SOFTWARE INSTALLATION GUIDE

NI-IMAQ™ for IEEE 1394 Cameras

Version 2.0.1

NI-IMAQ for IEEE 1394 Cameras is the National Instruments image acquisition software for IEEE 1394 cameras. NI-IMAQ for IEEE 1394 Cameras provides driver support for Windows 2000/XP, as well as LabVIEW Real-Time (RT) targets. The following sections describe how to start using NI-IMAQ for IEEE 1394 Cameras with your IEEE 1394 adapter card.

This installation guide describes how to install the NI-IMAQ for IEEE 1394 Cameras software. Refer to the `readme.rtf` file for the most up-to-date information about this release of NI-IMAQ for IEEE 1394 Cameras. The `readme.rtf` file is installed with NI-IMAQ for IEEE 1394 Cameras and is also available on the installation CD.

If you are using NI-IMAQ for IEEE 1394 Cameras with a National Instruments CVS-1450 Series compact vision system, refer to the *Compact Vision System Considerations* section of this document.

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New Features in NI-IMAQ for IEEE 1394 Cameras 2.0

This release of NI-IMAQ for IEEE 1394 Cameras includes the following features:

- Bayer color decoding—Supports automatic Bayer color decoding with no additional programming.
- Broadcast capabilities—Allows for multiple host computers to acquire images from a single camera, thus effectively distributing computations.
- FLIR Systems support—Allows for thermal imaging with IEEE 1394 FLIR ThermoVision cameras.
- Inline color conversion—Uses advanced instruction sets to decode YUV to RGB. Faster and more accurate than NI-IMAQ for IEEE 1394 Cameras 1.5.
- Updated LabVIEW support—Improves ease-of-use with property nodes. Enhances thread-scheduling between device drivers.
- IIDC 1.31 support—Enhanced version of IIDC 1.30 that supports IEEE 1394b-2002 compliant transfer, new video modes, and new camera features.
- Enhanced Windows support—Provides greater stability and performance.

Note Refer to the `readme.rtf` file for information about upgrading from NI-IMAQ for IEEE 1394 Cameras 1.*x*.

Minimum System Requirements

The development computer must meet the following minimum system requirements to run NI-IMAQ for IEEE 1394 Cameras.

- 750 MHz Pentium III-class processor
- 256 MB RAM
- 300 MB of free hard disk space
- 1,024 × 768 resolution video adapter and monitor

Software Components

The NI-IMAQ for IEEE 1394 Cameras software kit contains the following components:

- ❑ NI-IMAQ for IEEE 1394 Cameras device driver software
- ❑ NI-IMAQ for IEEE 1394 Cameras user libraries
- ❑ NI-IMAQ for IEEE 1394 Cameras sample code
- ❑ NI-IMAQ I/O device driver software, with user libraries and sample code
- ❑ Support files for NI 1450 Series compact vision systems
- ❑ National Instruments Measurement & Automation Explorer (MAX)
- ❑ Online documentation

Software Support

NI-IMAQ for IEEE 1394 Cameras supports the following operating systems:

- LabVIEW Real-Time Module 7.0 or later
- Windows 2000/XP

NI-IMAQ for IEEE 1394 Cameras supports the following application development environments (ADEs):

- LabVIEW Real-Time Module 7.0 or later
- LabVIEW 7.0 or later
- LabWindows™/CVI™ 6.0 or later
- Visual Basic 6.0 or later
- Visual C++ 6.0 or later
- Visual Studio .NET 2003 or later

You can also use NI-IMAQ for IEEE 1394 Cameras with NI Vision Builder for Automated Inspection (Vision Builder AI) version 2.5 or later to prototype, benchmark, and deploy your applications.

NI-IMAQ I/O supports the following application development environments (ADEs):

- LabVIEW Real-Time Module 7.0 or later[1]
- LabVIEW 7.0 or later[1]
- LabWindows/CVI 6.0 or later

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[1] Version 7.0 supports NI 1450 Series only.

- VisualBasic 6.0 or later
- Visual C++ 6.0 or later
- Visual Studio .NET 2003 or later

Compact Vision System Considerations

The following sections provide specific information about updating your software for use with your CVS-1450 device.

