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GPIB-ENET

GPIB

Getting Started with Your GPIB-ENET and the GPIB Software for Windows 95/98

June 1998 Edition
Part Number 321243C-01

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Federal Communications Commission

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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If necessary, consult National Instruments or an experienced radio/television technician for additional suggestions. The following booklet prepared by the FCC may also be helpful: *Interference to Home Electronic Entertainment Equipment Handbook*. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402.

Canadian Department of Communications

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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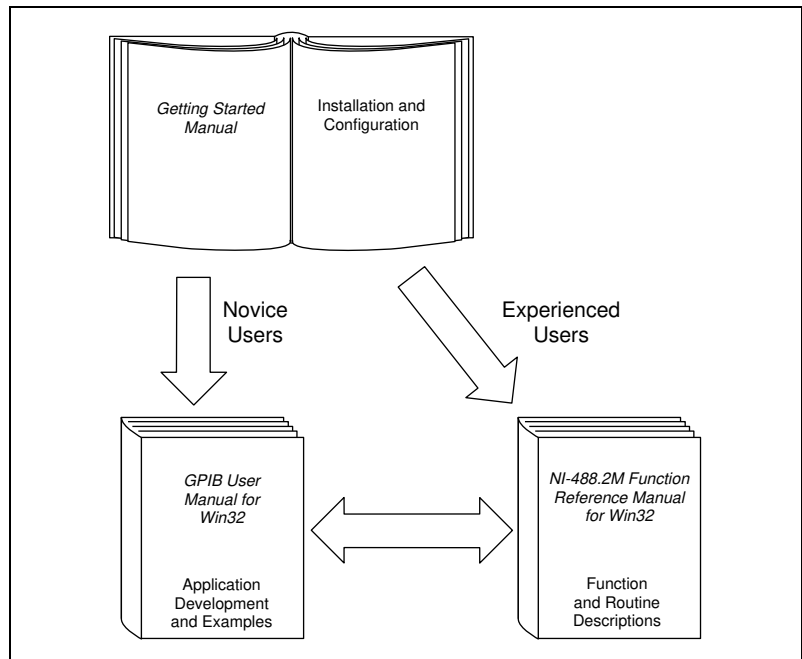
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About This Manual

This manual contains instructions to help you install and configure the National Instruments GPIB-ENET hardware and the GPIB software.

This manual assumes that you are already familiar with Windows 95 or Windows 98 and TCP/IP networks and that your computer is connected to an Ethernet network. Before you can use the driver software for the GPIB-ENET, you must already have a Windows Sockets (WinSock) Interface, version 1.1 or later, installed. Microsoft provides a WinSock Interface with Windows. Additionally, you can use a WinSock Interface purchased from another network vendor.

How to Use the Manual Set



Use this getting started manual to install and configure your GPIB-ENET and the GPIB software.

Use the *GPIB User Manual for Win32* to learn the basics of GPIB and how to develop an application program. The user manual also contains debugging information and detailed examples.

Use the *NI-488.2M Function Reference Manual for Win32* for specific NI-488 function and NI-488.2 routine information, such as format, parameters, and possible errors.

Organization of This Manual




This manual is organized as follows:

- Chapter 1, *Introduction*, explains how to use this manual, lists what you need to get started and optional equipment you can order, and briefly describes the GPIB-ENET hardware and the GPIB software.
- Chapter 2, *Installation and Configuration*, describes how to install and configure the GPIB-ENET hardware and the GPIB software.
- Chapter 3, *Verify the Installation*, describes how to verify that the hardware and software are functioning correctly.
- Chapter 4, *Begin to Use the GPIB Software*, helps you get started with the GPIB software.
- Appendix A, *Uninstall the Hardware and Software*, describes how to uninstall your GPIB-ENET and the GPIB software.
- Appendix B, *GPIB-ENET 8-Bit DIP Switch*, describes how the 8-bit DIP switch on the back panel can affect the operation of the GPIB-ENET.
- Appendix C, *READY LED Signaling*, describes how to interpret the **READY** LED error codes.
- Appendix D, *Troubleshooting and Common Questions*, describes how to troubleshoot problems and answers some common questions.
- Appendix E, *Specifications*, describes the characteristics of the GPIB-ENET, the transfer rates of the GPIB software, and the recommended operating conditions.
- Appendix F, *Customer Communication*, contains forms you can use to request help from National Instruments or to comment on our products and manuals.

- The *Glossary* contains an alphabetical list and description of terms used in this manual, including abbreviations, acronyms, metric prefixes, mnemonics, and symbols.

Conventions Used in This Manual

The following conventions are used in this manual:

»	The » symbol leads you through nested menu items and dialog box options to a final action. The sequence File»Page Setup»Options»Substitute Fonts directs you to pull down the File menu, select the Page Setup item, select Options , and finally select the Substitute Fonts option from the last dialog box.
	This icon to the left of bold italicized text denotes a note, which alerts you to important information.
	This icon to the left of bold italicized text denotes a caution, which advises you of precautions to take to avoid injury, data loss, or a system crash.
	This icon to the left of bold italicized text denotes a warning, which advises you of precautions to take to avoid being electrically shocked.
bold	Bold text denotes the names of menus, menu items, parameters, dialog boxes, dialog box buttons or options, icons, windows, Windows tabs, or LEDs.
<i>bold italic</i>	Bold italic text denotes a note, caution, or warning.
bold monospace	Bold text in this font denotes the messages and responses that the computer automatically prints to the screen. This font also emphasizes lines of code that are different from the other examples.
IEEE 488 and IEEE 488.2	<i>IEEE 488</i> and <i>IEEE 488.2</i> refer to the ANSI/IEEE Standard 488.1-1987 and the ANSI/IEEE Standard 488.2-1992, respectively, which define the GPIB.
<i>italic</i>	Italic text denotes emphasis, a cross reference, or an introduction to a key concept. This font also denotes text from which you supply the appropriate word or value, as in Windows 3.x.
<i>italic monospace</i>	Italic text in this font denotes that you must enter the appropriate words or values in the place of these items.

monospace

Text in this font denotes text or characters that should literally enter from the keyboard, sections of code, programming examples, and syntax examples. This font is also used for the proper names of disk drives, paths, directories, programs, subprograms, subroutines, device names, functions, operations, variables, filenames and extensions, and for statements and comments taken from programs.

Related Documentation

The following documents contain information that you may find helpful as you read this manual:

- ANSI/IEEE Standard 488.1-1987, *IEEE Standard Digital Interface for Programmable Instrumentation*
- ANSI/IEEE Standard 488.2-1992, *IEEE Standard Codes, Formats, Protocols, and Common Commands*
- ANSI/IEEE Standard 802.3-1988, *Information Processing Systems, Local Area Networks, Part 3*
- Microsoft Windows 95/98 Online Help, Microsoft Corporation

Additionally, you might need to refer to the documentation provided by your WinSock vendor.

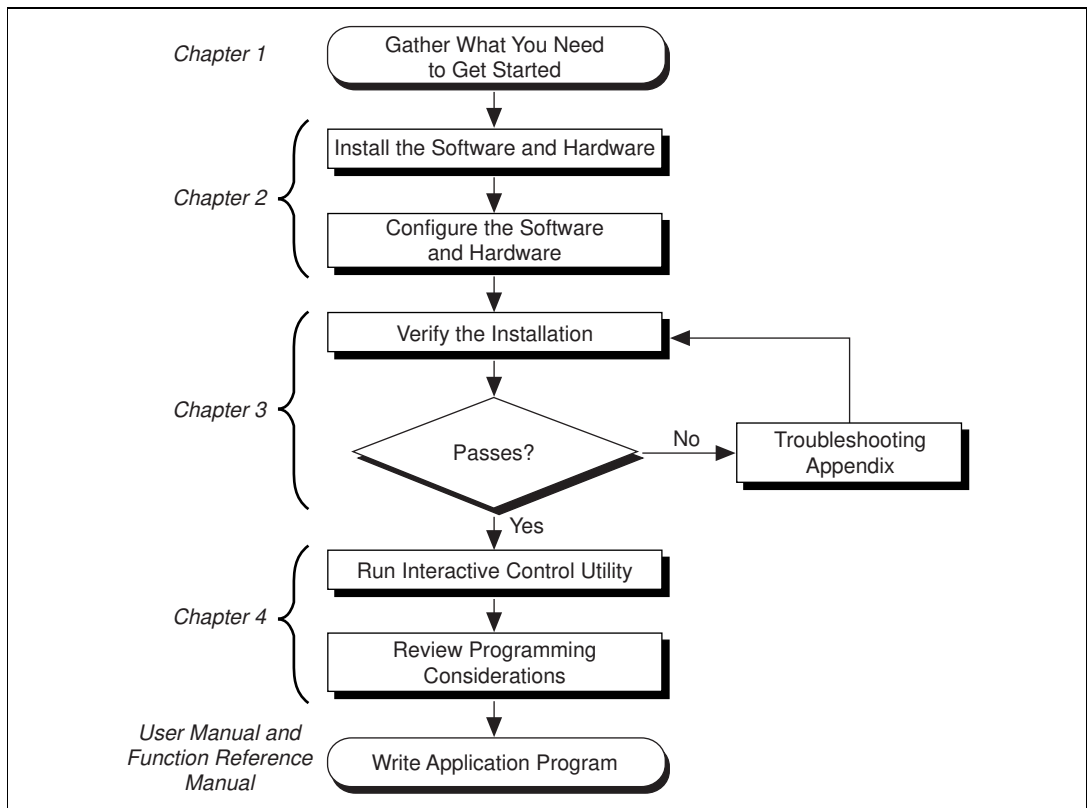
Customer Communication

National Instruments wants to receive your comments on our products and manuals. We are interested in the applications you develop with our products, and we want to help if you have problems with them. To make it easy for you to contact us, this manual contains comment and configuration forms for you to complete. These forms are in Appendix F, *Customer Communication*, at the end of this manual.

