

NI-IMAQ[™] VI Reference Help

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The *NI-IMAQ VI Reference Help* is for NI-IMAQ driver software users. The NI-IMAQ VI Library, a series of virtual instruments (VIs) for using LabVIEW with National Instruments image acquisition devices, is included with the NI-IMAQ driver software.

The NI-IMAQ VI Library also includes several basic NI Vision VIs. NI Vision is an image processing and analysis library that consists of more than 250 VIs for use with LabVIEW. If you use these included basic VIs, you can later upgrade the programs to use NI Vision without any changes to the image acquisition VIs.

NI-IMAQ VIs give you the basic tools to perform the following functions:

- Load information about devices and cameras from a configuration file.
- Select a video channel.
- Adjust the acquisition parameters.
- Start or stop an acquisition.
- Transfer an image from device memory to an NI Vision image buffer.
- Monitor and control the device trigger lines.

For more information about this help file, refer to the following topics:

Using Help

Related Documentation

<u>Glossary</u>

Important Information

Technical Support and Professional Services

To comment on National Instruments documentation, refer to the <u>National</u> <u>Instruments Web site</u>.

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Related Documentation

Some NI-IMAQ manuals also are available as PDFs. You must have Adobe Acrobat Reader with Search and Accessibility 5.0.5 or later installed to view the PDFs. Refer to the <u>Adobe Systems Incorporated</u> <u>Web site</u> to download Acrobat Reader. Refer to the <u>National Instruments</u> <u>Product Manuals Library</u> for updated documentation resources.

The following documents contain information that you may find helpful as you use this help file:

- *NI-IMAQ Examples*—Illustrate common applications you can create with NI-IMAQ. You can find these examples in the <LabVIEW>\Examples\IMAQ directory, where <LabVIEW> is the location to which you installed LabVIEW.
- *NI Vision Acquisition Software Release Notes*—Contains information about new functionality, minimum system requirements, and installation instructions for NI-IMAQ driver software.
- *Measurement & Automation Explorer Help for NI-IMAQ—* Describes how to configure NI-IMAQ driver software, NI image acquisition devices, and cameras using Measurement & Automation Explorer.
- NI Developer Zone—For more information about developing your image acquisition application, visit the <u>NI Developer Zone</u> at ni.com/zone. NI Developer Zone contains example programs, tutorials, technical presentations, the Instrument Driver Network, a measurement glossary, an online magazine, and a product advisor, as well as a community area where you can share ideas, questions, and source code with developers around the world.

Using Help

<u>Conventions</u> <u>Navigating Help</u> <u>Searching Help</u> <u>Printing Help File Topics</u>

Conventions

This help file uses the following conventions:

- < > Angle brackets that contain numbers separated by an ellipsis represent a range of values associated with a bit or signal name—for example, AO <0..3>.
- The » symbol leads you through nested menu items and dialog box options to a final action. The sequence File»Page Setup»Options directs you to pull down the File menu, select the Page Setup item, and select Options from the last dialog box.
- The symbol indicates that the following text applies only to a specific product, a specific operating system, or a specific software version.
- This icon denotes a tip, which alerts you to advisory information.
- This icon denotes a note, which alerts you to important information.
- **bold** Bold text denotes items that you must select or click in the software, such as menu items and dialog box options. Bold text also denotes parameter names.
- green Underlined text in this color denotes a link to a help topic, help file, or Web address.
- *italic* Italic text denotes variables, emphasis, cross references, or an introduction to a key concept. Italic text also denotes text that is a placeholder for a word or value that you must supply.
- monospace Text in this font denotes text or characters that you should enter from the keyboard, sections of code, programming examples, and syntax examples. This font is also used for the proper names of disk drives, paths, directories, programs, subprograms, subroutines, device names, functions, operations, variables, filenames, and extensions.

Navigating Help (Windows Only)

To navigate this help file, use the **Contents**, **Index**, and **Search** tabs to the left of this window or use the following toolbar buttons located above the tabs:

- Hide—Hides the navigation pane from view.
- Locate—Locates the currently displayed topic in the Contents tab, allowing you to view related topics.
- **Back**—Displays the previously viewed topic.
- **Forward**—Displays the topic you viewed before clicking the **Back** button.
- **Options**—Displays a list of commands and viewing options for the help file.

Searching Help (Windows Only)

Use the **Search** tab to the left of this window to locate content in this help file. If you want to search for words in a certain order, such as "related documentation," add quotation marks around the search words as shown in the example. Searching for terms on the **Search** tab allows you to quickly locate specific information and information in topics that are not included on the **Contents** tab.

Wildcards

You also can search using asterisk (*) or question mark (?) wildcards. Use the asterisk wildcard to return topics that contain a certain string. For example, a search for "prog*" lists topics that contain the words "program," "programmatically," "progress," and so on.

Use the question mark wildcard as a substitute for a single character in a search term. For example, "?ext" lists topics that contain the words "next," "text," and so on.

Nested Expressions

Use nested expressions to combine searches to further refine a search. You can use Boolean expressions and wildcards in a nested expression. For example, "example AND (program OR VI)" lists topics that contain "example program" or "example VI." You cannot nest expressions more than five levels.

Boolean Expressions

Click the **•** button to add Boolean expressions to a search. The following Boolean operators are available:

- **AND** (default)—Returns topics that contain both search terms. You do not need to specify this operator unless you are using nested expressions.
- **OR**—Returns topics that contain either the first or second term.
- **NOT**—Returns topics that contain the first term without the second term.
- **NEAR**—Returns topics that contain both terms within eight words of each other.

Search Options

Use the following checkboxes on the **Search** tab to customize a search:

- Search previous results—Narrows the results from a search that returned too many topics. You must remove the checkmark from this checkbox to search all topics.
- Match similar words—Broadens a search to return topics that contain words similar to the search terms. For example, a search for "program" lists topics that include the words "programs," "programming," and so on.
- Search titles only—Searches only in the titles of topics.

Printing Help File Topics (Windows Only)

Complete the following steps to print an entire book from the **Contents** tab:

- 1. Right-click the book.
- 2. Select **Print** from the shortcut menu to display the **Print Topics** dialog box.
- 3. Select the **Print the selected heading and all subtopics** option.
 - Note Select Print the selected topic if you want to print the single topic you have selected in the **Contents** tab.
- 4. Click the **OK** button.

Printing PDF Documents

This help file may contain links to PDF documents. To print PDF documents, click the print button located on the Adobe Acrobat Viewer toolbar.

VIs

NI-IMAQ VIs Camera Control VIs Low-Level VIs Signal I/O VIs NI Vision VIs

Alphabetical List of VIs

IMAQ AVI Close IMAQ AVI Create **IMAQ AVI Write Frame IMAQ Bayer Color Decode IMAQ Close** IMAQ ColorImageToArray **IMAQ Configure Buffer IMAQ Configure List IMAQ Configure Trigger3 IMAQ Copy Acquired Buffer IMAQ Create IMAQ Create Bayer LUT IMAQ Dispose IMAQ Extract Buffer IMAQ Fit ROI IMAQ Generate Pulse3 IMAQ Get Buffer IMAO Get Camera Attribute IMAQ GetImageInfo IMAQ GetImageSize IMAQ Grab Acquire IMAQ Grab Setup IMAQ ImageToArray** IMAQ Init IMAQ Occurrence Config2 **IMAO Reset Encoder Position IMAQ Sequence**

IMAQ Serial Read Bytes IMAQ Serial Write IMAQ Serial Write IMAQ Set Camera Attribute IMAQ Set Camera Attribute IMAQ Set User LUT IMAQ Set User LUT IMAQ Snap IMAQ Start IMAQ Start IMAQ Start IMAQ Status IMAQ Stop IMAQ Trigger Drive2 IMAQ Trigger Read2 IMAQ Trigger Route2 IMAQ Wait Signal2 IMAQ WriteFile

NI-IMAQ VIs

Use NI-IMAQ VIs to set up the image acquisition system and acquire images. The NI-IMAQ VIs are sufficient for many applications. These VIs allow you to acquire images, open and close an interface, and decode Bayer-encoded images.

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IMAQ Snap

IMAQ Grab Setup

IMAQ Grab Acquire

IMAQ Sequence

Low-Level VIs

IMAQ Init

IMAQ Close

Signal I/O VIs

IMAQ Create Bayer LUT

IMAQ Bayer Color Decode

Property Node

Camera Control VIs

IMAQ Snap VI

Installed With: NI Vision Acquisition Software

Acquires a single image into **Image out**. A snap is appropriate for lowspeed or single-capture applications where ease of programming is essential.

If necessary, this VI performs a system initialization using <u>IMAQ Init</u> before the acquisition. When you invoke a snap, the VI initializes the device and acquires the next incoming video frame to a buffer.



- **Channel** specifies the device channel to acquire from. This parameter is valid only for NI PCI/PXI-1409 and NI PCI-1410 devices.
- Region of Interest specifies a rectangular portion of the image. Region of Interest is defined by an array of four elements [Left, Top, Right, Bottom]. You must set the width [Right-Left] to a multiple of eight. The [Right] and [Bottom] coordinates are <u>exclusive</u>. If Region of Interest is not connected or empty, the current region of interest is captured.
- **IMAQ Session In** identifies the device.
- **Image In** is a reference to an image that receives the captured pixel data.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.

- **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- Step x is a horizontal sampling step or horizontal reduction factor. If Step x is set to 1, each column of the image is transferred. If Step x is not connected or is set to -1, the current value of the Horizontal Scaling property is used. Step x accepts only values of -1, 1, 2, 4, or 8.
 - $\overline{\mathbb{Z}}$

Note This parameter is deprecated and not available on all NI image acquisition devices. Horizontal scaling is not supported on the NI 1427, NI 1429, NI 1430 or NI 17xx smart cameras.

Step y is a vertical sampling step or vertical reduction factor. If Step y is set to 1, each column of the image is transferred. If Step y is not connected or is set to -1, the current value of the Vertical Scaling property is used. Step x accepts only values of -1, 1, 2, 4, or 8.

- Note This parameter is deprecated and not available on all NI image acquisition devices. Vertical scaling is not supported on the NI 1427, NI 1429, NI 1430 or NI 17xx smart cameras.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- **Image Out** is a reference to the image.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the

same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the **error out** indicator on the front panel and select **Explain Error** from the shortcut menu for more information about the error.

- **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
- **code** is the error or warning code. If status is TRUE, **code** is a nonzero <u>error code</u>. If **status** is FALSE, **code** is 0 or a warning code.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Grab Setup VI

Installed With: NI Vision Acquisition Software

Starts a grab acquisition. This VI performs a continuous acquisition that provides access to the most recently acquired image.

Use <u>IMAQ Grab Acquire</u> to return a copy of the image. If necessary, this VI performs a system initialization using <u>IMAQ Init</u>.



- **Channel** specifies the device channel to acquire from. This parameter is valid only for NI PCI/PXI-1409 and NI PCI-1410 devices.
- Region of Interest specifies a rectangular portion of the image. Region of Interest is defined by an array of four elements [Left, Top, Right, Bottom]. You must set the width [Right-Left] to a multiple of eight. The [Right] and [Bottom] coordinates are <u>exclusive</u>. If Region of Interest is not connected or empty, the current region of interest is captured.
- **IMAQ Session In** identifies the device.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.

- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- Step x is a horizontal sampling step or horizontal reduction factor. If Step x is set to 1, each column of the image is transferred. If Step x is not connected or is set to -1, the current value of the Horizontal Scaling property is used. Step x accepts only values of -1, 1, 2, 4, or 8.
 - Note This parameter is deprecated and not available on all NI image acquisition devices. Horizontal scaling is not supported on the NI 1427, NI 1429, NI 1430 or NI 17xx smart cameras.
- Step y is a vertical sampling step or vertical reduction factor. If Step y is set to 1, each column of the image is transferred. If Step y is not connected or is set to -1, the current value of the Vertical Scaling property is used. Step x accepts only values of -1, 1, 2, 4, or 8.
 - $\overline{\mathbb{N}}$

Note This parameter is deprecated and not available on all NI image acquisition devices. Vertical scaling is not supported on the NI 1427, NI 1429, NI 1430 or NI 17xx smart cameras.

IMAQ Session Out has the same value as **IMAQ Session In**.

- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.

- code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Grab Acquire VI

Installed With: NI Vision Acquisition Software

Acquires an image from a grab acquisition. Use the grab function for high-speed image acquisition.

IMAQ Grab Acquire returns a copy of the most recently acquired image. Use IMAQ Grab Setup to start the acquisition and IMAQ Stop to stop the acquisition.



IMAQ Session In identifies the device.

Image In is a reference to an image.

- Immediate? determines if the system returns the image currently being acquired or the last completely acquired image. The default value if FALSE, which causes NI-IMAQ to wait until the current image is completely acquired before returning the image. TRUE returns the next acquired image
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
 - **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display

the corresponding error message.

- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- **Image Out** is a reference to the image.
- Acquired Buffer Number is the number of the buffer acquired in the acquisition.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select **Explain Error** from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Sequence VI

Installed With: NI Vision Acquisition Software

Starts, acquires, and releases a sequence acquisition. Use this VI to capture multiple images with fixed or variable delays between images.

If necessary, this VI initializes the system using IMAQ Init.



Channel specifies the device channel to acquire from. This parameter is valid only for NI PCI/PXI-1409 and NI PCI-1410 devices.

- Region of interest specifies a rectangular portion of the image. Region of Interest is defined by an array of four elements [Left, Top, Right, Bottom]. You must set the width [Right-Left] to a multiple of eight. If Region of Interest is not connected or empty, the entire acquisition window is captured.
- **IMAQ Session In** identifies the device.
- **Images In** is an array of image references that receives the captured pixel data. Each image in the array must have the same border size, and a unique name.
- **Skip table**is an array containing the number of frames to skip before acquiring each buffer. Each element in the array specifies the number of frames to skip before acquiring the corresponding buffer in the buffer list.
 - Note This parameter is not supported on the NI 1427, NI 1429, or NI 1430.
 - Note This parameter is optional. If you choose to specify an array for **Skip table**, the array must contain the same number of elements as the **Images In** array.

error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred

before this VI or function runs, the VI or function passes the **error in** value to **error out**. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in **error out**. Use the <u>Simple Error Handler</u> or <u>General Error</u> <u>Handler</u> VIs to display the description of the error code. Use **error in** and **error out** to check errors and to specify execution order by wiring **error out** from one node to **error in** of the next node.

- **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- Step x is a horizontal sampling step or horizontal reduction factor. If Step x is set to 1, each column of the image is transferred. If Step x is not connected or is set to -1, the current value of the Horizontal Scaling property is used. Step x accepts only values of -1, 1, 2, 4, or 8.
 - Note This parameter is deprecated and not available on all NI image acquisition devices. Horizontal scaling is not supported on the NI 1427, NI 1429, NI 1430 or NI 17xx smart cameras.
- Step y is a vertical sampling step or vertical reduction factor. If Step y is set to 1, each column of the image is transferred. If Step y is not connected or is set to -1, the current value of the Vertical Scaling property is used. Step x accepts only values of -1, 1, 2, 4, or 8.
 - N

Note This parameter is deprecated and not available on all

NI image acquisition devices. Vertical scaling is not supported on the NI 1427, NI 1429, NI 1430 or NI 17xx smart cameras.

- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- **[b] Images Out** is the array of captured images.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select **Explain Error** from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Init VI

Installed With: NI Vision Acquisition Software

Loads an NI-IMAQ configuration file and configures the image acquisition device.



- Interface Name is the name of the interface to be loaded. The name must match the configuration file name used in Measurement & Automation Explorer (MAX).
 - Note Interface Name always identifies a single port of an image acquisition device. A port identifies a single independent data stream from a camera. All NI image acquisition devices support at least one port. Devices that support multiple ports can sustain independent and asynchronous acquisitions from the cameras on each port.

The port number may be explicitly identified by using the :: operator to append the port number suffix to the interface name. Port numbers are zero-based. For example, img0::1 opens port number 1 of the image acquisition device identified by img0. Interface names that do not have a port number suffix default to port 0. img0::0 and img0 are equivalent in meaning.

error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.

status is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.

- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **IMAQ Session Out** identifies the initialized device.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Close VI

Installed With: NI Vision Acquisition Software

Stops the acquisition if one is in progress, releases resources associated with the acquisition, and closes the specified IMAQ session.

IMAQ Session In	×
error in (no error)	error out

- **IMAQ Session In** identifies the device.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
 - **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.

- **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
- **code** is the error or warning code. If status is TRUE, **code** is a nonzero <u>error code</u>. If **status** is FALSE, **code** is 0 or a warning code.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Create Bayer LUT VI

Installed With: NI Vision Acquisition Software

Creates the red, green, and blue (RGB) lookup tables (LUTs) for a Bayer decoded image.



Tip To find the appropriate values for the Red, Blue, and Green Gain controls, use the White Balancing Utility located at Start»All Programs»National Instruments»Vision»White Balancing Utility.



Red Gain is the gain to be applied to the red pixels in a Bayerencoded image.

The valid range for this parameter is 0 to 3.999.

Green Gain is the gain to be applied to the green pixels in a Bayerencoded image.

The valid range for this parameter is 0 to 3.999.

Blue Gain is the gain to be applied to the blue pixels in a Bayerencoded image.

The valid range for this parameter is 0 to 3.999.

- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The

default is FALSE.

- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- Bit Depth is the number of bits per pixel of the Bayer-encoded monochrome image.

Valid values are 8-, 10-, 12-, or 14-bits.

Output Luts are the generated lookup tables to pass to <u>IMAQ</u> <u>Bayer Color Decode</u>.

[U32] redLUT

[1032] greenLUT

[1032] blueLUT

- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select **Explain Error** from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Bayer Color Decode VI

Installed With: NI Vision Acquisition Software

Decodes a Bayer encoded image to produce an RGB representation of the image.



Source Image is a reference to the Bayer-encoded monochrome image.

This image can be an 8-, 10-, 12, or 14-bit image.

Destination Image is a reference to the destination image.

The image must be an RGB 32-bit image.

Input Luts is a cluster of LUTs to be applied to the Bayer image.

Create these LUTs using IMAQ Create Bayer LUT

- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
 - **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.

- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **Bayer Pattern** is the selected variation of the Bayer encoding pattern.
 - Tip To find the appropriate Bayer encoding pattern, use the White Balancing Utility located at Start»All
 Programs»National Instruments»Vision»White Balancing Utility.
- **Image Out** is a reference to the image.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
Camera Control VIs

Use Camera Control VIs to get and set camera-specific properties and to control the camera modes.



IMAQ Get Camera Attribute IMAQ Set Camera Attribute IMAQ Serial Read IMAQ Serial Read Bytes IMAQ Serial Write

IMAQ Get Camera Attribute VI

Installed With: NI Vision Acquisition Software

Gets the value of camera attributes.

Camera attributes vary according to which camera you are using. Refer to Measurement & Automation Explorer (MAX) for information about valid camera attributes for your camera and image acquisition device.



IMAQ Session In identifies the device.

Camera Attribute is the attribute name as documented in MAX.

- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
 - **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Session Out has the same value as **IMAQ Session In**.

Attribute Value is the current value of the attribute.

- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Set Camera Attribute VI

Installed With: NI Vision Acquisition Software

Sets the value of camera attributes.

Camera attributes vary according to which camera you are using. Refer to Measurement & Automation Explorer (MAX) for information about valid camera attributes for your camera and image acquisition device.