Vision Builder for Automated Inspection

If you are using Vision Builder AI with your CVS-1450 device, you must have Vision Builder AI 2.5 or later. If you have Vision Builder AI 2.0 installed, go to `ni.com/support`, and click the **Drivers and Updates** link to find and install the latest downloadable update. Without this support, you cannot configure the CVS-1450 device. Refer to your Vision Builder AI `readme.txt` file for additional information about this update.

LabVIEW Real-Time Module

If you previously used the LabVIEW Real-Time Module 7.0 to program your CVS-1450 device and you upgrade to the LabVIEW Real-Time Module 7.1, any VIs that use the digital I/O functionality of the CVS-1450 device may have a broken run arrow.

To correct this problem, select **Tools»FPGA Interface Update Utility** from the front panel or block diagram of the VIs. This utility restores the VIs by updating the **HW Exec Ref** and **HW Exec Ref Out** parameters in the VIs and any subVIs. Run this utility for each VI you created with the LabVIEW Real-Time Module 7.0.

Refer to the *FPGA Interface* section of the *LabVIEW Help* for more information about the **HW Exec Ref** and **HW Exec Ref Out** parameters.

Note You must have NI-IMAQ for IEEE 1394 Cameras version 2.0 installed to access the FPGA Interface Update Utility.

After you have updated the NI-IMAQ for IEEE 1394 Cameras software on your host computer, you must also update the software on your LabVIEW RT target. Refer to the *LabVIEW Real-Time Module* section for information about updating software on your LabVIEW RT target.

Installing the IEEE 1394 Hardware

Begin by installing the IEEE 1394 adapter card. Follow the installation instructions provided by the manufacturer. Then, refer to the *Installing and Configuring Your Camera Driver Software* section of this document.

Installing and Configuring Your Camera Driver Software

Windows 2000/XP

If you are using Windows 2000/XP, complete the following steps to install and configure NI-IMAQ for IEEE 1394 Cameras:

1. Disconnect all IEEE 1394 cameras.
2. Install the NI-IMAQ for IEEE 1394 Cameras software.
3. Reboot the computer when prompted.

4. Connect the IEEE 1394 camera.
5. Double-click the MAX icon  on your desktop. You can use MAX to modify camera attributes. After you have saved these attributes, they become the default settings for all NI-IMAQ for IEEE 1394 Cameras or IMAQ Vision applications.
6. Expand **Devices and Interfaces»NI-IMAQ IEEE 1394 Devices** in the configuration tree to display the cameras installed on your computer.
7. If your camera does not show up as an NI-IMAQ IEEE 1394 digital camera, change the associated driver by right-clicking the camera and selecting **Driver»NI-IMAQ IEEE 1394 IIDC Digital Camera**, as shown in Figure 1.

