Getting Started with Your PCMCIA-GPIB and the NI-488.2™ Software for Macintosh

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This equipment generates and uses radio frequency energy and, if not installed and used in strict accordance with the instructions in this manual, may cause interference to radio and television reception. This equipment has been tested and found to comply with the following two regulatory agencies:

Federal Communications Commission

This device complies with Part 15 of the Federal Communications Commission (FCC) Rules for a Class A digital device. Operation is subject to the following two conditions:

1. This device may not cause harmful interference in commercial environments.

2. This device must accept any interference received, including interference that may cause undesired operation.

Canadian Department of Communications

This device complies with the limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications (DOC).

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe A prescrites dans le règlement sur le brouillage radioélectrique édicté par le ministère des communications du Canada.

Instructions to Users

These regulations are designed to provide reasonable protection against harmful interference from the equipment to radio reception in commercial areas. 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.

There is no guarantee that interference will not occur in a particular installation. However, the chances of interference are much less if the equipment is installed and used according to this instruction manual.

If the equipment does cause interference to radio or television reception, which can be determined by turning the equipment on and off, one or more of the following suggestions may reduce or eliminate the problem.

- Operate the equipment and the receiver on different branches of your AC electrical system.

- Move the equipment away from the receiver with which it is interfering.
- Reorient or relocate the receiver's antenna.
- Be sure that the equipment is plugged into a grounded outlet and that the grounding has not been defeated with a cheater plug.

Notice to user: Changes or modifications not expressly approved by National Instruments could void the user's authority to operate the equipment under the FCC Rules.

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: *How to Identify and Resolve Radio-TV Interference Problems.* This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock Number 004-000-00345-4.

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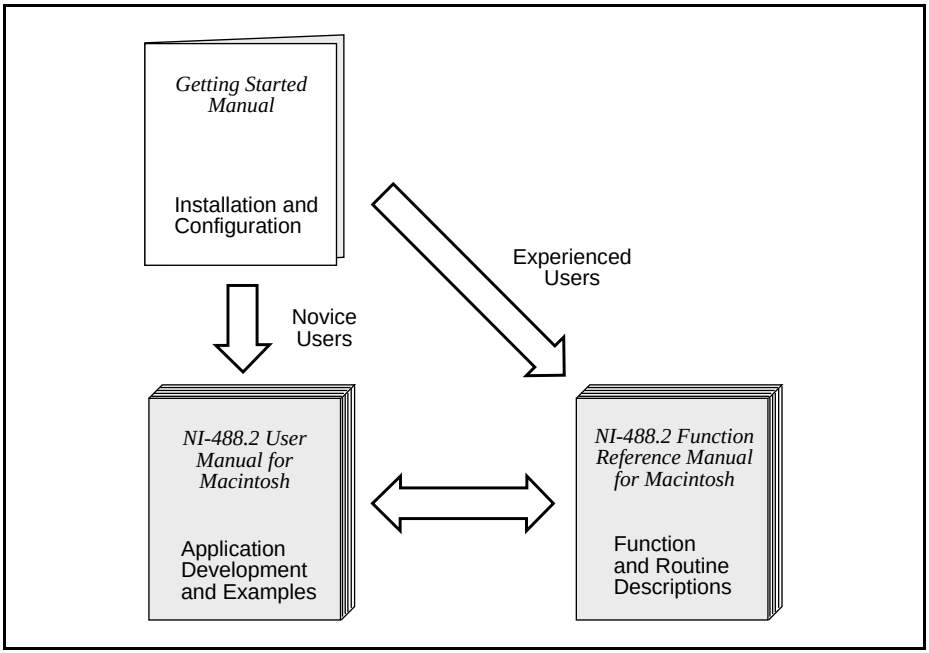
About This Manual

This manual contains instructions for installing and configuring the National Instruments PCMCIA-GPIB card and the NI-488.2 software for Macintosh. You should use this manual with the *NI-488.2 User Manual for Macintosh* and the *NI-488.2 Function Reference Manual for Macintosh*.

This manual assumes that you are already familiar with the Macintosh operating system.

How to Use This Manual Set



Use this getting started manual to install your GPIB hardware and to install and configure your NI-488.2 software.

Use the *NI-488.2 User Manual for Macintosh* 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-488.2 Function Reference Manual for Macintosh* 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 briefly describes the NI-488.2 software and the PCMCIA-GPIB card.
- Chapter 2, *Hardware and Software Installation*, contains instructions for installing your PCMCIA-GPIB card and the NI-488.2 software for Macintosh.
- Chapter 3, *Verification and Configuration*, contains instructions for verifying the installation and configuring your NI-488.2 software.
- Chapter 4, *Troubleshooting*, describes how to troubleshoot hardware and software problems and lists some common questions.
- Chapter 5, *Using Your NI-488.2 Software*, describes the `IBIC 488.2` utility and lists some general programming considerations.
- Appendix A, *Specifications*, describes the physical characteristics of the PCMCIA-GPIB hardware and software, along with the recommended operating conditions.
- Appendix B, *Using Two or More GPIB Cards*, contains information about how PCMCIA-GPIB cards are assigned as GPIB boards if you are using more than one PCMCIA-GPIB card.
- Appendix C, *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, and mnemonics.

Conventions Used in This Manual

The following conventions are used in this manual.

bold	Bold text denotes commands, menus, menu items, options, screen button names, and checkboxes.
italic	Italic text denotes emphasis, a cross reference, or an introduction to a key concept.

bold italic	Bold italic text denotes a note, caution, or warning.
`monospace`	Text in this font denotes the proper names of programs, utility names, filenames, folder names, device names, and icon names.
IEEE 488 and IEEE 488.2	IEEE 488 and IEEE 488.2 refer to the ANSI/IEEE Standard 488.1-1987 and ANSI/IEEE Standard 488.2-1992, respectively, which define the GPIB.

Abbreviations, acronyms, metric prefixes, mnemonics, symbols, and terms are listed in the *Glossary*.

