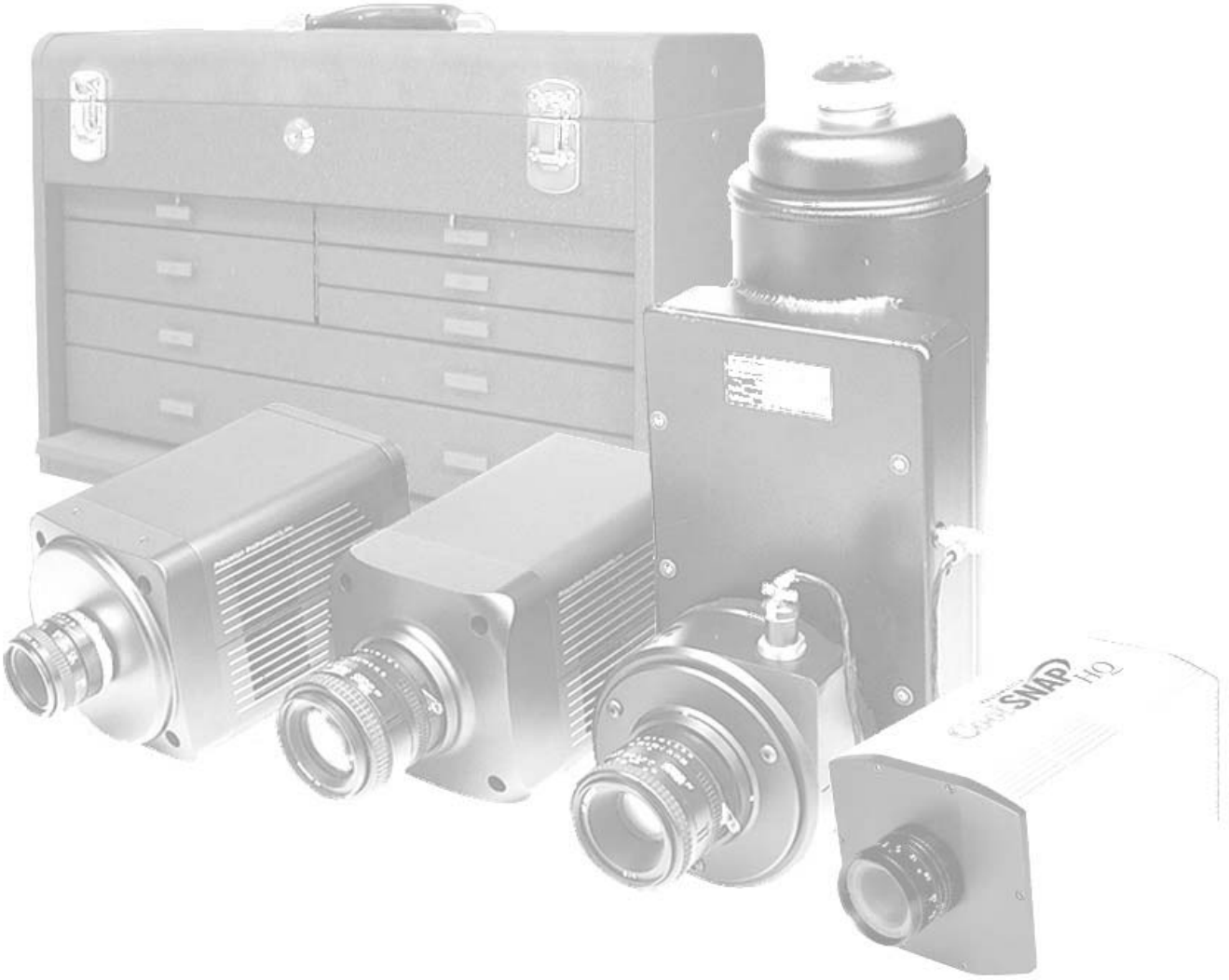

# *Scientific Imaging ToolKit™*

# *for LabView®*

# Table of Contents

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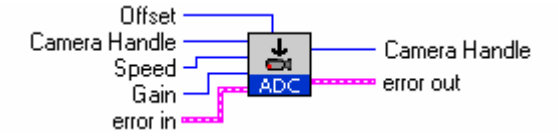
# Chapter 1
# Camera VIs

## CameraADC

This VI will allow the user to set the ADC to be used for data collection.




### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Speed** ADC speed index, selects ADC speed 0 to n depending on the number of ADCs and ports on the camera.

**Gain** ADC gain index 0 to n depending on the number of gains an ADC has. This is per ADC.

**Offset** ADC offset 0 to n depending on the number of ADC offsets.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

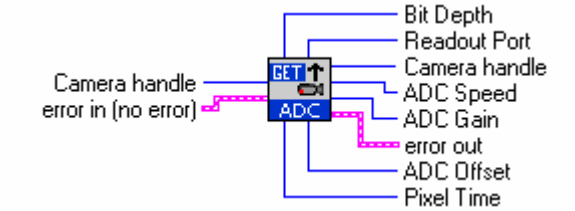
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraADCget

This VI will allow the user to get information on the currently selected ADC.