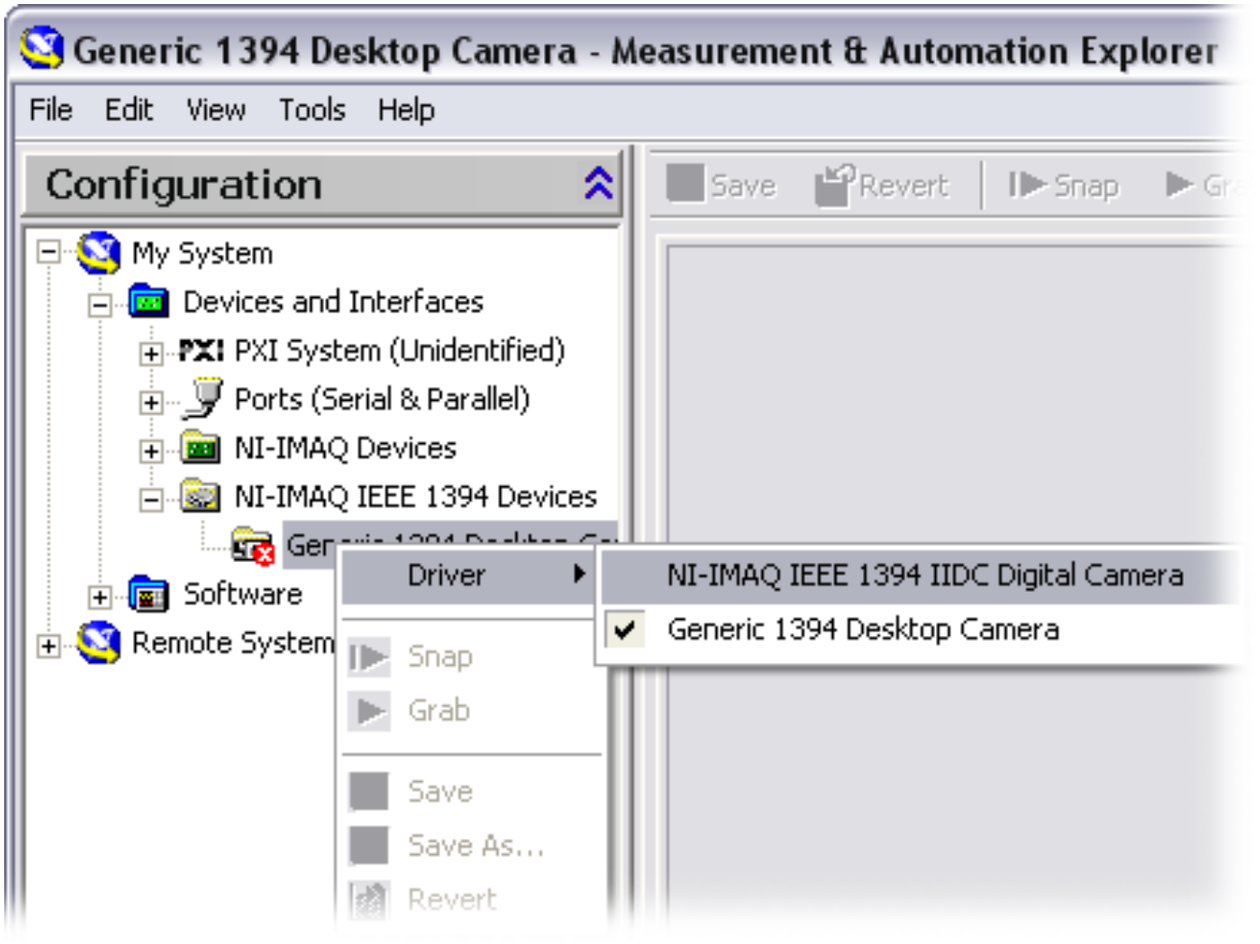

Figure 1. Switching the Camera Driver

8. Select the camera from the list. You then can view or modify the camera attributes from the **Properties Panel** located below the image viewer, as shown in Figure 2.