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*
- *Card Services Specification, Release 2.1,* Personal Computer Memory Card International Association (PCMCIA).
- *PC Card Standard, Release 2.1,* Personal Computer Memory Card International Association (PCMCIA).
- *Socket Services Specification, Release 2.1,* Personal Computer Memory Card International Association (PCMCIA).

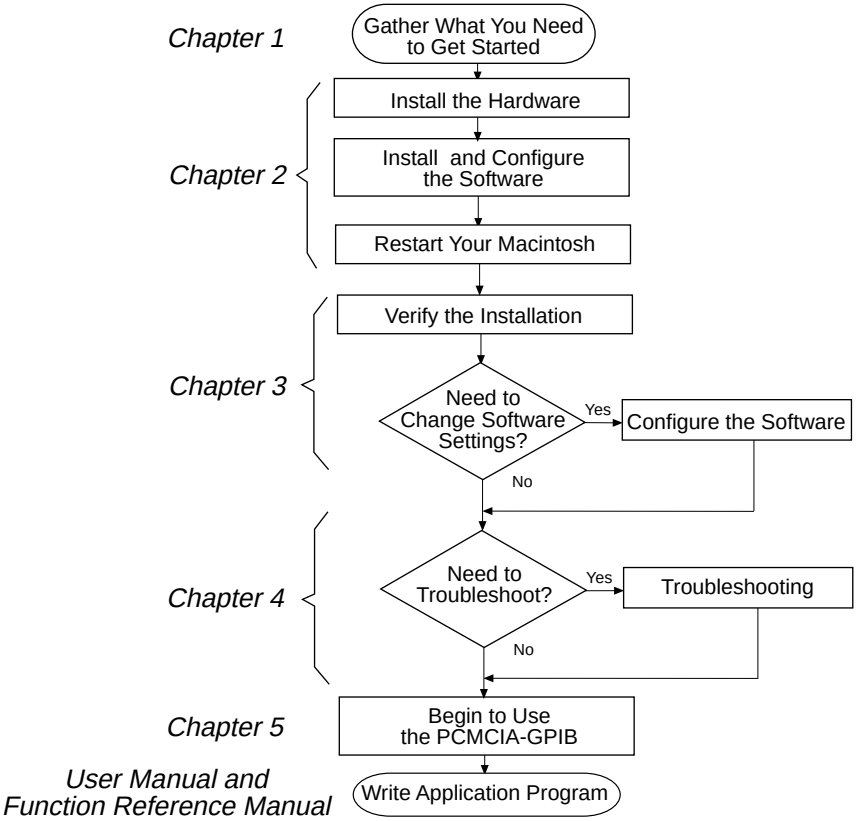
Customer Communication

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 C, *Customer Communication*, at the end of this manual.

Chapter 1
Introduction

This chapter explains how to use this manual, lists what you need to get started, and briefly describes the NI-488.2 software and the PCMCIA-GPIB card.

How to Use This Manual



What You Need to Get Started

- PCMCIA-GPIB, which your kit contains
- 3.5 in. *NI-488.2 Software for Macintosh Distribution Disk*, which your kit contains
- 3.5 in. *Macintosh Hardware Verification Disk*, which your kit contains
- PowerBook computer with most recent Macintosh OS Version
- PCMCIA Expansion Module for the PowerBook 500 series

NI-488.2 Software Description

NI-488.2 software for Macintosh is part of your PCMCIA-GPIB kit. It is a comprehensive package of software for transforming the Macintosh into a GPIB Controller with complete communication and bus management capability. The NI-488.2 software also comes with an interactive GPIB control utility and the Microsoft QuickBASIC, Macintosh Programmer's Workshop (MPW) C, THINK C, and Metrowerks CodeWarrior C language interfaces.

Hardware Description

The PCMCIA-GPIB uses the TNT4882C ASIC, which combines the circuitry of the NAT4882 ASIC, the Turbo488 performance-enhancing ASIC, and GPIB transceivers to create a single-chip IEEE 488.2 Talker/Listener/Controller interface. The TNT4882C also implements the HS488 high-speed protocol, which increases the maximum data transfer rate of the PCMCIA-GPIB to 1.5 Mbytes/s. For more information about HS488, refer to Chapter 7, *GPIB Programming Techniques*, in the *NI-488.2 User Manual for Macintosh.*

The PCMCIA-GPIB is fully compatible with other IEEE 488 devices. You can connect the PCMCIA-GPIB with up to 14 devices. If you want to use more than 14 devices, you can order a bus extender or expander from National Instruments. Refer to Appendix A, *Specifications*, for more information about the PCMCIA-GPIB specifications and operating conditions.

Optional Programming Tools

Your kit includes the NI-488.2 software for Macintosh. In addition, you can order the LabVIEW software from National Instruments. LabVIEW includes instrument driver libraries that make it easier to communicate with your GPIB instruments.

LabVIEW is a complete programming environment that departs from the sequential nature of traditional programming languages and features a graphical programming environment. It includes all the tools needed for instrument control, data acquisition, analysis, and presentation. When you order LabVIEW, you also get more than 300 complete instrument drivers, which are modular, source-code programs that handle the communication with your instrument so that you do not have to learn the programming details.

For more information about LabVIEW, contact National Instruments.

Chapter 2
Hardware and Software Installation

This chapter contains instructions for installing your PCMCIA-GPIB card and the NI-488.2 software for Macintosh.

Install the PCMCIA-GPIB Hardware

To install the PCMCIA-GPIB in your computer, insert the PCMCIA-GPIB card into a free PCMCIA socket the same way you insert a disk into a floppy drive. The PCMCIA-GPIB has no jumpers or switches to set, and you do not need to power down the system when you insert it. The NI-488.2 software automatically detects the PCMCIA-GPIB and configures it for use as a GPIB board. Figure 2-1 shows how to insert the PCMCIA-GPIB and how to connect the PCMCIA-GPIB cable.