Introduction

This chapter explains how to use this manual, lists what you need to get started and optional equipment you can order, and briefly describes the GPIB-ENET hardware and the GPIB software.

How to Use This Manual



What You Need to Get Started

Make sure you have all of the items listed before you attempt to install the hardware and software.

- Windows 95 or later installed on your computer
- WinSock Interface version 1.1 or later installed on your computer
- One of the following boxes, which is included in your kit:
 - GPIB-ENET—10Base-T Version (100-120 VAC)
 - GPIB-ENET—10Base-T Version (220-240 VAC)
 - GPIB-ENET—Coax Version (100-120 VAC)
 - GPIB-ENET—Coax Version (220-240 VAC)
- One of the following power cords, which is included in your kit:
 - U.S.A. standard power cord
 - Switzerland power cord
 - Australian power cord
 - Universal European power cord
 - North American power cord
 - U.K. power cord
- The following 3.5 in., high-density (1.44 MB) disks, which are included in your kit:
 - *GPIB Software for Windows 95/98 (Disk 1 of 2)*
 - *GPIB Software for Windows 95/98 (Disk 2 of 2)*
- One of the following shielded GPIB cables, which you can purchase from National Instruments:
 - Type X1 single-shielded cables (1, 2, or 4 m)
 - Type X2 double-shielded cables (1, 2, or 4 m)
- One of the following Ethernet cables, which you can purchase from National Instruments:
 - Twisted Pair (10Base-T) cables (1, 5, or 10 m)
 - Coax (10Base-2) cables (1, 5, or 10 m)
 - AUI (10Base-5) cables (1, 5, or 10 m)



Note: *To meet FCC emission limits for this device, you must use a shielded (Type X1 or X2) GPIB cable. Operating this equipment with a non-shielded cable may cause interference to radio and television reception.*

Optional Equipment

Multiple-Computer Software License

A multiple-computer software license is available so that one or more hosts on a single physical network can access one or more GPIB-ENET boxes. Contact National Instruments for more information regarding the license.

Optional Hardware

Call National Instruments for more information about the following optional equipment:

- Serial or parallel bus extender and cables
- Bus expander/isolator
- GPIB mechanical switch

GPIB-ENET Hardware Overview

The GPIB-ENET transparently handles data transfers between an Ethernet-based TCP/IP host and the GPIB. With the GPIB-ENET, multiple hosts can share a set of GPIB instruments or a single host can control several GPIB systems.

The GPIB-ENET converts a computer equipped with the GPIB software and an Ethernet port into a GPIB Talker/Listener/Controller. It is powered by an internal 100-120 VAC or 220-240 VAC supply.

The GPIB-ENET has all the software and logic required to implement the physical and electrical characteristics of all versions of the ANSI/IEEE 488 standard, including ANSI/IEEE Standard 488.2-1992, and ANSI/IEEE Standard 802.3. The GPIB-ENET interprets and executes commands that you send to it over an Ethernet link and performs all necessary Ethernet-to-GPIB protocol conversions. For detailed hardware specifications, refer to Appendix E, [Specifications](#).

Figure 1-1 shows the seven light-emitting diodes (LEDs) on the GPIB-ENET top panel. The LEDs show the current status of the GPIB-ENET. Table 1-1 describes each LED.

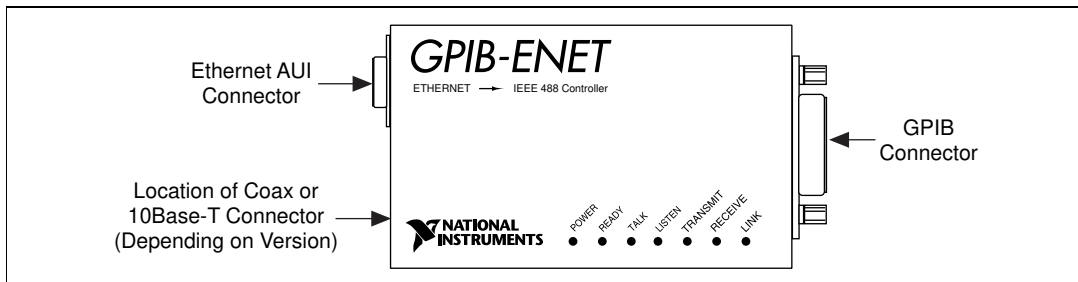


Figure 1-1. GPIB-ENET Top Panel and LEDs

Table 1-1. LED Descriptions

LED	Indication
POWER	Indicates that power has been supplied to the unit and the ON/OFF switch is in the ON position.
READY	Indicates the functional state of the GPIB-ENET. When the GPIB-ENET is powered on, this LED flashes and then becomes steady when the box is ready for operation. Continuous flashing indicates an error has occurred.
TALK	Indicates that the GPIB-ENET is configured as a GPIB Talker.
LISTEN	Indicates that the GPIB-ENET is configured as a GPIB Listener.
TRANSMIT	Indicates that the GPIB-ENET is transmitting onto the Ethernet network.
RECEIVE	Indicates that the GPIB-ENET is receiving Ethernet network traffic.
LINK	Indicates that the GPIB-ENET has detected a twisted pair (10Base-T) link. For GPIB-ENET coax and AUI options, this LED is not used and remains OFF.

GPIB Software Overview

The GPIB software includes a native, 32-bit multitasking driver that is fully Plug and Play aware.

The GPIB software supports the concurrent use of multiple types of GPIB hardware. For example, you can communicate with GPIB devices through an AT-GPIB/TNT, a PCMCIA-GPIB, and a GPIB-ENET in the same system at the same time. The GPIB software is fully integrated into the Windows operating system. It is configurable through the System applet and uninstallable through the Add/Remove Programs applet of the Control Panel.

The GPIB software, along with the GPIB-ENET hardware, transforms a general-purpose PC into a GPIB Talker/Listener/Controller with complete communications and bus management capability. The GPIB software includes the following components:

- Device driver
- Diagnostic utility
- Configuration utility
- Interactive control program
- Utilities for software development
- Language interface libraries for Microsoft Visual C/C++ 2.0 or later, Borland C/C++ 4.0 or later, and Microsoft Visual Basic 4.0 or later
- Example programs that use NI-488 functions and NI-488.2 routines

Refer to Appendix E, *Specifications*, for information about the GPIB software transfer rate for the GPIB-ENET.

Time-Saving Development Tools

Your kit includes the GPIB software. In addition, you can order the LabWindows/CVI or LabVIEW software from National Instruments to speed your application development time and make it easier to communicate with your instruments.

LabVIEW is an easy-to-use, graphical programming environment you can use to acquire data from thousands of different instruments, including IEEE 488.2 devices, VXI devices, serial devices, PLCs, and

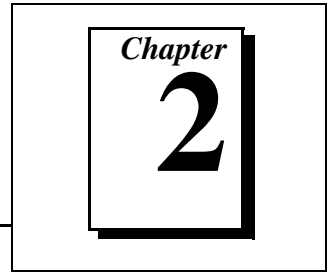
plug-in data acquisition boards. After you have acquired raw data, you can convert it into meaningful results using the powerful data analysis routines in LabVIEW. LabVIEW also comes with hundreds of instrument drivers, which dramatically reduce software development time, because you do not have to spend time programming the low-level control of each instrument.

LabWindows/CVI is similar to LabVIEW, except that it combines an interactive, easy-to-use development approach with the programming power and flexibility of compiled ANSI C code.

The GPIB Analyzer is another optional tool available from National Instruments that is useful in troubleshooting a variety of IEEE 488 hardware and software problems. With its built-in time-stamping capability, you can easily determine the throughput and overhead of your GPIB systems. The GPIB Analyzer software comes with the AT-GPIB/TNT+ and PCMCIA-GPIB+ products, which provide GPIB Analyzer support along with the functionality of a high-performance GPIB Controller.

For ordering information, or to request free demonstration software, contact National Instruments.

Installation and Configuration



This chapter describes how to install and configure the GPIB-ENET hardware and the GPIB software.

Install the GPIB Software

Before installing the GPIB-ENET hardware, complete the following steps to install the GPIB software.

1. Select **Start»Settings»Control Panel**.
2. Double-click on the **Add/Remove Programs** icon in the Control Panel to launch the Add/Remove Programs applet. A dialog box similar to the one in Figure 2-1 appears.



Figure 2-1. Add/Remove Programs Properties Dialog Box

Notice that you can use this same applet to uninstall the software at a later time. Refer to Appendix A, *Uninstall the Hardware and Software*, for more information.