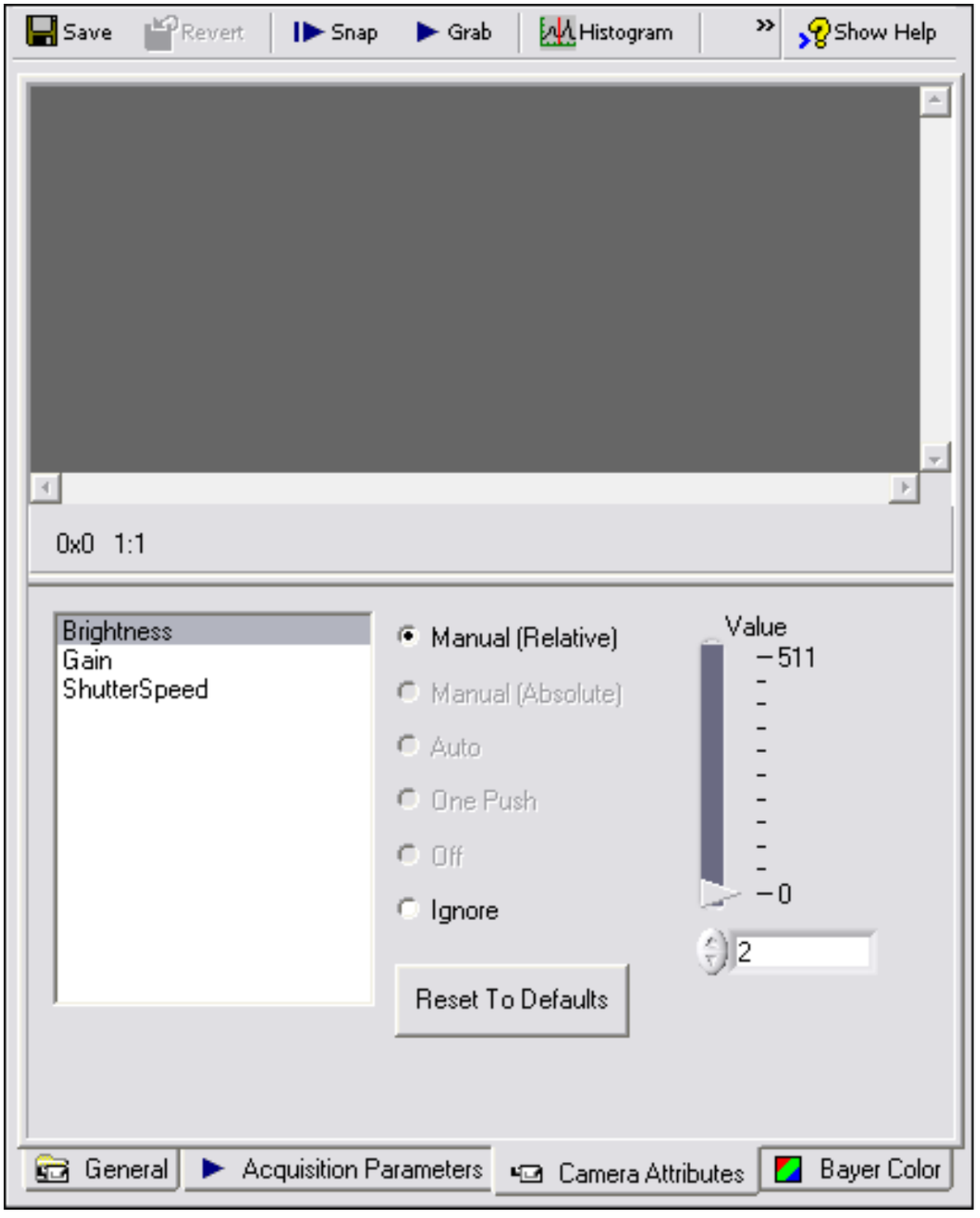

Figure 2. Setting Camera Attributes

Tip Click the **Show Help** button to display the help window on the right side of the image viewer. Move your mouse over the properties to view context-sensitive help in the bottom half of the help window.

LabVIEW Real-Time Module

If you are using a Windows development machine and a LabVIEW RT target, complete the following steps to install and configure NI-IMAQ for IEEE 1394 Cameras:

1. Install the NI-IMAQ for IEEE 1394 Cameras software on your Windows development machine.
2. Make sure your LabVIEW RT target is connected to the same subnet as the Windows development machine.
3. Double-click the MAX icon  on your desktop.
4. Expand the **Remote Systems** list in the configuration tree.
5. Select your LabVIEW RT target in the list.
6. Configure your network settings. Refer to the *Remote Systems Help* section of the *Measurement & Automation Explorer Help* (**Help»MAX Help**) for instructions about configuring network settings.
7. Install NI-IMAQ for IEEE 1394 Cameras on the LabVIEW RT target.
   a. Click the **Software** item below your LabVIEW RT target in the configuration tree.
   b. Click **Install Software** on the MAX toolbar to launch the LabVIEW Real-Time Install Software Wizard.

c. Select **NI-IMAQ for IEEE 1394 RT**, as well as any additional software you would like to install on the target machine, as shown in Figure 3.

