

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

June 1995 Edition

Part Number 320966A-01

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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

The PCI-GPIB complies with Part 15 of the Federal Communications Commission (FCC) Rules for Class A digital devices. Operation is subject to the following two conditions:

1. The device may not cause harmful interference in commercial environments.
2. The device must accept any interference received, including interference that may cause undesired operation.

Canadian Department of Communications

The PCI-GPIB 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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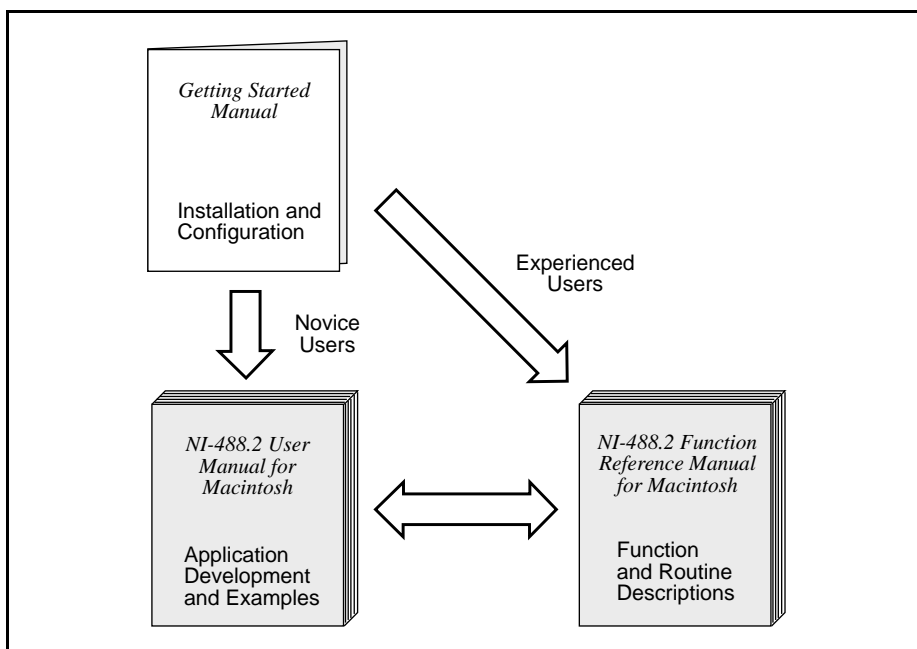
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About This Manual

This manual contains instructions for installing and configuring the National Instruments PCI-GPIB interface board and the NI-488.2 software for Macintosh. This manual is meant to be used 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 and configure your GPIB hardware and 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 PCI-GPIB and the NI-488.2 software.
- Chapter 2, *Installation and Configuration*, contains instructions for installing and configuring your PCI-GPIB and the NI-488.2 software.
- Chapter 3, *Verify the Installation*, contains instructions for verifying the installation of your PCI-GPIB and the 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 programming considerations.
- Appendix A, *Hardware Specifications*, specifies the electrical, environmental, and physical characteristics of the PCI-GPIB and the recommended operating conditions.
- Appendix B, *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.
<i>italic</i>	Italic text denotes emphasis, a cross reference, or an introduction to a key concept.
<i>bold italic</i>	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 488.2-1987, 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*
- *PCI Local Bus Specification*, Revision 2.0