### Controls and Indicators

**Camera handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**error in (no error)** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera handle** Camera handle as input returned.

**ADC Speed** This is the speed of the currently selected ADC in KHz.

For example a speed of 100 = 100 kHz, 1000 = 1 MHz.

**ADC Gain** This is the gain currently set in the camera. It is a value between 1 and the maximum gain. The maximum gain depends on the type of camera. A value of -1 is returned if the gain is not available from the camera.

**Readout Port** This is the readout port currently set in the camera. It is a value between 1 and the maximum readout port. The maximum readout port depends on the type of camera. A value of -1 is returned if the readout port is not available from the camera.

**ADC Offset** This is the offset currently set in the camera. It is a value between 1 and the maximum offset. The maximum offset depends on the type of camera. A value of -1 is returned if the offset is not available from the camera.

**Bit Depth** This is the bit depth of the current ADC. This value is commonly between 12 and 16 bits but may be different depending on the capabilities of the camera.

**Pixel Time** This value is the pixel time in ms. It is determined by the reciprocal of the ADC speed (1/ADC Speed).

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

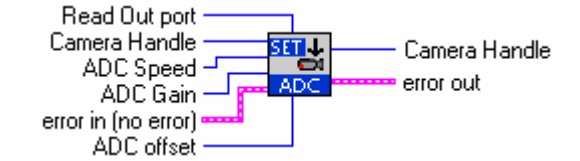
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraADCset

This VI will allow the user to select and setup the ADC.




**Controls and Indicators**

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**ADC Speed** This allows the user to select the ADC speed in kHz (25 = 25 kHz, 1000 = 1 MHz). For convenience, the following additional values are offered:

-1 = Use the current ADC (do not change it).

-2 = Use the fastest ADC available on the camera.

-3 = Use the slowest ADC available on the camera.

**ADC Gain** This will set the gain of the ADC. The values can be from 1 to the maximum gain allowed (determined by the type of camera).

A value of -1 should be used to keep the currently set gain value (do not change it).

**Read Out Port** This will set the readout port of the ADC. The values can be from 1 to the maximum readout port allowed (determined by the type of camera).

A value of -1 should be used to keep the currently set readout port value (do not change it).

**ADC offset** This will set the offset of the ADC. The values can be from 1 to the maximum offset allowed (determined by the type of camera).

A value of -1 should be used to keep the currently set offset value (do not change it).

**error in (no error)** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

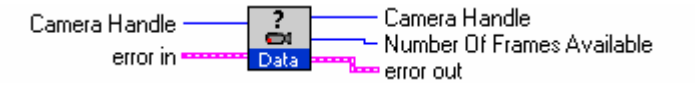
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraCheckData

This function will return the number of complete frames of data available to the calling function.




**Controls and Indicators**

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**Number Of Frames Available** The number of frames of data available to the calling function. Only completed frames of data are counted.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

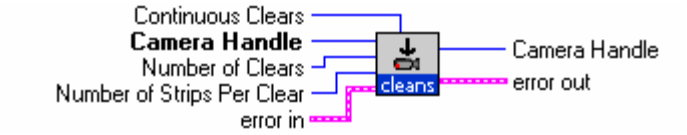
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraCleans

This VI will define the clearing of charge from the CCD chip before acquisition. This is done to eliminate charge buildup that may occur when not acquiring data. The way that the chip is cleared is defined by the number of clears (blocks of strips) and the number of strips per clear. Clears may be done continuously which allows the CCD chip to be cleared while waiting for each acquisition trigger.




### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Number of Clears** This is the number of blocks of strips that are cleared from the CCD camera when not acquiring data. Each block is composed of a number of strips defined by the "Number of Strips Per Clear" parameter.

**Number of Strips Per Clear** The number of strips shifted on shift register that define clears or continuous clears. This parameter is necessary only for Princeton Instruments brand cameras.

**Continuous Clears** This parameter is a flag that will allow clears to be performed "continuously" while running. This is the number of strips to clear before looking if an external trigger has arrived. This mode is usually used when collecting data with the camera in external trigger mode and the shutter disabled open.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

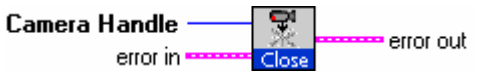
**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

# CameraClose

Closes the Camera associated with the Camera Handle. All associated memory will be freed. This function should be called as part of a general cleanup.