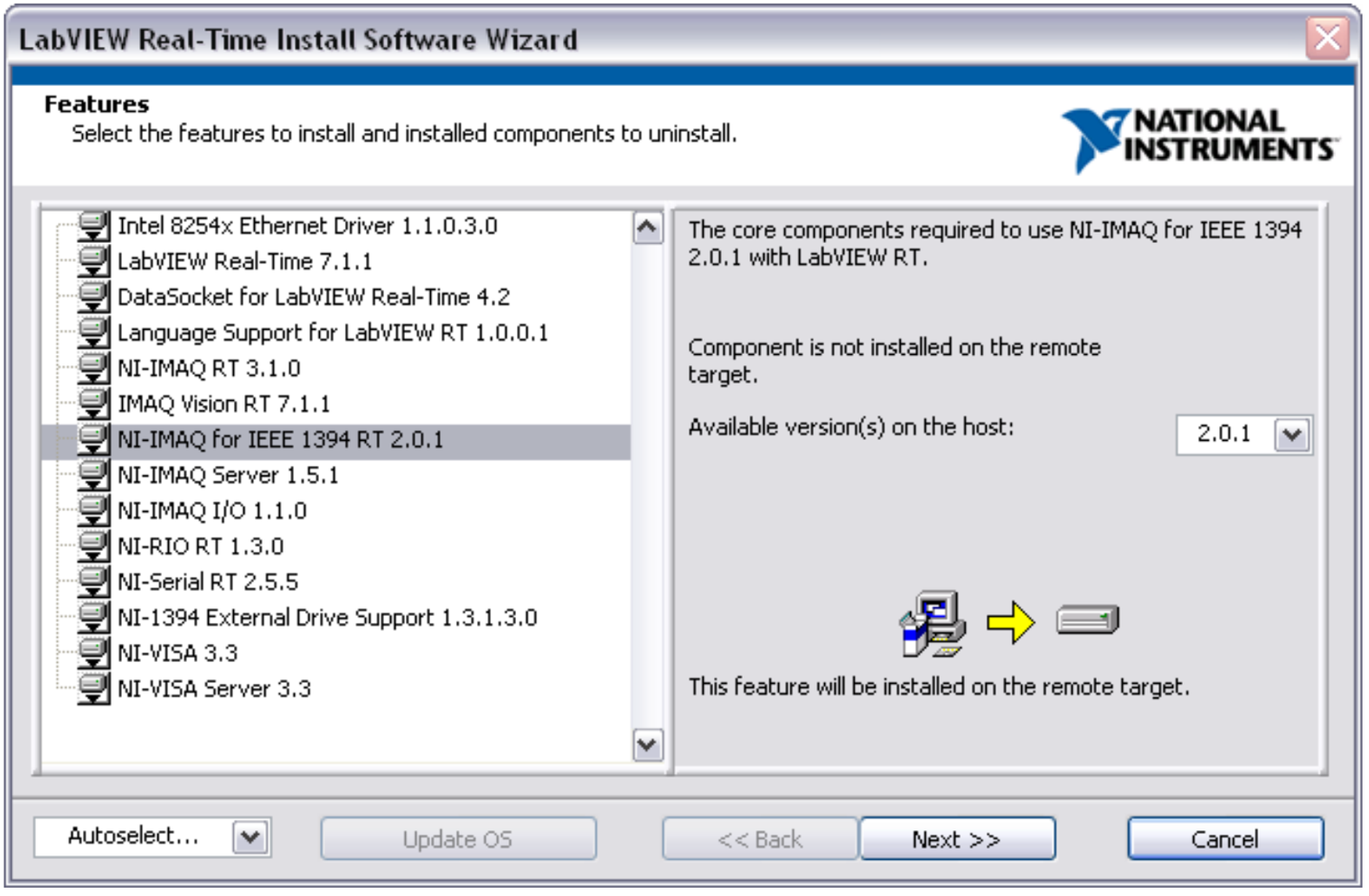

Figure 3. Selecting Software for the Target Machine

d. Click **Next**. Review the list of software you selected to install.

e. Click **Next** to begin downloading the software to the target machine. When MAX has finished downloading the software, it restarts the remote device.

f. Click **Finish**.

8. Connect your camera to your remote system.
9. Press the <F5> key to refresh the MAX configuration tree. Your IEEE 1394 camera should be listed in the **Remote Systems** list, as shown in Figure 4.

Tip Press <F5> to refresh the configuration tree whenever you connect a new device to a LabVIEW RT target.

10. Expand **Devices and Interfaces»NI-IMAQ IEEE 1394 Devices** in the configuration tree to display the cameras installed on your computer.
11. Select the camera from the list. You then can view or modify the camera attributes from the Properties panel located below the image viewer.