Customer Communication

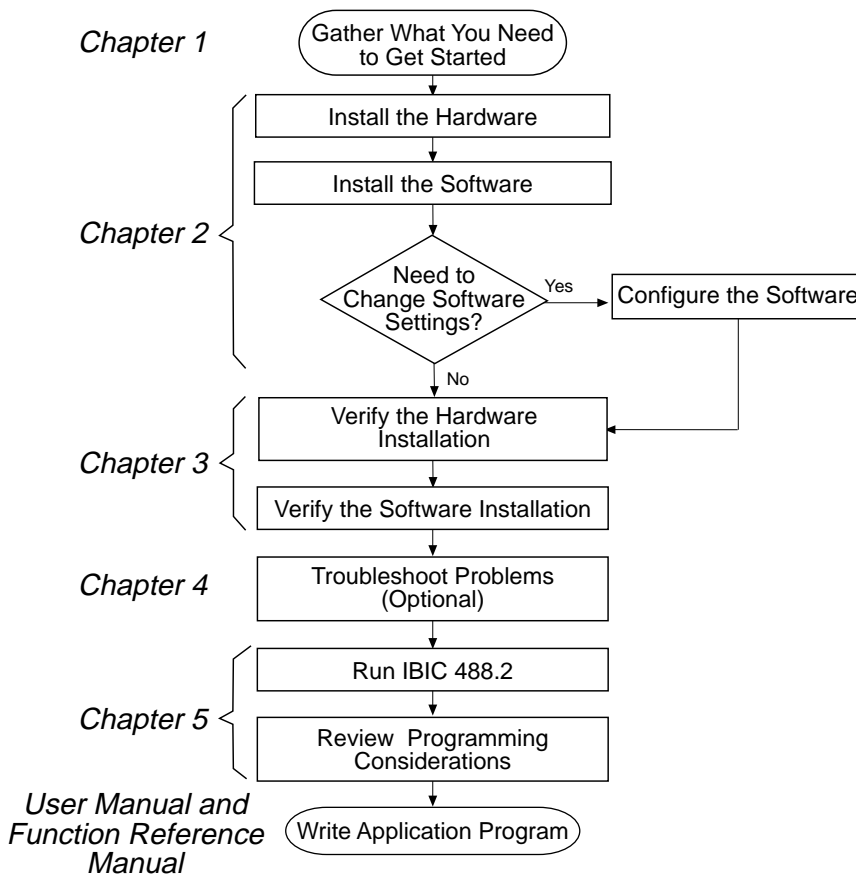
National Instruments wants to receive your comments on our products and manuals. We are interested in the applications you develop with our products, and we want to help if you have problems with them. To make it easy for you to contact us, this manual contains comment and configuration forms for you to complete. These forms are in Appendix B, *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 PCI-GPIB and the NI-488.2 software.

How to Use This Manual



What You Need to Get Started

- PCI-GPIB interface board with GPIB extension connector
- 3.5 in. *NI-488.2 Software for MacOS Distribution Disk*
- 3.5 in. *PCI-GPIB Hardware Verification for Macintosh*
- Macintosh operating system version 7.5.2 or later

Hardware Description

The PCI-GPIB is an IEEE 488 interface for computers with PCI expansion slots. The TNT4882C ASIC performs the basic IEEE 488 Talker, Listener, and Controller functions, including those required by the most recent GPIB standard, IEEE 488.2. The PCI-GPIB can sustain data transfer rates of 1.3 Mbytes/s, and can also implement a high-speed GPIB protocol (HS488), so that you can have data transfers greater than 1.7 Mbytes/s, depending on the speed of your system.

You can use standard GPIB cables to connect the PCI-GPIB with up to 14 instruments. If you need to use more than the maximum number of instruments, you can use the National Instruments GPIB extenders or the GPIB expander/isolator to add additional instruments to the system. Double-shielded GPIB cables are also available.

Refer to Appendix A, *Hardware Specifications*, for more information about the PCI-GPIB specifications and recommended operating conditions.

Software Description

The NI-488.2 software for Macintosh is part of your PCI-GPIB kit. It is a comprehensive package of software for transforming the Macintosh into a GPIB Controller with complete communications 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.

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

Installation and Configuration

This chapter contains instructions for installing and configuring your PCI-GPIB and the NI-488.2 software.

Warning: *Several components on your PCI-GPIB can be damaged by electrostatic discharge. To avoid such damage in handling the board, touch the antistatic plastic package to a metal part of your computer chassis before removing the board from the package.*

Install the Hardware

Follow these steps to install your PCI-GPIB.