**Controls and Indicators**

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

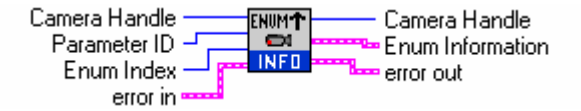
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraEnumInfo

This VI will return enumerated information for a camera parameter. Use the CameraGetIDInfo VI to determine that a parameter contains enumerated information (data type) and the number of enumerated values possible (number of enums). Input the index of the enum value (1 to number of enums) and get the enum value and a text description.




### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Parameter ID** This is the ID of the parameter on which information is requested. A list of IDs available depends on the camera type and is provided in separate documentation.

**Enum Index** This is the index of the enumerated value for which information is to be returned.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**Enum Information**

**Parameter ID** Parameter ID as input returned.

**Enum Index** Enum index as input returned.

**Enum Value** Internal value associated with this enumerated index. This is the value that would be used when setting a parameter or returned when getting a parameter.

**Enum String** Text description of the enumerated value.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

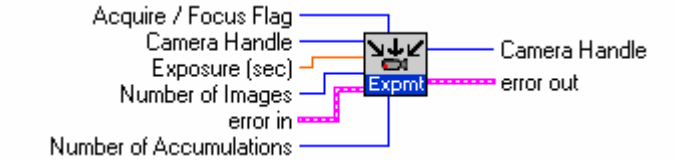
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraExperiment

This function will allow the setup and running of a basic data collection experiment. All advanced camera settings are set to good defaults.




### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Exposure (sec)** The amount of time to expose the camera for each data acquisition. The time units are always in seconds.

**Acquire / Focus Flag** Flag which selects the type of data collection to perform.

1 = Synchronous Focus Mode

This mode collects data as fast as possible but only the latest frame is used when the system is ready to accept data. This mode is designed to be used when focusing the camera and the data will either be discarded, or every frame is not needed.

2 = Synchronous NFrame Mode

This mode collects data as fast as possible and always uses every frame. If the system cannot keep up with the data collection, an error occurs.

3 = Asynchronous Mode

In this mode, data is only collected when the system is ready to accept it. The camera will collect a frame of data, then wait until the system is ready before collecting another.

4 = Sequence Mode

In this mode, the data is streamed in sequence.

**Number of Images** The number of complete images to collect. If the Acquire/Focus flag is set to Synchronous Nframe or Sequence Mode, entering a 0 here indicates continuous data collection until the CameraStop function is called.

**Number of Accumulations** The number of times to collect data and accumulate it into a single image.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

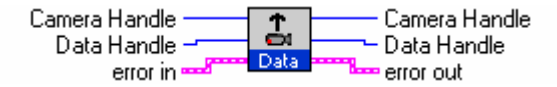
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraGetData

This VI will retrieve the data from the camera and store it in the data area of the data cluster parameter. The storage space for the data must be pre-allocated by the caller. The dimensions to be allocated may be obtained from the CameraGetDataDim VI.




### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Data Handle** Data handle input. This cluster contains all the information about the data such as x, y, z dimensions and data type. It also contains a handle directly to the data space. The data space must be pre-allocated with the correct dimensions before using this VI. The VI CameraGetDataDim will provide this information for the camera in its current configuration.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**Data Handle** Data handle returned as input.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

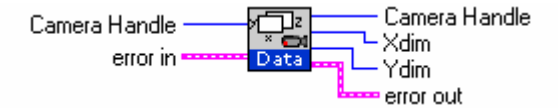
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraGetDataDim

This VI will return the X and Y dimensions of one frame of data as defined in the camera.




### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**Xdim** Number of data points defined in the X direction.

**Ydim** Number of data points defined in the Y direction.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

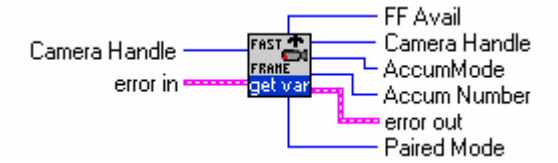
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraGetFFvars

This VI will display the current fast frame state of the camera.

For more information, consult the Photometrics document on the CoolSNAP HQ Paired Mode (DIF) Option (SPR#3028) and CoolSNAP HQ Accumulation Option.

**Note:** This VI is only valid for the CoolSnap HQ with the Paired mod (DIF) and/or Accumulation options.




### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**FF Avail** This flag shows if Fast Frame hardware is present on this camera.

0 = Fast Frame hardware is not present

1 = Fast Frame hardware is present

**AccumMode** This shows the current state of the on-chip accumulation mode.

0 = Accumulation is OFF

1 = Accumulation is ON

**Accum Number** This is the number of on-chip accumulations to perform before the data is read. Consult the camera hardware manual for more information.

**Paired Mode** This shows the current state of the paired mode (DIF).

0 = OFF

1 = ON

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

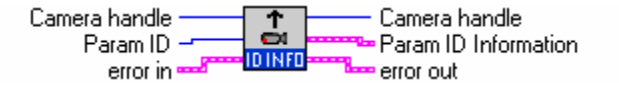
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraGetIDinfo

This VI gives access to information for many parameters associated with the camera. Each parameter is accessed with an ID. The information returned about the parameter includes it's availability, current value, default value, minimum and maximum values, increment, data type, access type, bit used flag, number of enumerated values and a description. See the descriptions for the individual items for more details. A list of parameter IDs available depends on the camera and is provided in separate documentation.