3. Click on the **Install** button.
4. Insert the *GPIB Software for Windows 95/98 (Disk 1 of 2)*, and click on the **Next** button to proceed.
5. The software installation wizard begins with the screen shown in Figure 2-2. Click on the **Next** button to proceed with installation.



Figure 2-2. GPIB Software Setup Screen

The setup wizard guides you through the necessary steps to install the GPIB software. You may go back and change values where appropriate by choosing **Back**. You can exit the setup if necessary by choosing **Cancel**.

6. When the setup is complete, restart Windows.

Proceed to the next section, *Install the GPIB-ENET Hardware*.

Install the GPIB-ENET Hardware

Use the **Add New Hardware Wizard** to inform Windows about the new hardware you are about to install in your system.

1. Select **Start»Settings»Control Panel**.
2. Launch the **Add New Hardware Wizard** by double-clicking on the **Add New Hardware** icon.
3. Click on the **Next** button in the first **Add New Hardware Wizard** dialog box.

4. Because the GPIB/ENET is not a Plug and Play interface, Windows is unable to detect its presence automatically.

Windows 95:

When the next **Add New Hardware Wizard** dialog box offers to detect new hardware, check **No** instead of **Yes (Recommended)**, then click on the **Next** button to continue.

Windows 98:

- a. Click on the **Next** button in the next **Add New Hardware Wizard** dialog box.
 - b. In the next dialog box, check **No, the device isn't in the list**, then click on the **Next** button to continue.
 - c. In the next dialog box, check **No, I want to select the hardware from a list**, then click on the **Next** button to continue.
5. The next **Add New Hardware Wizard** dialog box lets you select the type of hardware you want to install. Select the **Other Devices** item, as shown in Figure 2-3. You may select the **National Instruments GPIB Interfaces** item instead, if it appears in the dialog box. Click on **Next** to continue.



Figure 2-3. Add New Hardware Wizard Hardware Selection

6. The next **Add New Hardware Wizard** dialog box lets you select the manufacturer and model of your hardware. Select **National Instruments** as the manufacturer and **GPIB-ENET** as the model, and click on **Next** to continue.
7. Click on **Finish** in the final **Add New Hardware Wizard** dialog box.

Configure the Software and Hardware

Step 1. Determine IP and Ethernet Addresses

The Internet Protocol (IP) address is the address that TCP/IP-based networks use to route information to the appropriate network and host. When you first install a GPIB-ENET in a network, or if the IP address for the GPIB-ENET changes, you must configure the GPIB-ENET IP address.

1. Note the Ethernet address from the identification label on the bottom panel of the GPIB-ENET.

The Ethernet address is not the same as the IP address. All devices on an Ethernet network are assigned a physical address, the Ethernet address, so that they can communicate with each other. See Figure 2-4 for a picture of the GPIB-ENET identification label.

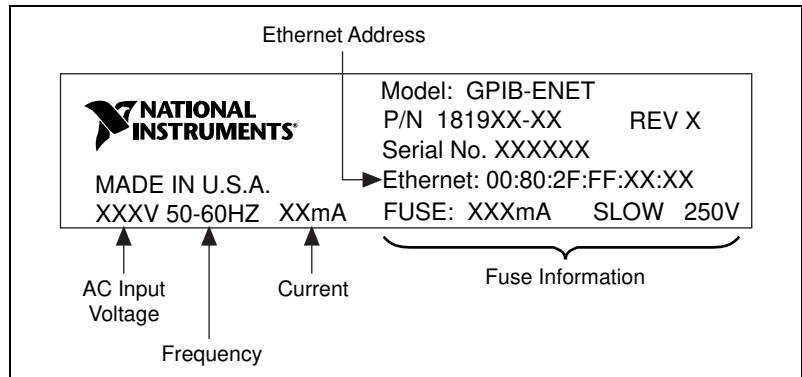


Figure 2-4. GPIB-ENET Bottom Panel Identification Label

2. Contact your network administrator for information about using the GPIB-ENET on your network.

Your network administrator reserves a unique, valid IP address for your GPIB-ENET. Your network administrator can also tell you whether the GPIB-ENET should have its IP address assigned by a RARP (Reverse Address Resolution Protocol) server, or manually using the Assign IP Address utility. You will use this information in the following steps.

Step 2. Configure the GPIB Software Characteristics

The GPIB Configuration utility is fully integrated with the Windows Device Manager. You can use it to examine or modify the configuration of the GPIB software. The context-sensitive online help, available by right-clicking on any of the controls on the configuration utility tabs, includes all of the information that you need to configure the GPIB software properly.

Configure the GPIB Interface

To begin to configure the GPIB software, double-click on the **System** icon under **Start»Settings»Control Panel**. In the **System Properties** dialog box that appears, select the **Device Manager** tab, click on the **View devices by type** button at the top of the tab, and scroll down to the **National Instruments GPIB Interfaces** icon.

To configure a particular interface, double-click on that interface in the list of installed interfaces immediately below **National Instruments GPIB Interfaces**.

The **GPIB Settings** tab provides information about the software configuration for the GPIB interface. Use the **Interface Name** drop-down box on this tab to select a logical name (**GPIB0**, **GPIB1**, and so on) for the GPIB interface. Repeat this process for each interface you need to configure. Figure 2-5 shows the **GPIB Settings** tab for a GPIB-ENET.

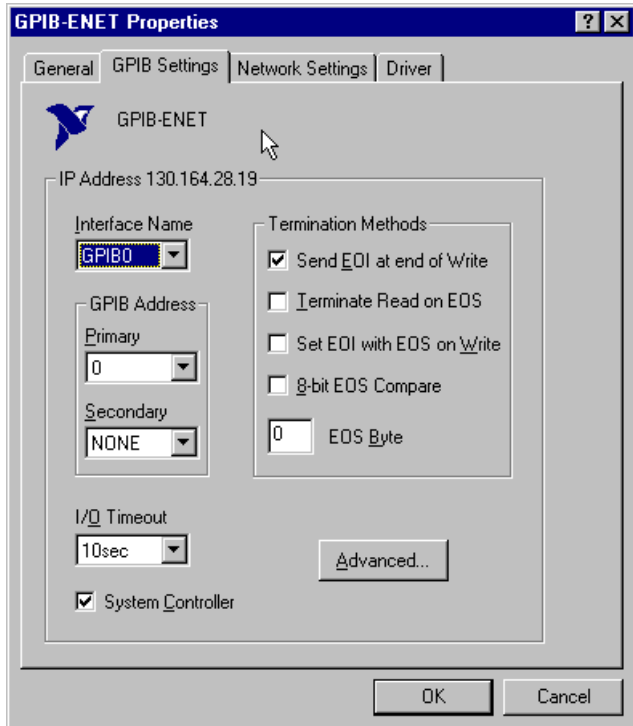


Figure 2-5. GPIB Settings Tab for the GPIB-ENET

Configure the Network Addresses

The Network Settings tab, shown in Figure 2-6, provides information about the network addresses assigned to the GPIB interface.

Enter the IP Address reserved by your network administrator in the IP address box on the **Network Settings** tab.

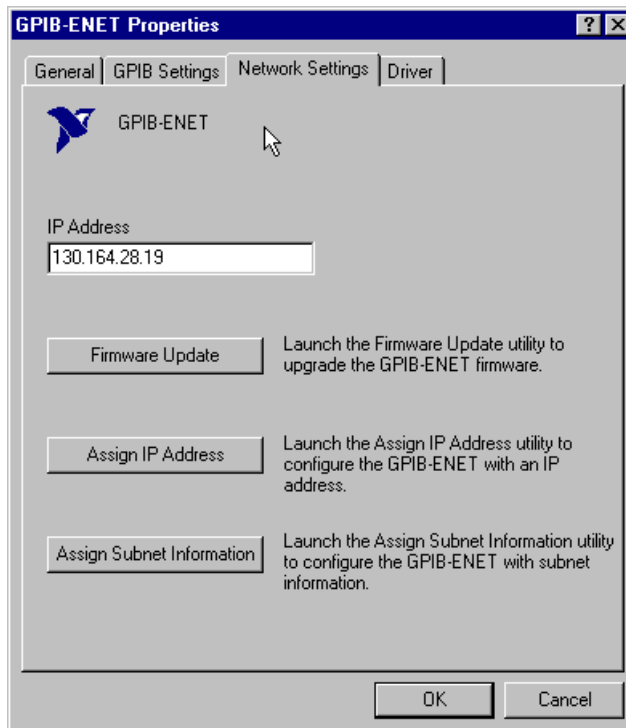


Figure 2-6. Network Settings Tab

The Network Settings tab also provides access to the three GPIB-ENET support utilities: Firmware Update, Assign IP Address, and Assign Subnet Information. To run any of these utilities, click on the corresponding button for that utility. Each utility includes built-in, context-sensitive online help.

Configure the Device Templates

If you want to examine or modify the logical device templates for the GPIB software, double-click on the **System** icon under **Start»Settings»Control Panel**. In the **System Properties** dialog box that appears, select the **Device Manager** tab, click on the **View devices by type** button at the top of the tab, scroll down to the **National Instruments GPIB Interfaces** icon, and click on the **Properties** button. Select the **Device Templates** tab to view the logical device templates, as shown in Figure 2-7.