1. Turn off your computer. Keep the computer plugged in so that it remains grounded while you install the PCI-GPIB.
2. Install the PCI-GPIB according to the instructions in the manual that came with your computer. You can install the board into any slot. If you are installing multiple boards in your computer, space them evenly to maximize airflow. For example, if you are installing three boards in a computer with six slots, position them in slots two, four, and six.

3. Connect the GPIB extension connector, as shown in Figure 2-1, to the PCI-GPIB through the slot in the Macintosh back panel. Push the connector in until it is secure.

Note: *In some Macintosh computers, the GPIB extension connector may not fit. You must use a narrower single-ended cable such as the Type X5 cable, available from National Instruments, with these computers.*

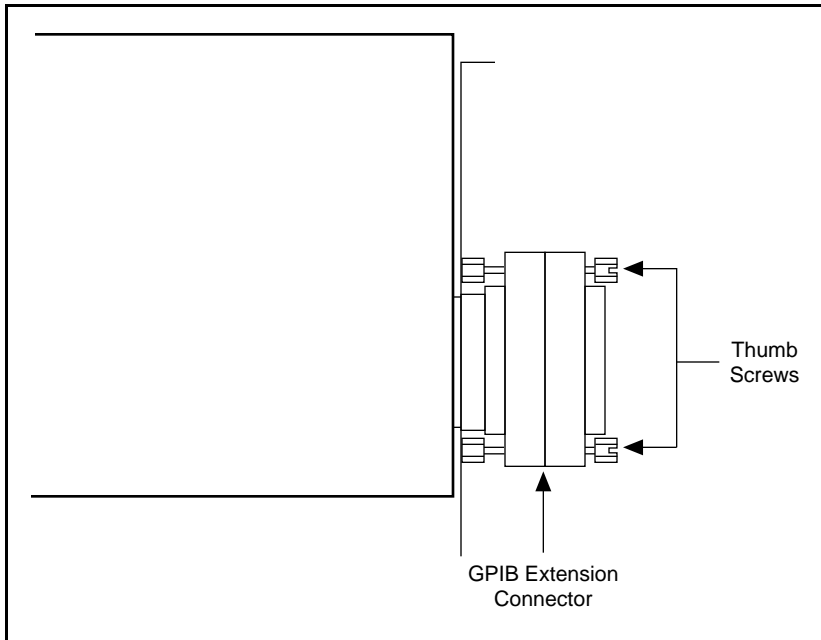


Figure 2-1. The GPIB Extension Connector

4. Tighten the thumb screws on each side of the GPIB extension connector.

Note: *If you are going to verify the hardware installation with the IBDIAG program, do not connect the GPIB cable at this time.*

5. Turn on your computer.

After you have installed your board, follow the instructions in the next section to install the NI-488.2 software. You must install the software before you verify the hardware installation using IBDIAG.

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 two 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, NI-DMA/DSP, or PCI_GPIB 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 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.
- NI-DMA/DSP is a system extension that provides DMA functionality through an RTSI connection to a DMA-2800 or DMA-8. This extension is for systems with NuBus slots only.
- PCI-GPIB is a native PowerMac device driver which supports the PCI-GPIB interface.
- 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

Note: *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 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.