- **IMAQ Session In** identifies the device.
- **Camera Attribute** is the attribute name as documented in MAX.
- **Attribute Value** is the new value of the attribute.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
 - **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Session Out has the same value as **IMAQ Session In**.

- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Serial Read VI

Installed With: NI Vision Acquisition Software

Reads in data from the serial port on image acquisition devices that support serial communication.

This VI fills the buffer with characters received from the serial port until either a termination character has been received or the timeout period has elapsed. The termination character is defined in the camera file associated with the session.



IMAQ Session In identifies the device.

Timeout is the time, in milliseconds, to wait for the read to finish.

- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
 - **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- **String Read** is the string read from the serial port.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select **Explain Error** from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Serial Read Bytes VI

Installed With: NI Vision Acquisition Software

Reads in an expected number of bytes from the serial port on image acquisition devices that support serial communication.

This VI fills the buffer with characters received from the serial port until either the buffer is full or the timeout period has elapsed. When you use this VI, the serial termination string attribute is ignored.



IMAQ Session In identifies the device.

- Bytes to Read is the number of bytes to read from the serial port.
- **Timeout** is the time, in milliseconds, to wait for the read to finish.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
 - **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the

error or warning. The default is an empty string.

- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- **[18]** Byte Array returns an array of bytes read from the serial port.
- **Bytes Read** is the number of bytes stored in Byte Array.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select **Explain Error** from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Serial Write VI

Installed With: NI Vision Acquisition Software

Writes data to the serial port.

Serial communication parameters, such as baud rate, are set in the camera file associated with the session. You can adjust these communication parameters directly in the camera file.



IMAQ Session In identifies the device.

String to write is the string write to the serial port.

Complete the following steps to convert the string to hexadecimal format:

- 1. Create a string constant from the **String to write** input.
- 2. Right-click the string constant, and select **Hex Display**.
- 3. Enter the hexadecimal value you want to pass.

Timeout is the time, in milliseconds, to wait for the read to finish.

- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
 - **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error

handler VIs to look up the meaning of this code and to display the corresponding error message.

- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - **code** is the error or warning code. If status is TRUE, **code** is a nonzero <u>error code</u>. If **status** is FALSE, **code** is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

Low-Level VIs

Use Low-Level VIs for more direct control of the image acquisition hardware.

Low-Level Acquisition 🛛 🛛	
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IMAQ Configure List IMAQ Configure Buffer IMAQ Start IMAQ Fit ROI IMAQ Get Buffer IMAQ Extract Buffer IMAQ Copy Acquired Buffer IMAQ Stop IMAQ Status IMAQ Set User LUT

IMAQ Configure List VI

Installed With: NI Vision Acquisition Software

Configures a buffer list to be used in an acquisition.

The buffers must be configured individually with <u>IMAQ Configure Buffer</u> after calling IMAQ Configure List.



- Region of interest specifies a rectangular portion of the image. Region of Interest is defined by an array of four elements [Left, Top, Right, Bottom]. You must set the width [Right-Left] to a multiple of eight. If Region of Interest is not connected or empty, the entire acquisition window is captured.
- **IMAQ Session In** identifies the device.
- **Continuous?** specifies if the acquisition is continuous or one-shot.
- **Number of buffers** is the number of buffers in the buffer list.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
 - **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error

handler VIs to look up the meaning of this code and to display the corresponding error message.

- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- Memory Location specifies if the acquired images are stored on the host or on the image acquisition device.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Configure Buffer VI

Installed With: NI Vision Acquisition Software

Configures individual buffers in the buffer list.

You must call IMAQ Configure Buffer for each buffer in the buffer list. Call IMAQ Configure List before calling IMAQ Configure Buffer.



Note All images in a buffer list must have the same border size and unique names.



- **Channel** specifies the device channel to acquire from. This parameter is valid only for NI PCI/PXI-1409 and NI PCI-1410 devices.
- **Skipcount** is the number of images to skip before the acquisition into the buffer. This parameter is not valid for line scan cameras.
- **IMAQ Session In** identifies the device.
- **Image In** is a reference to an image.
- **Buffer Number** is the index of the buffer in the buffer list you want to acquire.

error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.

status is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.

- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Copy Acquired Buffer VI

Installed With: NI Vision Acquisition Software

Returns a copy of an acquired image. IMAQ Copy Acquired Buffer allows you to copy an image from onboard memory to system memory, or from driver-allocated system memory to user-allocated system memory.



- **IMAQ Session In** identifies the device.
- **Image In** is a reference to an image.
- **Buffer Number** is the index of the buffer in the buffer list you want to acquire.
- **Overwrite Mode** is applicable only when you are copying acquired buffers that have been overwritten.

Get Oldest (0)	Gets the oldest available buffer.
Get Next Iteration (1)	Gets the next available buffer, which is determined by the buffer index. The buffer index is the remainder of the buffer number divided by the number of buffers in the buffer list.
Fail (2)	Causes the copy to return an error when it encounters an overwritten buffer.

error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the **error in** value to **error out**. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in **error out**. Use the <u>Simple Error Handler</u> or <u>General Error Handler</u> VIs to display the description of the error code. Use **error in** and **error out** to check errors and to specify execution order by wiring **error out** from one node to **error in** of the next node.

status is TRUE (X) if an error occurred before this VI or

function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.

- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- Region of Interest specifies a rectangular portion of the image. Region of Interest is defined by an array of four elements [Left, Top, Right, Bottom]. You must set the width [Right-Left] to a multiple of eight. The [Right] and [Bottom] coordinates are <u>exclusive</u>. If Region of Interest is not connected or empty, the entire acquisition window is captured.
- IMAQ Session Out has the same value as IMAQ Session In.
- **Image Out** is a reference to the image.
- **Buffer Number Copied** is the number of the copied buffer.
- **Buffer Index Copied** is the buffer index of the copied buffer.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Get Buffer VI

Installed With: NI Vision Acquisition Software

Returns one or all acquired images from a one-shot acquisition. IMAQ Get Buffer waits until the requested buffer has been acquired before returning an image.



- **IMAQ Session In** identifies the device.
- **Buffer Number (-1:all)** is the cumulative number of the acquired buffer to return.

If **Buffer Number** is -1, the VI returns all image buffers using the **Images Out** output.

- **Timeout (ms)** specifies the amount of time, in milliseconds, to wait for each buffer to be acquired. The VI returns with a timeout error is the image or images are not acquired within the specified amount of time.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
 - **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error

handler VIs to look up the meaning of this code and to display the corresponding error message.

- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **Frame Numbers** is reserved for future use.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- **Images Out** is the array of image references. It contains all images in the buffer list if **Buffer Number** equal –1.
- **Image Out** is a reference to the image.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select **Explain Error** from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Extract Buffer VI

Installed With: NI Vision Acquisition Software

Extracts a buffer from a continuous acquisition. IMAQ Extract Buffer allows for the examination of the buffer during acquisition. The buffer is extracted from the acquisition and protected from being overwritten until IMAQ Extract Buffer is called again. When IMAQ Extract Buffer is called, any currently extracted buffer is reinserted into the buffer list.

If the buffer remains extracted long enough that the acquisition hardware wraps around the buffer list and encounters the extracted buffer again, the acquisition will stall, increment the lost frame count, and the extracted buffer will not be overwritten.



- **IMAQ Session In** identifies the device.
- Buffer to extract is the buffer to extract from the buffer list, as specified by the cumulative buffer number. Input –1 to release the currently extracted buffer without extracting a new buffer.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
 - **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is

FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.

source describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

Actual Width is the width of the extracted image.

Actual Width is also the current setting for the ROI width.

Actual Height is the height of the extracted image.

In most cases, **Actual Height** is equal to the ROI height. When in variable height acquisition mode, this value equals the actual number of lines acquired as determined by the duration of the trigger. Refer to the *NI-IMAQ Help* for more information about variable height acquisition.

- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- **Image Out** is a reference to the image.
- **Buffer Number** is the cumulative buffer number of the buffer in the list that was returned in **Image Out**.

The image number can be different from the image number requested by **Buffer to Extract** if the **Buffer to Extract** image is no longer available.

- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the

error or warning. The default is an empty string.

IMAQ Fit ROI VI

Installed With: NI Vision Acquisition Software

Evaluates the region of interest (ROI) you specify, and returns valid left, top, height, and width values.



- **Imaq Session in** identifies the device.
- **Region of Interest in** specifies a rectangular portion of the image to be captured. **Region of Interest in** is defined by an array of four elements [Left, Top, Right, Bottom]. The VI analyzes this ROI to determine if the ROI coordinates are valid. If the coordinates are not valid, the VI modifies the ROI to use valid values.

Fit Mode is the next smallest or next largest acquirable ROI.

- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
 - **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the

error or warning. The default is an empty string.

- **Imaq Session out** has the same value as **IMAQ Session In**.
- **Region of Interest out** is the fitted ROI.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Set User LUT VI

Installed With: NI Vision Acquisition Software

Downloads a custom lookup table (LUT) to an image acquisition device. This VI can download 8-bit or 16-bit LUTs for analog or digital devices. If the image acquisition device has multiple LUTs, you can input all of the LUTs into this VI. Call this VI before starting the acquisition.



Note This VI is not applicable for the NI PCI-1405, NI PCI-1426, NI PCIe-1427, NI PCIe-1429, NI PCIe-1430 or NI 17xx smart cameras.



IMAQ Session In identifies the device.

Tap 0 LUT (Red) is used for analog monochrome devices, the red channel for RGB digital cameras, or tap 0 on digital devices.

If the bit depth is 8-bit, wire an array of 8-bit unsigned integers containing 256 elements. If the bit depth is greater than 8-bits, wire an array of 16-bit unsigned integers containing 2^n elements where n is the bit depth of the camera (1,024 for 10-bit, 4,096 for 12-bit, and so on).

Tap 1 LUT (Green) is used for the green channel for RGB digital cameras or tap 1 on digital devices.

If the bit depth is 8-bit, wire an array of 8-bit unsigned integers containing 256 elements. If the bit depth is greater than 8-bits, wire an array of 16-bit unsigned integers containing 2^n elements where n is the bit depth of the camera (1,024 for 10-bit, 4,096 for 12-bit, and so on).

error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error

status in **error out**. Use the <u>Simple Error Handler</u> or <u>General Error</u> <u>Handler</u> VIs to display the description of the error code. Use **error in** and **error out** to check errors and to specify execution order by wiring **error out** from one node to **error in** of the next node.

- **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **Tap 2 LUT (Blue)** is used for the blue channel for RGB digital cameras or tap 2 on digital devices.

If the bit depth is 8-bit, wire an array of 8-bit unsigned integers containing 256 elements. If the bit depth is greater than 8-bits, wire an array of 16-bit unsigned integers containing 2^n elements where n is the bit depth of the camera (1,024 for 10-bit, 4,096 for 12-bit, and so on).

Tap 3 LUT is used for tap 3 on digital devices.

If the bit depth is 8-bit, wire an array of 8-bit unsigned integers containing 256 elements. If the bit depth is greater than 8-bits, wire an array of 16-bit unsigned integers containing 2^n elements where n is the bit depth of the camera (1,024 for 10-bit, 4,096 for 12-bit, and so on).

- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for

more information about the error.

- **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
- **code** is the error or warning code. If status is TRUE, **code** is a nonzero <u>error code</u>. If **status** is FALSE, **code** is 0 or a warning code.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Start VI

Installed With: NI Vision Acquisition Software

Starts an asynchronous image acquisition.

IMAQ Start returns immediately after the acquisition has started. Before calling this VI, you must configure the acquisition with <u>IMAQ Configure List</u> and <u>IMAQ Configure Buffer</u>.



- **IMAQ Session In** identifies the device.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
 - **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the

same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the **error out** indicator on the front panel and select **Explain Error** from the shortcut menu for more information about the error.

- **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
- **code** is the error or warning code. If status is TRUE, **code** is a nonzero <u>error code</u>. If **status** is FALSE, **code** is 0 or a warning code.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Stop VI

Installed With: NI Vision Acquisition Software

Stops the currently executing acquisition on the image acquisition device specified by **IMAQ Session**.

IMAQ Stop does not free the resources associated with the acquisition. Call IMAQ Close to free resources.



- **IMAQ Session In** identifies the device.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
 - **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the

same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the **error out** indicator on the front panel and select **Explain Error** from the shortcut menu for more information about the error.

- **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
- **code** is the error or warning code. If status is TRUE, **code** is a nonzero <u>error code</u>. If **status** is FALSE, **code** is 0 or a warning code.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Status VI

Installed With: NI Vision Acquisition Software

Returns status information about the acquisition, such as the state of the acquisition and the last valid buffer acquired.



- **IMAQ Session In** identifies the device.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
 - **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- ETE Acquiring? specifies if the image acquisition device is acquiring images.

Acquiring? is TRUE if the device is acquiring.

- **Last Valid Buffer Index** is the buffer list index of the last acquired image.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **Last Valid Buffer Number** is the cumulative number of the last acquired image.

Signal I/O VIs

Use Signal I/O VIs to control the trigger lines, generate pulses, and wait for hardware events.



IMAQ Configure Trigger3

IMAQ Trigger Drive2

IMAQ Trigger Read2

IMAQ Trigger Route2

IMAQ Generate Pulse3

IMAQ Occurrence Config2

IMAQ Wait Signal2

IMAQ Reset Encoder Position

IMAQ Configure Trigger3 VI

Installed With: NI Vision Acquisition Software

Configures the trigger conditions for an acquisition. Use this VI before any acquisition VI to setup a triggered image acquisition.



- **Frame timeout (ms)** specifies the amount of time in milliseconds that NI-IMAQ waits for the trigger to occur and an image to be captured.
- **Polarity** specifies the polarity of the trigger signal.

The following values are valid.

Rising Edge (0) Sets the polarity to rising edge.

Falling Edge (1) Sets the polarity to falling edge.

- **IMAQ Session In** identifies the device.
- **Type** specifies the type of the trigger signal.

The following values are valid.

Note Scaled Encoder is valid only when Trigger each line is selected for the Trigger action on the front panel. Use the Divide Factor property to configure the amount of scaling to apply to the Scaled Encoder signal. Refer to Scaled Encoder Signal for an overview of the Scaled Encoder signal. Software Trigger is valid only for the NI 17xx smart cameras.

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Note To use the ISO_IN or RS422_IN signals on the NI PCI-1426, select **External** as the **Trigger Type** for your function and choose **ISO IN** or **RS-422** as the **Signal Level** for the trigger line in Measurement & Automation Explorer (MAX).

External (0)	Use an external trigger for the trigger.
RTSI (1)	Use an RTSI line for the trigger.
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ISO In (2)	Use an isolated input for the trigger.
Scaled Encoder (5)	Use scaled encoder counts for the trigger.
Software Trigger (6)	Use a software trigger for the trigger.

- **Line Number** specifies the number of the trigger.
- Action specifies if an assertion edge of this trigger line should start an acquisition.

The following values are valid:

Note When using Trigger end of acquisition, the device will continue acquiring a variable number of post trigger buffers before stopping the acquisition. Use the <u>Number of Post Trigger Buffers</u> property to set the number of post trigger buffers.

Disabled (0)	Triggering is disabled.
Trigger start of acquisition (1)	When the assertion edge of the trigger is received, the acquisition is started.
Trigger start of each buffer list (2)	When the assertion edge of a trigger is received, the buffer list is acquired. If the acquisition is continuous, buffer index 0 always waits on a trigger before acquiring.
Trigger each buffer (3)	Each buffer waits for a trigger before acquiring an image into the buffer.
Trigger each line (line scan) (4)	Each line is triggered. This is useful when using an encoder to acquire line scan images.
Trigger end of acquisition (5)	When the assertion edge of the trigger is received, the acquisition is stopped.

error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error

status in **error out**. Use the <u>Simple Error Handler</u> or <u>General Error</u> <u>Handler</u> VIs to display the description of the error code. Use **error in** and **error out** to check errors and to specify execution order by wiring **error out** from one node to **error in** of the next node.

- **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **Delay**specifies how long the active edge of the **Trigger** is delayed from the point when the **Trigger** is asserted.
 - **Walue**specifies the length of the **Delay**.
 - **Units** specifies the **Units** for the **Value** parameter.

The following values are valid:

Note A non-zero **Delay** is only supported for NI 17xx smart cameras when the trigger **Action** is set to **Trigger each buffer**.

Scaled Encoder Counts (4)	The delay is measured in scaled encoder counts.
Milliseconds (5)	The delay is measured in milliseconds.

Skip trigger (linescan only) is the number of triggers to skip before acquiring a new line.

This feature is useful when using an encoder to trigger lines. For example, you may have an encoder that outputs 1,000 ticks per revolution. If you need only 200 lines per revolution, set **Skip trigger** to 4.

 \mathbb{N} Note This input is valid only when using a line scan camera.

IMAQ Session Out has the same value as **IMAQ Session In**.

- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **Source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Trigger Drive2 VI

Installed With: NI Vision Acquisition Software

Drives a trigger line with a specified signal.



Trigger polarity specifies the polarity of the trigger signal.

The following values are valid:

High True (0)Drives the line high when the signal is true.Low True (1)Drives the line low when the signal is true.

IMAQ Session In identifies the device.

Trigger Type specifies the type of the trigger signal.

The following values are valid:

Note To use the ISO_IN or RS422_IN signals on the NI PCI-1426, select External as the Trigger Type for your function and choose ISO IN or RS-422 as the Signal Level for the trigger line in Measurement & Automation Explorer (MAX).

External (0)	Use an external trigger for the trigger.
RTSI (1)	Use an RTSI line for the trigger.
ISO Out (3)	Use an isolated output for the trigger.

- **Trigger Number** specifies the number of the trigger.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.

- **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

Trigger drive specifies the signal that drives the trigger line.

The following values are valid:

line scan applications	
Disabled (0)	The trigger line is disabled.
Acquisition in Progress (1)	Asserts when an acquisition is in progress.
Acquisition Done (2)	Asserts when the entire acquisition is completed.
Pixel Clock (3)	Specifies the pixel clock as the signal that drives the trigger line.
Unasserted (4)	Forces the trigger to its unasserted state as defined by Trigger Polarity .
Asserted (5)	Forces the trigger to its asserted state as defined by Trigger Polarity .
Horizontal Synchronization Signal (6)	Asserts a horizontal synchronization signal at the beginning of each line by the camera.
Vertical Synchronization Signal (7)	Asserts a vertical synchronization signal at the beginning of each frame by the camera. This value is not applicable to line scan acquisitions.
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Note Frame Start and Frame Done are not supported for line scan applications

Frame Start (8)	Asserts when a frame is being captured.
Frame Done (9)	Asserts at the end of each frame that is captured.
Scaled Encoder (10)	Pulses for cumulative forward movement of encoder Phase A and Phase B signals after applying a scaling factor.

- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - **code** is the error or warning code. If status is TRUE, **code** is a nonzero <u>error code</u>. If **status** is FALSE, **code** is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Trigger Read2 VI

Installed With: NI Vision Acquisition Software

Reads the current value of a trigger line.



Trigger Polarity specifies the polarity of the trigger signal.

The following values are valid:

High True (0) Drives the line high when the signal is true.

Low True (1) Drives the line low when the signal is true.

IMAQ Session In identifies the device.

Trigger Type specifies the type of the trigger signal.