Figure 2-7. Device Templates Tab for the Logical Device Templates

Step 3. Configure the GPIB-ENET Operating Characteristics

The GPIB-ENET has a two-position slide switch that you use to configure the network interface connector of the box. The GPIB-ENET also has an 8-bit DIP switch used to configure the operating characteristics. The switches are located on the back panel of the GPIB-ENET, as shown in Figure 2-8.

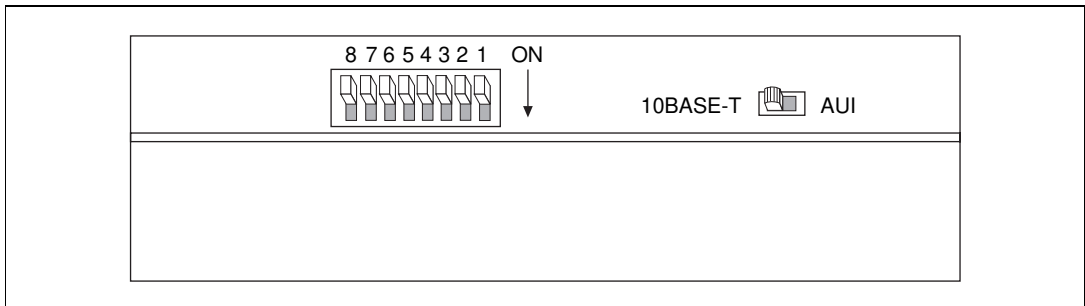


Figure 2-8. GPIB-ENET Back Panel Switches

Configure the Slide Switch

Your GPIB-ENET has two network interface connectors: a 15-pin AUI connector, and either a 10Base-T Ethernet connector or a coax Ethernet connector. Use the slide switch to select the connector the GPIB-ENET uses. The default switch setting is either 10Base-T or coax. Figure 2-9 depicts the default setting for the different types of GPIB-ENET boxes.

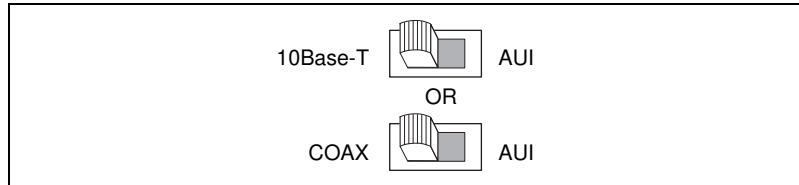


Figure 2-9. Default Switch Setting for Ethernet Port Configuration

If you want to use the AUI connector, change the switch setting to match the appropriate setting, as shown in Figure 2-10.

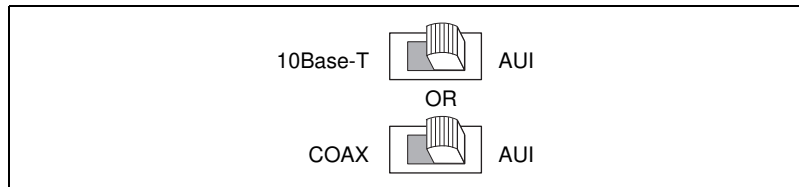


Figure 2-10. Switch Setting for AUI Ethernet Port Configuration

Configure the 8-Bit DIP Switch

The 8-bit DIP switch selects the operating mode of the GPIB-ENET. The GPIB-ENET is shipped to you with the DIP switches set for normal operation mode. In normal operation mode, all the switches are in the OFF position. Most customers use the GPIB-ENET in normal operating mode. Do not change the DIP switch settings unless you run a GPIB-ENET utility that prompts you to change them. For information about the 8-bit DIP switch, refer to Appendix B, [GPIB-ENET 8-Bit DIP Switch](#).

Step 4. Connect the Cables

If you do not have both a GPIB cable and an Ethernet cable, as listed in the *What You Need to Get Started* section of Chapter 1, *Introduction*, you can purchase them from National Instruments.

1. Connect one end of the Ethernet cable to the GPIB-ENET and securely fasten it. Connect the other end of the Ethernet cable to your Ethernet network. Be sure to follow all IEEE 802.3 cabling restrictions.
2. Connect one end of the GPIB cable to the GPIB-ENET and tighten the thumb screws on the connector. Connect the other end of the GPIB cable to your GPIB system. Be sure to follow all IEEE 488.1 cabling restrictions and use only shielded GPIB cables.
3. Plug the power cord into an AC outlet of the correct voltage.

Step 5. Switch on Your GPIB-ENET



Caution: *Operating the GPIB-ENET at any voltage other than the one specified could damage the unit.*

The GPIB-ENET is shipped from the factory with either a 100-120 VAC or 220-240 VAC power supply. Before you configure your GPIB-ENET, verify that the voltage rating listed on the bottom of the box matches the voltage that is supplied in your area.

Assign IP Address Using a RARP Server

Power on the GPIB-ENET. The **POWER** LED comes on immediately. The **READY** LED flashes while the GPIB-ENET completes its power-on self tests and assigns the IP address. When the **READY** LED remains steady, the unit is ready to operate.

The power-on self tests take about 10 seconds to complete, then the box obtains its IP address. The time required for the IP address assignment is highly dependent on your network and the configuration of your GPIB-ENET. If the **READY** LED does not become steady after one minute, refer to the *Troubleshooting Hardware Problems* section in Appendix D, *Troubleshooting and Common Questions*.

Assign IP Address Using the Assign IP Address Utility

If your network administrator instructs you to assign the IP address manually, you must run the **Assign IP Address** utility. Follow these instructions to configure and assign an IP Address.

1. To configure the IP Assign Protocol:
 - a. Select **Start»Settings»Control Panel**.
 - b. Double-click on the **Network** icon.
 - c. In the **Network** dialog box, click on the **Add...** button.
 - d. In the **Select Network Component Type** dialog box, select **Protocol** from the list of network components, and click on the **Add...** button.
 - e. In the **Select Network Protocol** dialog box, select **National Instruments** from the list of **Manufacturers** and select **National Instruments IPassign Protocol** from the **National Protocols** list, then click on the **OK** button.
 - f. In the **Network** dialog box, click on the **OK** button.
 - g. Reboot your computer when prompted. After your computer has rebooted, you may run the **Assign IP Address** utility.
2. To run the Assign IP Address utility:
 - a. Select **Start»Settings»Control Panel**.
 - b. Double-click on the **System** icon.
 - c. In the **System Properties** dialog box that appears, select the **Device Manager** tab, and double-click on the **National Instruments GPIB Interfaces** icon.
 - d. Double-click on the appropriate **GPIB-ENET** item in the list.
 - e. In the **GPIB-ENET Properties** dialog box that appears, select the **Network Settings** tab.
 - f. To run the **Assign IP Address** utility, click on the **Assign IP Address** button. This utility has built-in, context-sensitive online help, available by clicking on the **Help** button.

Step 6. Configure Subnet Information

Before you begin using the GPIB-ENET for your application, you should configure it with proper subnet information. Your GPIB-ENET may work properly even if you skip this step, but National Instruments recommends that you configure information about the subnet. This information includes the broadcast IP address and netmask to use on the

subnet and up to four router IP addresses. Run the Assign Subnet Information utility by clicking on the **Assign Subnet Information** button on the **Network Settings** tab of the Device Manager. This utility has built-in, context-sensitive online help, available by clicking on the **Help** button.

When you have finished configuring the software and hardware, proceed to Chapter 3, *Verify the Installation*.

Verify the Installation

This chapter describes how to verify that the hardware and software are functioning correctly.

Power-On Self Tests

When you power on your GPIB-ENET, the **POWER** LED comes on immediately. The **READY** LED flashes while the GPIB-ENET completes its power-on self-tests and is assigned an IP address. When the tests complete successfully and the IP address is assigned, the **READY** LED remains steady, indicating that the unit is ready to operate.

The power-on self tests take about 10 seconds to complete. The time required for the IP address assignment is highly dependent on your network and the configuration of your GPIB-ENET. If the **POWER** LED does not come on immediately or the **READY** LED continues to flash for more than 1 minute, refer to Appendix D, *Troubleshooting and Common Questions*.

Diagnostic Utility

The Diagnostic utility, installed with your GPIB software, verifies that your hardware and software are functioning properly. To run the utility, select the **Diagnostic** item under **Start»Programs»National Instruments GPIB**.

When you have started the Diagnostic utility, test your GPIB interfaces by clicking on the **Test All** button. If the Diagnostic is successful, it puts a checkmark next to the interface and changes its status from “untested” to “passed.” If the Diagnostic fails, it puts an X next to the interface, and changes its status from “untested” to “failed.” Figure 3-1 shows the Diagnostic utility after it has tested some GPIB interfaces.

