Model Number: HP J2573A (ISA)
HP J2577A (EISA)
HP J2585A (PCI)

conforms to the following Product Specifications:

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

EMC: EN 55022 (1994) / CISPR-22 (1993) class A
EN50082-1 (1992)
prEN 55024-2 (1992) / 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. LEDs in this product(s) are Class-1 in accordance with EN60825-1:1994.

Tested with Hewlett-Packard Co. products only.

Roseville, October 3, 1997

Karen Dornak, Quality Manager

European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department TRE, Herrenberger Strasse 130, D-71034 Böblingen

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