The following values are valid:

Note To use the ISO_IN or RS422_IN signals on the NI PCI-1426, select External as the Trigger Type for your function and choose ISO IN or RS-422 as the Signal Level for the trigger line in Measurement & Automation Explorer (MAX).

External (0)	Use an external trigger for the trigger.
RTSI (1)	Use an RTSI line for the trigger.
ISO In (2)	Use an isolated input for the trigger.
ISO Out (3)	Use an isolated output for the trigger.

- **Trigger Number** specifies the number of the trigger.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by

wiring error out from one node to error in of the next node.

- **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- **Trigger status** specifies the current value on the trigger line.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Trigger Route2 VI

Installed With: NI Vision Acquisition Software

Drives the destination trigger line with the signal on the source trigger line.



Dst Trigger Number specifies the number of the destination trigger line.

Dst Trigger Type specifies the type of the destination trigger line.

The following values are valid:

Note To use the ISO_IN or RS422_IN signals on the NI PCI-1426, select External as the Dst Trigger Type for your function and choose ISO IN or RS-422 as the Signal Level for the trigger line in Measurement & Automation Explorer (MAX).

External (0)	Use an external trigger for the trigger.
RTSI (1)	Use an RTSI line for the trigger.
ISO Out (3)	Use an isolated output for the trigger.

- **IMAQ Session In** identifies the device.
- Src Trigger Type specifies the type of the source trigger line. Use None to disable the trigger route.

The following values are valid:

Note To use the ISO_IN or RS422_IN signals on the NI PCI-1426, select External as the Src Trigger Type for your function and choose ISO IN or RS-422 as the Signal Level for the trigger line in Measurement & Automation Explorer (MAX).

None (42)	Disables triggering.
External (0)	Use an external trigger for the trigger.

RTSI (1) Use an RTSI line for the trigger.

ISO In (2) Use an isolated input for the trigger.

- Src Trigger Number specifies the number of the source trigger line.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
 - **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.

status is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.

- **code** is the error or warning code. If status is TRUE, **code** is a nonzero <u>error code</u>. If **status** is FALSE, **code** is 0 or a warning code.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Generate Pulse3 VI

Installed With: NI Vision Acquisition Software

Generates a pulse on a trigger line. IMAQ Generate Pulse3 can generate a pulse immediately or on the assertion edge of a status or trigger signal. Each trigger pulse uses a Pulse ID, which is automatically generated each time you call this VI.

<u>Details</u>



Signal polarity specifies the polarity of the status or trigger signal parameter.

The following values are valid:

Rising Edge (0)Sets the signal polarity to rising edge.**Falling Edge** (1)Sets the signal polarity to falling edge.

Pulse Mode specifies if the pulse is repeated.

The following values are valid:

Pulse train (0)	Generates a continuous pulse train on the first assertion edge of the pulse stimulus signal.
Single pulse (1)	Generates a single pulse on the first assertion edge of the pulse stimulus signal.
Rearmed pulse (2)	Generates a single pulse on all assertion edges of the pulse stimulus signal.
Stop (3)	Stops the pulse generation.

Pulse Parameters specifies the parameters used to describe a pulse.

Pulse Delay is the desired duration of the first phase of the signal in seconds. If the **Units** specified are seconds, the

Pulse Delay should be greater than 0. If the **Units** specified are **Scaled Encoder**, the **Pulse Delay** uses one cycle when 0 is specified.

- Pulse Width is the desired duration of the second phase of the signal in seconds. If the Units specified are seconds, the Pulse Width should be greater than 0. If the Units specified are Scaled Encoder, the Pulse Width uses one cycle when 0 is specified.
- **Pulse Polarity** is the polarity of second phase (period two) of each delayed pulse.
- Units Specifies the units for the Pulse Delay and Pulse Width parameters. If Scaled Encoder Counts is selected, Pulse Delay and Pulse Width must be integral values.
- **IMAQ Session In** identifies the device.
- **Pulse ID In** identifies the Pulse Id input. This parameter is used only when **Mode** is set to **Stop**.
- **Trigger Type** specifies the type of the trigger signal.

The following values are valid:

Note To use the ISO_IN or RS422_IN signals on the NI PCI-1426, select External as the Trigger Type for your function and choose ISO IN or RS-422 as the Signal Level for the trigger line in Measurement & Automation Explorer (MAX).

External (0)	Use an external trigger for the trigger.
RTSI (1)	Use an RTSI line for the trigger.
ISO Out (3)	Use an isolated output for the trigger.

- **Trigger Number** specifies the number of the trigger.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error

in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.

- **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- Signal Type specifies the type of signal that causes the pulse to be generated.

The following values are valid:

Note To use the ISO_IN or RS422_In signals on the NI PCI-1426, select External as the Trigger Type for your function and select either ISO In or RS-422 In as the Signal Level in Measurement & Automation Explorer (MAX).

External (0)	Specifies the signal type as the external trigger lines.
RTSI (1)	Specifies the signal type as the RTSI trigger lines.
ISO In (2)	Specifies the signal type as the isolated input trigger lines.
Status (4)	Specifies the signal type as one of the Status Signal signals.

Status Signal specifies the signal that causes the pulse to be generated if **Signal Type** is set to **Status**.

The following values are valid:

 \mathbb{N}

Note The **Frame start** and **Frame done** signals are not valid for line scan acquisitions unless each buffer is triggered.

Acquisition in progress (15)	Asserts when the acquisition begins.	
Acquisition done (8)	Asserts when the entire acquisition is finished.	
Horizontal Synchronization Signal (18)	Asserts a horizontal synchronization signal at the beginning of each line by the camera.	
Vertical Synchronization Signal (19)	Asserts a vertical synchronization signal at the beginning of each frame by the camera. This value is not applicable to line scan acquisitions.	
Frame start (9)	Asserts at the beginning of each frame that is captured.	
Frame done (10)	Asserts at the end of each frame that is captured.	
Immediate (16)	Asserts immediately.	

- Signal Number specifies the number of the trigger line that causes the pulse to be generated if **Signal Type** is set to one of the trigger types.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- **Pulse Id Out** identifies the Pulse Id output.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select **Explain Error** from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **Source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

Details

Only the NI 1409, NI 1410, NI 1422, NI 1424, NI 1426, NI 1427, NI 1428, NI 1429, NI 1430 and the NI 17xx smart cameras can generate pulses.

- The NI 1409, NI 1410, NI 1422, NI 1424, NI 1426, and NI 1428 can generate a maximum of 2 pulses.
- The NI 1427 and NI 1429 can generate a maximum of 3 pulses.
- The NI 1430 can generate a maximum of 6 pulses.
- The NI 17xx smart cameras can generate 2 pulses.

These pulse generators can be automatically configured by NI-IMAQ for generating pulses used to control the camera. In these cases, the VI returns the Exhausted Resources error when the total number of pulses is greater than the maximum number of pulses supported.

IMAQ Occurrence Config2 VI

Installed With: NI Vision Acquisition Software

Creates occurrences that are set by image acquisition signals such as the assertion of a status or trigger signal. Occurrences produced by this VI are used as inputs to the Wait on Occurrence LabVIEW primitive. Anything dependent on the execution of the Wait on Occurrence primitive will wait until the occurrence is set.



Signal polarity specifies the polarity of the status or trigger signal parameter.

The following values are valid:

Rising Edge (0) Sets the signal polarity to rising edge.

Falling Edge (1) Sets the signal polarity to falling edge.

- **IMAQ Session In** identifies the device.
- **Signal Type** specifies the type of signal that causes the occurrence to be set.

The following values are valid:

Note To use the ISO_IN or RS422_In signals on the NI PCI-1426, select External as the Trigger Type for your function and select either ISO In or RS-422 In as the Signal Level in Measurement & Automation Explorer (MAX).

External (0)	Specifies the signal type as the external trigger lines.	
RTSI (1)	Specifies the signal type as the RTSI trigger lines.	
ISO In (2)	Specifies the signal type as the isolated input trigger lines.	
ISO Out (3)	Specifies the signal type as the isolated output trigger lines.	
Status (4)	Specifies the signal type as one of the Status Signal	

signals.

Status Signal Signal specifies the signal that causes the occurrence to be set if **Signal Type** is set to **Status**.

The following values are valid:

Note The Frame start and Frame done signals are not valid for line scan acquisitions unless each buffer is triggered.

Acquisition in progress (15)	Asserts when the acquisition begins.
Acquisition done (8)	Asserts when the entire acquisition is finished.
Frame start (9)	Asserts at the beginning of each frame that is captured.
Frame done (10)	Asserts at the end of each frame that is captured.
Buffer Complete (11)	Asserts when a buffer has been transferred to memory.

- Signal Number specifies the number of the trigger line that causes the occurrence to be set if **Signal Type** is set to one of the trigger types.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.

- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **create/clear** instructs the VI to create an occurrence or to clear all occurrences that have been created for the image acquisition device specified in **IMAQ Session In**.

The following values are valid:

create an occurrence (0)	Creates an occurrence.
clear all occurrences (1)	Clears all occurrences.

- **Rearm? (FALSE : No Rearm)** indicates whether the occurrence should be generated once, or each time the signal occurs. When you set this parameter to TRUE, call this VI again with the **create/clear** parameter set to **clear all occurrences** to stop the occurrence.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- occurrence is the occurrence value created. Wire this output to a Wait on Occurrence LabVIEW primitive. Wire the output of the primitive to the part of your diagram you wish to execute when an event happens and the occurrence is set.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - **code** is the error or warning code. If status is TRUE, **code** is a nonzero <u>error code</u>. If **status** is FALSE, **code** is 0 or a

warning code.

source describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Wait Signal2 VI

Installed With: NI Vision Acquisition Software

Waits for either a status or trigger signal to be asserted. IMAQ Wait Signal2 does not return until the specified signal is asserted or a timeout occurs.



- Timeout (ms) specifies the amount of time to wait for the assertion edge of Signal in milliseconds. The VI returns an error is the assertion edge does not occur within the specified time.
- **Signal polarity** specifies the polarity of the status or trigger signal parameter.

The following values are valid:

Rising Edge (0)Sets the signal polarity to rising edge.**Falling Edge** (1)Sets the signal polarity to falling edge.

- **IMAQ Session In** identifies the device.
- **Signal Type** specifies the type of signal that causes the occurrence to be set.

The following values are valid:

Note To use the ISO_IN or RS422_In signals on the NI PCI-1426, select External as the Trigger Type for your function and select either ISO In or RS-422 In as the Signal Level in Measurement & Automation Explorer (MAX).

External (0)	Specifies the signal type as the external trigger lines.	
RTSI (1)	Specifies the signal type as the RTSI trigger lines.	
ISO In (2)	Specifies the signal type as the isolated input trigger lines.	
ISO Out (3)	Specifies the signal type as the isolated output trigger lines.	

Status (4)	Specifies the signal type as one of the Status Signal
	signals.

Status Signal Signal specifies the signal that causes the occurrence to be set if **Signal Type** is set to **Status**.

The following values are valid:

Note The Frame start and Frame done signals are not valid for line scan acquisitions unless each buffer is triggered.

Acquisition in progress (15)	Asserts when the acquisition begins.
Acquisition done (8)	Asserts when the entire acquisition is finished.
Frame start (9)	Asserts at the beginning of each frame that is captured.
Frame done (10)	Asserts at the end of each frame that is captured.
Buffer Complete (11)	Asserts when a buffer has been transferred to memory.

- Signal Number specifies the number of the trigger line that causes the occurrence to be set if **Signal Type** is set to one of the trigger types.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.

status is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.

- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Reset Encoder Position VI

Installed With: NI Vision Acquisition Software

Resets the absolute encoder position counter to 0.

Reads the position counter value by querying the <u>Position (U32)</u> or <u>Position (U64)</u> properties.



- **IMAQ Session In** identifies the device.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
 - **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Session Out has the same value as **IMAQ Session In**.

error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that

this VI or function produces. Right-click the **error out** indicator on the front panel and select **Explain Error** from the shortcut menu for more information about the error.

- **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
- **code** is the error or warning code. If status is TRUE, **code** is a nonzero <u>error code</u>. If **status** is FALSE, **code** is 0 or a warning code.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

NI Vision VIs

Several basic NI Vision functions are included with the NI-IMAQ software. Use these VIs to create and dispose of images and to convert images to arrays. After you convert an image to an array, use standard LabVIEW techniques to process and display the images.

IMAQ AVI Close

IMAQ AVI Create

IMAQ AVI Write Frame

IMAQ ColorImageToArray

IMAQ Create

IMAQ Dispose

IMAQ GetImageInfo

IMAQ GetImageSize

IMAQ ImageToArray

IMAQ Remote Compression

IMAQ RT Video Out

IMAQ SetImageSize

IMAQ Video Out Display Mode

IMAQ WriteFile

IMAQ AVI Close

IMAQ AVI Create

IMAQ AVI Write Frame

IMAQ ColorImageToArray

IMAQ Create

This VI is part of a subset of NI Vision VIs included with NI-IMAQ. Refer to the *NI Vision for LabVIEW VI Reference Help* for parameter information.

The following description contains additional information you need to know about the **Image Type** parameter when using IMAQ Create with NI-IMAQ:

Image Type has the following values:

- 8 bits 8-bit unsigned image used for monochrome images.
- 16 bits 16-bit signed image used for 10-, 12-, and 14-bit acquisitions on the NI PCI/PXI-1409, NI PCI-1410, NI PCI/PXI-1422, NI PCI-1424, NI PCI-1426, NI PCI/PXI-1428, NI PCIe-1429, and NI PCIe-1430 devices.
- Float Not used with NI image acquisition devices.

Complex Not used with NI image acquisition devices.

- RGB 32-bit standard color image used for acquisitions on the NI PCI-1405, NI PCI/PXI 1411, NI PCI-1424, NI PCI-1426, NI PCI/PXI-1428, NI PCIe-1429, and NI PCIe-1430 devices.
- HSL 32-bit HSL color image used for acquisitions on the NI PCI/PXI-1411 device.

IMAQ Dispose

IMAQ GetImageInfo

IMAQ GetImageSize

IMAQ ImageToArray

This VI is part of a subset of NI Vision VIs included with NI-IMAQ. Refer to the *NI Vision for LabVIEW Help* for parameter information.

The following descriptions contain additional information you need to know about the **Image Pixels (I16) and Image Pixels (Float)** parameters when using the IMAQ ImageToArray VI with NI-IMAQ:

- Image Pixels (U8) returns the extracted pixel values into a 2D array. The first index corresponds to the vertical axis and the second index corresponds to the horizontal axis. Use this output only when Image is an unsigned 8-bit image. The boards that have this output include the NI PCI/PXI-1409, NI PCI-1410, NI PCI/PXI-1422, NI PCI-1424, NI PCI-1426, NI PCIe-1427, NI PCI/PXI-1428, NI PCIe-1429, NI PCIe-1430 and NI 17xx smart cameras.
- Image Pixels (I16) output is used with a 16-bit image type, which is used with boards that have a 10-bit output or greater. These include the NI PCI/PXI-1409, NI PCI-1410, NI PCI/PXI-1422, NI PCI-1424, NI PCI-1426, NI PCIe-1427, NI PCI/PXI-1428, NI PCIe-1429, and NI PCIe-1430 devices.
- **Image Pixels (Float)** is not used with NI image acquisition devices.
- **Optional Rectangle** defines a four-element array that contains the left, top, right, and bottom coordinates of the region to extract. The operation applies to the entire image if the input is empty or not connected.

IMAQ Remote Compression
IMAQ RT Video Out

IMAQ SetImageSize

IMAQ Video Out Display Mode

IMAQ WriteFile

Vision Express

Use the Vision Express VIs to quickly develop common image acquisition and processing applications.

Palette Object	Description
Vision Assistant Express VI	Use NI Vision Assistant from within the LabVIEW environment to perform common image processing tasks. You must install the NI Vision Development Module to use the Vision Assistant Express VI.
Vision Acquisition Express VI	Acquires images from cameras using NI-IMAQ or NI- IMAQdx. Refer to the <i>NI Vision Acquisition Express VI Help</i> for more information.

Vision Acquisition Express VI

Acquires images from cameras using NI-IMAQ or NI-IMAQdx. Refer to the *NI Vision Acquisition Express VI Help* for more information. The *NI Vision Acquisition Express VI Help* installs to the <LabVIEW>\help directory, where <LabVIEW> is the location to which you installed LabVIEW.

Image Acquisition Properties

Image acquisition properties are divided into groups. Click the links for a description, the possible values or range, and the data type of the properties within each group.

- Analog Parameters
- Device Information
- <u>Color</u>
- Encoder
- Image Parameters
- Status Information

IMAQ Property Node



The IMAQ Property Node gets and/or sets image acquisition properties. The node is expandable. Evaluation starts from the top and proceeds downward until an error or the final evaluation occurs. To access the property node in LabVIEW 7.*x*, select **Functions»NI Measurements»Vision»Image Acquisition»Property Node**. To access the property node in LabVIEW 8.0, select **Functions»Vision and Motion»Image Acquisition»Property Node**.

To select a specific property, right-click one of the name terminals and select **Properties**. To set property information, right-click and select **Change to Write**. To get property information, right-click and select **Change to Read**. Some properties are read-only, so **Change to Write** is not listed in the context menu. If you want to add items to the node, right-click and select **Add Element** or click and drag the node to expand the number of items in the node.

The properties are changed in order from top to bottom. If an error occurs on one of the properties, the node stops at that property and returns an error. No further properties are handled. The error string reports which property caused the error.

If the small direction arrow on a property is on the left, you are setting the property value. If the small direction arrow on the property is on the right, you are getting the property value. Each property name has a short or long name that you can select by right-clicking and changing **Name Format**.

Acquisition Parameters

Acquisition parameters define properties that describe the timing, trigger, and image size for an acquisition.

Readable

Writable

Indicates when the property is readable:

- **Always**—Property is readable both during acquisition and during configuration.
- **Running**—Property is readable only during acquisition.
- **Configuration** Property is readable only during configuration.
- NotReadable— Property is never readable.

Indicates when the property is writable:

- Always—Property is writable both during acquisition and during configuration.
- **Running**—Property is writable only during acquisition.
- **Configuration** Property is writable only during configuration.
- NotWritable— Property is never writable.

Devices

Indicates the devices to which the property applies.

Acquisition Window Height

Gets/sets the acquisition window height of the camera associated with this session.

Datatype	Readable	Writable	Device
U32	Always	Always	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			• NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Acquisition Window Left

Gets/sets the left offset of the acquisition window for the camera associated with this session.

Datatype	Readable	Writable	Device
U32	Always	Always	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			• NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Acquisition Window Top

Gets/sets the top offset of the acquisition window for the camera associated with this session.

Datatype	Readable	Writable	Device
U32	Always	Always	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			• NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Acquisition Window Width

Gets/sets the acquisition window width of the camera associated with this session.

Datatype	Readable	Writable	Device
U32	Always	Always	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			• NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Channel

Programs the current channel selected on the interface (0-3) NI 1409/1410 only.

Datatype	Readable	Writable	Device
U32	Always	Always	 NI PCI/PXI-1409
			 NI PCI-1410

External Trigger Line Filter

Enables the noise filter for all external trigger lines.