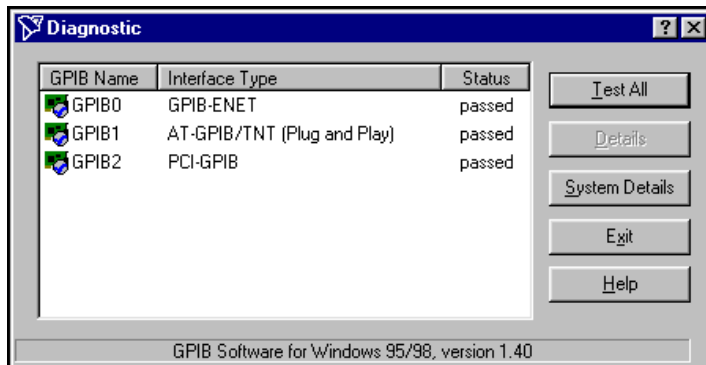
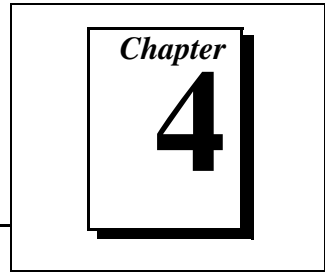


Figure 3-1. Diagnostic Utility after Testing

You can get details on any tested GPIB interface by selecting the interface and clicking on the **Details** button. For each failed GPIB interface, select it and click on the **Details** button to get a description of the failure. Use that information and the information in Appendix D, *Troubleshooting and Common Questions*, to troubleshoot the problem. Troubleshooting information is also available in the online help for the Diagnostic utility, which you can access by clicking on the **Help** button.

Begin to Use the GPIB Software



This chapter helps you get started with the GPIB software.

Introduction to the Win32 Interactive Control Utility

You can use the interactive control utility to enter NI-488 functions and NI-488.2 routines interactively and see the values returned by the function calls. You can use the utility to do the following:

- Verify GPIB communication with your device.
- Learn the NI-488 functions and NI-488.2 routines before you write your application.
- Become familiar with the commands of your device.
- Receive data from your GPIB device.
- Troubleshoot problems with your application.

To run this utility, select the **Win32 Interactive Control** item under **Start»Programs»National Instruments GPIB**. This utility includes extensive online help, available by entering `help` at the `:` prompt.

For more information about the Win32 Interactive Control utility, refer to the *GPIB User Manual for Win32*.

Introduction to the NI Spy Utility

Included with the GPIB software is NI Spy, a Win32 utility that can be used to monitor NI-488.2 calls made by Win32, Win16, and DOS GPIB applications. You can use NI Spy to do the following:

- Capture information about NI-488 functions and NI-488.2 routines as they are invoked by your GPIB applications.
- Display captured information, including, but not limited to, input and output parameter values, I/O buffer contents, and return values.
- Save, restore, and print captured information.

To run NI Spy, select the **NI Spy** item under **Start»Programs»National Instruments GPIB**. For more information about the NI Spy utility, refer to Chapter 5, *NI Spy Utility*, in the *GPIB User Manual for Win32*, or use its built-in, context-sensitive online help.

Running Existing DOS GPIB Applications

With the GPIB software properly configured, you can run your existing DOS GPIB applications along with your Win16 and Win32 applications. No DOS device driver is required. In fact, make sure that no older version of the GPIB DOS device driver is being loaded from your `config.sys` file, a file located on the boot drive of your computer.



Note: *To determine if `config.sys` is loading an older GPIB DOS driver, look for the line `device=<path>\gpib.com` in your `config.sys` file, where `<path>` refers to the drive and directory where `gpib.com` is located. If that line appears, either delete it or comment it out, and restart your computer.*

To configure the GPIB software to run existing DOS GPIB applications, first make sure that you have installed the GPIB software and your GPIB hardware. Then complete the following steps:

1. Double-click on the **System** icon under **Start»Settings»Control Panel**.
2. In the **System Properties** dialog box that appears, select the **Device Manager** tab.
3. Click on the **View devices by type** radio button at the top of the page.
4. Click on the **National Instruments GPIB Interfaces** icon.
5. Click on the **Properties** button to display the **General** property page for the GPIB software.
6. Select the check box labeled **Enable Support for DOS GPIB Applications**, and click on the **OK** button.
7. Restart your computer.

After you restart your computer, you can begin to run your existing DOS GPIB applications.

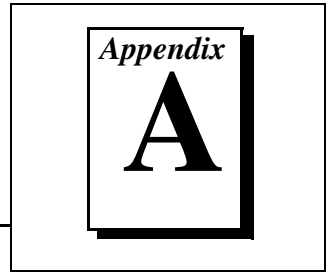
General Programming Considerations

As you begin developing your Win32 GPIB application, remember the following points:

- For your C/C++ application, you must include the GPIB header file in your source code.
- The GPIB software is accessed through the 32-bit DLL, `gpib-32.dll`, either by linking with one of the language interfaces provided with the GPIB software, or by using direct DLL entry from other programming environments.
- Several sample GPIB applications are included with the GPIB software. Use these as a guide for your own application development.

For information about choosing a programming method, developing your application, or compiling and linking, refer to the *GPIB User Manual for Win32*. For detailed information about each NI-488 function and NI-488.2 routine, refer to the *NI-488.2M Function Reference Manual for Win32*.

Uninstall the Hardware and Software



This appendix describes how to uninstall your GPIB-ENET and the GPIB software.

Uninstalling the Hardware

Before you physically remove the GPIB-ENET hardware from your system, you must remove the hardware information from the Windows Device Manager. Complete the following steps to remove the hardware information:

1. Select **Start»Settings»Control Panel** and double-click on the **System** icon.
2. In the **System Properties** dialog box, select the **Device Manager** tab, click on the **View devices by type** button, and double-click on the **National Instruments GPIB Interfaces** icon.
3. Select the interface you want to remove from the **National Instruments GPIB Interfaces** list, as shown in Figure A-1. Click on the **Remove** button to remove the hardware information.
4. Click on the **OK** button, shut down Windows, turn off your system, and physically remove the interface from your system.

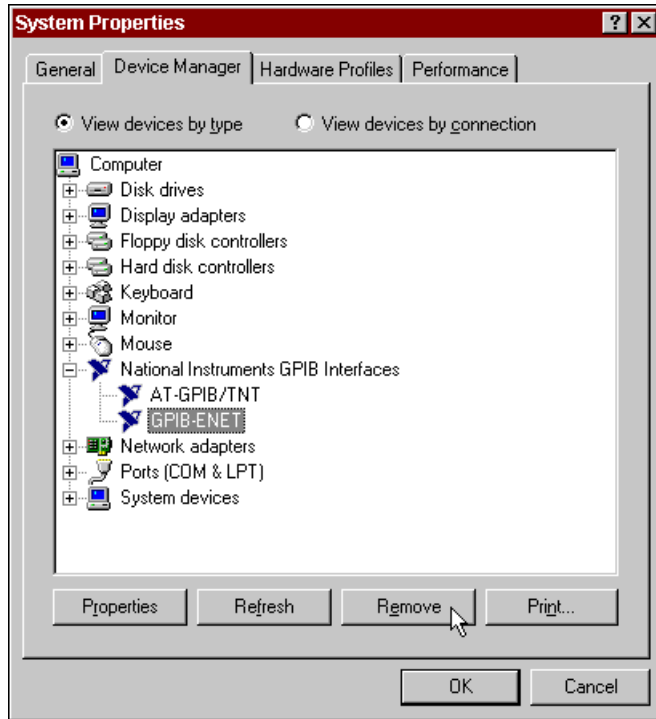


Figure A-1. Selecting an Interface to Remove

Uninstalling the Software

Before you uninstall the GPIB software, you should remove all GPIB hardware information from the Windows Device Manager, as described in the previous section. Complete the following steps to uninstall the GPIB software:

1. Select **Start»Settings»Control Panel** and double-click on the **Add/Remove Programs** icon. The dialog box shown in Figure A-2 lists the software available for removal.

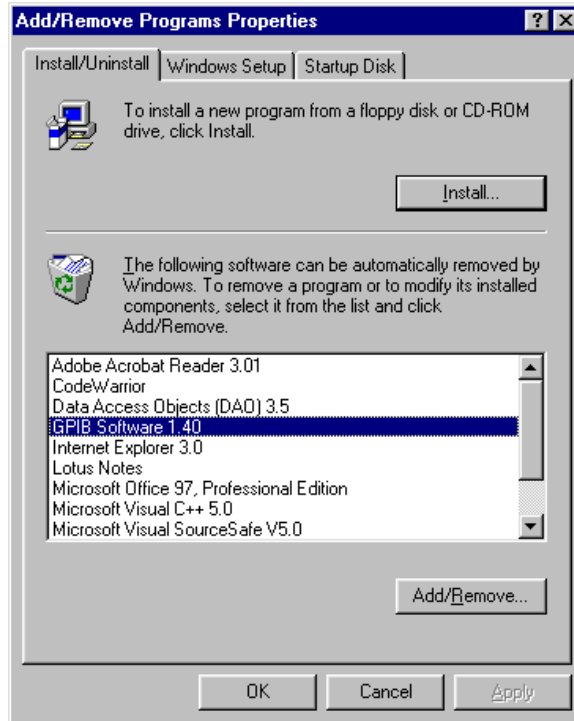


Figure A-2. Add/Remove Programs Properties Dialog Box

2. Select the GPIB software you want to remove and click on the **Add/Remove** button. The uninstall program removes all folders, programs, VxDs, DLLs, and registry entries associated with the GPIB software.

The uninstall program removes only items that the GPIB setup program installed. If you add anything to a directory that was created by the GPIB setup program, the uninstall program does not delete that directory, because the directory is not empty after the uninstallation. You will need to remove any remaining components yourself.

If you want to reinstall the GPIB hardware and software, refer to Chapter 2, *Installation and Configuration*.

