RELEASE NOTES

NI Vision Acquisition Software

This document describes how to install and configure NI Vision Acquisition Software. NI Vision Acquisition Software allows you to acquire, display, and save images; control the digital I/O on IEEE 1394 hardware; and configure your drivers and hardware. NI Vision Acquisition Software includes the following features:

- NI-IMAQ 3.5.1—The latest generation driver in the NI Vision product line. Using NI-IMAQ you can program your image acquisition device to acquire, display, and save images.
- NI-IMAQ for IEEE 1394 Cameras 2.0.2—The National Instruments driver software for IEEE 1394 cameras. NI-IMAQ for IEEE 1394 Cameras gives you the ability to use IEEE 1394 industrial digital video cameras to acquire images.
- NI-IMAQ I/O 1.1.0—The National Instruments I/O device driver software for controlling the digital I/O on image acquisition devices.
- NI Measurement & Automation Explorer (MAX) 4.0—The National Instruments graphical configuration utility you can use to configure NI software and hardware, execute system diagnostics, add new channels and interfaces, and view the devices you have connected to your computer.

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NATIONAL INSTRUMENTS™

There is a `readme.rtf` file for each NI Vision Acquisition Software driver. The `readme.rtf` files are installed in the following default locations:

- NI-IMAQ—`C:\Program Files\National Instruments\NI-IMAQ\Docs\readme.rtf`
- NI-IMAQ for IEEE 1394 Cameras—`C:\Program Files\National Instruments\NI-IMAQ for IEEE-1394\Docs\readme.rtf`
- NI-IMAQ I/O—`C:\Program Files\National Instruments\NI-IMAQ IO\Docs\readme.rtf`

Refer to the `readme.rtf` files for late-breaking information and known issues.

New Features

This release of NI-IMAQ includes the following features:

- Support for the NI PCIe-1430 device.
- Support for quadrature encoder on the NI PCI-1426, NI PCIe-1429, and NI PCIe-1430.
- Support for extended image buffer allocations on Windows operating systems.
- Support for simultaneous Camera Link serial port access from multiple processes.

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

- Support for automatic Bayer color decoding with no additional programming.
- Support for multiple host computers to acquire images from a single camera, thus effectively distributing computations.
- Support for thermal imaging with IEEE 1394 FLIR ThermoVision cameras.

- 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 to improve ease-of-use with property nodes.
- Enhanced thread-scheduling between device drivers.
- Enhanced version of IIDC 1.30 that supports IEEE 1394b-2002 compliant transfer, new video modes, and new camera features.
- Enhanced Windows support to provide greater stability and performance.

This release of NI-IMAQ I/O includes the following features:

- Support for LabVIEW 8.0, the LabVIEW Real-Time Module 8.0, and the LabVIEW FPGA Module 8.0.
- Support for single-shot pulse generation for ISO Input 5, ISO Input 8, TRIG 0, TTL Input 0, and TTL Input 1.
- Support for trigger change detection for ISO Input 8, ISO Input 9, ISO Input 10, TRIG 0, TTL Input 0, and TTL Input 1.

Minimum System Requirements

The development computer must meet the following requirements to run NI Vision Acquisition Software:

- Pentium III 750 MHz processor
- 256 MB RAM
- 300 MB of free hard disk space
- 1024 × 768 resolution video adapter and monitor
- Internet Explorer 5.0 or later to view online documentation

Software Components

NI Vision Acquisition Software contains the following components:

- NI-IMAQ 3.5.1
  - NI-IMAQ device driver software, with user libraries and sample code
  - Documentation
- NI-IMAQ for IEEE 1394 Cameras 2.0.2
  - NI-IMAQ for IEEE 1394 Cameras device driver software, with user libraries and sample code
  - Documentation
- IEEE 1394 Hardware Support
  - NI 8254R documentation
  - NI CVS-1450 Series support
  - NI-IMAQ I/O 1.1.0 and documentation
- NI Measurement & Automation Explorer 4.0

Software Support

This section describes the operating systems and application development environments (ADEs) supported by NI-IMAQ, NI-IMAQ for IEEE 1394 Cameras, and NI-IMAQ I/O.

NI-IMAQ, NI-IMAQ for IEEE 1394 Cameras, and NI-IMAQ I/O support the following operating systems:

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

Note To use NI-IMAQ 3.5.1 with the LabVIEW Real-Time Module 7.1, you must use the LabVIEW Real-Time Module 7.1.1 patch. If you use the LabVIEW Real-Time Module 7.1, upgrade to the LabVIEW Real-Time Module 7.1.1 patch before installing NI-IMAQ 3.5.1. The LabVIEW Real-Time Module 7.1.1 patch is a free upgrade that can be downloaded from the **Drivers and Updates** section of `ni.com`. If you use the LabVIEW Real-Time Module 7.0 or earlier, continue to use NI-IMAQ 3.0.