Datatype	Readable	Writable	Device
TF	Always	Always	 NI PCIe-1427
			 NI PCIe-1429
			 NI PCIe-1430

Frame Rate

Sets/gets the desired frame rate of the image sensor, in frames per second. Setting the frame rate automatically enables <u>Fixed-Frame-Rate</u> <u>Mode</u>. This property only takes effect when no buffer trigger is configured. This property is valid only for NI 17*xx* smart cameras.

Datatype	Readable	Writable	Device
DBL	Always	Always	NI 17 <i>xx</i>

Frame Timeout (ms)

Gets/sets the frame timeout value in milliseconds.

Datatype	Readable	Writable	Device
U32	Always	Always	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			• NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Max Frame Rate

Returns the maximum achievable frame rate, in frames per second, under the current configuration. This property is valid only for NI 17xx smart cameras.

Datatype	Readable	Writable	Device
DBL	Always	NotWritable	NI 17 <i>xx</i>

Number of Post Trigger Buffers

After receiving the stop trigger, the image acquisition device will continue acquiring this many buffers before the acquisition stops.

Datatype	Readable	Writable	Device
U32	Always	Configuration	• NI PCIe-1427
			 NI PCIe-1429
			 NI PCIe-1430

Region of Interest Height

Gets/sets the height offset of the region of interest for the camera/channel associated with this session.

Datatype	Readable	Writable	Device
U32	Always	Always	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			• NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Region of Interest Left

Gets/sets the height offset of the region of interest for the camera/channel associated with this session.

Datatype	Readable	Writable	Device
U32	Always	Always	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			• NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Region of Interest Top

Gets/sets the top offset of the region of interest for the camera/channel associated with this session.

Datatype	Readable	Writable	Device
U32	Always	Always	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			• NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Region of Interest Width

Gets/sets the top offset of the region of interest for the camera/channel associated with this session.
Datatype	Readable	Writable	Device
U32	Always	Always	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			• NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Rowpixels

Gets/sets the true width (in pixels) of a horizontal line in memory. Used to calculate the memory offset of the next line.

Datatype	Readable	Writable	Device
U32	Always	Always	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			• NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

RTSI Trigger Line Filter

Enables the noise filter for all RTSI trigger lines.

Datatype	Readable	Writable	Device
TF	Always	Always	 NI PCIe-1427
			 NI PCIe-1429
			 NI PCIe-1430

Send Software Trigger

Issues a trigger for an action configured to wait for a software trigger. This property is valid only for NI 17xx smart cameras.

Send Software Trigger

Datatype	Readable	Writable	Device
TF	NotReadable	Always	NI 17 <i>xx</i>

Variable Height Acquisition

Gets/sets the variable height acquisition mode associated with this session.

Datatype	Readable	Writable	Device
U32	Always	Always	• NI PCI/PXI-1409
			• NI PCI-1410
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430

Analog

Analog properties allow you to set analog device parameters such as antichrominance filter and input range.

Readable

Writable

Indicates when the property is readable:

- Always—Property is readable both during acquisition and during configuration.
- **Running**—Property is readable only during acquisition.
- Configuration— Property is readable only during configuration.
- NotReadable Property is never readable.

Indicates when the property is writable:

- Always—Property is the property writable both during acquisition and during configuration.
- **Running**—Property is writable only during acquisition.
- Configuration— Property is writable only during configuration.
- NotWritable— Property is never writable.

Devices

Indicates the devices that

applies to.

Antichrominance Filter

Gets/sets the antichrominance filter used by the image acquisition device. This property is valid only on devices with an antichrominance filter.

The following list includes possible values:

- Disabled—specifies no video filter
- NTSC—specifies NTSC video filter
- PAL—specifies PAL video filter

Datatype	Readable	Writable	Device
U32	Always	Configuration	 NI PCI/PXI-1409
			 NI PCI-1410

Black Reference (Volts)

Gets/sets the black reference level, in volts, of the channel associated with this session. Refer to the following tables for value ranges that are valid for each device.



Note The black reference level must be less than the white reference level.

Datatype	Readable	Writable	Device	Range (volts)
DBL	Always	Configuration	NI 1405	0
DBL	Always	Always	NI 1407 (PCI Rev A through D)	0 to 1.26
DBL	Always	Always	NI 1407 (PCI Rev E or later)	0 to 0.5
DBL	Always	Always	NI 1407 (PXI All Revs)	0 to 1.26
DBL	Always	Configuration	NI 1409	0 to 1.4
DBL	Always	Configuration	NI 1410	0 to 1.4
DBL	Always	Configuration	NI 1411	0

The following table includes possible values:

White Reference (Volts)

Gets/sets the white reference level, in volts, of the channel associated with this session. Refer to the following tables for value ranges that are valid for each device.



Note The white reference level must be greater than the black reference level.

The following table includes possible values:

Datatype	Readable	Writable	Device	Range (volts)
DBL	Always	Configuration	NI 1405	0 to 1.26
DBL	Always	Always	NI 1407 (PCI Rev A through E or later)	0 to 1.26
DBL	Always	Always	NI 1407 (PXI All Revs)	0 to 1.26
DBL	Always	Configuration	NI 1409	0 to 1.4
DBL	Always	Configuration	NI 1410	0 to 1.4
DBL	Always	Configuration	NI 1411 (PXI and PCI Rev A)	0 to 0.08
DBL	Always	Configuration	NI 1411 (PXI and PCI Rev B or later)	0 to 1.26

Color

Color properties set parameters associated with a color acquisition. You can only use the NI PCI-1405 and NI PCI/PXI-1411 for color acquisitions.

Readable

Writable

Indicates when the property is readable:

- **Always**—Property is readable both during acquisition and during configuration.
- **Running**—Property is readable only during acquisition.
- **Configuration** Property is readable only during configuration.
- NotReadable— Property is never readable.

Indicates when the property is writable:

- Always—Property is the property writable both during acquisition and during configuration.
- **Running**—Property is writable only during acquisition.
- **Configuration** Property is writable only during configuration.
- NotWritable— Property is never writable.

Devices

Indicates the devices that

Color Blue Gain

Gets/sets the gain applied to the blue color plane of the RGB image. This gain also affects the blue data used to calculate the hue, saturation, and luminance planes.

The range is 0.8 to 1.198. The default value is 1.0.

Datatype	Readable	Writable	Device
DBL	Always	Configuration	 NI PCI-1405
			• NI PCI/PXI-1411

Color Brightness

Adjusts the brightness of an image-the amount of white light added to or subtracted from each image pixel. The range is -50 to +50 IRE in steps of 1. IRE is the percentage of the white level. The default is 0 IRE.

Datatype	Readable	Writable	Device
DBL	Always	Configuration	 NI PCI-1405
			• NI PCI/PXI-1411

Color Chroma Bandwidth

Specifies the resulting bandwidth of the chroma information of the image.

The following list includes possible values:

- **High**—Highest bandwidth (default).
- **Low**—Lowest bandwidth.

Datatype	Readable	Writable	Device
132	Always	Configuration	 NI PCI-1405
			• NI PCI/PXI-1411

Color Chroma Comb

Selects the type of comb filter used in the chroma path.

The following list includes possible values:

- **Comb Off**—Comb filter disabled (default in S-Video (Y/C) mode)
- Comb 1 Line—Comb filtering using one delayed line
- **Comb 2 Lines**—Comb filtering using two delayed lines

Datatype	Readable	Writable	Device
132	Always	Configuration	 NI PCI-1405
			• NI PCI/PXI-1411

Color Chroma Phase

Specifies the value of a correction angle that can be applied to the chroma vector (adjustment of tint). This attribute is only active when an NTSC camera is used.

The correction angle range is -180 to 180 in degrees. The default value is 0 degrees.

Datatype	Readable	Writable	Device
132	Always	Configuration	 NI PCI-1405
			• NI PCI/PXI-1411

Color Chroma Process

Specifies the processing applied to the chroma signal.

The following list includes possible values:

- **Chroma Process Always Off**—Used with a monochrome camera (default for CCIR or RS-170).
- Always On—Used with a color camera (default for NTSC or PAL).
- Autodetect—Used if the camera type (monochrome or color) is unknown.

Datatype	Readable	Writable	Device
132	Always	Configuration	 NI PCI-1405
			• NI PCI/PXI-1411

Color Chroma Trap

Enables the chroma trap filter in the luma signal path. Ensure that this property is always disabled in S-Video (Y/C) mode.
The following list includes possible values:

- **FALSE**—Chroma trap filter disabled (default in S-Video (Y/C) mode.)
- **TRUE**—Chroma trap filter enabled, if the chroma trap filter is needed in composite mode.

Datatype	Readable	Writable	Device
TF	Always	Configuration	 NI PCI-1405
			• NI PCI/PXI-1411

Color Contrast

Adjusts the contrast of the image. The value is a scaling factor applied to every pixel. The contrast adjustment is centered around the median pixel value.

The range is 0.4 to 1.5. The default is 1.00.

Datatype	Readable	Writable	Device
DBL	Always	Configuration	 NI PCI-1405
			• NI PCI/PXI-1411

Color Green Gain

Gets/sets the gain applied to the green color plane of the RGB image. This gain also affects the green data used to calculate the hue, saturation, and luminance planes.

The range is 0.8 to 1.198. The default value is 1.0.

Datatype	Readable	Writable	Device
DBL	Always	Configuration	 NI PCI-1405
			• NI PCI/PXI-1411

Color HSL Coring Level

Gets/sets the HSL coring level when Image Representation is set to HSL. In HSL mode, if the saturation value (S) of on any image pixel is lower than the specified value, the Hue value (H) of the pixel is set to the Hue Replace Value.

The range is 0 to 255 LSB. The default is 0 LSB.

Datatype	Readable	Writable	Device
132	Always	Configuration	NI PCI/PXI-1411

Color Hue Offset Angle

Rotates the Hue plane with a specified offset angle. The hue value of a pixel is defined as an angle in the normal color plane. You can offset this angle to move the discontinuity point (at 0 modulo 360°) to another angle value.

The range is -180° to $+180^{\circ}$. The default is 0° .

Datatype	Readable	Writable	Device
DBL	Always	Configuration	NI PCI/PXI-1411

Color Hue Replace Value

Gets/sets the value used to replace the hue when it is below <u>Color HSL</u> <u>Coring Level</u>. You use this property only when the Image Representation is set to HSL.

Datatype	Readable	Writable	Device
132	Always	Configuration	NI PCI/PXI-1411

Color Image Representation

Specifies the type of image data that will be returned when a color image is acquired.

Values are RGB32, Red8, Green8, Blue8, Lum8, Hue8, Sat8, Int8, Lum16, Hue16, Sat16, Int16, RGB48, RGB24, RGB16, HSL32, and HSI32. Refer to <u>Color Image Representation</u> for descriptions of these Image Representations.

Datatype	Readable	Writable	Device
132	Always	Configuration	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			 NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430

Color Luma Bandwidth

Selects different bandwidths for the luminance signal.

The following list includes possible values:

- **Full**—All filters including decimation filter disabled. Default value in CCIR or RS-170 mode.
- **High**—Highest available bandwidth with decimation filter enabled. Default value for PAL or NTSC mode.
- Medium—Decimation filter enabled, medium bandwidth.
- **Low**—Decimation filter enabled, lowest bandwidth.

Datatype	Readable	Writable	Device
132	Always	Configuration	 NI PCI-1405
			• NI PCI/PXI-1411

Color Luma Comb

Selects the type of comb filter used in the luma path.

The following list includes possible values:

- Comb Off—Comb filter disabled (default in S-Video (Y/C) mode).
- **Comb 1 Line**—Comb filtering using 1 delayed line.
- **Comb 2 Lines**—Comb filtering using 2 delayed lines.

Datatype	Readable	Writable	Device
132	Always	Configuration	 NI PCI-1405
			• NI PCI/PXI-1411

Color NTSC Setup Enable

Enables the setup correction of 7.5 IRE in NTSC mode. A standard NTSC signal has a setup level that moves up the black level 7.5% of the white level (or 7.5 IRE). Perform correction for this setup during acquisition by enabling this property.

The following list includes possible values:

- **FALSE**—Disables the setup correction (default in PAL or CCIR mode).
- **TRUE**—Enables the setup correction (default in NTSC or RS-170 mode).

Datatype	Readable	Writable	Device
TF	Always	Configuration	 NI PCI-1405
			• NI PCI/PXI-1411

Color Peaking Enable

Enables the peaking filter in the luma path.

The following list includes possible values:

- **FALSE**—Peaking filter disabled (default)
- **TRUE**—Peaking filter enabled

Datatype	Readable	Writable	Device
TF	Always	Configuration	 NI PCI-1405
			• NI PCI/PXI-1411

Color RGB Coring Level

Selects among four different coring levels. On any image pixel, if the color saturation of the pixel is lower than the specified value, the saturation is set to zero, which results in a monochrome pixel.

The following list includes possible values:

- **NoCoring**—Coring not activated.
- **C1**—Coring activated for saturation equal or below 1 LSB.
- **C3**—Coring activated for saturation equal or below 3 LSB.
- **C7**—Coring activated for saturation equal or below 7 LSB.

Datatype	Readable	Writable	Device
132	Always	Configuration	 NI PCI-1405
			• NI PCI/PXI-1411

Color Red Gain

Gets/sets the gain applied to the red color plane of the RGB image. This gain also affects the red data used to calculate the hue, saturation, and luminance planes.

The range is 0.8 to 1.198. The default value is 1.0.
Datatype	Readable	Writable	Device
DBL	Always	Configuration	 NI PCI-1405
			• NI PCI/PXI-1411

Color Saturation

Adjusts the saturation of the image-a factor multiplied to the chroma information of the image.

Values

The range is 0.5 to 1.5. The default is 1.00.

Datatype	Readable	Writable	Device
DBL	Always	Configuration	 NI PCI-1405
			• NI PCI/PXI-1411

Device Information

Device information properties return information concerning the image acquisition device.

Readable

Indicates when the property is readable:

- Always—Property is readable both during acquisition and during configuration.
- **Running**—Property is readable only during acquisition.
- Configuration— Property is readable only during configuration.
- NotReadable— Property is never readable.

Writable

Indicates when the property is writable:

- Always—Property is the property writable both during acquisition and during configuration.
- **Running**—Property is writable only during acquisition.
- Configuration— Property is writable only during configuration.
- NotWritable— Property is never writable.

Devices

Indicates the devices that

applies to.

Calibration Date

Returns the calibration date of the image acquisition device in a timezone independent number of seconds that have elapsed since 12:00 a.m., Friday, January 1, 1904, Universal Time.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411

Color Interface

Returns TRUE if the image acquisition device is color capable.

Datatype	Readable	Writable	Device
TF	Always	NotWritable	• NI PCI-1405
			 NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			• NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Current Port Number

Returns the port number that the current session is accessing.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			 NI PCI/PXI-1407
			 NI PCI/PXI-1409
			• NI PCI-1410
			 NI PCI/PXI-1411
			 NI PCI/PXI-1422
			• NI PCI-1424
			• NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			• NI PCIe-1430

Interface Type

Returns the image acquisition device associated with this session.

Datatype	Readable	Writable	Device
132	Always	NotWritable	• NI PCI-1405
			 NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Line Scan Camera

Returns TRUE if the camera associated with this session is a line scan camera.

Datatype	Readable	Writable	Device
TF	Always	NotWritable	• NI PCI-1405
			 NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			• NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Maximum Horizontal Resolution

Returns the maximum horizontal resolution of the interface.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Maximum Vertical Resolution

Returns the maximum vertical resolution of the interface.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Number of Channels

Returns the number of channels that an image acquisition device supports.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			 NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			 NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430

Number of External Trigger Lines

Returns the number of external trigger lines available to the device.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Number of Iso In Trigger Lines

Returns the maximum horizontal resolution of the interface.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Number of Iso Out Trigger Lines

Returns the number of Iso Out trigger lines available to the device.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Number of Ports

Returns the number of ports that an image acquisition device supports.



Note A port identifies a single independent data stream from a camera. All NI image acquisition devices support at least one port. Devices that support multiple ports can sustain independent and asynchronous acquisitions from the cameras on each port.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			 NI PCI/PXI-1407
			 NI PCI/PXI-1409
			• NI PCI-1410
			 NI PCI/PXI-1411
			 NI PCI/PXI-1422
			• NI PCI-1424
			• NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			• NI PCIe-1430

Number of RTSI Trigger Lines

Returns the number of RTSI trigger lines available to the device.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Onboard RAM

Returns the port number that the current session is accessing.

Datatype	Readable	Writable	Device
TF	Always	NotWritable	• NI PCI-1405
			 NI PCI/PXI-1407
			 NI PCI/PXI-1409
			• NI PCI-1410
			 NI PCI/PXI-1411
			 NI PCI/PXI-1422
			• NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430

Onboard RAM Size

Returns the size of onboard RAM on the image acquisition device in bytes.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			 NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			 NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430

Pixel Clock Detect

Determines if the existence of a pixel clock is checked before starting an acquisition.
Datatype	Readable	Writable	Device
U32	Always	Always	• NI PCI-1405
			 NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430

Pixel Depth

Returns the maximum pixel depth of the image acquisition device in bits.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Serial Number

Returns the serial number of the image acquisition device associated with this session.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Encoder

Encoder properties return information concerning the encoder.

M **Note** Refer to the **Quadrature Encoder Overview** for more information about guadrature encoders.

Readable

Writable

Indicates when the property is readable:

- Always—Property is readable both during acquisition and during configuration.
- **Running**—Property is readable only during acquisition.
- Configuration— Property is readable only during configuration.
- NotReadable Property is never readable.

Indicates when the property is writable:

- Always—Property is the property writable both during acquisition and during configuration.
- **Running**—Property is writable only during acquisition.
- Configuration— Property is writable only during configuration.
- NotWritable— Property is never writable.

Devices

Indicates the devices that

applies to.

Divide Factor

Specifies the divide factor to use to derive the scaled encoder signal.

Datatype	Readable	Writable	Device
U32 I	Always	Always	 NI PCI-1426
			 NI PCIe-1427
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Phase A & B Filter

When TRUE, enables a low-pass noise filter for the Phase A and Phase B inputs.

The following table shows when the property is readable and writable and what devices it applies to.

Datatype	Readable	Writable	Device
TF	Always	Always	• NI PCIe-1427
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Note The NI 1426 does not support enabling the Phase A & B filter.

Phase A Polarity

Get/set the Phase A signal polarity.

Values

The following list includes possible values:

- Active High—Sets the phase A signal polarity to active high.
- Active Low—Sets the phase A signal polarity to active low.

The following table shows when the property is readable and writable and what devices it applies to.

Datatype	Readable	Writable	Device
U32	Always	Always	• NI PCI-1426
			 NI PCIe-1427
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Note The NI 1426 only supports a High-True Phase A signal polarity.

Phase B Polarity

Get/set the Phase B signal polarity.

Values

The following list includes possible values:

- Active High—Sets the phase B signal polarity to active high.
- Active Low—Sets the phase B signal polarity to active low.

The following table shows when the property is readable and writable and what devices it applies to.

Datatype	Readable	Writable	Device
U321	Always	Always	 NI PCI-1426
			 NI PCIe-1427
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Note The NI 1426 only supports a High-True Phase B signal polarity.

Position (U32)

Returns the absolute encoder position as an unsigned 32-bit integer.

The following table shows when the property is readable and writable and what devices it applies to.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	 NI PCIe-1427
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Note The NI PCI-1426 encoder hardware does not support reading the absolute encoder position.

Position (U64)

Returns the absolute encoder position as an unsigned 64-bit integer.