GPIB-ENET 8-Bit DIP Switch

Appendix B

This appendix describes how the 8-bit DIP switch on the back panel can affect the operation of the GPIB-ENET.

The 8-bit DIP switch is located on the back panel of the GPIB-ENET, as shown in Figure B-1. The DIP switches are used to set the operation mode of the GPIB-ENET. The GPIB-ENET is shipped to you with the DIP switches set for normal operation mode; all the switches are in the OFF position.

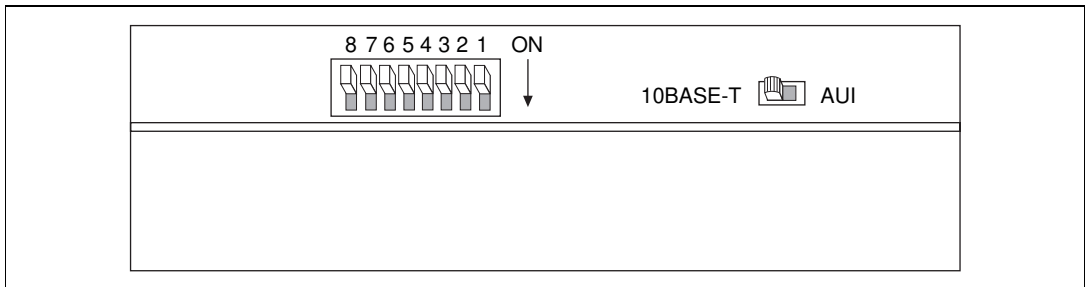


Figure B-1. GPIB-ENET Back Panel Switches

8-Bit DIP Switch Descriptions

Table B-1 shows the possible configurations of the GPIB-ENET DIP switches and what each configuration indicates. The entries in ***bold italic*** text represent the default settings.

Table B-1. DIP Switch Settings for Modes of Operation

Switch	Position	Indication
8	ON	Extended Factory Test
	<i>OFF</i>	<i>Normal Operation</i>
7	ON	Modify Mode
	<i>OFF</i>	<i>Normal Operation</i>
6	ON	Use Stored IP Address
	<i>OFF</i>	<i>Obtain IP Address</i>
5	ON	Manual IP Assignment
	<i>OFF</i>	<i>Automatic IP Assignment</i>
1-4	<i>OFF</i>	<i>These switches are reserved and should remain OFF.</i>

Switch 8 selects the Extended Factory Test mode and should remain OFF for normal operating mode. When this switch is ON, the GPIB-ENET performs extended tests which require special connections to the GPIB and Ethernet ports. Without these connections, the GPIB-ENET cannot pass the extended factory tests.

Switch 7 selects the Modify Mode and should remain OFF for normal operating mode. The firmware controlling the GPIB-ENET is stored in an electrically erasable memory. When this switch is ON, you can reprogram the firmware memory from the Ethernet network using the Firmware Update utility, or you can modify the subnet information using the Assign Subnet Information utility. To run one of these utilities, click the button with its name on the **Network Settings** tab of the Device Manager. Both of these utilities have built-in, context-sensitive online help.

To get to the **Network Settings** tab, complete the following steps:

1. Double-click on the **System** icon under **Start»Settings»Control Panel**.
2. In the **System Properties** dialog box that appears, select the **Device Manager** tab.
3. Click on the **View devices by type** button at the top of the **Device Manager** tab.
4. Double-click on the **National Instruments GPIB Interfaces** icon.
5. Select the GPIB-ENET from the list of interfaces and click on the **Properties** button.
6. Select the **Network Settings** tab.

Switch 6 indicates how the GPIB-ENET IP address is determined when it is powered on. If switch 6 is OFF, the GPIB-ENET expects to receive its IP address from the network each time it is powered on. Each time the IP address is received from the network, the GPIB-ENET stores it in nonvolatile memory. If switch 6 is ON, the GPIB-ENET retrieves the IP address that is stored in nonvolatile memory.

Switch 5 selects the method by which IP addresses are configured in the GPIB-ENET. When switch 5 is OFF, the GPIB-ENET issues RARP (Reverse Address Resolution Protocol) requests each time it is powered on. The GPIB-ENET continues to issue RARP requests until a valid RARP reply is received. If switch 5 is ON, the GPIB-ENET does not issue RARP requests.

In most networks, the GPIB-ENET can use RARP to have its address automatically configured; however, there are some networks which, for security or other reasons, do not use RARP. In this case, you must manually configure the IP address of the GPIB-ENET by running the **Assign IP Address** utility, which is accessible through the **Network Settings** tab of the Device Manager. This utility has built-in, context-sensitive online help, available by clicking on the **Help** button.

Note that if switch 6 is ON, the setting of Switch 5 is ignored.

Switches 1-4 are reserved for future expansion and should remain OFF.

READY LED Signaling

Appendix

C

This appendix describes how to interpret the **READY** LED error codes.

READY LED Overview

The **READY** LED has several purposes on the GPIB-ENET. When you first power on the GPIB-ENET, the **READY** LED flashes quickly while it completes its power-on self-tests. When the tests complete successfully and the IP address is assigned from either nonvolatile memory or the network, the **READY** LED remains steady, indicating that the unit is ready to operate.

During operation, the **READY** LED might begin to blink slowly. This occurs after running the Firmware Update utility, when the GPIB-ENET reports status on the operation. At other times, the **READY** LED blinks slowly to alert you of internal GPIB-ENET errors. For assistance in correcting this problem, use this appendix to interpret and record the pattern that the **READY** LED flashes, and then contact National Instruments.



Note:

*By recording the **READY** LED status messages before calling National Instruments, you can save yourself time, and the GPIB Product Support Department can answer your questions more accurately and efficiently. Do not switch off power to your GPIB-ENET before recording the flashing **READY** LED pattern.*

READY LED signaling can report up to 100 different errors. The errors are numbered from 0 to 99 and are reported through sequences of **READY** LED flashes.

Step 1. Count the Long Flashes

A 3-second interval, during which the **READY** LED is OFF, separates each repetition of the sequence. The sequence begins with a series of long 1-second flashes—that is, one second ON, one second OFF. These long flashes represent the digit in the tens column. The long flashes

appear in sets of one to ten, which represent digits 0 through 9. For example, one long flash represents the digit 0 in the tens column, two long flashes represent the digit 1 in the tens column, and 10 long flashes represent the digit 9 in the tens column.

Step 2. Count the Short Flashes

The long flashes are followed by shorter flashes; each short flash lasts about one-fifth of a second. These short flashes represent the digit in the ones column. Flashes occur in sets of one to ten, which represent the digits 0 through 9. For example, one short flash represents the digit 0 in the ones column, two short flashes represent the digit 1 in the ones column, and 10 short flashes represent a 9 in the ones column.

Using this method, the **READY** LED flashes the following sequence to represent status message 11.

<three seconds OFF> <two long flashes> <two short flashes> <three seconds OFF> . . .

The **READY** LED flashes the following sequence to represent status message 30.

<three seconds OFF> <four long flashes> <one short flash> <three seconds OFF> . . .

Step 3. Record Your Status Code Number

When you have computed your status code number, record it on the *Hardware and Software Configuration Form* in Appendix F, *Customer Communication*, before calling National Instruments.

Table C-1 lists some examples of the long and short flashes and the status codes they report.

Table C-1. Sample READY LED Signals and the Corresponding Status Code Numbers

Number of Long Flashes	Number of Short Flashes	Corresponding Status Code Number
1	1	00
2	1	10
5	3	42
1	8	07
3	4	23
10	10	99

Troubleshooting and Common Questions

Appendix

D

This appendix describes how to troubleshoot problems and answers some common questions.

Troubleshooting Hardware Problems



Warning: *Do not attempt to open and service the box. The GPIB-ENET contains circuitry that operates with hazardous voltages. Refer servicing to qualified personnel.*

- Verify that all cables are securely connected to the GPIB-ENET.
- Verify that the GPIB-ENET is powered on. If the unit is powered on and plugged into an outlet of the proper voltage, yet you see no LED activity, check the condition of the fuse.



Warning: *For continued protection against fire, replace the fuse with only the same type and rating of fuse. See Appendix E, [Specifications](#), for fuse specifications.*

- Verify that the Ethernet port configuration slide switch is set to the correct Ethernet port. Refer to the [Configure the Slide Switch](#) section of Chapter 2, [Installation and Configuration](#), for more information.
- Verify that the DIP switch settings are configured properly for your setup. Refer to Appendix B, [GPIB-ENET 8-Bit DIP Switch](#), for more information.
- Verify with the system administrator that your IP address is valid and that the network is set up to recognize the IP address properly.
- If you configured the IP address manually using the Assign IP Address utility, verify that you have followed the steps in the online help for that utility.
- If the **READY** LED continues to flash for more than one minute, you have a problem with your setup. If the **READY** LED is flashing quickly, the GPIB-ENET is unable to obtain its IP address from the network. In this case, check with your network administrator to

verify your IP address and make sure that you recorded the Ethernet address correctly. If the **READY** LED is blinking slowly, the GPIB-ENET has an internal error. In this case, refer to Appendix C, *READY LED Signaling*, to determine which error is being reported and contact National Instruments.