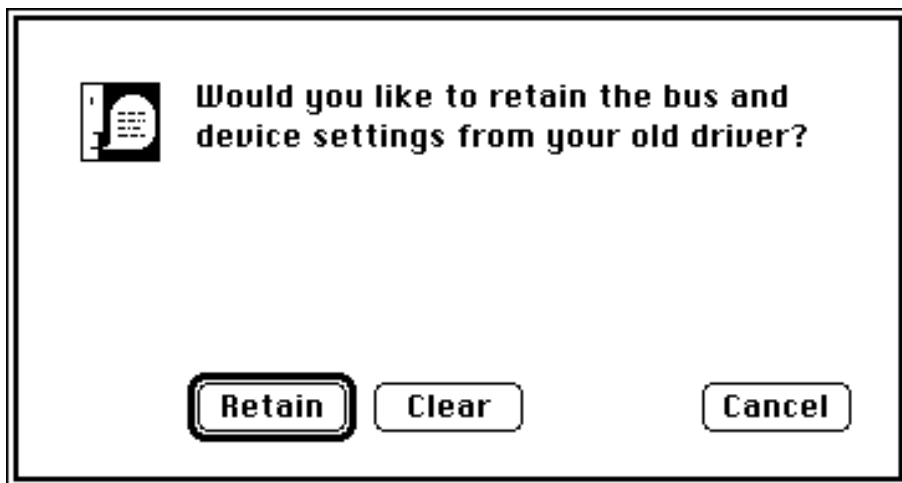


Figure 2-2. Settings Dialog Box

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.