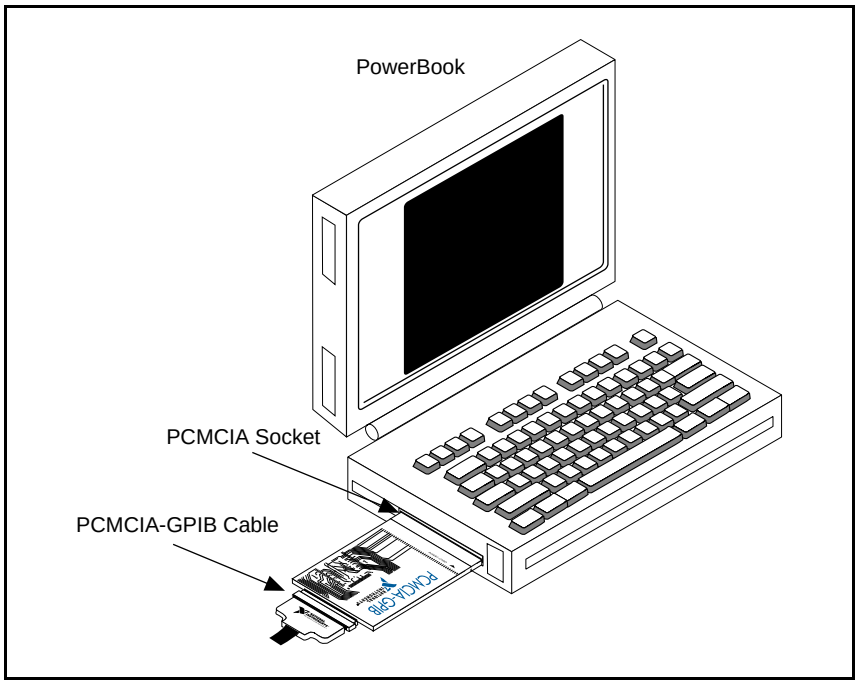


Figure 2-1. Inserting the PCMCIA-GPIB

After you have installed your PCMCIA-GPIB card, follow the instructions in the next section to install the software.

Install the Software

The NI-488.2 software is in compressed form on one disk. Installing all of the software requires about 1 MB of space on your hard disk and takes about five minutes.

If an `NI-488 INIT` file is already installed in your system, the `NI-488.2 Installer` program removes it and replaces it with the current `NI-488 INIT`. If the `NI-488 Config` or `NI-DMA/DSP` files are already installed in your system, they are also replaced.

The NI-488.2 software includes the following components:

- `NI-488.2 Installer` is the software installation program.
- `NI-488 INIT` is an INIT file that loads the device drivers for installed National Instruments GPIB interfaces when you power on or restart your Macintosh.
- `NI-488 Config` is a control panel configuration utility that you can use to examine or change the software settings.
- `NB-Boards` is a control panel utility that displays information about the cards currently installed in your computer if it contains plug-in sockets.
- `NI-DMA/DSP` is a system extension that provides DMA functionality through an RTSI connection to a DMA-2800 or DMA-8.
- `ENET/PCI Buffers` is a utility used to optimize I/O transfers on the PCI-GPIB.
- The `C LI` and `BASIC LI` folders contain language interfaces for Macintosh Programmer's Workshop (MPW) C, THINK C, Metrowerks CodeWarrior C, and Microsoft QuickBASIC.
- `Device Manager Calls` contains sample programs that make high-level and low-level Device Manager calls.
- `IBIC 488.2` is an interactive GPIB control utility.
- `NI-488.2 Test` is a software diagnostic utility.
- The `Ethernet` folder contains utilities that are applicable only if you have a National Instruments GPIB-ENET.
- The `Read Me` file contains the latest updates and corrections to the manual when appropriate.

Install the NI-488.2 software by completing the following steps.

Step 1. Install the NI-488.2 Files and Folders

Caution: ***Virus detection software might prevent the installer from copying important files to the*** `System Folder`. ***You must disable or bypass any virus prevention software before attempting the installation procedure.***

1. Insert the NI-488.2 software distribution disk and double-click on the `NI-488.2 Installer` icon.

2. If you have a National Instruments software driver already installed, the dialog box shown in Figure 2-2 appears. If the dialog box does not appear, skip to Step 3.

   If you want to copy the bus and device settings from your original driver to the new `NI-488 INIT`, click on the **Retain** button. Otherwise, reset all settings to the defaults by clicking on the **Clear** button. To exit from the installation procedure, click on the **Cancel** button.

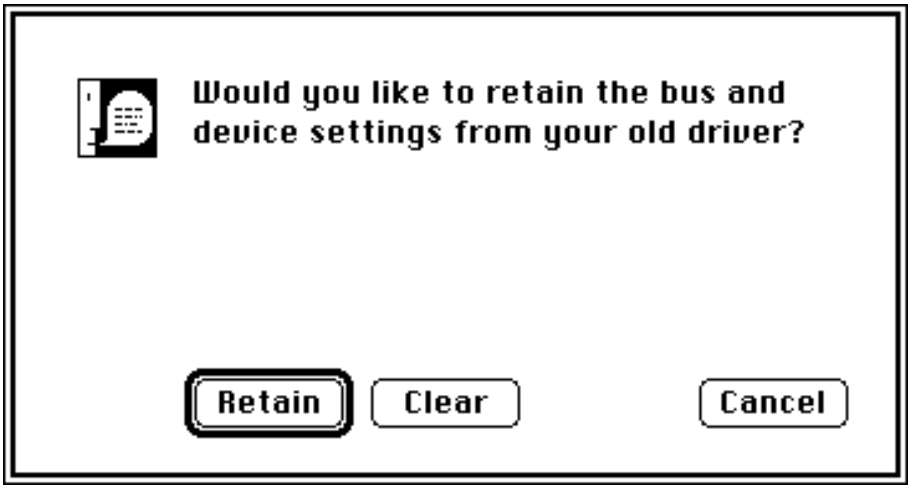


Figure 2-2. Settings Dialog Box

3. The installer creates a folder named `NI-488.2` to contain NI-488.2 files and folders. If you want to name the folder something else, click on the **Change Folder** button in the installation dialog box, shown in Figure 2-3, and enter a new folder name.