The following table shows when the property is readable and writable and what devices it applies to.

Datatype	Readable	Writable	Device
064	Always	NotWritable	 NI PCIe-1427
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Note The NI PCI-1426 encoder hardware does not support reading the absolute encoder position.

Image Parameters

Image parameters define properties that affect the image appearance.

Readable

Indicates when the property is readable:

- **Always**—Property is readable both during acquisition and during configuration.
- **Running**—Property is readable only during acquisition.
- **Configuration** Property is readable only during configuration.
- NotReadable— Property is never readable.

Writable

Indicates when the property is writable:

- Always—Property is writable both during acquisition and during configuration.
- **Running**—Property is writable only during acquisition.
- **Configuration** Property is writable only during configuration.
- NotWritable— Property is never writable.

Devices

Indicates the devices to which the property applies.

Binary Threshold High

The upper limit for the binary threshold LUT.

Datatype	Readable	Writable	Device
132	Always	Configuration	• NI PCI/PXI-1407
			• NI PCI/PXI-1409
			• NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Binary Threshold Low

The lower limit for the binary threshold LUT.

Datatype	Readable	Writable	Device
132	Always	Configuration	• NI PCI/PXI-1407
			• NI PCI/PXI-1409
			• NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Binning

Gets/sets the binning mode of the image sensor. This property is valid only for NI 17xx smart cameras.

Values

The following list includes possible values:

- **Off**—Pixels are not combined.
- **1×2**—Vertical pixels are combined.

Datatype	Readable	Writable	Device
U32	Always	Configuration	NI 17 <i>xx</i>

Bits per Pixel

Returns the bits per pixel of the camera associated with this session.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Bytes per Pixel

Returns the bytes per pixel of the camera associated with this session.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Exposure Time

Gets/sets the exposure time of the image sensor in milliseconds. This property is valid only for NI 17xx smart cameras.

Datatype	Readable	Writable	Device
DBL	Always	Always	NI 17 <i>xx</i>

Gain

Gets/sets the gain level of the image sensor. This is a raw value. This property is valid only for NI 17xx smart cameras.

Datatype	Readable	Writable	Device
U32	Always	Always	NI 17 <i>xx</i>
Horizontal Scaling

Gets/sets the horizontal hardware scaling factor for the channel associated with this session.

The following list includes possible values:

- **1/2**—Scale by 2.
- 1/4—Scale by 4.
- 1/8—Scale by 8.

Datatype	Readable	Writable	Device
132	Always	Always	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			• NI PCI/PXI-1428

Image Type

Returns the image type used as an input to the IMAQ Create VI.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Acquire Field

Sets the field acquired when the Frame/Field property is set to Field.

The following list includes possible values:

- **Even**—Acquire even fields.
- **Odd**—Acquire odd fields.
- All—Acquire all fields.

Datatype	Readable	Writable	Device
132	Always	Always	• NI PCI-1405
			• NI PCI/PXI-1409
			• NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			• NI PCI-1424
			• NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			• NI PCIe-1430

Interlacing Mode

Gets/sets the current interlace mode of the acquisition.

The following list includes possible values:

- Field—Acquires a single, non-interlaced field per image buffer.
- Frame—Acquires two interlaced fields per image buffer.

Datatype	Readable	Writable	Device
1321	Always	Always	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			 NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424

Start Field

Gets/sets the start field setting of the camera associated with this session. Valid when the Frame/Field property is set to Frame.

- Even
- Odd
- Note Only Frame mode is valid for the NI PCI/PXI-1422 and the NI PCI-1424.

Datatype	Readable	Writable	Device
1321	Always	Always	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			 NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424

Invert

Gets/sets the invert image mode.

The following list includes possible values:

- **NonInv**—The image is rightside up in memory.
- **Invert**—The image is upside down in memory.

Datatype	Readable	Writable	Device
132	Always	Always	• NI PCI-1405
			 NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430

Lookup Table

Programs the lookup table (LUT) for the given session.

The following list includes possible values:

- Normal
- Inverse
- Log
- Inverse Log
- Binary
- Inverse Binary

Note Normal, Inverse, Binary, and Inverse Binary are the only valid values for the NI PCIe-1427 and the NI 17*xx* smart cameras.

Datatype	Readable	Writable	Device
132	Always	Always	• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			 NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Partial Scan

Gets/sets the partial scan mode of the image sensor. This property is valid only for NI 17xx smart cameras.

The following list includes possible values:

- Off—Reads the full sensor.
- **1/2**—Reads the middle half of the sensor.
- **1/4**—Reads the middle quarter of the sensor.

Datatype	Readable	Writable	Device
U32	Always	Configuration	NI 17 <i>xx</i>

Vertical Scaling

Gets/sets the vertical hardware scaling factor for the channel associated with this session.

- None—No Scaling.
- **1/2**—Scale by 2.
- 1/4—Scale by 4.
- 1/8—Scale by 8.
- **Other**—User-specified scaling factor.

Datatype	Readable	Writable	Device
132	Always	Always	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			• NI PCI/PXI-1428

Lighting

Lighting parameters define properties that affect the Direct Drive lighting controller and external lighting strobe pins.

Readable

Writable

Indicates when the property is readable:

- **Always**—Property is readable both during acquisition and during configuration.
- **Running**—Property is readable only during acquisition.
- **Configuration** Property is readable only during configuration.
- NotReadable— Property is never readable.

Indicates when the property is writable:

- Always—Property is writable both during acquisition and during configuration.
- **Running**—Property is writable only during acquisition.
- **Configuration** Property is writable only during configuration.
- NotWritable— Property is never writable.

Devices

Indicates the devices to which the property applies.

24V Strobe

Enables/disables the 24 V external lighting strobe signal for external lighting controllers. This property is valid only for NI 17*xx* smart cameras.

The following list includes possible values:

- Off—External 24 V strobe output is disabled.
- **Rising**—External 24 V strobe output asserts a rising edge.

Datatype	Readable	Writable	Device
U32	Always	Always	NI 17 <i>xx</i>

5V Strobe (TTL)

Enables/disables the 5 V TTL external lighting strobe signal to be used with external lighting controllers. This property is valid only for NI 17xx smart cameras.

The following list includes possible values:

- Off—External 5 V strobe output is disabled.
- **Rising**—External 5 V strobe output asserts a rising edge.
- **Falling**—External 5 V strobe output asserts a falling edge.

Datatype	Readable	Writable	Device
U32	Always	Always	NI 17 <i>xx</i>

Current Level

Gets/sets the amount of current sourced by the Direct Drive lighting controller, in milliamperes (mA). This property can be set regardless of the status of the Lighting Mode attribute. This property is valid only for NI 17*xx* smart cameras.

Datatype	Readable	Writable	Device
DBL	Always	Always	NI 17 <i>xx</i>

Max Current Level

Returns the maximum amount of current, in milliamperes (mA), that can be sourced by the Direct Drive lighting controller under the current configuration. This property is valid only for NI 17*xx* smart cameras.
Datatype	Readable	Writable	Device
DBL	Always	NotWritable	NI 17 <i>xx</i>

Lighting Mode

Gets/sets the operation mode of the Direct Drive lighting controller. This property is valid only for NI 17xx smart cameras.

Values

The following list includes possible values:

- **Off**—Direct Drive lighting controller is disabled.
- **Continuous**—Direct Drive lighting controller is continuously enabled.
- **Strobed**—Direct Drive lighting controller is strobed with each image acquired.

Datatype	Readable	Writable	Device
U32	Always	Always	NI 17 <i>xx</i>

Status Information Properties

Status information properties return status information about an acquisition.

Readable

Indicates when the property is readable:

- Always—Property is readable both during acquisition and during configuration.
- **Running**—Property is readable only during acquisition.
- Configuration— Property is readable only during configuration.
- NotReadable Property is never readable.

Writable

Indicates when the property is writable:

- Always—Property is the property writable both during acquisition and during configuration.
- **Running**—Property is writable only during acquisition.
- Configuration— Property is writable only during configuration.
- NotWritable— Property is never writable.

Devices

Indicates the devices that

applies to.

Acquisition in Progress

Returns TRUE if an acquisition is in progress on the camera associated with this session.

Datatype	Readable	Writable	Device
TF	Always	NotWritable	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			• NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Frame Count

Returns the total number of images (one-based) acquired since the start of the acquisition.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Free Buffers

Returns the number of reserved driver buffers currently available.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Last Valid Buffer

Returns the buffer list index (zero-based) that contains the last acquired image. This value is always less than or equal to *N*-1, where *N* is the number of buffers in the buffer list.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Last Valid Frame

Returns the cumulative buffer number (zero-based) of the last acquired image. At the beginning of the acquisition, this value starts at -1 and continuously increments by 1 for each image acquired.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Lost Frames

Returns the total number of lost frames in a continuous acquisition. The value increments one time for each lost frame.

Datatype	Readable	Writable	Device
U32	Always	NotWritable	• NI PCI-1405
			• NI PCI/PXI-1407
			 NI PCI/PXI-1409
			 NI PCI-1410
			• NI PCI/PXI-1411
			 NI PCI/PXI-1422
			 NI PCI-1424
			 NI PCI-1426
			 NI PCIe-1427
			 NI PCI/PXI-1428
			 NI PCIe-1429
			 NI PCIe-1430
			• NI 17 <i>xx</i>

Temperature

Returns the current temperature of the device, in degrees Celsius.

Datatype	Readable	Writable	Device
DBL	Always	NotWritable	 NI PCIe-1429/ NI PCIe-1430 NI 17xx

Pass LED

Enables/disables the **Pass LED**. This property is valid only for NI 17xx smart cameras.

Datatype	Readable	Writable	Device
TF	Always	Always	NI 17 <i>xx</i>

Fail LED

Enables/disables the **Fail LED**. This property is valid only for NI 17xx smart cameras.

Datatype	Readable	Writable	Device
TF	Always	Always	NI 17 <i>xx</i>

Reference

Error Codes Quadrature Encoder Overview Scaled Encoder Signal Deprecated VIs

Error Codes

Error Code	Status Name
-1074397183	IMG_ERR_NCAP
-1074397182	IMG_ERR_OVRN
-1074397181	IMG_ERR_EMEM
-1074397180	IMG_ERR_OSER
-1074397179	IMG_ERR_PAR1
-1074397178	IMG_ERR_PAR2
-1074397177	IMG_ERR_PAR3
-1074397176	IMG_ERR_PAR4
-1074397175	IMG_ERR_PAR5
-1074397174	IMG_ERR_PAR6
-1074397173	IMG_ERR_PAR7
-1074397172	IMG_ERR_MXBF
-1074397171	IMG_ERR_DLLE
-1074397170	IMG_ERR_BSIZ
-1074397169	IMG_ERR_MXBI
-1074397168	IMG_ERR_ELCK

-1074397167	IMG_ERR_DISE
-1074397166	IMG_ERR_BBUF
-1074397165	IMG_ERR_NLCK
-1074397164	IMG_ERR_NCAM
-1074397163	IMG_ERR_BINT
-1074397162	IMG_ERR_BROW
-1074397161	IMG_ERR_BROI
-1074397160	IMG_ERR_BCMF
-1074397159	IMG_ERR_NVBL
-1074397158	IMG_ERR_NCFG
-1074397157	IMG_ERR_BBLF
-1074397156	IMG_ERR_BBLE
-1074397155	IMG_ERR_BBLB
-1074397154	IMG_ERR_NAIP
-1074397153	IMG_ERR_VLCK
-1074397152	IMG_ERR_BDMA
-1074397151	IMG_ERR_AIOP

-1074397150	IMG_ERR_TIMO	
-1074397149	IMG_ERR_NBUF	
-1074397148	IMG_ERR_ZBUF	
-1074397147	IMG_ERR_BTRG	
107/2071/5	IMC EDD NINE	
-1074397143		
-1074397144		
-1074397143		
-1074397142	IMG_ERR_NOSR	
-1074397141	IMG_ERR_BTAC	
-1074397140	IMG_ERR_FIFO	
-1074397139	IMG_ERR_MLCK	
-1074397138	IMG_ERR_ILCK	
-1074397137	IMG_ERR_NEPK	
-1074397136	IMG_ERR_SCLM	
-1074397135	IMG_ERR_SCC1	

-1074397134	IMG_ERR_SMALLALLOC
-1074397133	IMG_ERR_ALLOC
-1074397132	IMG_ERR_BADCAMTYPE
-1074397131	IMG_ERR_BADPIXTYPE
-1074397130	IMG_ERR_BADCAMPARAM
-1074397129	IMG_ERR_PALKEYDTCT
-1074397128	IMG_ERR_BFRQ
-1074397127	IMG_ERR_BITP
-1074397126	IMG_ERR_HWNC
-1074397125	IMG_ERR_SERIAL
-1074397124	IMG_ERR_MXPI
-1074397123	IMG_ERR_BPID
-1074397122	IMG_ERR_NEVR
-1074397121	IMG_ERR_SERIAL_TIMO
-1074397120	IMG_ERR_PG_TOO_MANY
-1074397119	IMG_ERR_PG_BAD_TRANS

-1074397117	IMG_ERR_BPMD
-1074397116	IMG_ERR_NSAT
-1074397115	IMG_ERR_HYBRID
-1074397114	IMG_ERR_BADFILFMT
-1074397113	IMG_ERR_BADFILEXT
-1074397112	IMG_ERR_NRTSI
-1074397111	IMG_ERR_MXTRG
-1074397110	IMG_ERR_MXRC
-1074397109	IMG_ERR_OOR
-1074397108	IMG_ERR_NPROG
-1074397107	IMG_ERR_NEOM
-1074397106	IMG_ERR_BDTYPE
-1074397105	IMG_ERR_THRDACCDEN
-1074397104	IMG_ERR_BADFILWRT
-1074397103	IMG_ERR_AEXM
-1074397102	IMG_ERR_BAD_LUT_TYPE
-1074397101	IMG_ERR_ATTRIBUTE_NOT_READABLE
-1074397100	IMG_ERR_BOARD_NOT_SUPPORTED
-1074397099	IMG_ERR_BAD_FRAME_FIELD
1074207009	

-1074397097	IMG_ERR_BAD_LINE_MAP
-1074397095	IMG_ERR_BAD_CHANNEL
-1074397094	IMG_ERR_BAD_CHROMA_FILTER
-1074397093	IMG_ERR_BAD_SCALE
-1074397091	IMG_ERR_BAD_TRIGGER_MODE
-1074397090	IMG_ERR_BAD_CLAMP_START
-1074397089	IMG_ERR_BAD_CLAMP_STOP
-1074397088	IMG_ERR_BAD_BRIGHTNESS
-1074397087	IMG_ERR_BAD_CONTRAST
-1074397086	IMG_ERR_BAD_SATURATION
-1074397085	IMG_ERR_BAD_TINT
-1074397084	IMG_ERR_BAD_HUE_OFF_ANGLE
-1074397083	IMG_ERR_BAD_ACQUIRE_FIELD
-1074397082	IMG_ERR_BAD_LUMA_BANDWIDTH
-1074397081	IMG_ERR_BAD_LUMA_COMB

-1074397080	IMG_ERR_BAD_CHROMA_PROCESS
-1074397079	IMG_ERR_BAD_CHROMA_BANDWIDTH
-1074397078	IMG_ERR_BAD_CHROMA_COMB
-1074397077	IMG_ERR_BAD_RGB_CORING
-1074397076	IMG_ERR_BAD_HUE_REPLACE_VALUE
-1074397075	IMG_ERR_BAD_RED_GAIN
-1074397074	IMG_ERR_BAD_GREEN_GAIN
-1074397073	IMG_ERR_BAD_BLUE_GAIN
-1074397072	IMG_ERR_BAD_START_FIELD
-1074397071	IMG_ERR_BAD_TAP_DIRECTION
-1074397070	IMG_ERR_BAD_MAX_IMAGE_RECT
-1074397069	IMG_ERR_BAD_TAP_TYPE
-1074397068	IMG_ERR_BAD_SYNC_RECT
-1074397067	IMG_ERR_BAD_ACQWINDOW_RECT
-1074397066	IMG_ERR_BAD_HSL_CORING
4074007005	

-1074397064	IMG_ERR_BAD_TAP_1_VALID_RECT
-1074397063	IMG_ERR_BAD_TAP_2_VALID_RECT
-1074397062	IMG_ERR_BAD_TAP_3_VALID_RECT
-1074397061	IMG_ERR_BAD_TAP_RECT
-1074397060	IMG_ERR_BAD_NUM_TAPS
-1074397059	IMG_ERR_BAD_TAP_NUM
-1074397058	IMG_ERR_BAD_QUAD_NUM
-1074397057	IMG_ERR_BAD_NUM_DATA_LINES
-1074397056	IMG_ERR_BAD_BITS_PER_COMPONENT
-1074397055	IMG_ERR_BAD_NUM_COMPONENTS
-1074397054	IMG_ERR_BAD_BIN_THRESHOLD_LOW
-1074397053	IMG_ERR_BAD_BIN_THRESHOLD_HIGH
-1074397052	IMG_ERR_BAD_BLACK_REF_VOLT
-1074397051	IMG_ERR_BAD_WHITE_REF_VOLT
-1074397050	IMG_ERR_BAD_FREQ_STD
-1074397049	IMG_ERR_BAD_HDELAY

-1074397047	IMG_ERR_BAD_BUFFER_LIST
-1074397046	IMG_ERR_BOARD_NOT_INITIALIZED
-1074397045	IMG_ERR_BAD_PCLK_SOURCE
-1074397044	IMG_ERR_BAD_VIDEO_LOCK_CHANNEL
-1074397043	IMG_ERR_BAD_LOCK_SEL
-1074397042	IMG_ERR_BAD_BAUD_RATE
-1074397041	IMG_ERR_BAD_STOP_BITS
-1074397040	IMG_ERR_BAD_DATA_BITS
-1074397039	IMG_ERR_BAD_PARITY
-1074397038	IMG_ERR_TERM_STRING_NOT_FOUND
-1074397037	IMG_ERR_SERIAL_READ_TIMEOUT
-1074397036	IMG_ERR_SERIAL_WRITE_TIMEOUT
-1074397035	IMG_ERR_BAD_SYNCHRONICITY

-1074397034	IMG_ERR_BAD_INTERLACING_CONFIG
-1074397032	IMG_ERR_BAD_CHIP_CODE
-1074397031	IMG_ERR_LUT_NOT_PRESENT
-1074397030	IMG_ERR_DSPFILTER_NOT_PRESENT
-1074397029	IMG_ERR_DEVICE_NOT_FOUND
-1074397028	IMG_ERR_ONBOARD_MEM_CONFIG
-1074397027	IMG_ERR_BAD_POINTER
-1074397026	IMG_ERR_BAD_BUFFER_LIST_INDEX
-1074397025	IMG_ERR_INVALID_BUFFER_ATTRIBUTE
-1074397024	IMG_ERR_INVALID_BUFFER_PTR
-1074397023	IMG_ERR_BUFFER_LIST_ALREADY_LOCKED
-1074397022	IMG_ERR_BAD_DEVICE_TYPE
-1074397021	IMG_ERR_BAD_BAR_SIZE