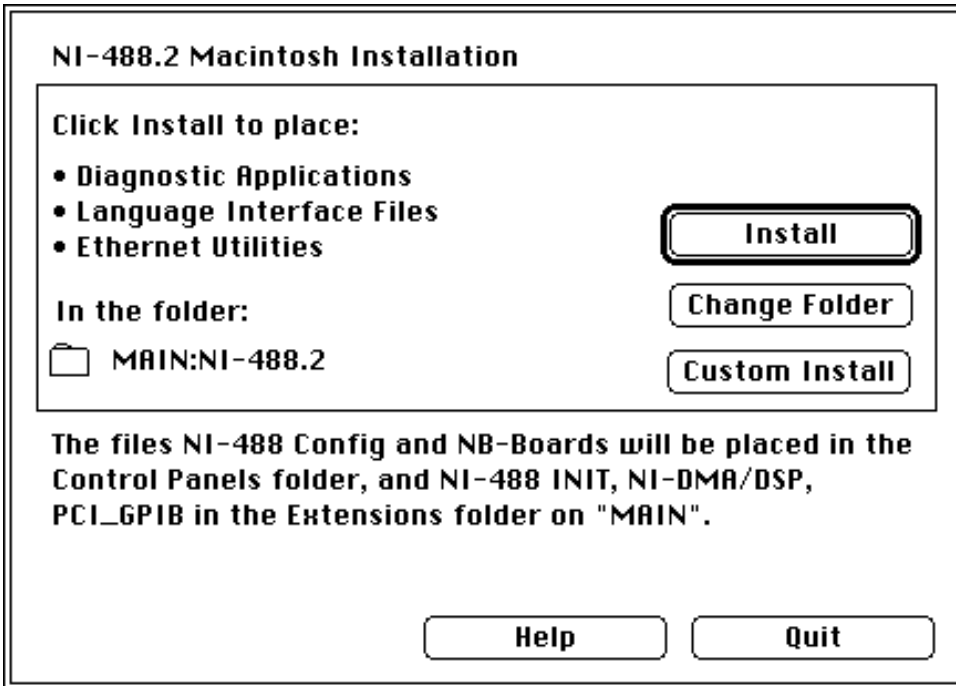


Figure 2-3. Installation Dialog Box

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

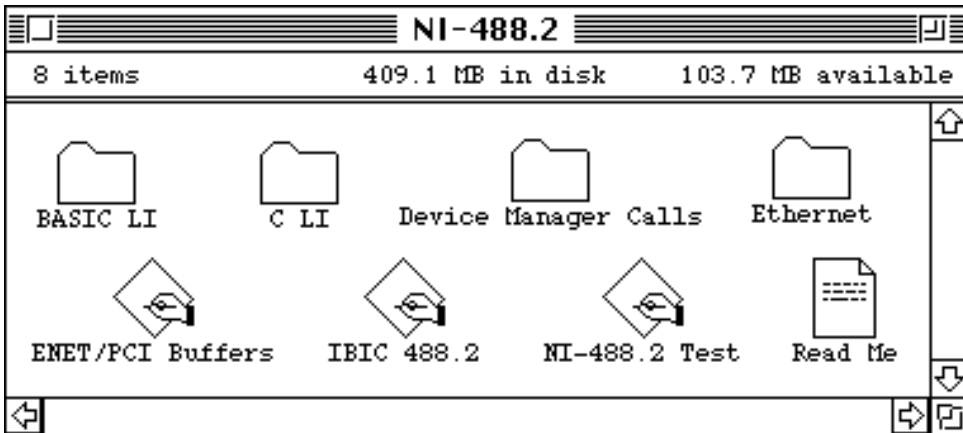


Figure 2-4. File and Folder Organization after Installation

Step 2. Examine or Change the Software Settings

You might want to configure the NI-488.2 software using the configuration utility. 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 activate the configuration utility by selecting **Control Panels** from the **Apple** menu and double-clicking on the NI-488 Config icon.

Figure 2-5 shows a possible configuration for the PCI-GPIB. The **Auto Configure** box is selected by default and assigns gpib0 (bus number 0) to the appropriate slot. If an **X** does not appear in a system slot box, follow the instructions in the section *Verify the Hardware Installation*, in Chapter 3, *Verify the Installation*, to verify that the board is operating correctly.

Refer to Chapter 6, *GPIB Configuration Utility*, in the *NI-488.2 User Manual for Macintosh* for more information on running the NI-488 Config utility and for information about the configurable software parameters.

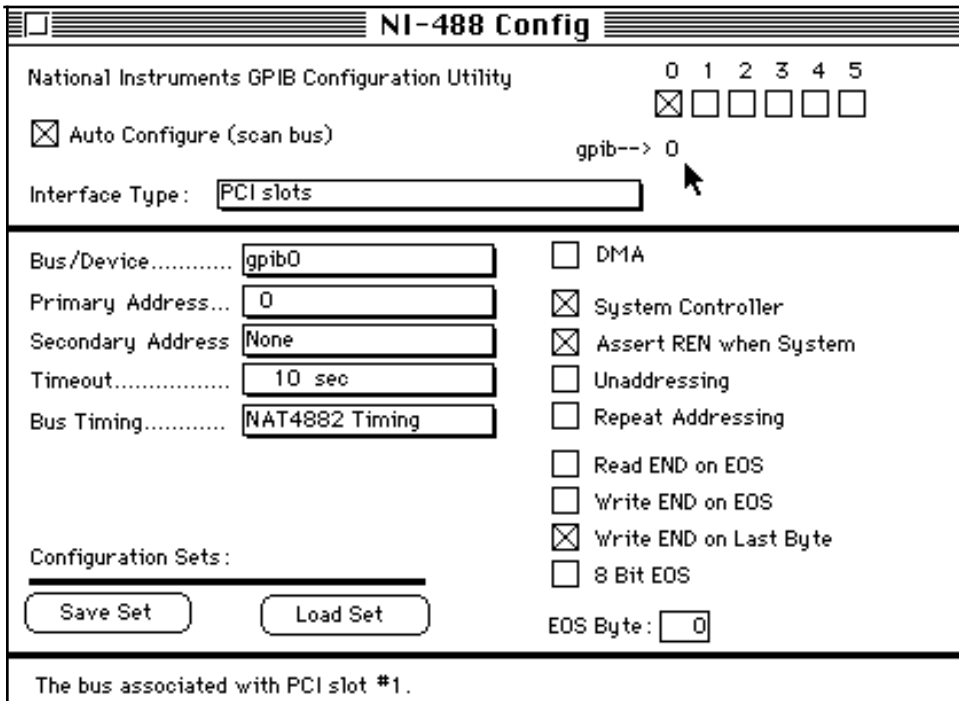


Figure 2-5. Sample Configuration for the PCI-GPIB

Step 3. 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 software installation procedure.