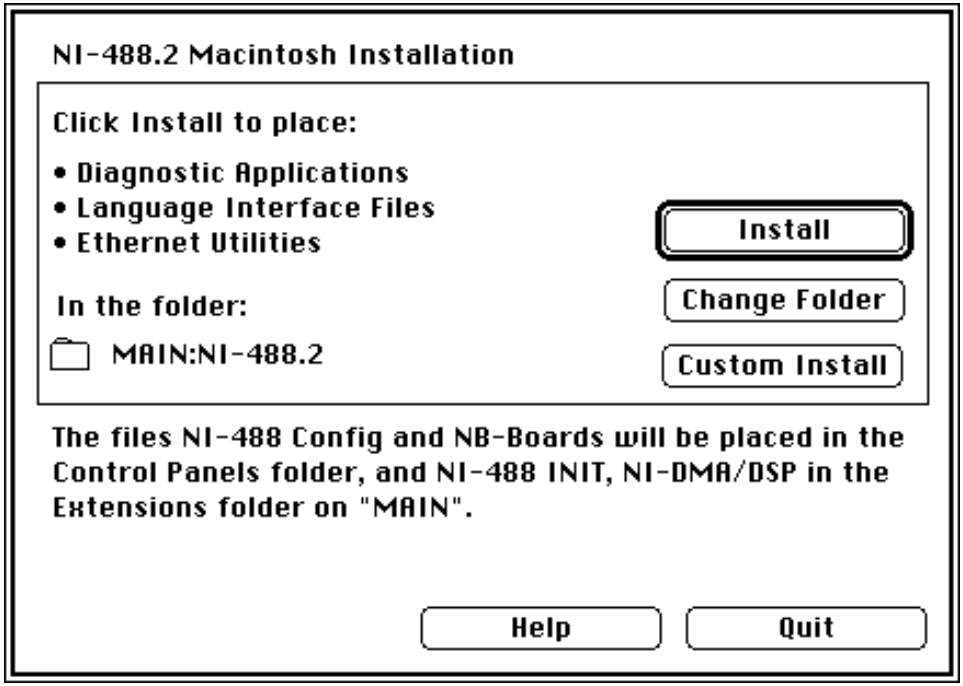


Figure 2-3. Installation Dialog Box

4. Click on the **Install** button to install all of the NI-488.2 software. If you want to install only some of the files, click on the **Custom Install** button and select the items to install.

After installing all of the software, the `NI-488.2` folder should contain the items shown in Figure 2-4. The `NI-488 Config` file is placed in the `Control Panels` folder, and the `NI-488 INIT` and `NI-DMA/DSP` files are placed in the `Extensions` folder.

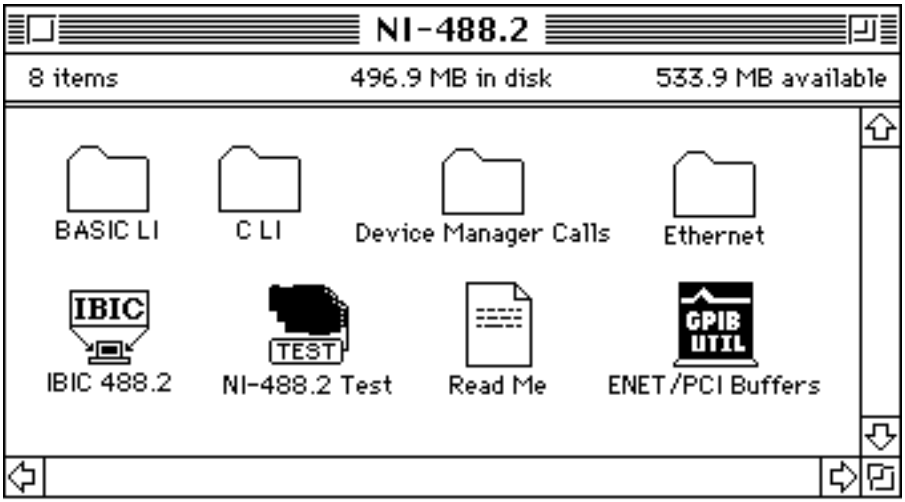


Figure 2-4. File and Folder Organization after Installation

`NI-488 Config` is a configuration utility that you can use to examine and change the software settings for your PCMCIA-GPIB card. You can activate the configuration utility by selecting **Control Panels** from the **Apple** menu and double-clicking on the `NI-488 Config` icon. At this time, you can use `NI-488 Config` to configure a card as a certain GPIB board, such as `gpib0`, and to place the card in the system at a certain place. For more information about how PCMCIA-GPIB cards are configured as GPIB boards, see Appendix B, *Using Two or More GPIB Cards.*

Figure 2-5 shows a possible configuration for the PCMCIA-GPIB card. The **Auto Configure** box is selected by default and assigns `gpib0` (bus number 0) to the appropriate socket. The *socket boxes*, located in the upper right corner of the `NI-488 Config` dialog box, are labeled “L” and “U” for the lower and upper slots. If an **X** does not appear in a socket box, follow the instructions in the section *Verify the Hardware Installation*, in Chapter 3, *Verification and Configuration*, to verify that the card is operating correctly.