-1074397018	IMG_ERR_ACQ_STOPPED
-1074397017	IMG_ERR_BAD_TRIGGER_ACTION
-1074397016	IMG_ERR_BAD_TRIGGER_POLARITY
-1074397015	IMG_ERR_BAD_TRIGGER_NUMBER
1074207014	
-1074397014	IMG_ERR_BUFFER_NUT_AVAILABLE
-1074397012	IMG_ERR_BAD_PULSE_ID
-1074397011	IMG_ERR_BAD_PULSE_TIMEBASE
-1074397010	IMG_ERR_BAD_PULSE_GATE
-1074397009	IMG_ERR_BAD_PULSE_GATE_POLARITY
-1074397008	IMG_ERR_BAD_PULSE_OUTPUT
-1074397007	IMG_ERR_BAD_PULSE_OUTPUT_POLARITY
-1074397006	IMG_ERR_BAD_PULSE_MODE
-1074397005	IMG_ERR_NOT_ENOUGH_RESOURCES
-1074397004	IMG_ERR_INVALID_RESOURCE
1074397003	IMG_ERR_BAD_FVAL_ENABLE

-1074397002	IMG_ERR_BAD_WRITE_ENABLE_MODE
-1074397001	IMG_ERR_COMPONENT_MISMATCH
-1074397000	IMG_ERR_FPGA_PROGRAMMING_FAILED
-1074396999	IMG_ERR_CONTROL_FPGA_FAILED
-1074396998	IMG_ERR_CHIP_NOT_READABLE
-1074396997	IMG_ERR_CHIP_NOT_WRITABLE
-1074396996	IMG_ERR_I2C_BUS_FAILED
-1074396995	IMG_ERR_DEVICE_IN_USE
-1074396994	IMG_ERR_BAD_TAP_DATALANES
-1074396993	IMG_ERR_BAD_VIDEO_GAIN
-1074396992	IMG_ERR_VHA_MODE_NOT_ALLOWED
-1074396991	IMG_ERR_BAD_TRACKING_SPEED
-1074396990	IMG_ERR_BAD_COLOR_INPUT_SELECT
-1074396989	IMG_ERR_BAD_HAV_OFFSET
-1074396988	IMG_ERR_BAD_HS1_OFFSET
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-1074396987	IMG_ERR_BAD_HS2_OFFSET
-1074396986	IMG_ERR_BAD_IF_CHROMA
-1074396985	IMG_ERR_BAD_COLOR_OUTPUT_FORMAT
-1074396984	IMG_ERR_BAD_SAMSUNG_SCHCMP
-1074396983	IMG_ERR_BAD_SAMSUNG_CDLY
-1074396982	IMG_ERR_BAD_SECAM_DETECT
-1074396981	IMG_ERR_BAD_FSC_DETECT
-1074396980	IMG_ERR_BAD_SAMSUNG_CFTC
-1074396979	IMG_ERR_BAD_SAMSUNG_CGTC
-1074396978	IMG_ERR_BAD_SAMSUNG_SAMPLE_RATE
-1074396977	IMG_ERR_BAD_SAMSUNG_VSYNC_EDGE
-1074396976	IMG_ERR_SAMSUNG_LUMA_GAIN_CTRL
-1074396975	IMG_ERR_BAD_SET_COMB_COEF
-1074396974	IMG_ERR_SAMSUNG_CHROMA_TRACK
-1074396973	IMG_ERR_SAMSUNG_DROP_LINES

107/206072	
-1074390972	
-1074396971	IMG_ERR_BAD_PG_TRANSITION
-1074396970	IMG_ERR_TOO_MANY_PG_TRANSITIONS
-1074396969	IMG_ERR_BAD_CL_DATA_CONFIG
-1074396968	IMG_ERR_BAD_OCCURRENCE
-1074396967	IMG_ERR_BAD_PG_MODE
-1074396966	IMG_ERR_BAD_PG_SOURCE
-1074396965	IMG_ERR_BAD_PG_GATE
-1074396964	IMG_ERR_BAD_PG_GATE_POLARITY
-1074396963	IMG_ERR_BAD_PG_WAVEFORM_INITIAL_STATE
-1074396962	IMG_ERR_INVALID_CAMERA_ATTRIBUTE
-1074396961	IMG_ERR_BOARD_CLOSED
-1074396960	IMG_ERR_FILE_NOT_FOUND
-1074396959	IMG_ERR_BAD_1409_DSP_FILE
-1074396958	IMG_ERR_BAD_SCARABXCV200_32_FILE

-1074396957	IMG_ERR_BAD_SCARABXCV200_16_FILE
-1074396956	IMG_ERR_BAD_CAMERA_LINK_FILE
-1074396955	IMG_ERR_BAD_1411_CSC_FILE
-1074396954	IMG_ERR_BAD_ERROR_CODE
-1074396953	IMG_ERR_DRIVER_TOO_OLD
-1074396952	IMG_ERR_INSTALLATION_CORRUPT
-1074396951	IMG_ERR_NO_ONBOARD_MEMORY
-1074396950	IMG_ERR_BAD_BAYER_PATTERN
-1074396949	IMG_ERR_CANNOT_INITIALIZE_BOARD
-1074396948	IMG_ERR_CALIBRATION_DATA_CORRUPT
-1074396947	IMG_ERR_DRIVER_FAULT
-1074396946	IMG_ERR_ADDRESS_OUT_OF_RANGE
-1074396945	IMG_ERR_ONBOARD_ACQUISITION
-1074396944	IMG_ERR_NOT_AN_ONBOARD_ACQUISITION
-1074396943	IMG_ERR_BOARD_ALREADY_INITIALIZED

-1074396942	IMG_ERR_NO_SERIAL_PORT
-1074396941	IMG_ERR_BAD_VENABLE_GATING_MODE
-1074396940	IMG_ERR_BAD_1407_LUT_FILE
-1074396939	IMG_ERR_BAD_SYNC_DETECT_LEVEL
-1074396938	IMG_ERR_BAD_1405_GAIN_FILE
-1074396937	IMG_ERR_CLAMP_DAC_NOT_PRESENT
-1074396936	IMG_ERR_GAIN_DAC_NOT_PRESENT
-1074396935	IMG_ERR_REF_DAC_NOT_PRESENT
-1074396934	IMG_ERR_BAD_SCARABXC2S200_FILE
-1074396933	IMG_ERR_BAD_LUT_GAIN
-1074396932	IMG_ERR_BAD_MAX_BUF_LIST_ITER
-1074396931	IMG_ERR_BAD_PG_LINE_NUM
-1074396930	IMG_ERR_BAD_BITS_PER_PIXEL
-1074396929	IMG ERR TRIGGER ALARM

-1074396928	IMG_ERR_BAD_SCARABXC2S200_03052009_FILE
-1074396927	IMG_ERR_LUT_CONFIG
-1074396926	IMG_ERR_CONTROL_FPGA_REQUIRES_NEWER_DRIV
-1074396925	IMG_ERR_CONTROL_FPGA_PROGRAMMING_FAILED
-1074396924	IMG_ERR_BAD_TRIGGER_SIGNAL_LEVEL
-1074396923	IMG_ERR_CAMERA_FILE_REQUIRES_NEWER_DRIVEF
-1074396922	IMG_ERR_DUPLICATED_BUFFER
-1074396921	IMG_ERR_NO_ERROR
-1074396920	IMG_ERR_INTERFACE_NOT_SUPPORTED
-1074396919	IMG_ERR_BAD_PCLK_POLARITY
-1074396918	IMG_ERR_BAD_ENABLE_POLARITY
-1074396917	IMG_ERR_BAD_PCLK_SIGNAL_LEVEL

-1074396916	IMG_ERR_BAD_ENABLE_SIGNAL_LEVEL
-1074396915	IMG_ERR_BAD_DATA_SIGNAL_LEVEL
-1074396914	IMG_ERR_BAD_CTRL_SIGNAL_LEVEL
-1074396913	IMG_ERR_BAD_WINDOW_HANDLE
-1074396912	IMG_ERR_CANNOT_WRITE_FILE
-1074396911	IMG_ERR_CANNOT_READ_FILE
-1074396910	IMG_ERR_BAD_SIGNAL_TYPE
-1074396909	IMG_ERR_BAD_SAMPLES_PER_LINE
-1074396908	IMG_ERR_BAD_SAMPLES_PER_LINE_REF
-1074396907	IMG_ERR_USE_EXTERNAL_HSYNC
-1074396906	IMG_ERR_BUFFER_NOT_ALIGNED
-1074396905	IMG_ERR_ROWPIXELS_TOO_SMALL
-1074396904	IMG_ERR_ROWPIXELS_NOT_ALIGNED
-107/306003	IMG FRR ROI WIDTH NOT ALIGNED

-1074396902	IMG_ERR_LINESCAN_NOT_ALLOWED
-1074396901	IMG_ERR_INTERFACE_FILE_REQUIRES_NEWER_DRIV
-1074396900	IMG_ERR_BAD_SKIP_COUNT
-1074396899	IMG_ERR_BAD_NUM_X_ZONES
-1074396898	IMG_ERR_BAD_NUM_Y_ZONES
-1074396897	IMG_ERR_BAD_NUM_TAPS_PER_X_ZONE
-1074396896	IMG_ERR_BAD_NUM_TAPS_PER_Y_ZONE
-1074396895	IMG_ERR_BAD_TEST_IMAGE_TYPE
-1074396894	IMG_ERR_CANNOT_ACQUIRE_FROM_CAMERA
-1074396893	IMG_ERR_BAD_CTRL_LINE_SOURCE
-1074396892	IMG_ERR_BAD_PIXEL_EXTRACTOR
-1074396891	IMG_ERR_BAD_NUM_TIME_SLOTS
-1074396890	IMG_ERR_BAD_PLL_VCO_DIVIDER

-1074396889	IMG_ERR_CRITICAL_TEMP
-1074396888	IMG_ERR_BAD_DPA_OFFSET
-1074396887	IMG_ERR_BAD_NUM_POST_TRIGGER_BUFFERS
-1074396886	IMG_ERR_BAD_DVAL_MODE
-1074396885	IMG_ERR_BAD_TRIG_GEN_REARM_SOURCE
-1074396884	IMG_ERR_BAD_ASM_GATE_SOURCE
-1074396883	IMG_ERR_TOO_MANY_BUFFERS
-1074396882	IMG_ERR_BAD_TAP_4_VALID_RECT
-1074396881	IMG_ERR_BAD_TAP_5_VALID_RECT
-1074396880	IMG_ERR_BAD_TAP_6_VALID_RECT
-1074396879	IMG_ERR_BAD_TAP_7_VALID_RECT
-1074396878	IMG_ERR_FRONT_END_BANDWIDTH_EXCEEDED
-1074396877	IMG_ERR_BAD_PORT_NUMBER
-1074396876	IMG_ERR_PORT_CONFIG_CONFLICT

-1074396875	IMG_ERR_BITSTREAM_INCOMPATIBLE
-1074396874	IMG_ERR_SERIAL_PORT_IN_USE
-1074396873	IMG_ERR_BAD_ENCODER_DIVIDE_FACTOR
-1074396872	IMG_ERR_ENCODER_NOT_SUPPORTED
-1074396871	IMG_ERR_BAD_ENCODER_POLARITY
-1074396870	IMG_ERR_BAD_ENCODER_FILTER
-1074396869	IMG_ERR_ENCODER_POSITION_NOT_SUPPORTED
-1074396868	IMG_ERR_IMAGE_IN_USE
-1074396867	IMG_ERR_BAD_SCARABXL4000_FILE
-1074396866	IMG_ERR_BAD_CAMERA_ATTRIBUTE_VALUE

-1074396864	IMG_ERR_FPGA_FILE_NOT_FOUND
-1074396863	IMG_ERR_FPGA_FILE_CORRUPT
-1074396862	IMG_ERR_BAD_PULSE_DELAY
-1074396861	IMG_ERR_BAD_PG_IDLE_SIGNAL_LEVEL
-1074396860	IMG_ERR_BAD_PG_WAVEFORM_IDLE_STATE
-1074396859	IMG_ERR_64_BIT_MEMORY_NOT_SUPPORTED
-107/306858	IMG ERR 64 BIT MEMORY LIPDATE AVAILABLE
-1074390636	
-1074396857	IMG_ERR_32_BIT_MEMORY_LIMITATION

-1074396856	IMG_ERR_KERNEL_NOT_LOADED
-1074396855	IMG_ERR_BAD_SENSOR_SHUTTER_PERIOD
-1074396854	IMG_ERR_BAD_SENSOR_CCD_TYPE
-1074396853	IMG_ERR_BAD_SENSOR_PARTIAL_SCAN
-1074396852	IMG_ERR_BAD_SENSOR_BINNING
-1074396851	IMG_ERR_BAD_SENSOR_GAIN
-1074396850	IMG_ERR_BAD_SENSOR_BRIGHTNESS
-1074396849	IMG_ERR_BAD_LED_STATE
-1074396848	IMG_ERR_64_BIT_NOT_SUPPORTED
-1074396847	IMG_ERR_BAD_TRIGGER_DELAY
-1074396846	IMG_ERR_LIGHTING_CURRENT_EXCEEDS_LIMITS
-1074396845	IMG_ERR_LIGHTING_INVALID_MODE
-1074396844	IMG_ERR_LIGHTING_EXTERNAL_INVALID_MODE
-1074396843	IMG_ERR_BAD_SENSOR_EXPOSURE

-1074396842	IMG_ERR_BAD_FRAME_RATE
-1074396841	IMG_ERR_BAD_SENSOR_PARTIAL_SCAN_BINNING_C
-1074396840	IMG_ERR_SOFTWARE_TRIGGER_NOT_CONFIGURED
-1074396839	IMG_ERR_FREE_RUN_MODE_NOT_ALLOWED
-1074396838	IMG_ERR_BAD_LIGHTING_RAMPUP
107/206927	
-1074390037	
-1074396836	IMG_ERR_LIGHTING_ARM_TIMEOUT
-1074396835	IMG_ERR_LIGHTING_SHORT_CIRCUIT
-1074396834	IMG_ERR_BAD_BOARD_HEALTH
-1074396833	IMG_ERR_LIGHTING_BAD_CONTINUOUS_CURRENT_L

-1074396832	IMG_ERR_LIGHTING_BAD_STROBE_DUTY_CYCLE_LIN
-1074396831	IMG_ERR_LIGHTING_BAD_STROBE_DURATION_LIMIT
-1074396830	IMG_ERR_BAD_LIGHTING_CURRENT_EXPOSURE_CO
-1074396829	IMG_ERR_LIGHTING_HEAD_CONFIG_NOT_FOUND
-1074396828	IMG_ERR_LIGHTING_HEAD_DATA_CORRUPT
-1074396827	IMG_ERR_LIGHTING_ABORT_TIMEOUT
-1074396826	IMG_ERR_LIGHTING_BAD_STROBE_CURRENT_LIMIT
-1074396825	IMG_ERR_DMA_ENGINE_UNRESPONSIVE

Quadrature Encoder Overview

A quadrature encoder uses two output channels, Phase A and Phase B, to track the position of a rotary shaft. Generally, this shaft is coupled to a motor drive that controls the movement of an object of interest. By monitoring the encoder Phase A and Phase B signals, you can obtain a precise measurement of the object's position.

To generate Phase A and Phase B signals, the quadrature encoder uses two code tracks with sectors positioned 90 degrees out of phase. The phase difference indicates the position and direction of rotation. If Phase A leads Phase B, the shaft is rotating in a clockwise direction. If Phase B leads Phase A, the shaft is rotating in a counter-clockwise direction. The following figure illustrates the Phase A signal leading the Phase B signal.



Compatible NI image acquisition devices include hardware that can be used to track both the position and direction of rotation of the Phase A and Phase B signals. For example, this information can be used in conjunction with a line scan camera to acquire lines synchronous to the movement of a conveyor belt, giving you the ability to specify your line rate in terms of positional units (such as inches or centimeters) rather than time.

Scaled Encoder Signal

The scaled encoder signal is an edge-sensitive signal that is used to track cumulative forward progression of the quadrature encoder Phase A and Phase B signals. The scaled encoder signal is derived by applying a divide factor to the raw positional signal that is encoded between Phase A and Phase B.

All NI image acquisition devices expect the raw positional signal to be encoded with quadrature encoding. The scaled encoder signal can be used as a line trigger, as a timebase for pulse generation, and it can be driven out on a trigger line for external usage. The following figure illustrates the scaled encoder signal that is produced when using a divide factor of six.



NI image acquisition devices that support multiple ports have a unique scaler per port. The unique scaler allows you to simultaneously acquire from multiple line scan cameras using different line rates that are all synchronous to the same quadrature encoder. Some NI image acquisition devices also support querying the absolute position counter value. Refer to the image acquisition device documentation to determine if the device supports querying the absolute position counter.

Refer to the <u>Quadrature Encoder Overview</u> for more information about quadrature encoders.

Deprecated VIs

Deprecated VIs are VIs from a previous version of NI-IMAQ that have been replaced by newer VIs. Though the current version of NI-IMAQ still supports these VIs, use the newer VIs whenever possible.

The following VIs are deprecated.

IMAQ Configure TriggerIMAQ Configure Trigger2IMAQ CopyIMAQ Generate PulseIMAQ Generate Pulse2IMAQ Occurrence ConfigIMAQ Trigger DriveIMAQ Trigger ReadIMAQ Trigger RouteIMAQ Trigger Route

Glossary A B C D E F G H I L M N O P Q R S T U V W Y

Α

Analog-to-digital.
Alternating current.
The image size specific to a video standard or camera resolution.
The region of lines actively being stored; defined by a line start (relative to vertical sync signal) and a line count.
The region of pixels actively being stored; defined by a pixel start (relative to the horizontal sync signal) and a pixel count.
Analog-to-digital converter. An electronic device, often an integrated circuit, that converts an analog voltage to a digital number.
Character code that identifies a specific location (or series of locations) in memory.
American National Standards Institute.
Removes the color information from the video signal.
Application programming interface.
A rectangular portion of an acquisition window or frame that is controlled and defined by software.
Ordered, indexed set of data elements of the same type.
Application-specific integrated circuit. A proprietary semiconductor component designed and manufactured to perform a set of specific functions for a specific customer.
The ratio of a picture or image's width to its height.

В

back The area of the video signal between the rising edge of the horizontal sync signal and the active video information.

Bayer Method to produce color images with a single imaging sensor, as opposed to three individual sensors for the red, green, and blue components of light.

Bayer Color filter array pattern that can appear in four variations, depending on the current left and top offsets of the acquisition window:

GBGB GRGR BGBG RGRG RGRG BGBG GRGR GBGB

bit depth The number of bits per pixel.

black The level that represents the darkest an image can get. **See** reference **also** <u>white reference level</u>.

BMP Bitmap. Image file format commonly used for 8-bit and color images (extension .bmp).

buffer Temporary storage for acquired data.

bus The group of conductors that interconnect individual circuitry in a computer, such as the PCI bus; typically the expansion vehicle to which I/O or other devices are connected.

С

cache	High-speed processor memory that buffers commonly used instructions or data to increase processing throughput.
CCIR	Comite Consultatif International des Radiocommunications. A committee that developed standards for color video signals.
chrominance	The color information in a video signal.
CMOS	Complementary metal-oxide semiconductor.
CompactPCI	Refers to the core specification defined by the PCI Industrial Computer Manufacturer's Group (PICMG).
compiler	A software utility that converts a source program in a high-level programming language, such as Basic, C, or Pascal, into an object or compiled program in machine language. Compiled programs run 10 to 1,000 times faster than interpreted programs. See also interpreter.
conversion device	Device that transforms a signal from one form to another; for example, analog-to-digital converters (ADCs) for analog input and digital-to-analog converters (DACs) for analog output.
CPU	Central processing unit.
CSYNC	Composite sync signal. A combination of the horizontal and vertical sync pulses.