After you have installed the NI-488.2 software, proceed to the next chapter, *Verify the Installation*, to verify the installation.

Chapter 3

Verify the Installation

This chapter contains instructions for verifying the installation of your PCI-GPIB and the 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 board does not conflict with anything else in the system.

1. Disconnect all GPIB cables from the PCI-GPIB and the GPIB extension connector (see Figure 2-1) before running the hardware verification program.
2. Turn on your computer.
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.

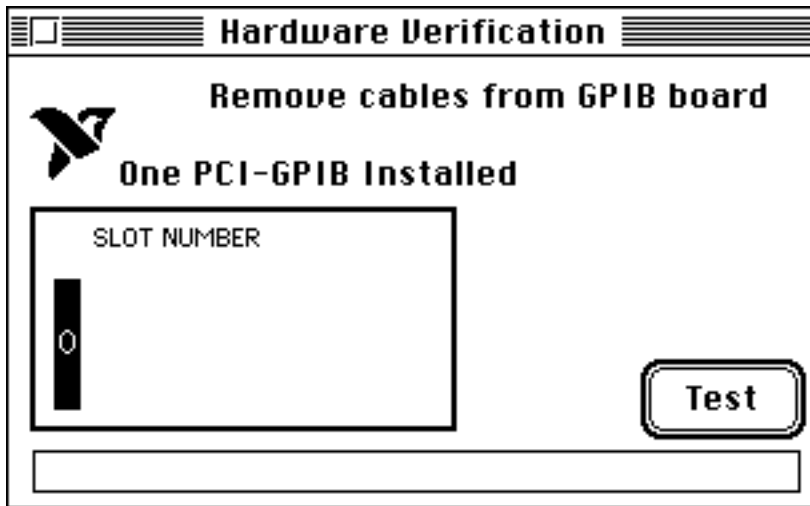


Figure 3-1. Test Window

The slot indicators show the Macintosh slots that have boards installed. A slot indicator highlighted in black shows the slot number of a PCI-GPIB 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 PCI-GPIB hardware installation. A bar graph indicates the progress of the tests, and a message appears above the slot 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.