### Controls and Indicators

**Camera handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Param ID** This is the ID of the parameter on which information is requested. A list of IDs available depends on the camera type and is provided in separate documentation.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera handle** Camera handle as input returned.

**Param ID Information**

**Param ID** The parameter ID as input returned.

**Avail Flag** This value indicates if information is available from this camera for this ID.

0 = Information is NOT available.

Not 0 = Information is available.

**Current Value** This is the current value of the parameter.

**Default Value** This is the default value for the parameter.

**Min Value** This is the minimum value for the parameter.

**Max Value** This is the maximum value for the parameter.

**Increment** This is the increment value for the parameter.

**Data Type** This is the data type of the parameter.

1 = 8-bit Signed Integer (signed character)
2 = 16-bit Signed Integer (short)
3 = 32-bit Signed Integer (long)
4 = 32-bit Floating Point (float)
5 = 64-bit Floating Point (double)
6 = 8-bit Unsigned Integer (unsigned char)
7 = 16-bit Unsigned Integer (unsigned short)
8 = 32-bit Unsigned Integer (unsigned long)
9 = Enumerated
10 = Boolean

**Access Type** This is the type of access available for the parameter.

1 = Read Only

2 = Read/Write

3 = Parameter exists but no access is available

4 = Write Only

**Bit Used Flag** Since not all parameters have valid information for each return value, the Bit Used Flag is used to tell which information is valid. The following is a list of bits used for each value. If the bit is set (1), the value returned is valid.

| | | |
|---|---|---|
| Available Flag | - Bit 1 | (0x0001) |
| Current Value | - Bit 2 | (0x0002) |
| Default Value | - Bit 3 | (0x0004) |
| Data Type | - Bit 4 | (0x0008) |
| Number of Enums | - Bit 5 | (0x0010) |
| Minimum Value | - Bit 6 | (0x0020) |
| Maximum Value | - Bit 7 | (0x0040) |
| Increment Value | - Bit 8 | (0x0080) |
| Short Description | - Bit 9 | (0x0100) |
| Long Description | - Bit 10 | (0x0200) |
| Access (Read/Write) | - Bit 11 | (0x0400) |

**Number of Enums** This is the number of enumerated types that are available for this parameter. This value will be valid only if the data type is enumerated.

**Description** This is a short description of the parameter in ASCII text.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

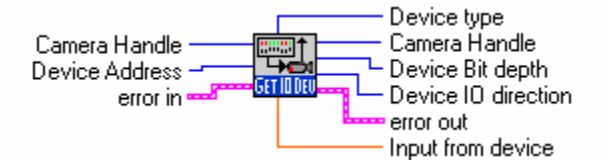
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraGetInOutDevice

This VI will return information on any TTL lines or DACs attached to the camera. It will return the type (TTL or DAC), the bit depth, I/O Direction and the current value. To write a value to the device, use the CameraOutputDevice VI.




### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Device Address** This is the device address for the IO signal.

Trenton (Princeton Instruments) cameras:

This value is always 0.

Only TTL is supported.

Tucson (Photometrics) cameras:

This value is based on the number of devices available (n) and ranges from 0 to n.

Both TTL and DAC devices are supported.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**Input from device** This is the current value of IO signal for the attached device. The number of valid bits is determined by the bit depth.

**Device type** The device type attached to the camera. If no devices are attached, a warning is issued.

1 = TTL

2 = DAC

**Device Bit depth** Number of bits for the signal at the attached device.

For TTL, this is the number of bits read or written to.

For DAC, this is the number of bits written to the DAC

**Device IO direction** This is the direction of the IO for the attached device.

1 = Input and Output

2 = Output Only

3 = Input Only

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraGetTemp

This VI will read the current temperature from the device and return it in degrees Centigrade.


**Controls and Indicators**

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**error in (no error)** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**Temperature** The current temperature, in Centigrade, as read from the device.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraGetVar

This VI will return the value of the specified camera object variable.


### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Parameter ID** This is the ID of the camera variable that is to be returned. This ID is defined in the SIToolKit (TM) documentation file.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**Value** This is the value of the camera variable returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraInitialize

This VI will initialize the camera specified by the Camera Handle. All necessary information will be sent to the camera and any other initialization needed to be ready to collect data will be done. Data collection can occur immediately upon receipt of the CameraStart command.


**Controls and Indicators**

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle returned as input.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

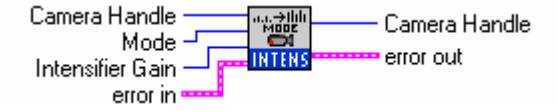
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraIntensMode

This VI will set the Mode and Gain of the intensifier to the specified values. The camera must have an intensifier for this VI to be valid.




### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Mode** This is the mode to which the intensifier is to be set.

1 = Safe Mode - The intensifier's photocathode is continuously biased OFF

2 = Gate Mode - The intensifier's photocathode is biased ON by pulses generated from a pulse generator.

3 = Shutter Mode - The intensifier's photocathode is biased ON for the set Exposure Time and OFF during each readout of the array.

**Intensifier Gain** This value is the intensifier gain. The range is in arbitrary units from 0 to 256.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraOnlineBackSubSetup

This VI will setup the background image that will be used for performing background subtraction during data collection (online). It also allows the online function to be turned ON or OFF.


**Controls and Indicators**

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Background Image Handle** The Handle of the Image containing background data to be used for background subtraction. This value must be obtained via a call to ImageOpen.

**Background Flag** Flag used to turn background subtraction ON (1) or OFF (0).

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**Background Image Handle** Background Image handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraOnlineFlatfieldSetup

This VI will setup the flatfield image that will be used for performing flatfielding during data collection (online). It also allows the online function to be turned ON or OFF.


**Controls and Indicators**

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Flat Field Image Handle** The Handle of the Image containing flatfield data to be used for flatfielding. This value must be obtained via a call to ImageOpen.

**Flat Field Flag** Flag used to turn flatfield ON (1) or OFF (0).

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**Flat Field Image Handle** Flatfield Image handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

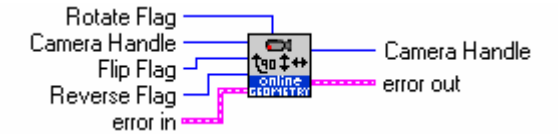
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraOnlineGeo

This VI will allow the implementation of online geometric manipulation of the data. Flipping is done vertically, Reversing is done horizontally and Rotation is done clockwise by 90 degrees.




**Controls and Indicators**

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Rotate Flag** Flag to implement online clockwise rotation of the data by 90 degrees.

0 = OFF

1 = ON

**Flip Flag** Flag to implement online vertical flipping of the data.

0 = OFF

1 = ON

**Reverse Flag** Flag to implement online horizontal reversing of the data.

0 = OFF

1 = ON

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraOpen

Opens a camera device and sets good default values.


**Camera Device ID** Enter the device ID of the camera to be opened. If this is 0, the first camera available will be opened. Otherwise, you must call CameraRetrieve VI to provide the value for a specific camera.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** The Camera Handle is returned. If the open is successful, this value will be greater than or equal to 0. The Camera Handle is required by all VIs that access the camera.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

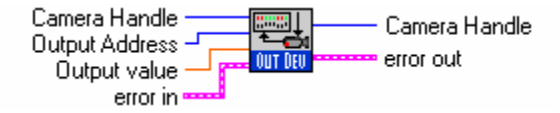
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraOutputDevice

This VI will write a value to the specified TTL or DAC attached to the camera. To determine information about and/or read the device, use the CameraGetInOutDevice VI.




### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Output Address** This is the device address for the IO signal.

Trenton (Princeton Instruments) cameras:

This value is always 0.

Only TTL is supported.

Tucson (Photometrics) cameras:

This value is based on the number of devices available (n) and ranges from 0 to n.

Both TTL and DAC devices are supported.

**Output value** This is the current value of IO signal for the attached device. The number of valid bits is determined by the bit depth that can be obtained using the CameraGetInOutDevice VI.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

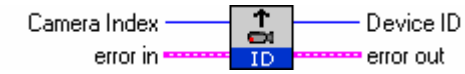
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraRetrieve

This VI is used to obtain the Device ID for a camera. This is done by passing an index representing a camera's place in line. The minimum value for the index is 1 and the maximum is obtained via the CamerasInSystem VI. The Device ID returned is required to identify the camera to be opened via the CameraOpen VI.




### Controls and Indicators

**Camera Index** This is an index number used to retrieve the Device ID for a camera. The range is from 1 to the number of cameras in the system (obtained from the CamerasInSystem VI).

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Device ID** The Device ID is returned from the VI. It is required in order to open a camera via the CameraOpen VI.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

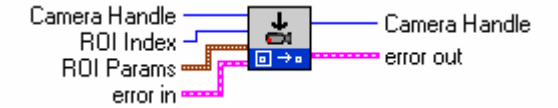
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraROI

This VI allows the setting of a Region Of Interest in the camera. This region of data is returned during data collection. Multiple regions may be defined and the combined data of all regions will be returned.




### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**ROI Index** This is the number of the Region Of Interest that is being setup.

ROIs must be setup in numeric sequence. If the index indicates an existing ROI, it will be overwritten with the new parameters. To create a new ROI, pass an index of 1 greater than the current number of ROIs.