Figure 4. Viewing the Camera on the Remote System

Using the MAX Toolbar

The following list describes the functions of the toolbar buttons in MAX.

- Click **Save** to save the current acquisition configuration.

- Click **Revert** to reset the configuration values to those of the last saved configuration.

- Click **Snap** to acquire and display a single image.

- Click **Grab** to acquire and display a continuous set of images, which is useful, for example, when you need to focus the camera.

- Click **Histogram** to view a quantitative distribution of the pixels in an image per gray-level value.

- Click **Save Image** to save the image.

- Click **Show/Hide Help** to display/hide the topic and context-sensitive help to the right of the image viewer.

Installation Procedures

Insert the NI-IMAQ for IEEE 1394 Cameras CD into your drive to launch the autorun screen.

Note If you are using a previous version of NI-IMAQ for IEEE 1394 Cameras, National Instruments recommends that you uninstall the older version first.

Note If you are running Windows XP or Windows 2000, you must have administrator access to perform the installation.

Click **Install NI-IMAQ for IEEE 1394 Cameras 2.0.1** to launch the NI-IMAQ for IEEE 1394 Cameras installer, and follow the instructions on the installation screens.

Camera Configuration

If you are using a CVS-1450 device with Vision Builder for AI, refer to the Vision Builder AI documentation for camera configuration information.

NI-IMAQ for IEEE 1394 Cameras integrates with MAX, the National Instruments utility for configuring and testing your measurement and automation system.

An icon for MAX appears on your desktop after you install NI-IMAQ for IEEE 1394 Cameras. Double-click this icon to run the utility. You also can use MAX to configure other National Instruments hardware, such as data acquisition (DAQ) or GPIB devices.

Instructions for configuring an IMAQ IEEE 1394 device are included in **MAX Help for NI-IMAQ for IEEE 1394 Cameras**. You can access this help file from the MAX **Help** menu.

Using the Online Help

The NI-IMAQ for IEEE 1394 Cameras software online help and PDF documentation is installed onto your hard drive with the NI-IMAQ for IEEE 1394 Cameras software.

To view the online help, select **Start»Programs»National Instruments» Vision»Documentation,** and choose the appropriate document. You can access the **NI-IMAQ for IEEE 1394 VI Reference Help** from the LabVIEW **Help** menu.

Note You must have Adobe Acrobat Reader with Search and Accessibility 5.0.5 or later installed to view the PDFs. Refer to the Adobe Systems Incorporated Web site at `www.adobe.com` to download Acrobat Reader.

Where to Go for Support

The National Instruments Web site is your complete resource for technical support. At `ni.com/support` you have access to everything from troubleshooting and application development self-help resources to email and phone assistance from NI Application Engineers.

A Declaration of Conformity (DoC) is our claim of compliance with the Council of the European Communities using the manufacturer's declaration of conformity. This system affords the user protection for electronic compatibility (EMC) and product safety. You can obtain the DoC for your product by visiting `ni.com/certification`. If your product supports calibration, you can obtain the calibration certificate for your product at `ni.com/calibration`.

National Instruments corporate headquarters is located at 11500 North Mopac Expressway, Austin, Texas, 78759-3504. National Instruments also has offices located around the world to help address your support needs. For telephone support in the United States, create your service request at `ni.com/support` and follow the calling instructions or dial 512 795 8248. For telephone support outside the United States, contact your local branch office:

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Finland 385 0 9 725 725 11, France 33 0 1 48 14 24 24,
Germany 49 0 89 741 31 30, India 91 80 51190000, Israel 972 0 3 6393737,
Italy 39 02 413091, Japan 81 3 5472 2970, Korea 82 02 3451 3400,
Lebanon 961 0 1 33 28 28, Malaysia 1800 887710, Mexico 01 800 010 0793,
Netherlands 31 0 348 433 466, New Zealand 0800 553 322,
Norway 47 0 66 90 76 60, Poland 48 22 3390150, Portugal 351 210 311 210,
Russia 7 095 783 68 51, Singapore 1800 226 5886, Slovenia 386 3 425 4200,
South Africa 27 0 11 805 8197, Spain 34 91 640 0085,
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