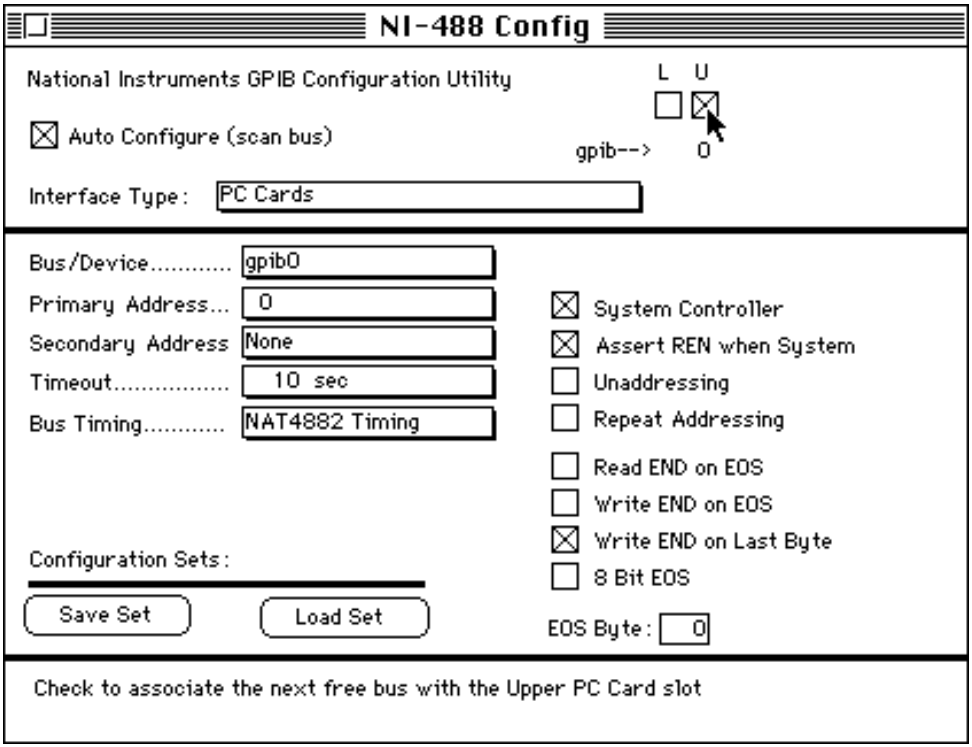


Figure 2-5. Sample Configuration for the PCMCIA-GPIB Card

Step 2. Restart Your Macintosh

The NI-488.2 software is installed every time you start or restart your Macintosh. The NI-488.2 software displays the National Instruments icon momentarily in the lower left corner of the screen to indicate that the software is being installed. If the National Instruments icon does not appear on your screen, repeat the installation procedure before you proceed to the next chapter, *Verification and Configuration.*

Chapter 3
Verification and Configuration

This chapter contains instructions for verifying the installation and configuring your NI-488.2 software.

Verify the Hardware Installation

To verify and test the hardware installation, run the `IBDIAG` hardware diagnostic program that came with your NI-488.2 software. `IBDIAG` verifies that your hardware is functioning properly and that the configuration of your card does not conflict with anything else in the system.

Caution: ***Disconnect all PCMCIA-GPIB cables from your computer before running the hardware verification program.***

1. Power on your computer.

2. Insert the PCMCIA-GPIB card that you want to test.

3. Insert the hardware verification disk. When startup completes, the disk icon called `Hardware Verification` appears on the screen.

4. Double-click on the `Hardware Verification` icon. The `IBDIAG` icon appears on the screen.

5. Double-click on the `IBDIAG` icon.

   A test window appears on the screen, as shown in Figure 3-1.

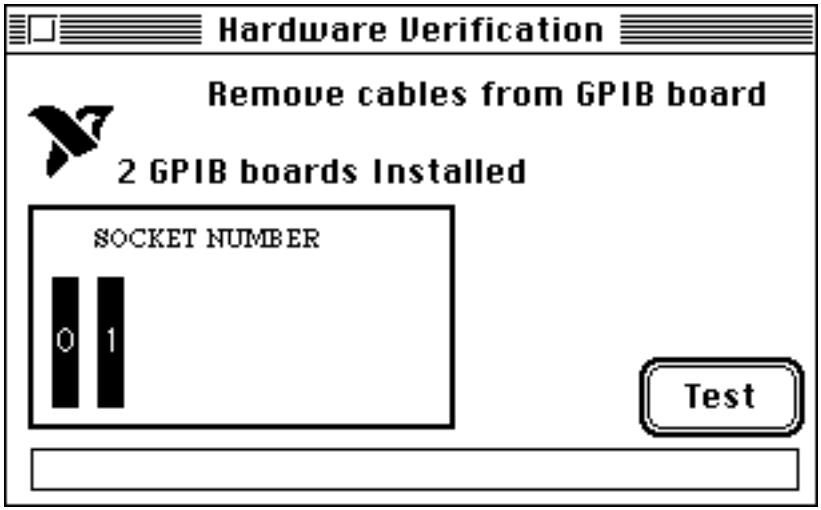


Figure 3-1. Test Window

The socket indicators show the PCMCIA sockets that have cards installed. A socket indicator highlighted in black shows the socket number of a PCMCIA-GPIB card that you can test. You can exit the `IBDIAG` program without running it by choosing **Quit** from the **File** menu.

6. Click on the **Test** button to run a series of tests that verify the PCMCIA-GPIB hardware installation. A bar graph indicates the progress of the tests, and a message appears above the socket indicators at the completion of all tests.

7. View the test results. Figure 3-2 shows the test window that appears if no error was detected. You can exit the `IBDIAG` program if your hardware verification was successful by choosing **Quit** from the **File** menu.

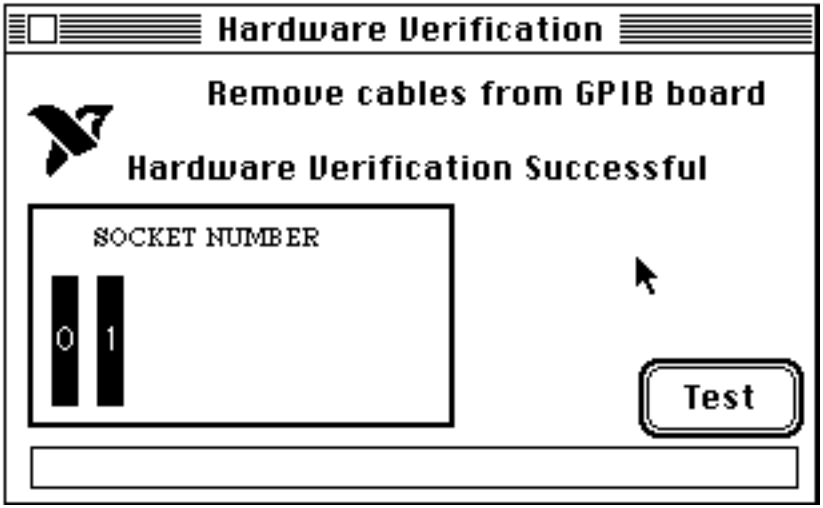


Figure 3-2. Hardware Verification Window after Successful Completion of Tests

Figure 3-3 is an example of the Alert Box screen that appears if an error was detected. The Alert Box screen has error information and the option to continue or stop.