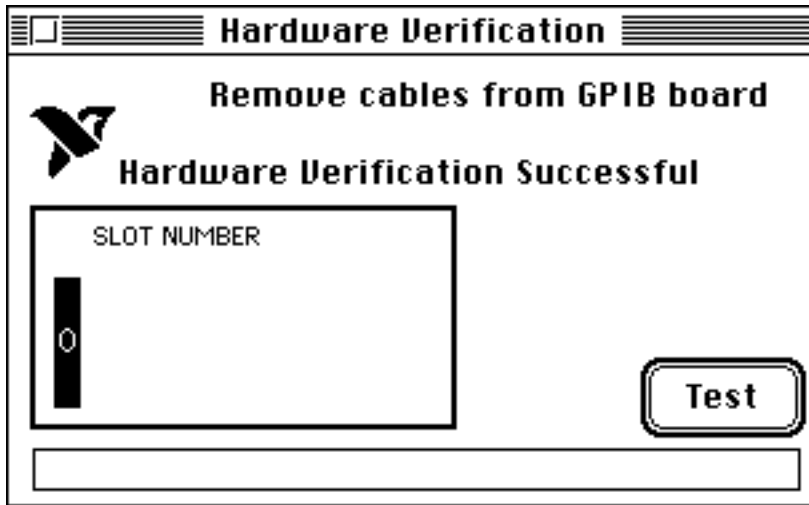


Figure 3-2. Hardware Verification Window after Successful Completion of Tests

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

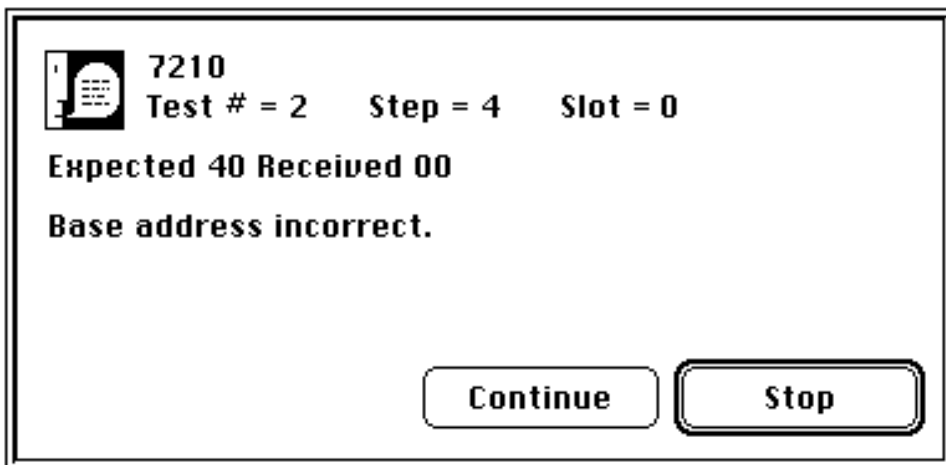


Figure 3-3. Dialog Box with Error Information

8. Record the error information. Whenever a dialog box 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, a screen appears as shown in Figure 3-4.

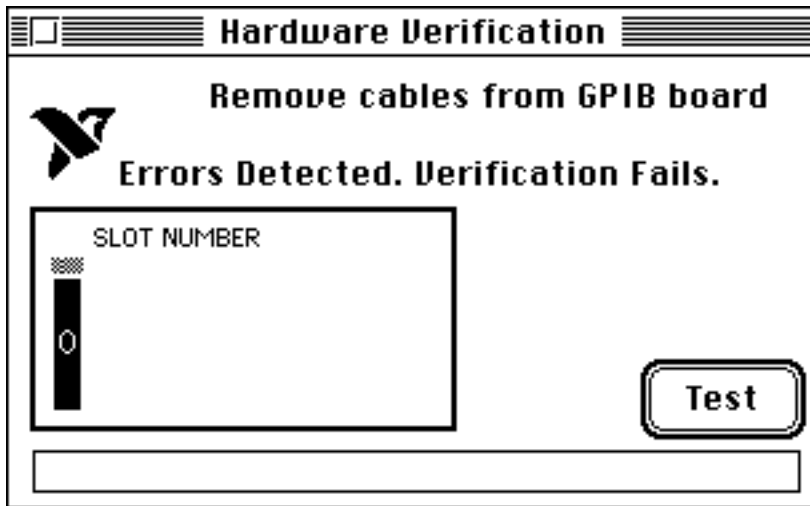


Figure 3-4. Hardware Verification Window after Unsuccessful Completion of Tests

9. If IBDIAG fails, make sure that the PCI-GPIB is positioned securely in its slot and that no GPIB cables are connected to the PCI-GPIB or the GPIB extension connector. 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 PCI-GPIB. First disconnect all GPIB cables from the PCI-GPIB and the GPIB extension connector (see Figure 2-1), 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 the NI-488.2 Test still 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 *PCI-GPIB Hardware and Software Configuration Form* in Appendix B, *Customer Communication*, and contact National Instruments.

If the verification test is successful, you are ready to connect the GPIB cable to the GPIB extension connector and start writing your own application program. Refer to the *NI-488.2 Function Reference Manual for Macintosh* for sample programs.

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 B, *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 PCI-GPIB is positioned securely in its slot.
- If the hardware verification test fails, make sure that no GPIB cables are connected to the PCI-GPIB or the GPIB extension connector (see Figure 2-1).
- Make sure that you install the NI-488.2 software and restart your Macintosh before running `IBDIAG`.

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 **PCI Slots**.
 - An **X** should appear in a system slot box for each PCI-GPIB board. If it does not, try moving the board to a different slot. If other boards are already installed, swap the arrangement of the boards.