D

D/A Digital-to-analog.

- DAC Digital-to-analog converter; an electronic device, often an integrated circuit, that converts a digital number into a corresponding analog voltage or current.
- DAQ Data acquisition. (1) Collecting and measuring electrical signals from sensors, transducers, and test probes or fixtures and inputting them to a computer for processing. (2) Collecting and measuring the same kinds of electrical signals with A/D or DIO devices plugged into a computer, and possibly generating control signals with D/A and/or DIO devices in the same computer.
- DC Direct current.

default
A default parameter value recorded in the driver; in many
cases, the default input of a control is a certain value (often
0) that means use the current default setting.

DIN Deutsche Industrie Norme. A format for electrical connectors.

distance Determination of the physical dimensions of a pixel by calibration defining the physical dimensions of a line in the image.

distance Assigns to each pixel in an object a gray-level value equal to its shortest Euclidean distance from the border of the object.

- DLL Dynamic link library. A software module in Microsoft Windows containing executable code and data that can be called or used by Windows applications or other DLLs; functions and data in a DLL are loaded and linked at run time when they are referenced by a Windows application or other DLLs.
- DMA Direct memory access. A method by which data can be transferred to and from computer memory from and to a device or memory on the bus while the processor does something else; DMA is the fastest method of transferring data to/from computer memory.
- DRAM Dynamic RAM.
- driver Software that controls a specific hardware device such as an image acquisition device.
- dynamic The ratio of the largest signal level a circuit can handle to

Ε

- EEPROM Electrically erasable programmable read-only memory. ROM that can be erased with an electrical signal and reprogrammed.
- external A voltage pulse from an external source that triggers an event such as A/D conversion.

F

- field For an interlaced video signal, a field is half the number of horizontal lines needed to represent a frame of video; the first field of a frame contains all of the odd-numbered lines, and the second field contains all of the even-numbered lines.
- FIFO First-in first-out memory buffer. The first data stored is the first data sent to the acceptor; FIFO buffers are used on image acquisition devices to temporarily store incoming data until that data can be retrieved.
- flash An ADC whose output code is determined in a single step by ADC a bank of comparators and encoding logic.
- frame A complete image; in interlaced formats, a frame is composed of two fields.
- front The area of a video signal between the start of the horizontal porch blank and the start of the horizontal sync.
- function A set of software instructions executed by a single line of code that may have input and/or output parameters and returns a value when executed.

G

- gain Applied value to compensate for discrepancies in the filter for a particular color.
- gamma The nonlinear change in the difference between the video signal's brightness level and the voltage level needed to produce that brightness.
- genlock The process of synchronizing a video source to the signal from a separate video source. The circuitry aligns the video timing signals by locking together the horizontal, vertical, and color subcarrier frequencies and phases and generates a pixel clock that clocks pixel data into memory for display or into another circuit for processing.
- grab Performs an acquisition that loops continually on one buffer. You obtain a copy of the acquisition buffer by grabbing a copy to a separate buffer that can be used for analysis.
- GUI Graphical user interface. An intuitive, easy-to-use means of communicating information to and from a computer program by means of graphical screen displays; GUIs can resemble the front panels of instruments or other objects associated with a computer program.

Н

- hardware The physical components of a computer system, such as the circuit boards, plug-in boards, chassis, enclosures, peripherals, cables, and so on.
- HSYNC Horizontal sync signal. The synchronization pulse signal produced at the beginning of each video scan line that keeps a video monitor's horizontal scan rate in step with the transmission of each new line.
- hue Represents the dominant color of a pixel. The hue function is a continuous function that covers all the possible colors generated using the R, G, and B primaries. **See also** <u>RGB</u>.

I

IEEE Institute of Electrical and Electronics Engineers.

INL Integral nonlinearity. A measure, in LSB, of the worst-case deviation from the ideal A/D or D/A transfer characteristic of the analog I/O circuitry.

instrument A set of high-level software functions, such as NI-IMAQ,

- driver that controls specific plug-in computer boards; instrument drivers are available in several forms, ranging from a function callable from a programming language to a virtual instrument (VI) in LabVIEW.
- interlaced A video frame composed of two interleaved fields; the number of lines in a field are half the number of lines in an interlaced frame.
- interpreter A software utility that executes source code from a highlevel language, such as Java or Basic, by reading one line at a time and executing the specified operation. In contrast, a compiler converts all source code to executable machine code before execution. Compiled languages give significantly higher performance than interpreted languages. Examples of compiled languages are C, C++, and LabVIEW, while Java and Basic are generally interpreted languages. **See also** <u>compiler</u>.
- interrupt A computer signal indicating that the CPU should suspend its current task to service a designated activity.

interrupt The relative priority at which a device can interrupt.

level

- I/O Input/output. The transfer of data to/from a computer system involving communications channels, operator interface devices, or data acquisition and control interfaces.
- IRE A relative unit of measure (named for the Institute of Radio Engineers). 0 IRE corresponds to the blanking level of a video signal, 100 IRE to the white level. Note that for CIR/PAL video the black level is equal to the blanking level or 0 IRE, while for RS-170/NTSC video, the black level is at 7.5 IRE.
- IRQ Interrupt request. See also interrupt.

ISO A high voltage isolated trigger.

Trigger

L

- library A file containing compiled object modules, each comprised of one or more functions, that can be linked to other object modules that make use of these functions.
- line count The total number of horizontal lines in the picture.
- LSB Least significant bit.
- luminance The brightness information in the video picture. The luminance signal amplitude varies in proportion to the brightness of the video signal and corresponds exactly to the monochrome picture.
- LUT Lookup table. Table containing values used to transform the gray-level values of an image. For each gray-level value in the image, the corresponding new value is obtained from the lookup table. Also a selection in Measurement & Automation Explorer (MAX) for Vision that contains formulas that let you implement simple imaging operations such as contrast enhancement, data inversion, gamma manipulation, or other nonlinear transfer functions.

Μ

MAX Measurement & Automation Explorer. The National Instruments Windows-based graphical configuration utility you can use to configure NI software and hardware, execute system diagnostics, add new channels and interfaces, and view the devices and instruments you have connected to your computer. MAX is installed on the desktop during the National Instruments driver software installation.

memory See <u>buffer</u>.

buffer

memory Continuous blocks of memory that can be accessed quickly window by changing addresses on the local processor.

- MSB Most significant bit.
- MTBF Mean time between failure.
- mux Multiplexer. A switching device with multiple inputs that selectively connects one of its inputs to its output.

Ν

- NI-IMAQ Driver software for National Instruments image acquisition hardware.
- noninterlaced A video frame where all the lines are scanned sequentially, rather than being divided into two frames as in an interlaced video frame.
- NTSC National Television Standards Committee. The committee that developed the color video standard used primarily in North America, which uses 525 lines per frame. **See also** PAL.
- NVRAM Nonvolatile RAM. RAM that is not erased when a device loses power or is turned off.

0

one- Applies to pulse generation and acquisitions. A one-shot pulse shot or acquisition happens only once.

Ρ

- PAL Phase Alternation Line. One of the European video color standards; uses 625 lines per frame. **See also <u>NTSC</u>**.
- PCI Peripheral Component Interconnect. A high-performance expansion bus architecture originally developed by Intel to replace ISA and EISA; it is achieving widespread acceptance as a standard for PCs and workstations and offers a theoretical maximum transfer rate of 133 Mbytes/s.
- PCIe PCI express. A high-performance expansion bus architecture originally developed by Intel to replace PCI. PCIe offers a theoretical maximum transfer rate that is dependent upon lane width. A x1 link theoretically provides 250 MB/s in each direction—to and from the device. Once overhead is accounted for, a x1 link can provide approximately 200 MB/s of input capability and 200 MB/s of output capability. Increasing the number of lanes in a link increases maximum throughput by approximately the same factor.
- PCLK Pixel clock signal. Times the sampling of pixels on a video line.
- PGIA Programmable gain instrumentation amplifier.
- picture The ratio of the active pixel region to the active line region; for aspect standard video signals such as RS-170 or CCIR, the full-size picture aspect ratio typically is 4/3 (1.33).
- pixel Picture element. The smallest division that makes up the video scan line; for display on a computer monitor, a pixel's optimum dimension is square (aspect ratio of 1:1, or the width equal to the height).

pixel The ratio between the physical horizontal size and the vertical

- aspect size of the region covered by the pixel. An acquired pixel should optimally be square, thus the optimal value is 1.0;
- however, typically it falls between 0.95 and 1.05, depending on camera quality.

pixel Divides the incoming horizontal video line into pixels.

clock

pixel The total number of pixels between two horizontal sync

- count signals; the pixel count determines the frequency of the pixel clock.
- PLL Phase-locked loop. Circuitry that provides a very stable pixel

Q

quadrature An encoding technique for a rotating device where two encoder tracks of information are placed on the device, with the signals on the tracks offset by 90 degrees from each other. The phase difference indicates the position and direction of rotation.

R

RAM Random-access memory.

real time A property of an event or system in which data is processed as it is acquired instead of being accumulated and processed at a later time.

relative A measure in LSB of the accuracy of an ADC; it includes all accuracy on nonlinearity and quantization errors but does not include offset and gain errors of the circuitry feeding the ADC.

- resolution (1) The number of rows and columns of pixels. An image composed of m rows and n columns has a resolution of . This image has n pixels along its horizontal axis and m pixels along its vertical axis. (2) The smallest signal increment that can be detected by a measurement system. Resolution can be expressed in bits, proportions, or a percentage of full scale. For example, a system has 12-bit resolution, one part in 4,096 resolution, and 0.0244 percent of full scale.
- RGB Color encoding scheme using red, green, and blue (RGB) color information where each pixel in the color image is encoded using 32 bits: 8 bits for red, 8 bits for green, 8 bits for blue, and 8 bits for the alpha value (unused).

ribbon A flat cable in which the conductors are side by side.

- cable
- ring Performs an acquisition that loops continually on a specified number of buffers.
- ROI Region of interest. (1) An area of the image that is graphically selected from a window displaying the image. This area can be used focus further processing. (2) A hardware-programmable rectangular portion of the acquisition window.

ROM Read-only memory.

- RS-170 The U.S. standard used for black-and-white television.
- RTSI bus Real-Time System Integration Bus. The National Instruments timing bus that connects image acquisition and DAQ devices directly, by means of connectors on top of the devices, for precise synchronization of functions.

S

- saturation The amount of white added to a pure color. Saturation relates to the richness of a color. A saturation of zero corresponds to a pure color with no white added. Pink is a red with low saturation.
- scaling Circuitry that scales down the resolution of a video signal.

circuitry

- scatter- A type of DMA that allows the DMA controller to reconfigure gather on-the-fly.
- DMA
- sequence Performs an acquisition that acquires a specified number of buffers, then stops.
- snap Acquires a single frame or field to a buffer.
- SRAM Static RAM.
- StillColor A post-processing algorithm that allows the acquisition of high-quality color images generated either by an RGB or composite (NTSC or PAL) camera using a monochrome video acquisition device.
- sync Tells the display where to put a video picture; the horizontal sync indicates the picture's left-to-right placement and the vertical sync indicates top-to-bottom placement.
- systemRAM installed on a personal computer and used by theRAMoperating system, as contrasted with onboard RAM.

Т

transfer rate	The rate, measured in bytes/s, at which data is moved from source to destination after software initialization and setup operations; the maximum rate at which the hardware can operate.
trigger	Any event that causes or starts some form of data capture.
trigger control and mapping circuitry	Circuitry that routes, monitors, and drives the external and RTSI bus trigger lines; you can configure each of these lines to start or stop acquisition on a rising or falling edge.
T TI	Transistor transistor logic A digital sizewit compared of

TTL Transistor-transistor logic. A digital circuit composed of bipolar transistors wired in a certain manner. A typical medium-speed digital technology. Nominal TTL logic levels are 0 and 5 V. U

UV plane See \underline{YUV} .
V

- VCO Voltage-controlled oscillator. An oscillator that changes frequency depending on a control signal; used in a PLL to generate a stable pixel clock.
- VI Virtual Instrument. (1) A combination of hardware and/or software elements, typically used with a PC, that has the functionality of a classic stand-alone instrument (2) A LabVIEW software module (VI), which consists of a front panel user interface and a block diagram program.
- video A video line consists of a horizontal sync signal, back porch, line active pixel region, and a front porch.
- VSYNC Vertical sync signal. The synchronization pulse generated at the beginning of each video field that tells the video monitor when to start a new field.

white	The level that defines what is white for a particular video
reference	system. See also <u>black reference level</u> .
level	

W

Υ

YUV A representation of a color image used for the coding of NTSC or PAL video signals. The luminance information is called Y, while the chrominance information is represented by two components, U and V, that represent the coordinates in a color plane.

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Number of Post Trigger Buffers

After receiving the stop trigger, the image acquisition device will continue acquiring this many buffers before the acquisition stops.

Remarks

The following table shows when the property is readable and writable and what devices it applies to.

Datatype	Readable	Writable	Device
U32	Always	Configuration	• NI PCIe-1427
			 NI PCIe-1429
			 NI PCIe-1430

Fixed-Frame-Rate Mode

Enables/disables the fixed-frame-rate mode of the image sensor. When this property is enabled, the sensor acquires images at the rate specified by the **Frame Rate** property. When this property is disabled, the sensor acquires images at the maximum possible frame rate. This property is ignored when a buffer trigger is configured. This property is valid only for NI 17*xx* smart cameras.

Remarks

The following table shows when the property is readable and writable and what devices it applies to.

Datatype	Readable	Writable	Device
TF	Always	Always	NI 17 <i>xx</i>

Color Image Representation

The image representation describes the type of image data that will be returned after a color acquisition. **Image Representation** is the constant name of the image representation. **Image Type** specifies the image type of the image buffer returned by the image acquisition VI after the color acquisition. **Description** describes the image representation.

Image Representation	Image Type	Description
Blue 8-bit (Blue8)	8-bit	The blue plane encoded in 8 bits extracted from the RGB image.
Green 8-bit (Green8)	8-bit	The green plane encoded in 8 bits extracted from the RGB image.
HSL 32-bit (HSL32)	HSL	A color image encoded in 32 bits: 8 bits unused, and 8 bits for the Hue, Saturation, and Luminance planes.
Hue 8-bit (Hue8)	8-bit	The hue information encoded in 8 bits extracted from the RGB image. The hue is calculated as
		H = ATN2(Y, X) where Y = (Green – Blue) / (square root of 2) and X = (2 × Red – Green – Blue) / (square root of 6)
Intensity 8-bit (Int8)	8-bit	The intensity information encoded in 8 bits extracted from the RGB image. The intensity is calculated as
		I = (Red + Green + Blue) / 3
Luminance 8-bit (Lum8)	8-bit	The luminance information encoded in 8 bits extracted from the RGB image. The luminance is calculated as
		Y = 0.299 × Red + 0.587 × Green + 0.114 × Blue
Red 8-bit (Red8)	8-bit	The red plane encoded in 8 bits extracted from the RGB image.

RGB 32-bitRGBA color image encoded in 32 bits—8 bits for the
alpha channel, which is not used, and 8 bits
each for the Red, Green, and Blue planes.

Saturation 8-bit 8-bit (Sat8)

The saturation information encoded in 8 bits extracted from the RGB image. The saturation is calculated on the NI PCI/PXI-1411 as:



IMAQ Configure Trigger VI

Installed With: NI Vision Acquisition Software

Configures the trigger conditions for an acquisition. Use this VI before any acquisition VI to set up a triggered image acquisition.



Note This VI is <u>deprecated</u>. The replacement VI is <u>IMAQ</u> <u>Configure Trigger3</u>, which incorporates the functionality of IMAQ Configure Trigger but also returns additional information.



Frame timeout (ms) specifies the amount of time in milliseconds that NI-IMAQ waits for the trigger to occur and an image to be captured.

Trigger polarity specifies the polarity of the trigger signal.

TRUE indicates the trigger occurs on the rising edge. FALSE indicates the trigger occurs on the falling edge. The default is TRUE.

IMAQ Session In identifies the device.

Trigger line specifies the source of the trigger signal.

The following values are valid:

- External trigger 0
- External trigger 1
- External trigger 2
- External trigger 3
- RTSI line 0
- RTSI line 1
- RTSI line 2
- RTSI line 3
- RTSI line 4
- RTSI line 5

- RTSI line 6
- **Trigger action** specifies if an assertion edge of this trigger line should start an acquisition.

The following values are valid:

- **Disabled**—Triggering is disabled.
- **Trigger start of acquisition**—When the assertion edge of the trigger is received, the acquisition is started.
- **Trigger start of each buffer list**—When the assertion edge of a trigger is received, the buffer list is acquired. If the acquisition is continuous, buffer index 0 always waits on a trigger before acquiring.
- **Trigger each buffer**—Each buffer waits for a trigger before acquiring an image into the buffer.
- **Trigger each line (line scan only)**—Each line is triggered. This is useful when using an encoder to acquire line scan images.
- **Trigger end of acquisition**—When the assertion edge of the trigger is received, the acquisition is stopped.
- Note When using Trigger end of acquisition, the device will continue acquiring a variable number of post trigger buffers before stopping the acquisition. Use the <u>Number of Post Trigger Buffers</u> property to set the number of post trigger buffers.

error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.

status is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or

that no error occurred before this VI or function ran. The default is FALSE.

- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

Skip trigger (linescan only) is the number of triggers to skip before acquiring a new line.

This feature is useful when using an encoder to trigger lines. For example, you may have an encoder that outputs 1,000 ticks per revolution. If you need only 200 lines per revolution, set **Skip trigger** to 4.

Note This input is valid only when using a line scan camera.

IMAQ Session Out has the same value as **IMAQ Session In**.

- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Configure Trigger2 VI

Installed With: NI Vision Acquisition Software

Configures the trigger conditions for an acquisition. Use this VI before any acquisition VI to setup a triggered image acquisition.



Note This VI is <u>deprecated</u>. The replacement VI is <u>IMAQ</u> <u>Configure Trigger3</u>, which incorporates the functionality of IMAQ Configure Trigger2 but also returns additional information.



- **Frame timeout (ms)** specifies the amount of time in milliseconds that NI-IMAQ waits for the trigger to occur and an image to be captured.
- **Trigger Polarity** specifies the polarity of the trigger signal.

The following values are valid:

- Rising Edge
- Falling Edge

IMAQ Session In identifies the device.

Trigger Type specifies the type of the trigger signal.

The following values are valid:

- External
- RTSI
- ISO In
- Scaled Encoder



Note Scaled Encoder is valid only when Trigger each line is selected for the Trigger action on the front panel. Use the <u>Divide Factor</u> property to configure the amount of scaling to apply to the scaled encoder signal. Refer to <u>Scaled Encoder</u> <u>Signal</u> for an overview of the scaled encoder signal. Note To use the ISO_IN or RS422_IN signals on the NI PCI-1426, select External as the Trigger Type for your function and choose ISO IN or RS-422 as the Signal Level for the trigger line in Measurement & Automation Explorer (MAX).

Trigger Number specifies the number of the trigger.

error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.