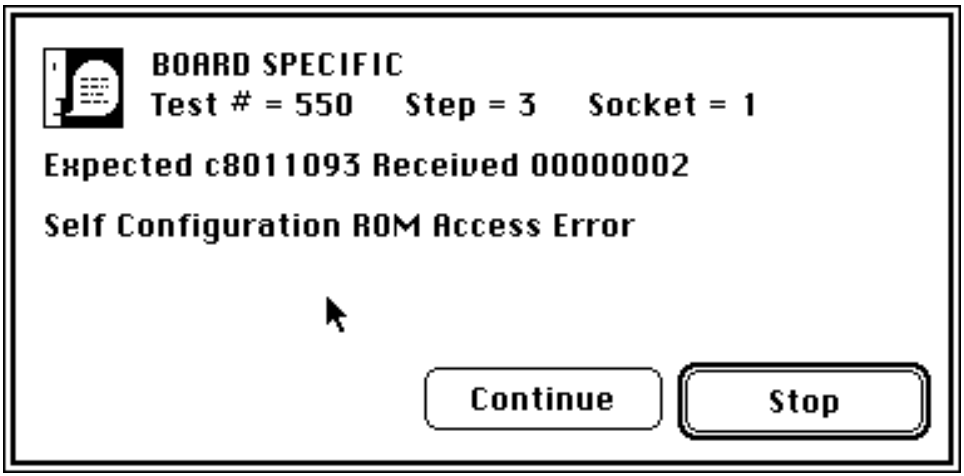


Figure 3-3. Alert Box with Error Information

8. Record the error information. Whenever an Alert Box screen appears, record the information before clicking on either **Continue** or **Stop**. At the end of the program, if the hardware verification did not complete successfully, the screen displays as shown in Figure 3-4.

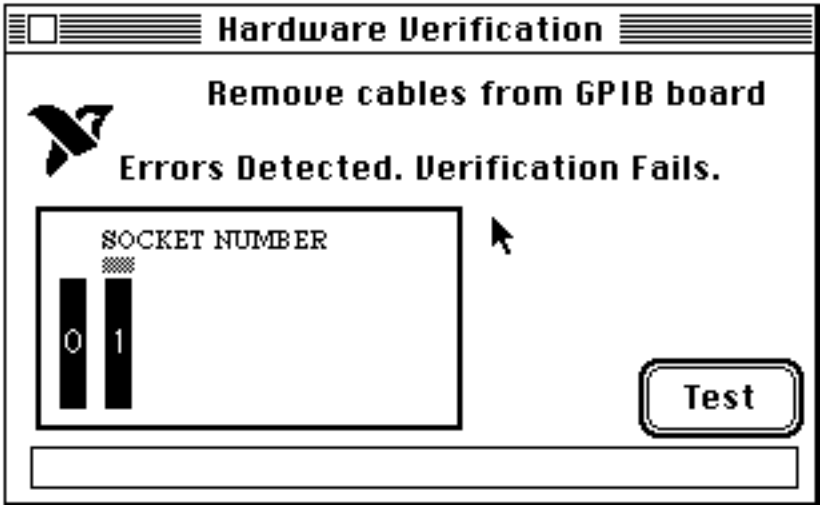


Figure 3-4. Hardware Verification Window after Unsuccessful Completion of Tests

9. If `IBDIAG` fails, make sure that the PCMCIA-GPIB card is positioned securely in its socket and that no PCMCIA-GPIB cables are connected. Run the `IBDIAG` program again. If the program still detects errors, refer to Chapter 4, *Troubleshooting*, for possible solutions.

10. Exit the `IBDIAG` program by selecting **Quit** from the **File** menu.

Verify the Software Installation

This step verifies that the software is installed and functioning with the PCMCIA-GPIB. First disconnect all PCMCIA-GPIB cables from the PCMCIA-GPIB card, then double-click on the `NI-488.2 Test` icon in the `NI-488.2` folder.

If no error messages appear on the screen, the installation is complete. If error messages do appear on the screen, select **Restart** from the **Special** menu, and double-click on the `NI-488.2 Test` icon. If the test fails again, reinstall the NI-488.2 software from the distribution disk, restart your Macintosh, and double-click on the `NI-488.2 Test` icon.

If any one of the software installation steps fails, review the material in Chapter 4, *Troubleshooting*, which describes how to troubleshoot problems and lists some common questions. If you need to change a software setting, refer to Chapter 6, *GPIB Configuration Utility*, in the *NI-488.2 User Manual for Macintosh*. If the software settings are correct and the verification still fails, carefully note all error information on the *PCMCIA-GPIB Card Hardware and Software Configuration Form* in Appendix C, *Customer Communication*, and contact National Instruments.

If the verification test is successful, you are ready to write your own application program. Refer to the *NI-488.2 Function Reference Manual for Macintosh* for sample programs.

Configure the Software (Optional)

The default settings for the software work for most applications and devices. However, you might want to change a device name or primary address. Also, if more than one GPIB interface or external box is installed, you might want to associate a device with a particular interface.

You can examine and adjust the configuration of the software using the `NI-488 Config` control panel utility. At this time, you can use `NI-488 Config` to configure the addresses of the PCMCIA-GPIB and the communication options on the right side of the `NI-488 Config` dialog box, shown in Figure 2-5. Refer to Chapter 6, *GPIB Configuration Utility*, in the *NI-488.2 User Manual for Macintosh* for more information on running the utility and for information about the configurable software parameters.

Chapter 4
Troubleshooting

This chapter describes how to troubleshoot hardware and software problems and lists some common questions.

If hardware or software problems persist after you try the solutions recommended in this chapter, note all error information on the *Technical Support Form* in Appendix C, *Customer Communication*, and contact National Instruments.