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 PCI-GPIB or the GPIB extension connector (see Figure 2-1).
- Make sure to restart your Macintosh after you install the NI-488.2 software.

Common Questions

What can I do if the software doesn't recognize my PCI-GPIB after I install it?

Run the `IBDIAG` hardware diagnostic program as described in Chapter 3, *Verify the Installation*.

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

In `NI-488 Config`, an **X** should appear in a system slot box for each PCI-GPIB. If an **X** does not appear in any box, try moving the board to a different slot. If other boards are already installed, swap the arrangement of the boards.

What do I do if my GPIB extension connector does not fit?

You may need to order a Type X5 single-ended GPIB cable, available from National Instruments.

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. You can use the `Extensions Manager` control panel to disable certain extensions and control panels.

What do I do if my board does not work correctly with a scanner?

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

What do I do if my board does not work correctly with a film recorder?

Try checking the **Repeat Addressing** 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 configuration form in Appendix B, *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 Chapter 2, *Developing Your Application*, in 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

Hardware Specifications

This appendix specifies the electrical, environmental, and physical characteristics of the PCI-GPIB and the recommended operating conditions.

Table A-1. Electrical Characteristics of the PCI-GPIB

Characteristic	Specification
Number of GPIB Loads	1
Maximum Transfer Rate (programmed I/O)	1.3 Mbytes/s using three-wire handshake* 1.7 Mbytes/s using HS488*
Power Requirement	+5 VDC, 600 mA maximum
* Actual rates are dependent on instrument capabilities and system configuration.	

Table A-2. Environmental Characteristics of the PCI-GPIB

Characteristic	Specification
Operating Temperature	0° to 40° C
Storage Temperature	-20° to 70° C
Relative Humidity	5% to 90%, noncondensing
EMI	FCC Class A Verified

Table A-3. Physical Characteristics of the PCI-GPIB

Characteristic	Specification
Dimensions	13.34 cm by 10.67 cm (5.25 in. by 4.20 in.)
I/O Connector	IEEE 488 Standard 24-pin

Appendix B

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 9179	03 9 879 9422
Austria	0662 45 79 90 19	0662 45 79 90 0
Belgium	02 757 03 11	02 757 00 20
Denmark	45 76 71 11	45 76 26 00
Finland	90 502 2930	90 527 2321
France	1 48 14 24 14	1 48 14 24 24
Germany	089 714 60 35	089 741 31 30
Hong Kong	2686 8505	2645 3186
Italy	02 48301915	02 48301892
Japan	03 5472 2977	03 5472 2970
Korea	02 596 7455	02 596 7456
Mexico	5 202 2544	5 520 3282
Netherlands	03480 30673	03480 33466
Norway	32 84 86 00	32 84 84 00
Singapore	2265887	2265886
Spain	91 640 0533	91 640 0085
Sweden	08 730 43 70	08 730 49 70
Switzerland	056 20 51 55	056 20 51 51
Taiwan	02 737 4644	02 377 1200
U.K.	01635 523154	01635 523545

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 Brand _____

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 _____

PCI-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 hardware or software configuration, and use this form as a reference for your current configuration.

National Instruments Products

- PCI-GPIB Revision Number _____
- NI-488.2 Software Version Number on Disk _____
- NI-488 Config Control Panel Settings _____

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 _____
- Type of Monitor _____

Glossary

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

°	degrees
%	percent
A	amperes
AC	alternating current
ANSI	American National Standards Institute
ASIC	application-specific integrated circuit
C	Celsius
EMI	electromagnetic interference
FCC	Federal Communications Commission
GPIB	General Purpose Interface Bus
Hz	hertz
IEEE	Institute of Electrical and Electronic Engineers
in.	inches
I/O	input/output
m	meters
MB	megabytes of memory
RAM	random-access memory
s	seconds
VDC	volts direct current