Troubleshooting EDVR Error Conditions

In some cases, calls to NI-488 functions or NI-488.2 routines may return with the ERR bit set in `ibsta` and the value EDVR in `iberr`. The value stored in `ibcntl` is useful in troubleshooting the error condition.

EDVR Error Condition with `ibcntl` Set to 0xE028002C (-534249428)

If a call is made with a board number that is within the range of allowed board numbers (typically 0 to 3), but which has not been assigned to a GPIB interface, an EDVR error condition occurs with `ibcntl` set to 0xE028002C. You can assign a board number to a GPIB interface by configuring the GPIB software and selecting an interface name. For information on how to configure the GPIB software, refer to *Configure the Software and Hardware* in Chapter 2, *Installation and Configuration*.

EDVR Error Condition with `ibcntl` Set to 0xE0140025 (-535560155)

If a call is made with a board number that is not within the range of allowed board numbers (typically 0 to 3), an EDVR error condition occurs with `ibcntl` set to 0xE0140025.

EDVR Error Condition with `ibcntl` Set to 0xE0140035 (-535560139)

If a call is made with a device name that is not listed in the logical device templates that are part of the GPIB Configuration utility, an EDVR error condition occurs with `ibcntl` set to 0xE0140035.

EDVR Error Conditions with `ibcntl` in the Range from 0xE1002710 (-520083696) to 0xE1002EE0 (-520081696)

These errors are returned from the WinSock Interface. The lower 16 bits of `ibcntl` specify the actual WinSock Interface error. For more information about the specific error, refer to your WinSock Interface documentation.

EDVR Error Condition with `ibcntl` set to `0xE1030043 (-519897021)`

This error occurs if you have enabled DOS GPIB support and attempted to run an existing GPIB DOS application that was compiled with an older, unsupported DOS language interface.

Troubleshooting Diagnostic Utility Failures

The following sections explain common error messages generated by the Diagnostic utility.

Missing Software Components

This error occurs if the software components that are necessary for the GPIB software to function correctly are not present in the system. If you encounter this problem, reinstall the GPIB software and run the Diagnostic utility again.

No GPIB Interfaces Present

This error occurs if there are no GPIB interfaces physically present in the system or if you have not assigned logical board names to your GPIB interfaces using the Device Manager. If you encounter this problem, use the Device Manager to examine the installed GPIB interfaces and the logical board names assigned to each. Then, run the Diagnostic utility again.

To access this information in the Device Manager, complete the following steps:

1. Double-click on the **System** icon under **Start»Settings»Control Panel**.
2. In the **System Properties** dialog box that appears, select the **Device Manager** tab.
3. Click on the **View devices by type** radio button at the top of the **Device Manager** tab.
4. Double-click on the **National Instruments GPIB Interfaces** icon. If there is no **National Instruments GPIB Interfaces** icon, either no GPIB interfaces are installed in your system or the GPIB software is installed incorrectly.
5. After you have opened the **National Instruments GPIB Interfaces** icon, double-click on the GPIB interface name and select the **GPIB Settings** tab to examine the logical board name associated with that

interface. If it is set to **None**, change it to the appropriate name, such as **GPIB0**.

GPIB-ENET Problem Encountered

This error occurs if an unknown problem is encountered while attempting to access the GPIB-ENET. There are several possible reasons that you might encounter this problem:

- The GPIB-ENET might not be properly configured. Refer to the [Configure the Software and Hardware](#) section in Chapter 2, [Installation and Configuration](#), for detailed instructions.
- The **IP Address** field in the GPIB Configuration utility might be incorrect for the GPIB-ENET. Run the GPIB Configuration utility, as described under [Step 2. Configure the GPIB Software Characteristics](#) in Chapter 2, [Installation and Configuration](#), to verify that the IP address value has been correctly specified.
- The GPIB-ENET might not be correctly configured for your network. Try to ping your GPIB-ENET to make sure it is recognizable on the network. The ping utility is a network utility that sends a packet to a device/host on the network, then waits for it to be echoed back, which indicates an active device/host. Your WinSock provider probably came with a ping utility. Find the directory where `ping.exe` is installed and type in the following command:

```
ping IPaddress
```

where *IPaddress* is the IP address assigned to your GPIB-ENET. If your network administrator assigned you a hostname also, you can type in `ping hostname` instead. If ping is unable to communicate with your GPIB-ENET and your network administrator tells you that your IP address is valid, contact National Instruments.

Missing WinSock Support

This error occurs only when the GPIB interface being tested is a GPIB-ENET and the Diagnostic utility is unable to detect the presence of a proper version of WinSock support.

WinSock support is enabled and configured in the **Network** control panel applet. To run the applet, perform the following steps.

1. Double-click on the **Network** icon under **Start»Settings»Control Panel**.

2. In the **Network** dialog box that appears, select the **Configuration** tab.
3. On the **Configuration** tab, click on the **Add** button.
4. In the **Select Network Component Type** dialog box that appears, choose **Protocol** from the component list and click on the **Add** button.
5. In the **Select Network Protocol** dialog box that appears, choose the appropriate manufacturer and protocol from the listboxes.

Because numerous network providers and various protocols are available in this dialog box, you should consult your network provider's documentation to discover which protocol listed actually provides WinSock support from that vendor. For example, Microsoft WinSock support is available by choosing **TCP/IP** in the **Network Protocols** listbox after choosing **Microsoft** in the **Manufacturers** listbox. You should also consult your network provider's documentation for details concerning additional configuration steps required for the chosen protocol.

After you have properly installed and configured WinSock support, run the Diagnostic utility again.

GPIB Cables Need to Be Disconnected

This error occurs if you have any GPIB cables connected to the GPIB interface. Disconnect all GPIB cables and run the Diagnostic utility again.

GPIB Software Problem Encountered

This error occurs if the Diagnostic utility detects that it is unable to communicate correctly with the GPIB hardware using the installed GPIB software. If you get this error, shut down your computer, restart it, and run the Diagnostic utility again. If the problem persists, try reinstalling the GPIB software.

Unknown Problem Encountered

This error occurs if an unknown problem is encountered while trying to execute the Diagnostic utility. If you encounter this problem, shut down your computer, restart it, and run the Diagnostic utility again. If the problem persists, try reinstalling the GPIB software.

Common Questions

I do not currently have a WinSock provider installed. What do I need to do to install a WinSock provider?

Before you can use the driver software for the GPIB-ENET, you must have a WinSock interface, version 1.1 or later, installed. You can install a WinSock interface from Microsoft or another network vendor. Refer to the [Missing WinSock Support](#) section of this appendix for information on installing and configuring WinSock support.

My driver is not communicating with the GPIB-ENET. What should I do?

Make sure that the GPIB-ENET is configured properly. Refer to Chapter 2, [Installation and Configuration](#).

My I/O worked with a board interface, but it times out when I use the GPIB-ENET interface. What should I do?

Network communication is slower than straight cable communication. You might need to raise the default **Timeout** value using the GPIB Configuration utility. Refer to [Step 2. Configure the GPIB Software Characteristics](#) in Chapter 2, [Installation and Configuration](#), for information about the GPIB Configuration utility.

I powered off my GPIB-ENET before recording the flashing READY LED pattern. What should I do?

Try to duplicate the error before calling National Instruments for assistance. Recording the **READY** LED pattern is not critical to the operation of your GPIB-ENET, but it saves you time and helps National Instruments to diagnose the problem quickly and accurately.

How can I determine which type of GPIB hardware I have installed?

Run the GPIB Configuration utility: select **Start»Settings»Control Panel** and double-click on the **System** icon. Select the **Device Manager** tab in the **System Properties** dialog box. Click on the **View devices by type** radio button at the top of the page. If any GPIB hardware is correctly installed, a **National Instruments GPIB Interfaces** icon

appears in the list of device types. Double-click on this icon to see a list of installed GPIB hardware.

How can I determine which version of the GPIB software I have installed?

Run the Diagnostic utility: select the **Diagnostic** item under **Start»Programs»National Instruments GPIB**. A banner at the bottom of the Diagnostic utility window displays the version of the GPIB software that is installed.

What do I do if the Diagnostic utility fails with an error?

Use the Diagnostic utility online help, or refer to the troubleshooting sections earlier in this appendix. If you have already completed the troubleshooting steps, fill out the forms in Appendix F, *Customer Communication*, and contact National Instruments.

How many GPIB interfaces can I configure for use with my GPIB software?

You can configure the GPIB software to communicate with up to 100 GPIB interfaces.

How many devices can I configure for use with my GPIB software?

The GPIB software provides a total of 1,024 logical devices for applications to use. The default number of devices is 32. The maximum number of physical devices you should connect to a single GPIB interface is 14, or fewer, depending on your system configuration.

How can I determine if my GPIB hardware and software are installed properly?

Run the Diagnostic utility: select the **Diagnostic** item under **Start»Programs»National Instruments GPIB**. Refer to the *Troubleshooting Diagnostic Utility Failures* section in this appendix or the online help to troubleshoot any problems.

When should I use the Win32 Interactive Control utility?

You can use the Win32 Interactive Control utility to test and verify instrument communication, troubleshoot problems, and develop your application program. For more information, refer to Chapter 4, [Begin to Use the GPIB Software](#).

How do I use a GPIB language interface?

For information about using GPIB language interfaces, refer to Chapter 3, *Developing Your Application*, in the *GPIB User Manual for Win32*.