Troubleshooting Hardware Problems

- Make sure that all GPIB cables are connected properly, unless you are running the hardware verification test.
- Make sure that the PCMCIA-GPIB card is positioned securely in its socket.
- If the hardware verification test fails, make sure that no GPIB cables are connected to the PCMCIA-GPIB card.

Troubleshooting Software Problems

- The `NI-488 Config` control panel (GPIB configuration utility) should show the following software configuration:
  - The **Interface Type** menu selection should be set to **PC Cards**.
  - An **X** should appear in the socket box that corresponds to the socket of your PCMCIA-GPIB card. The socket boxes are in the upper right corner of the `NI-488 Config` dialog box, and are labeled “L” for lower and “U” for upper.

  You can use the `NI-488 Config` control panel utility to examine and adjust the configuration of the software. Refer to Chapter 6, *GPIB Configuration Utility*, in the *NI-488.2 User Manual for Macintosh* for more information on running the utility and for information about the configurable software parameters.
- If the software verification test fails, make sure that no GPIB cables are connected to the PCMCIA-GPIB card.

Common Questions

What do I do if my card does not show up in the `NI-488 Config` utility?

In `NI-488 Config`, an **X** should appear in a socket box that corresponds to the location of your PCMCIA-GPIB card. If an **X** does not appear in any box, make sure the PCMCIA-GPIB is seated firmly in the socket.

What do I do if the hardware or software verification test fails with an error?

Refer to the troubleshooting sections of this chapter for information about what might cause these tests to fail.

What do I do if I have installed the NI-488.2 software and now my Macintosh crashes upon startup?

Try changing the name of the `NI-488 INIT` to `ZNI-488 INIT`. Because INIT files load in alphabetical order, the `ZNI-488 INIT` will load last, preventing possible corruption from INIT files that load after it. If changing the name of the `NI-488 INIT` does not solve the problem, another INIT file might have a conflict with the `NI-488 INIT`. Try removing some of your other INIT files. You can store them in a temporary folder, in case you need to reload them later. If you are using System 7.5 or later, you can use the `Extensions Manager` control panel to disable certain extensions and control panels.

What do I do if I try to eject the PCMCIA-GPIB, but it won't eject?

Make sure the card is offline by issuing an `ibonl(0)` call to the card. The card will not eject while online. Also, make sure the card is not stuck in the socket. Sometimes an improperly seated PC Card will fail to eject.

What do I do if my card does not work correctly with a scanner or film recorder?

Try checking the **Unaddressing** option in the `NI-488 Config` control panel.

When should I use `IBIC 488.2`?

You can use `IBIC 488.2` to test and verify instrument communication, troubleshoot problems, and develop your application program. For more information about `IBIC 488.2`, refer to Chapter 4, *Interface Bus Interactive Control Utility*, in the *NI-488.2 User Manual for Macintosh*.

How do I use an NI-488.2 language interface?

For information about using NI-488.2 language interfaces, refer to the *NI-488.2 User Manual for Macintosh*.

How can I use the files located in the `Ethernet` folder?

You do not need to use the files in the `Ethernet` folder unless you have a National Instruments GPIB-ENET.

What information should I have before I call National Instruments?

When you call National Instruments, you should have the results of the hardware and software verification tests. In addition, make sure you have filled out the *PCMCIA-GPIB Hardware and Software Configuration Form* in Appendix C, *Customer Communication*.

Chapter 5
Using Your NI-488.2 Software

This chapter describes the `IBIC 488.2` utility and lists some general programming considerations.

Introduction to IBIC 488.2

The NI-488.2 software includes the Interface Bus Interactive Control utility, `IBIC 488.2`. You can use `IBIC 488.2` to enter NI-488 functions and NI-488.2 routines interactively and display the results of the function calls automatically. Without writing an application, you can use `IBIC 488.2` to do the following:

- Verify GPIB communication with your device quickly and easily.
- Become familiar with the commands of your device.
- Receive data from your GPIB device.
- Learn new functions and routines before integrating them into your application.
- Troubleshoot problems with your application.

For more information about `IBIC 488.2`, refer to the *NI-488.2 User Manual for Macintosh.*

General Programming Considerations

Depending on the programming language you use to develop your application, you must include certain files, statements, or global variables at the beginning of your application. For specific instructions, refer to the *NI-488.2 User Manual for Macintosh*.

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

Appendix A
Specifications

This appendix describes the physical characteristics of the PCMCIA-GPIB hardware and software, along with the recommended operating conditions.

Hardware

Table A-1. PCMCIA-GPIB Hardware Characteristics

Characteristic	Specification
Dimensions	85.6 by 54.0 by 5.0 mm (3.370 by 2.126 by 0.197 in.)
Power Requirement (from PCMCIA expansion slot)	+5 VDC 65 mA Typical 85 mA Maximum
I/O Interface	Special IEEE 488 Cable with 24-Pin Converter for PC Card
Operating Environment	
Component Temperature Relative Humidity	0° to 40° C 10% to 90%, Noncondensing
Storage Environment	
Temperature Relative Humidity	-20° to 70° C 5% to 90%, Noncondensing
EMI	FCC Class A Verified

Software

Table A-2. NI-488.2 Software Characteristics for the PCMCIA-GPIB

Characteristic	Specification
GPIB Transfer Rates	
3-Wire (IEEE 488.1)	
Reads	700 kBytes/s*
Writes	800 kBytes/s*
HS488	
Reads	1.4 Mbytes/s*
Writes	1.5 Mbytes/s*
* Actual speed may vary considerably from speed shown due to system and instrumentation capabilities.	

Appendix B
Using Two or More GPIB Cards

This chapter contains information about how PCMCIA-GPIB cards are assigned as GPIB boards if you are using more than one PCMCIA-GPIB card.