NI-IMAQ, NI-IMAQ for IEEE 1394 Cameras, and NI-IMAQ I/O support the following ADEs:

- LabVIEW 7.0 or later
- LabVIEW Real-Time Module 7.0 or later
- LabWindows™/CVI™ 6.0 or later
- Microsoft Visual C/C++ 6.0 or later
- Microsoft Visual Basic 6.0 or later

NI-IMAQ for IEEE 1394 Cameras and NI-IMAQ I/O also support Microsoft Visual Studio .NET 2003.

You can also use NI-IMAQ, NI-IMAQ for IEEE 1394 Cameras, and NI-IMAQ I/O with the NI Vision Development Module 7.0 or later and NI Vision Builder for Automated Inspection (Vision Builder AI) 2.5 or later to prototype, benchmark, and deploy your applications.

Considerations for NI-IMAQ I/O Devices

The following sections provide specific information about updating your software for use with your NI-IMAQ I/O device. NI-IMAQ I/O devices include the NI CVS-1450 Series compact vision system and the NI PCI-8254R.

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 installed. 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 the Vision Builder AI `readme.txt` file for additional information about this update.

Upgrading NI-IMAQ I/O Host VIs for Use with LabVIEW 8.0

A host VI is a VI that communicates with an FPGA VI to control an FPGA target. A host VI can run on a Windows computer or on a real-time (RT) target. If you previously used LabVIEW 7.*x* to program your NI-IMAQ I/O device and you upgrade to LabVIEW 8.0, host VIs that use the digital I/O functionality of the NI-IMAQ I/O device may have a broken **Run** arrow when you open the VIs in LabVIEW 8.0.

Complete the following steps to correct the broken **Run** arrow:

1. In LabVIEW 8.0, select **Tools»Update 7.X VIs using NI-IMAQ I/O** in the Getting Started window or in the Project Explorer window of an open project.
2. Click **Add** to add the host VIs that you want to upgrade to the **VIs** list.
3. Choose the location to save the VIs.
4. Click **Continue**. The **Update 7.X VIs using NI-IMAQ I/O** window will automatically close when the update is complete.

Upgrading FPGA VIs for Use with LabVIEW 8.0

An FPGA VI is a VI that runs on an FPGA target. If you created FPGA VIs using LabVIEW 7.*x* and the LabVIEW FPGA Module 1.*x*, you can update the VIs for use with LabVIEW 8.0 and the LabVIEW FPGA Module 8.0. Refer to *Upgrading FPGA VIs, Host VIs, and Embedded Projects from LabVIEW FPGA Module 1.x to 8.0* in the *LabVIEW Help* for more information about upgrading FPGA VIs to LabVIEW 8.0.

Upgrading NI-IMAQ I/O Host VIs for Use with LabVIEW 7.1

If you previously used LabVIEW 7.0 to program your NI-IMAQ I/O device and you upgrade to LabVIEW 7.1, host VIs that use the digital I/O functionality of the NI-IMAQ I/O device may have a broken **Run** arrow when you open the VIs in LabVIEW 7.1.

To correct the broken **Run** arrow, 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 in LabVIEW 7.0.

Note You must have NI-IMAQ for IEEE 1394 Cameras version 2.0 or later 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 RT target. Refer to the *Configuring NI-IMAQ for IEEE 1394 Cameras for the LabVIEW Real-Time Module* section for information about updating software on your RT target.

Installation

Complete the following steps to install NI Vision Acquisition Software:

Note You must have administrator access to install the NI Vision Acquisition Software.

1. Insert the NI Vision Acquisition Software installation CD in the CD-ROM drive.
2. If you do not have autorun enabled, double-click `autorun.exe`. If you have autorun enabled, `autorun.exe` runs automatically.
3. Follow the onscreen instructions.

NI-IMAQ and NI-IMAQ for IEEE 1394 Cameras integrate with MAX, the National Instruments utility for configuring and testing your measurement and automation system. The MAX icon appears on your desktop after you install NI Vision Acquisition Software.

Configuring NI-IMAQ

Complete the following steps to install an image acquisition device and configure NI-IMAQ:

Note You must install NI-IMAQ before installing your image acquisition device.

Caution Power off and unplug the computer before installing your hardware. Wait for any motherboard LEDs to power off before proceeding, since some computers remain powered for some time after being unplugged.

1. Install your image acquisition device, and connect the camera. Refer to the device documentation for specific hardware installation instructions.

Note If you have to manually associate the image acquisition device with the NI-IMAQ driver software, Windows may return a warning stating that the driver is unsigned. It is safe to ignore the warning.

2. Run MAX.

a. Double-click the MAX icon on the desktop. You can use MAX to modify camera properties. Once you have saved these properties, they become the default settings for all NI-IMAQ applications.