**ROI Params** This cluster contains the parameters required to define an ROI.

**X start** The value is the start of the ROI in the X direction. This value must be greater than 0 and less than or equal to the size of the camera in the X direction. It must also be less than or equal to the ending value.

**X end** The value is the end of the ROI in the X direction. This value must be greater than 0 and less than or equal to the size of the camera in the X direction. It must also be greater than or equal to the starting value.

**X Binning/Grouping** This value indicates the number of pixels in the X direction that will be combined to form a single data value. This will reduce the number of data points returned. Groups must be sized so they are evenly divided into the X size. A grouping of 1 is the normal setting.

**Y start** The value is the start of the ROI in the Y direction. This value must be greater than 0 and less than or equal to the size of the camera in the Y direction. It must also be less than or equal to the ending value.

**Y end** The value is the end of the ROI in the Y direction. This value must be greater than 0 and less than or equal to the size of the camera in the Y direction. It must also be greater than or equal to the starting value.

**Y Binning/Grouping** This value indicates the number of pixels in the Y direction that will be combined to form a single data value. This will reduce the number of data points returned. Groups must be sized so they are evenly divided into the Y size. A grouping of 1 is the normal setting.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraSetFFvars

This VI will set the fast frame variables in the camera.

**Notes:**

1. When fast frame is enabled, the timing modes (SetTrigger VI) have the following meanings:

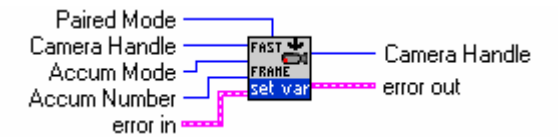
   Internal Trigger (free run/Timed mode::1)

   External Trigger starts all (Single Trigger::2)

   External Trigger per Exposure (Ext sync::3)

2. Also, this VI is only valid for the CoolSnap HQ with the Paired mod (DIF) and/or Accumulation options.

For more information, consult the Photometrics document on the CoolSNAP HQ Paired Mode (DIF) Option (SPR#3028) and CoolSNAP HQ Accumulation Option.




### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Accum Mode** This sets the state of the on-chip accumulation mode.

0 = Accumulation is OFF

1 = Accumulation is ON

**NOTE:** This mode cannot be set at the same time as the paired mode.

**Accum Number** This is the number of on-chip accumulations to perform before the data is read. Consult the camera hardware manual for more information.

**Paired Mode** This sets the current state of the paired mode (DIF).

0 = OFF

1 = ON

**NOTE:** This mode cannot be set at the same time as the on-chip accumulation mode.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraSetTemp

The VI will set the camera to the temperature provided in degrees Centigrade.


### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Temperature** The camera temperature to set in degrees Centigrade.

**error in (no error)** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

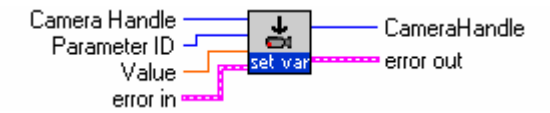
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraSetVar

This VI will allow the user to set the value of the specified camera object variable.




### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Parameter ID** This is the ID of the camera variable which is to be set. This ID is defined in the SIToolKit (TM) documentation file.

**Value** This is the value to be set in the camera variable.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**CameraHandle** Camera handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

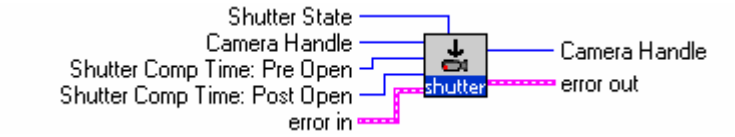
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraShutter

This VI is used to setup the shutter state and time information. The shutter may be opened or closed during an entire experiment or be opened and closed after each exposure. The time it takes a shutter to open and close will affect the total time it takes to acquire an exposure.




### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Shutter State** This is the state of the shutter to be set. The options are:

1 = The shutter is always closed. This mode is often used to collect a dark charge background.

2 = The shutter is opened before each exposure and closed after the exposure. The time it takes the shutter to open and close must be calculated into the total time of an acquisition.

3 = The shutter is opened before an acquisition sequence and not closed until the sequence is finished. It remains opened between each exposure that may allow a buildup of dark charge.

4 = The shutter is opened while waiting for an external trigger to occur.

**Shutter Compensation Time: Pre Open** This is the time in ms for the shutter to open. This parameter is supported only by Photometrics brand cameras and the Acton InSpectrum camera.