Why does the uninstall program leave some components installed?

The uninstall program removes only items that the GPIB setup program installed. If you add anything to a directory that was created by the GPIB setup program, the uninstall program does not delete that directory, because the directory is not empty after the uninstallation. You need to remove any remaining components yourself.

What information should I have before I call National Instruments?

When you call National Instruments, you should have the results of the Diagnostic utility test. Also, make sure you have filled out the forms in Appendix F, [Customer Communication](#).

Specifications

Appendix

E

This appendix describes the characteristics of the GPIB-ENET, the transfer rates of the GPIB software, and the recommended operating conditions.

Hardware Characteristics

Table E-1. Electrical Characteristics

Characteristic	Specification
Power Supply Unit	100–120 VAC 220–240 VAC
Maximum Current Requirement	100–120 VAC 110 mA or 220–240 VAC 55 mA
Fuse Rating and Type	100–120 VAC 300 mA, UL/CSA approved, or 220–240 VAC 500 mA, IEC approved

Table E-2. Environmental Characteristics

Characteristic	Specification
Operating Temperature	0° to 40° C
Storage Temperature	–20° to 70° C
Relative Humidity	10% to 90% noncondensing conditions
EMI	FCC Class A Verified

Table E-3. Physical Characteristics

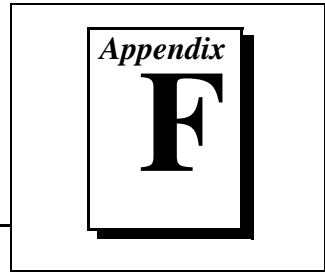
Characteristic	Specification
Overall Case Size (Dimensions)	8.89 by 14.35 by 4.11 cm (3.5 by 5.65 by 1.62 in.)
Case Material	All metal enclosure
Weight	0.41 kg (0.9 lb)

Software Transfer Rate

Table E-4. GPIB Software Transfer Rate for the GPIB-ENET

Transfer Method	Maximum GPIB Transfer Rate
3-wire (IEEE 488)	74 kbytes/s*
* Actual speed may vary considerably from speed shown because of system and instrumentation capabilities.	

Customer Communication



For your convenience, this appendix contains forms to help you gather the information necessary to help us solve your technical problems and a form you can use to comment on the product documentation. When you contact us, we need the information on the Technical Support Form and the configuration form, if your manual contains one, about your system configuration to answer your questions as quickly as possible.

National Instruments has technical assistance through electronic, fax, and telephone systems to quickly provide the information you need. Our electronic services include a bulletin board service, an FTP site, a fax-on-demand system, and e-mail support. If you have a hardware or software problem, first try the electronic support systems. If the information available on these systems does not answer your questions, we offer fax and telephone support through our technical support centers, which are staffed by applications engineers.

Electronic Services

Bulletin Board Support

National Instruments has BBS and FTP sites dedicated for 24-hour support with a collection of files and documents to answer most common customer questions. From these sites, you can also download the latest instrument drivers, updates, and example programs. For recorded instructions on how to use the bulletin board and FTP services and for BBS automated information, call 512 795 6990. You can access these services at:

United States: 512 794 5422

Up to 14,400 baud, 8 data bits, 1 stop bit, no parity

United Kingdom: 01635 551422

Up to 9,600 baud, 8 data bits, 1 stop bit, no parity

France: 01 48 65 15 59

Up to 9,600 baud, 8 data bits, 1 stop bit, no parity

FTP Support

To access our FTP site, log on to our Internet host, `ftp.natinst.com`, as anonymous and use your Internet address, such as `joesmith@anywhere.com`, as your password. The support files and documents are located in the `/support` directories.

Fax-on-Demand Support

Fax-on-Demand is a 24-hour information retrieval system containing a library of documents on a wide range of technical information. You can access Fax-on-Demand from a touch-tone telephone at 512 418 1111.

E-Mail Support (Currently USA Only)

You can submit technical support questions to the applications engineering team through e-mail at the Internet address listed below. Remember to include your name, address, and phone number so we can contact you with solutions and suggestions.

support@natinst.com

Telephone and Fax Support

National Instruments has branch offices all over the world. Use the list below to find the technical support number for your country. If there is no National Instruments office in your country, contact the source from which you purchased your software to obtain support.

Country	Telephone	Fax
Australia	03 9879 5166	03 9879 6277
Austria	0662 45 79 90 0	0662 45 79 90 19
Belgium	02 757 00 20	02 757 03 11
Brazil	011 288 3336	011 288 8528
Canada (Ontario)	905 785 0085	905 785 0086
Canada (Québec)	514 694 8521	514 694 4399
Denmark	45 76 26 00	45 76 26 02
Finland	09 725 725 11	09 725 725 55
France	01 48 14 24 24	01 48 14 24 14
Germany	089 741 31 30	089 714 60 35
Hong Kong	2645 3186	2686 8505
Israel	03 6120092	03 6120095
Italy	02 413091	02 41309215
Japan	03 5472 2970	03 5472 2977
Korea	02 596 7456	02 596 7455
Mexico	5 520 2635	5 520 3282
Netherlands	0348 433466	0348 430673
Norway	32 84 84 00	32 84 86 00
Singapore	2265886	2265887
Spain	91 640 0085	91 640 0533
Sweden	08 730 49 70	08 730 43 70
Switzerland	056 200 51 51	056 200 51 55
Taiwan	02 377 1200	02 737 4644
United Kingdom	01635 523545	01635 523154
United States	512 795 8248	512 794 5678

Technical Support Form

Photocopy this form and update it each time you make changes to your software or hardware, and use the completed copy of this form as a reference for your current configuration. Completing this form accurately before contacting National Instruments for technical support helps our applications engineers answer your questions more efficiently.

If you are using any National Instruments hardware or software products related to this problem, include the configuration forms from their user manuals. Include additional pages if necessary.

Name _____

Company _____

Address _____

Fax (____) _____ Phone (____) _____

Computer brand _____ Model _____ Processor _____

Operating system (include version number) _____

Clock speed _____ MHz RAM _____ MB Display adapter _____

Mouse ___yes ___no Other adapters installed _____

Hard disk capacity _____ MB Brand _____

Instruments used _____

National Instruments hardware product model _____ Revision _____

Configuration _____

National Instruments software product _____ Version _____

Configuration _____

The problem is: _____

List any error messages: _____

The following steps reproduce the problem: _____

Hardware and Software Configuration Form

Record the settings and revisions of your hardware and software on the line to the right of each item. Complete a new copy of this form each time you revise your software or hardware configuration, and use this form as a reference for your current configuration. Completing this form accurately before contacting National Instruments for technical support helps our applications engineers answer your questions more efficiently.

National Instruments Products

GPIO-ENET Hardware Revision _____

10Base-T or Coax Version _____

AC Input Voltage (100-120 V or 220-240 V) _____

DIP Switch Settings _____

Ethernet Port Configuration Slide Switch Setting _____

IP Address _____

READY LED Signaling Status Code _____

GPIO Software for Windows 95/98 Version Number on Disk _____

Programming Language Interface Version _____

Diagnostic Utility Results _____

Other Products

Resource Summary Report from the Device Manager

To create this report, first display the **System Properties** dialog box for the computer by double-clicking on the **System** icon under **Start»Settings»Control Panel**. Then click on the **Device Manager** tab and highlight the **Computer** icon. Click on the **Print** button, and check the **Print to file** checkbox in the **Print** dialog box before clicking on **OK**.

Programming Environment Information

Programming Language _____ Compiler Vendor _____ Compiler Version _____

Application Information

DOS Application _____ Win16 Application _____ Win32 Application _____

If Win16 or Win32, method of accessing DLL (link with language interface or direct entry?)

Documentation Comment Form

National Instruments encourages you to comment on the documentation supplied with our products. This information helps us provide quality products to meet your needs.

Title: *Getting Started with Your GPIB-ENET and the GPIB Software for Windows 95/98*

Edition Date: June 1998

Part Number: 321243C-01

Please comment on the completeness, clarity, and organization of the manual.

If you find errors in the manual, please record the page numbers and describe the errors.

Thank you for your help.

Name _____

Title _____

Company _____

Address _____

Phone (___) _____ Fax (___) _____

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National Instruments Corporation
6504 Bridge Point Parkway
Austin, TX 78730-5039

Fax to: Technical Publications
National Instruments Corporation
(512) 794-5678

Glossary

Prefix	Meanings	Value
m-	milli-	10^{-3}
c-	centi-	10^{-2}
k-	kilo-	10^3
M-	mega-	10^6

°	degrees
%	percent
A	amperes
AC	alternating current
ANSI	American National Standards Institute
AUI	attachment unit interface
C	Celsius
CSA	Canadian Standards Association
DIP	dual inline package
DLL	dynamic link library
EMI	electromagnetic interference
FCC	Federal Communications Commission

Glossary

g	grams
GPIB	General Purpose Interface Bus
Hz	hertz
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronic Engineers
in.	inches
IP	Internet Protocol
lb	pounds
LED	light-emitting diode
m	meters
MB	megabytes of memory
PC	personal computer
RAM	random-access memory
RARP	Reverse Address Resolution Protocol
s	seconds
TCP	Transmission Control Protocol
UL	Underwriters Laboratories
V	volts
VAC	volts alternating current