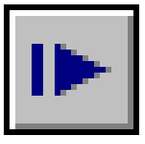
b. Expand **Devices and Interfaces** and **NI-IMAQ Devices** to display a list of the image acquisition devices installed on your computer.

Only one application can access the image acquisition device at any given time. Selecting an image acquisition device in MAX opens a session to the

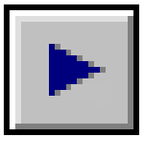
device, and the open session prevents other applications from accessing the device. To allow applications to access an image acquisition device, deselect the device in MAX to close the session.

If you are using a Camera Link image acquisition device with NI-IMAQ 3.5 or later, you can simultaneously open a session to the device in an application and use a camera control utility by using `clallserial.dll`.

3. Select a camera file, and acquire an image.
   a. Click the plus sign next to the image acquisition device to expand the menu tree and list the available channels or ports. Right-click the channel or port to display a list of available cameras.
   b. Select the appropriate camera type from the list. Camera type selection varies according to the image acquisition device installed.
   c. To change the camera settings, modify the parameters at the bottom of the image viewer panel.



   d. Click the **Snap** button on the toolbar to acquire an image.



   e. Click the **Grab** button on the toolbar to acquire images continuously. A grab allows you to focus the camera.

Tip For a complete list of supported cameras, right-click the channel or port, select **Camera**, and click **Search ni.com**.

Note Refer to the right side of the MAX user interface, which displays context-sensitive help, for information about configuring image acquisition devices with MAX.

Configuring a Remote NI Image Acquisition Device

Use MAX to install NI-IMAQ for LabVIEW Real-Time from the host machine onto the target system. The NI-IMAQ for LabVIEW Real-Time components enable the remote device to acquire and analyze images as directed by the host machine.

Note Install NI-IMAQ and the LabVIEW Real-Time Module on the remote system before you install and configure the image acquisition device. Follow the steps in the MAX help window to install software.

Tip Configuring remote image acquisition devices is similar to configuring local image acquisition devices, except that the procedure for working with camera files is different. Refer to the *NI-IMAQ Help* for information about working with camera files on remote image acquisition devices.

1. Launch MAX.
2. Expand **Remote Systems**.
3. Expand the appropriate system.
4. Expand **Devices and Interfaces**.
5. Expand **NI-IMAQ Devices**.
6. Expand the device you want to configure.

Refer to the *NI-IMAQ Help* for information about configuring specific NI image acquisition devices. You can access this help file from the MAX **Help** menu by selecting **Help»Help Topics»NI-IMAQ**.

Configuring NI-IMAQ for IEEE 1394 Cameras

Complete the following steps to install IEEE 1394 hardware and configure NI-IMAQ for IEEE 1394 Cameras.

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

Installing IEEE 1394 Hardware

Install your IEEE 1394 adapter card. Follow the installation instructions provided by the manufacturer.

Configuring NI-IMAQ for IEEE 1394 Cameras for Windows

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

1. Connect the IEEE 1394 camera.
2. Run MAX.

a. 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 NI Vision applications.

b. Expand **Devices and Interfaces»NI-IMAQ IEEE 1394 Devices** in the configuration tree to display a list of the cameras installed on your computer.

c. 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**.

d. Select the camera from the list. You then can view or modify the camera attributes on the **Camera Attributes** tab located below the image viewer.

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.

Configuring NI-IMAQ for IEEE 1394 Cameras for the LabVIEW Real-Time Module

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

1. Install NI-IMAQ for IEEE 1394 Cameras software on your Windows development machine.
2. Ensure that your RT target is connected to the same subnet as the Windows development machine.
3. Run MAX.

a. Double-click the MAX icon on your desktop.

b. Expand the **Remote Systems** list in the configuration tree.

c. Select your RT target in the list.

d. Configure your network settings. Refer to the *Remote Systems Help* in MAX (**Help»Help Topics»Remote Systems**) for instructions about configuring network settings.

4. Install NI-IMAQ for IEEE 1394 Cameras on the RT target.
   a. Click the **Software** item below the 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.
   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**.
5. Connect your camera to your remote system.

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

6. Press <F5> to refresh the MAX configuration tree. Your IEEE 1394 camera should be listed in the **Remote Systems** list.

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

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

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 display a histogram of the captured image.

- 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.

Documentation

The NI Vision Acquisition Software documentation is installed onto your hard drive with NI Vision Acquisition Software. The documentation ships as Adobe Acrobat portable document format (PDF) files and HTML Help files.

To view the NI Vision Acquisition Software documentation, select **Start»All Programs»National Instruments»Vision»Documentation**. You can access the *NI-IMAQ VI Reference Help* and the *NI-IMAQ for IEEE 1394 Cameras 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 Adobe Reader.