**Shutter Compensation Time: Post Open** This is the time in ms for the shutter to close. This parameter is necessary for both Photometrics, Princeton Instruments brand cameras and the Acton InSpectrum camera.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CamerasInSystem

This VI checks for all cameras currently available in the system and returns this number. For a camera to be available, it must be correctly connected and currently supported by the SILV VIs


### Controls and Indicators

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Number of Cameras** This is the number of cameras currently available in the system.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

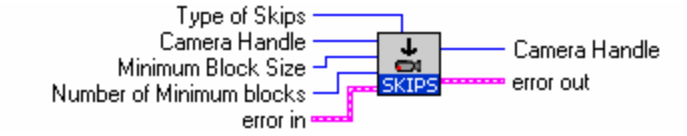
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraSkips

This Vi will allow the setting of the skip parameters in the camera. This will allow a number of pixels to be "passed over" and allows for a quicker read of the camera.




### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Type of Skips** Future use.

**Minimum Block Size** The number of lines to group on the CCD shift register before discarding (for lines that are to be skipped).

**Number of Minimum blocks** The number of minimum block sizes to do before active data,

after which the grouping increases geometrically.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

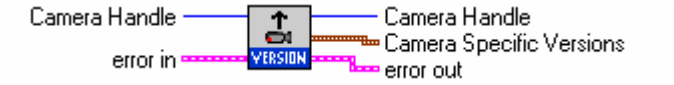
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraSpecificVer

This VI will return versions specific to a camera being controlled by Roper Scientific's PVCam. Versions for PVCam, camera, device drivers, firmware, and PCI card firmware are returned.




### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**Camera Specific Versions** This is the cluster returned which contains versions specific to Roper Scientific cameras.

**PvCam DLL Ver** This is the version of Roper Scientific's PVCam dll being used.

**Camera Serial Number** This is the serial number of the camera.

**Device Driver Ver** This is the version of the device driver being used to interface to the camera hardware.

**Camera FW Ver** This is the version of the firmware used to control the camera.

**PCI FW Ver** This is the version of the firmware used to control the PCI card

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraStart

This VI will do the actual start of the data collection. All setup of the camera should have been done previously and an initialization of the hardware via the CameraInitialize VI. Data collection will begin immediately following this command.


### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle returned as input.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraStop

This VI will stop the camera.


### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle returned as sent.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

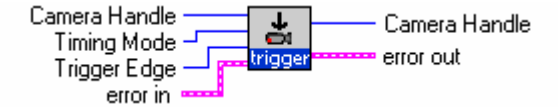
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraTrigger

This VI allows the user to set the triggering function of the camera.




### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Timing Mode**

1 = No external trigger (trigger is internal, free run)

2 = External trigger activates all data collection (trigger first). This mode is valid only for Photometrics brand cameras.

3 = Each exposure requires a trigger (Ext Sync, Strobed Mode)

4 = An external trigger signal controls both the beginning and end of each exposure (Bulb mode). This mode is valid only for Photometrics brand cameras.

5 = External triggers may occur at uneven intervals (Variable mode). This mode is valid only for Photometrics brand cameras.

6 = External trigger activates all data collection (Flash mode). In addition, if the camera is fitted with a flash port, the signal is brought out to these pins. This mode is valid only for Photometrics brand cameras.

**Trigger Edge** The signal edge on which the trigger is enabled.

1 = Positive (leading) edge

2 = Negative (falling) edge

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# CameraWaitForData

This VI will wait for the specified number of milliseconds for data to be returned. This is required for the Acton InSpectrum but may be used for any camera.


### Controls and Indicators

**Camera Handle** The Handle of the Camera to be accessed. This value must be obtained via a call to CameraOpen.

**Image Handle** Handle to an image that will hold the data. This is obtained via the ImageCreate VI.

**Time Out ms** Amount of time to wait for data in milliseconds.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Camera Handle** Camera handle returned as input.

**Image Handle** Handle to the image returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

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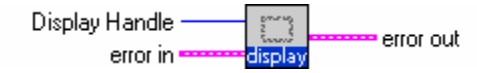
# Chapter 2
# Display VIs

## DisplayClose

This VI will close the display accessed via the display handle provided.




### Controls and Indicators

**Display Handle** Handle to a display. This handle is obtained via the DisplayOpen VI.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# DisplayImage

This VI will display the image data provided. Any previously displayed data will be overwritten. If the data is the same size as the display, it will be mapped 1:1 to each pixel. Otherwise it will be decimated (if larger) or replicated (if smaller) to fit into the display area.


### Controls and Indicators

**Display Handle** Handle to a display. This handle is obtained via the DisplayOpen VI.

**Image Handle** Handle to an image with data to be displayed. This handle is obtained via the ImageCreate VI.

**Title** This is the text to be shown in the display title bar.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Display Handle** Handle to the display returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

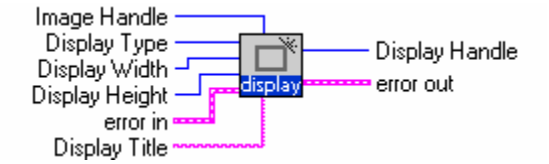
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# DisplayOpen

This VI will create a display window and attach the data provided by the image handle. If the display size is the same as the image size, the mapping of data will be 1:1. Otherwise, the image will either be decimated (if larger) or repilicated (if smaller), to fit the display.