How PCMCIA-GPIB Cards Are Assigned as GPIB Boards

Note: ***In the following paragraphs, the term*** *PCMCIA-GPIB card* ***refers to the actual card that you insert into your computer. The NI-488.2 software uses a logical reference to access each PCMCIA-GPIB card that you install. In the following paragraphs, these logical references are referred to as*** *GPIB boards.*

Whenever you reboot your computer and begin to use the NI-488.2 software, the NI-488.2 software scans the PCMCIA sockets and assigns the PCMCIA-GPIB cards as GPIB boards, such as `gpib0`, `gpib1`, and so on. If your computer has more than one PCMCIA socket, the NI-488.2 software starts the scan at the lowest numbered socket. As the NI-488.2 software finds the PCMCIA-GPIB cards that were inserted before power-on, it assigns the PCMCIA-GPIB in the lowest numbered socket as `gpib0`, the next lowest numbered PCMCIA-GPIB as `gpib1`, and so on. If you manually check a socket box using the `NI-488 Config` utility, the software assigns the card in that socket as the GPIB bus specified.

If you insert a PCMCIA-GPIB card while your computer is powered on, the NI-488.2 software assigns it as the first available GPIB board. A GPIB board reference is considered available if it has no existing PCMCIA-GPIB card assigned to it.

If you are using only one PCMCIA-GPIB card, it is always assigned `gpib0` regardless of which socket it is in. If you are using more than one PCMCIA-GPIB card, the assignment of the cards as GPIB boards varies depending on whether the cards were inserted with your computer on or off. If all PCMCIA-GPIB cards are inserted with your computer powered off, the card located in socket zero is assigned as `gpib0`. If all PCMCIA-GPIB cards are inserted with your computer powered on, and **Auto Configure** is checked, the first card you insert is assigned as `gpib0`.

If you remove a PCMCIA-GPIB card while your computer is powered on, you can no longer use the GPIB board to which it was assigned. If you attempt to access a GPIB board whose PCMCIA-GPIB card has been removed, the NI-488.2 software indicates a Non-Existent Board Error (ENEB). For information about GPIB error codes, refer to the *NI-488.2 User Manual for Macintosh*.

If you remove a PCMCIA-GPIB card and then reinsert it while an application is using its GPIB board, the GPIB board loses its state information and the ENEB error is reported. To use the GPIB board again, you must place the GPIB board back online by using `ibfind` or `ibonl` with a parameter of 1. As a general rule, you must place the GPIB board offline before removing its PCMCIA-GPIB card by calling `ibonl` with a parameter of 0.

If you want to use more than two PC Card Sockets by adding a PC Card expansion module, you can configure the additional socket by selecting the **PC Cards** expansion sockets interface menu.

Appendix C
Customer Communication

For your convenience, this appendix contains forms to help you gather the information necessary to help us solve technical problems you might have as well as a form you can use to comment on the product documentation. Filling out a copy of the *Technical Support Form* before contacting National Instruments helps us help you better and faster.

National Instruments provides comprehensive technical assistance around the world. In the U.S. and Canada, applications engineers are available Monday through Friday from 8:00 a.m. to 6:00 p.m. (central time). In other countries, contact the nearest branch office. You may fax questions to us at any time.

Corporate Headquarters
(512) 795-8248
Technical support fax: (800) 328-2203
(512) 794-5678

Branch Offices	**Phone Number**	**Fax Number**
Australia	03 9 879 9422	03 9 879 9179
Austria	0662 45 79 90 0	0662 45 79 90 19
Belgium	02 757 00 20	02 757 03 11
Canada (Ontario)	519 622 9310	519 622 9311
Canada (Quebec)	514 694 8521	514 694 4399
Denmark	45 76 26 00	45 76 71 11
Finland	90 527 2321	90 502 2930
France	1 48 14 24 24	1 48 14 24 14
Germany	089 741 31 30	089 714 60 35
Hong Kong	2645 3186	2686 8505
Italy	02 48301892	02 48301915
Japan	03 5472 2970	03 5472 2977
Korea	02 596 7456	02 596 7455
Mexico	95 800 010 0793	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
U.K.	01635 523545	01635 523154

Technical Support Form

Technical support is available at any time by fax. Include the information from your configuration form. Use additional pages if necessary.

Name _____

Company _____

Address _____

_____

Fax (___) _____ Phone (___) _____

Computer brand _____

Model _____ Processor _____

Operating system _____

Speed _____MHz RAM _____MB

Display adapter _____

Mouse _____yes _____no

Other adapters installed _____

Hard disk capacity _____MB

Instruments used _____

National Instruments hardware product model _____

Revision _____

Configuration _____

National Instruments software product _____

Version _____

Configuration _____

(continues)

The problem is _____

_____

_____

_____

_____

_____

_____

_____

List any error messages _____

_____

_____

_____

_____

_____

_____

The following steps will reproduce the problem _____

_____

_____

_____

_____

_____

_____

PCMCIA-GPIB Hardware and Software Configuration Form

Record the settings and revisions of your hardware and software on the line to the right of each item. Update this form each time you revise your software or hardware configuration, and use this form as a reference for your current configuration.

National Instruments Products

- PCMCIA-GPIB Hardware Revision _____
- NI-488.2 Software Version Number on Distribution Medium

  _____

Other Products

- Programming Language and Version Number _____
- Computer Make and Model _____
- Memory Capacity on Computer _____
- Clock Frequency _____
- Operating System Version _____
- Number of GPIB Devices on Bus _____
- Other Hardware Devices in System _____

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 PCMCIA-GPIB and the NI-488.2™ Software for Macintosh**

Edition Date: **December 1995**

Part Number: **321040A-01**

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

(continues)

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

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_____

Thank you for your help.

Name _____

Title _____

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Address _____

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Glossary

Prefix	Meaning	Value
m-	milli-	10^{-3}
k-	kilo-	10^{3}
M-	mega-	10^{6}

°	degrees
%	percent
A	amperes
AC	alternating current
ANSI	American National Standards Institute
ASIC	application-specific integrated circuit
BIOS	Basic Input/Output System
C	Celsius
EMI	electromagnetic interference
FCC	Federal Communications Commission
GPIB	General Purpose Interface Bus
hex	hexadecimal
Hz	hertz
I/O	input/output
IEEE	Institute of Electrical and Electronic Engineers
in.	inches
KB	kilobytes of memory
m	meters
MB	megabytes of memory
PC	personal computer
PCMCIA	Personal Computer Memory Card International Association
RAM	random-access memory
s	seconds
VDC	volts direct current