- **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **Trigger action** specifies if an assertion edge of this trigger line should start an acquisition.

The following values are valid:

- **Disabled**—Triggering is disabled.
- **Trigger start of acquisition**—When the assertion edge of the trigger is received, the acquisition is started.
- **Trigger start of each buffer list**—When the assertion edge of a trigger is received, the buffer list is acquired. If the

acquisition is continuous, buffer index 0 always waits on a trigger before acquiring.

- **Trigger each buffer**—Each buffer waits for a trigger before acquiring an image into the buffer.
- **Trigger each line (line scan only)**—Each line is triggered. This is useful when using an encoder to acquire line scan images.
- **Trigger end of acquisition**—When the assertion edge of the trigger is received, the acquisition is stopped.

Note When using **Trigger end of acquisition**, the device will continue acquiring a variable number of post trigger buffers before stopping the acquisition. Use the <u>Number of Post Trigger Buffers</u> property to set the number of post trigger buffers.

Skip trigger (linescan only) is the number of triggers to skip before acquiring a new line.

This feature is useful when using an encoder to trigger lines. For example, you may have an encoder that outputs 1,000 ticks per revolution. If you need only 200 lines per revolution, set **Skip trigger** to 4.

Note This input is valid only when using a line scan camera.

IMAQ Session Out has the same value as **IMAQ Session In**.

- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select **Explain Error** from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.

source describes the origin of the error or warning and is, in

most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Copy VI

Installed With: NI Vision Acquisition Software

Returns a copy of an acquired image. IMAQ Copy allows you to copy an image from onboard memory to system memory or from system memory to system memory.



Image In is a reference to an image.

- **Region of Interest** specifies a rectangular portion of the image. **Region of Interest** is defined by an array of four elements [Left, Top, Right, Bottom]. You must set the width [Right-Left] to a multiple of eight. The [Right] and [Bottom] coordinates are exclusive. If **Region of Interest** is not connected or empty, the current region of interest is captured.
- **Immediate?** determines if the system returns the image currently being acquired or the last completely acquired image. The default value if FALSE, which causes NI-IMAQ to wait until the current image is completely acquired before returning the image. TRUE returns the next acquired image
- **Buffer Index** Buffer Number is the number of the acquired buffer to copy into Image In.
- **error out** contains error information. If **error in** indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the **error out** indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - **EVALUATE:** EVALUE: EV a nonzero error code. If status is FALSE, code is 0 or a warning code.

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source describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
 - **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **IMAQ Session In** identifies the device.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- **Image Out** is a reference to the image.

IMAQ Generate Pulse VI

Installed With: NI Vision Acquisition Software

Generates a pulse on a trigger line. IMAQ Generate Pulse can generate a pulse immediately or on the assertion edge of a status or trigger signal. Each trigger pulse uses a Pulse Id, which is automatically generated each time you call this VI.



Note This VI is <u>deprecated</u>. The replacement VI is <u>IMAQ</u> <u>Generate Pulse3</u>, which incorporates the functionality of IMAQ Generate Pulse and IMAQ Generate Pulse2 and returns additional information.

Details



- **Signal polarity** specifies the polarity of the **Signal** input. TRUE indicates the signal occurs on the rising edge. FALSE indicates the signal occurs on the falling edge. The default is TRUE.
- **Pulse Parameters** defines polarity and describes the high and low duration of a pulse in seconds.
 - **Pulse Delay (s)** is the desired duration of the first phase of the signal in microseconds. If **Pulse Delay** equals 0, the VI selects a minimum delay of one cycle of the timebase used.
 - **Pulse Width (s)** is the desired duration of the second phase of the signal in seconds. If **Pulse Delay** equals 0, the VI selects a minimum delay of one cycle of the timebase used.
 - pulse polarity (high:0) is the polarity of second phase (period two) of each delayed pulse.

The following values are valid:

- **High pulse** (default)—Pulse starts at a low level and ends at a high level.
- Low pulse—Pulse starts at a high level and ends at a

low level.

IMAQ Session In identifies the device.

Pulse ID In identifies the Pulse Id input. This parameter is used only when **Mode** is set to **Stop**.

- **Trigger line** specifies the line on which the pulse is generated.
- **Signal** specifies the pulse initialization signal which causes the pulse to be generated.

error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.

- **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

Mode indicates if the pulse is repeated.

The following values are valid:

- **Pulse train**—Generates a continuous pulse train on the first assertion edge of **Signal**.
- **Single pulse**—Generates a pulse on the first assertion

edge of **Signal**.

- **Rearmed pulse**—Generates a pulse on all assertion edges of **Signal**.
- **Stop**—Stops the generation of pulses.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- **Pulse Id Out** identifies the Pulse Id output.
- **error out** contains error information. If **error in** indicates that an error occurred before this VI or function ran, **error out** contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the **error out** indicator on the front panel and select **Explain Error** from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - **code** is the error or warning code. If status is TRUE, **code** is a nonzero <u>error code</u>. If **status** is FALSE, **code** is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

Details

Only the NI PCI/PXI-1409, NI PCI-1410, NI PCI/PXI-1422, NI PCI-1424, NI PCI-1426, NI PCI/PXI-1428, NI PCIe-1429, and NI PCIe-1430 can generate pulses.

- The NI 1409, NI 1410, NI 1422, NI 1424, NI 1426, and NI 1428 can generate a maximum of 2 pulses.
- The NI 1429 can generate a maximum of 3 pulses.
- The NI 1430 can generate a maximum of 6 pulses.

These pulse generators can be automatically configured by NI-IMAQ for generating pulses used to control the camera. In these cases, the VI returns the Exhausted Resources error when the total number of pulses is greater than two.

IMAQ Generate Pulse2 VI

Installed With: NI Vision Acquisition Software

Generates a pulse on a trigger line. IMAQ Generate Pulse2 can generate a pulse immediately or on the assertion edge of a status or trigger signal. Each trigger pulse uses a Pulse Id, which is automatically generated each time you call this VI.



Note This VI is <u>deprecated</u>. The replacement VI is <u>IMAQ</u> <u>Generate Pulse3</u>, which incorporates the functionality of IMAQ Generate Pulse and IMAQ Generate Pulse2 and returns additional information.

Details



Signal polarity specifies the polarity of the status or trigger signal parameter.

The following values are valid:

Rising Edge (0) Sets the signal polarity to rising edge.

Falling Edge (1) Sets the signal polarity to falling edge.

Pulse Mode specifies if the pulse is repeated.

The following values are valid:

Pulse train (0)	Generates a continuous pulse train on the first assertion edge of the pulse stimulus signal.
Single pulse (1)	Generates a single pulse on the first assertion edge of the pulse stimulus signal.
Rearmed pulse (2)	Generates a single pulse on all assertion edges of the pulse stimulus signal.
Stop (3)	Stops the pulse generation.

Pulse Parameters specifies the parameters used to describe a pulse.

- Pulse Delay (s) is the desired duration of the first phase of the signal in microseconds. If Pulse Delay equals 0, the VI selects a minimum delay of one cycle of the timebase used.
- **Pulse Width (s)** is the desired duration of the second phase of the signal in seconds. If **Pulse Delay** equals 0, the VI selects a minimum delay of one cycle of the timebase used.
- **Pulse Polarity** is the polarity of second phase (period two) of each delayed pulse.
- **IMAQ Session In** identifies the device.
- **Pulse ID In** identifies the Pulse Id input. This parameter is used only when **Mode** is set to **Stop**.
- **Trigger Type** specifies the type of the trigger signal.

The following values are valid:

Note To use the ISO_IN or RS422_IN signals on the NI PCI-1426, select External as the Trigger Type for your function and choose ISO IN or RS-422 as the Signal Level for the trigger line in Measurement & Automation Explorer (MAX).

External (0)	Use an external trigger for the trigger.
RTSI (1)	Use an RTSI line for the trigger.
ISO Out (3)	Use an isolated output for the trigger.

- **Trigger Number** specifies the number of the trigger.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.



status is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.

- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **Signal Type** specifies the type of signal that causes the pulse to be generated.

The following values are valid:

Note To use the ISO_IN or RS422_In signals on the NI PCI-1426, select External as the Trigger Type for your function and select either ISO In or RS-422 In as the Signal Level in Measurement & Automation Explorer (MAX).

External (0)	Specifies the signal type as the external trigger lines.
RTSI (1)	Specifies the signal type as the RTSI trigger lines.
ISO In (2)	Specifies the signal type as the isolated input trigger lines.
Status (4)	Specifies the signal type as one of the Status Signal signals.

Status Signal specifies the signal that causes the pulse to be generated if **Signal Type** is set to **Status**.

The following values are valid:

Note The Frame start and Frame done signals are not valid for line scan acquisitions unless each buffer is triggered.

Acquisition in progress (15)	Asserts when the acquisition begins.

Acquisition done (8)	Asserts when the entire acquisition is finished.
Horizontal Synchronization Signal (18)	Asserts a horizontal synchronization signal at the beginning of each line by the camera.
Vertical Synchronization Signal (19)	Asserts a vertical synchronization signal at the beginning of each frame by the camera. This value is not applicable to line scan acquisitions.
Frame start (9)	Asserts at the beginning of each frame that is captured.
Frame done (10)	Asserts at the end of each frame that is captured.
Immediate (16)	Asserts immediately.

- Signal Number specifies the number of the trigger line that causes the pulse to be generated if **Signal Type** is set to one of the trigger types.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- **Pulse Id Out** identifies the Pulse Id output.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

Details

Only the NI PCI/PXI-1409, NI PCI-1410, NI PCI/PXI-1422, NI PCI-1424, NI PCI-1426, NI PCI/PXI-1428, NI PCIe-1429, and NI PCIe-1430 can generate pulses.

- The NI 1409, NI 1410, NI 1422, NI 1424, NI 1426, and NI 1428 can generate a maximum of 2 pulses.
- The NI 1429 can generate a maximum of 3 pulses.
- The NI 1430 can generate a maximum of 6 pulses.

These pulse generators can be automatically configured by NI-IMAQ for generating pulses used to control the camera. In these cases, the VI returns the Exhausted Resources error when the total number of pulses is greater than two.
IMAQ Occurrence Config VI

Installed With: NI Vision Acquisition Software

Creates occurrences that are set by image acquisition signals such as the assertion of a status or trigger signal. Occurrences produced by this VI are used as inputs to the Wait on Occurrence LabVIEW primitive. Anything dependent on the execution of the Wait on Occurrence primitive will wait until the occurrence is set.



Note This VI is deprecated. The replacement VI is IMAQ Occurrence Config2, which incorporates the functionality of IMAQ Occurrence Config but also returns additional information.



Signal polarity specifies the polarity of the **Signal** input. TRUE indicates the signal occurs on the rising edge. FALSE indicates the signal occurs on the falling edge. The default is TRUE.

IMAQ Session In identifies the device.

Signal specifies the assertion edge of the signal that causes the occurrence to be set.

- Acquisition in progress—Asserts when the acquisition begins.
- Acquisition done—Asserts when the entire acquisition is finished.
- Frame start—Asserts at the beginning of each frame that is captured.
- Frame done—Asserts at the end of each frame that is captured.
- **Buffer complete**—Asserts when a buffer has been transferred to memory.
- External trigger 0
- External trigger 1

- External trigger 2
- External trigger 3
- RTSI line 0
- RTSI line 1
- RTSI line 2
- RTSI line 3
- RTSI line 4
- RTSI line 5
- RTSI line 6



Note The Frame start and Frame done signals are not valid for line scan acquisitions unless each buffer is triggered.

create/clear instructs the VI to create an occurrence or to clear all occurrences that have been created for the image acquisition device specified in IMAQ Session In.

The following values are valid:

create an occurrence (0) Creates an occurrence. clear all occurrences (1) Clears all occurrences.

- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.
 - **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
 - **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is

FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.

- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **Rearm? (FALSE : No Rearm)** indicates whether the occurrence should be generated once, or each time the signal occurs. When you set this parameter to TRUE, call this VI again with the **create/clear** parameter set to **clear all occurrences** to stop the occurrence.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- occurrence is the occurrence value created. Wire this output to a Wait on Occurrence LabVIEW primitive. Wire the output of the primitive to the part of your diagram you wish to execute when an event happens and the occurrence is set.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select **Explain Error** from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Trigger Drive VI

Installed With: NI Vision Acquisition Software

Drives a trigger line with a specified signal.



Note This VI is <u>deprecated</u>. The replacement VI is <u>IMAQ Trigger</u> <u>Drive2</u>, which incorporates the functionality of IMAQ Trigger Drive but also returns additional information.



- **Trigger Polarity** specifies the polarity of the trigger signal. TRUE specifies that the trigger line is driven high when the signal is asserted, and the trigger line is driven low when the signal line is unasserted. FALSE specifies that the trigger line is driven low when the signal is asserted, and the trigger line is driven high when the signal is asserted.
- **IMAQ Session In** identifies the device.

Trigger line specifies the source of the trigger signal.

The following values are valid:

- External trigger 0
- External trigger 1
- External trigger 2
- External trigger 3
- RTSI line 0
- RTSI line 1
- RTSI line 2
- RTSI line 3
- RTSI line 4
- RTSI line 5
- RTSI line 6

Trigger drive specifies the signal drives the trigger line.

- **Disabled**—The trigger line is disabled.
- Acquisition in Progress—Asserts when an acquisition is in progress.
- Acquisition Done—Asserts when the entire acquisition is completed.
- **Unasserted**—Forces the trigger to its unasserted state as defined by **Trigger Polarity**.
- **Asserted**—Forces the trigger to its asserted state as defined by **Trigger Polarity**.
- Horizontal Synchronization Signal—Asserts a horizontal synchronization signal at the beginning of each line by the camera.
- Vertical Synchronization Signal—Asserts a vertical synchronization signal at the beginning of each frame by the camera. This value is not applicable to line scan acquisitions.
- Frame Start—Asserts when a frame is being captured.
- Frame Done—Asserts at the end of each frame that is captured.



Note Frame Start and **Frame Done** are not supported for line scan applications

error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.

status is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.

code code is the number identifying an error or warning. If

status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.

- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - **code** is the error or warning code. If status is TRUE, **code** is a nonzero <u>error code</u>. If **status** is FALSE, **code** is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Trigger Read VI

Installed With: NI Vision Acquisition Software

Reads the current value of a trigger line.



Note This VI is <u>deprecated</u>. The replacement VI is <u>IMAQ Trigger</u> <u>Read2</u>, which incorporates the functionality of IMAQ Trigger Read but also returns additional information.



IMAQ Session In identifies the device.

Trigger line specifies the source of the trigger signal.

- External trigger 0
- External trigger 1
- External trigger 2
- External trigger 3
- RTSI line 0
- RTSI line 1
- RTSI line 2
- RTSI line 3
- RTSI line 4
- RTSI line 5
- RTSI line 6
- **Polarity** specifies the polarity of the trigger signal. TRUE specifies that the trigger line is asserted when the signal is high, and the trigger line is unasserted when the signal is low. FALSE specifies that the trigger line is unasserted when the signal is high, and the trigger line is asserted when the signal is high, and the trigger line is asserted when the signal is low.
- error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no

error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in **error out**. Use the <u>Simple Error Handler</u> or <u>General Error</u> <u>Handler</u> VIs to display the description of the error code. Use **error in** and **error out** to check errors and to specify execution order by wiring **error out** from one node to **error in** of the next node.

- **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.
- **IMAQ Session Out** has the same value as **IMAQ Session In**.
- **Trigger status** is TRUE is the signal is asserted and FALSE is the signal is unasserted.
- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select **Explain Error** from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Trigger Route VI

Installed With: NI Vision Acquisition Software

Drives the destination trigger line with the signal on the source trigger line.



Note This VI is <u>deprecated</u>. The replacement VI is <u>IMAQ Trigger</u> <u>Route2</u>, which incorporates the functionality of IMAQ Trigger Route but also returns additional information.



IMAQ Session In identifies the device.

Src Trigger specifies the source trigger line.

The following values are valid:

- External trigger 0
- External trigger 1
- External trigger 2
- External trigger 3
- RTSI line 0
- RTSI line 1
- RTSI line 2
- RTSI line 3
- RTSI line 4
- RTSI line 5
- RTSI line 6

Dst Trigger specifies the destination trigger.

- External trigger 0
- External trigger 1
- External trigger 2
- External trigger 3
- RTSI line 0

- RTSI line 1
- RTSI line 2
- RTSI line 3
- RTSI line 4
- RTSI line 5
- RTSI line 6

error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.

- **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Session Out has the same value as **IMAQ Session In**.

error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.

TF

status is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.

- **code** is the error or warning code. If status is TRUE, **code** is a nonzero <u>error code</u>. If **status** is FALSE, **code** is 0 or a warning code.
- **Source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Wait Signal VI

Installed With: NI Vision Acquisition Software

Waits for either a status or trigger signal to be asserted. IMAQ Wait Signal does not return until the specified signal is asserted or a timeout occurs.



Note This VI is <u>deprecated</u>. The replacement VI is <u>IMAQ Wait</u> <u>Signal2</u>, which incorporates the functionality of IMAQ Wait Signal but also returns additional information.



- **Timeout (ms)** specifies the amount of time to wait for the assertion edge of **Signal** in milliseconds. The VI returns an error is the assertion edge does not occur within the specified time.
- **IMAQ Session In** identifies the device.
- **Signal** specifies the assertion edge of the signal that causes the occurrence to be set.

- Acquisition in progress—Asserts when the acquisition begins.
- Acquisition done—Asserts when the entire acquisition is finished.
- Frame start—Asserts at the beginning of each frame that is captured.
- Frame done—Asserts at the end of each frame that is captured.
- **Buffer complete**—Asserts when a buffer has been transferred to memory.
- External trigger 0
- External trigger 1
- External trigger 2
- External trigger 3

- RTSI line 0
- RTSI line 1
- RTSI line 2
- RTSI line 3
- RTSI line 4
- RTSI line 5
- RTSI line 6

Note The Frame start and Frame done signals are not valid for line scan acquisitions unless each buffer is triggered.

Signal polarity specifies the polarity of the **Signal** input. TRUE indicates the signal occurs on the rising edge. FALSE indicates the signal occurs on the falling edge. The default is TRUE.

error in (no error) describes error conditions that occur before this VI or function runs. The default is no error. If an error occurred before this VI or function runs, the VI or function passes the error in value to error out. This VI or function runs normally only if no error occurred before this VI or function runs. If an error occurs while this VI or function runs, it runs normally and sets its own error status in error out. Use the Simple Error Handler or General Error Handler VIs to display the description of the error code. Use error in and error out to check errors and to specify execution order by wiring error out from one node to error in of the next node.

- **status** is TRUE (X) if an error occurred before this VI or function ran or FALSE (checkmark) to indicate a warning or that no error occurred before this VI or function ran. The default is FALSE.
- **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.
- **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

IMAQ Session Out has the same value as **IMAQ Session In**.

- error out contains error information. If error in indicates that an error occurred before this VI or function ran, error out contains the same error information. Otherwise, it describes the error status that this VI or function produces. Right-click the error out indicator on the front panel and select Explain Error from the shortcut menu for more information about the error.
 - **status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.
 - code is the error or warning code. If status is TRUE, code is a nonzero error code. If status is FALSE, code is 0 or a warning code.
 - **source** describes the origin of the error or warning and is, in most cases, the name of the VI or function that produced the error or warning. The default is an empty string.

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