### Controls and Indicators

**Display Type** Reserved for future use.

**Display Width** The width of the display window in pixels.

**Display Height** The height of the display window in pixels.

**Display Title** Text to be shown in the display title bar.

**Image Handle** Handle to data which is to be shown in the display. This must be obtained via the ImageCreate VI.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Display Handle** Handle to the display created by this VI. This handle provides access to the display.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

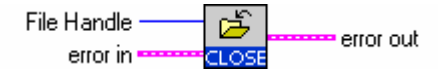
**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# Chapter 3
# File VIs

## FileClose

This VI will close the file designated by the file handle. Any memory allocated will be freed.




**Controls and Indicators**

**File Handle** This is the handle by which a specific file is accessed. It must be obtained from the FileOpen VI.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

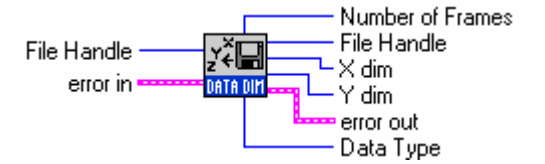
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# FileGetDataDim

This VI will return the dimensions and data type of a previously opened file.




### Controls and Indicators

**File Handle** This is the handle by which a specific file is accessed. It must be obtained from the FileOpen VI.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**File Handle** File handle as input, returned.

**X dim** The X dimension of each frame of data already stored or to be stored in this file. If the file is new, the X/Y dimensions of the first frame stored become the X/Y dimensions of the file. All subsequent frames stored must have the same X/Y dimensions.

**Y dim** The Y dimension of each frame of data already stored or to be stored in this file. If the file is new, the X/Y dimensions of the first frame stored become the X/Y dimensions of the file. All subsequent frames stored must have the same X/Y dimensions.

**Number of Frames** The number of frames of data stored in this file. This number is updated as additional frames are stored.

**Data Type** This is the data type of each point of data stored in the file.

These are the data types currently supported by the SIToolKit(TM).

Note that not all types of files support all data types.

1 = 8-Bit Signed Integer

2 = 16-Bit Signed Integer

3 = 32-Bit Signed Integer

4 = 32-Bit Floating Point

5 = 64-Bit Floating Point

6 = 8-Bit Unsigned Integer

7 = 16-Bit Unsigned Integer

8 = 32-Bit Unsigned Integer

9 = Enumerated data type

10 = Boolean

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

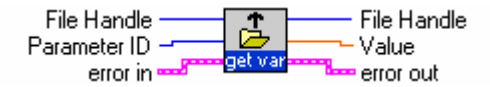
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# FileGetVar

This VI will return the value of the specified file object variable.




**Controls and Indicators**

**File Handle** The Handle of the File to be accessed. This value must be obtained via a call to FileOpen.

**Parameter ID** This is the ID of the camera variable that is to be returned. This ID is defined in the SIToolKit (TM) documentation file.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**File Handle** File handle as input returned.

**Value** This is the value of the camera variable returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

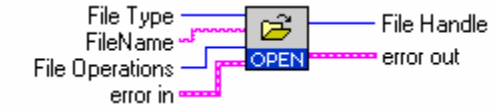
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# FileOpen

This VI will open a file of the type designated in the operating mode specified.




**Controls and Indicators**

**File Type** This is a number that represents the type of file that will be opened.

Roper Scientific SPE Files = 67371008 (0x4040000)

Photometrics PMI Files = 67436544 (0x4050000)

TIFF Files = 67174400 (0x4010000)

Generic Files (Read Only) = 67502080 (0x4060000)

**File Operations** This determines how the file is to be opened. If the file is opened as

new, any existing file will be overwritten. There are two sets of options: New or Append and Read and/or Write.

1 = New file (if file exists, will be overwritten)

2 = Append (opens existing file)

4 = Read

8 = Write

The above values must be added together for a final operation value.

16 = Open Existing File For Read Only (No other values may be added to this)

**FileName** This is the name of the file to open. The full path should be included if it is not in the default folder. If the file extension is not found in the name, it will be appended. Extensions of supported files are:

Roper Scientific SPE files: ".spe"

Photometrics PMI files: ".pmi"

TIFF files: ".tif"

Generic Files: No default extension

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**File Handle** This is a handle returned when the file has been opened successfully. This handle must be used for all other file VIs.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

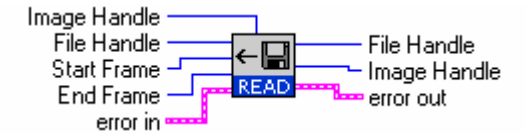
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# FileReadData

This Vi will read a number of frames of data from an opened file. The data area must be pre-allocated using the ImageCreate VI. The size of a frame in the file is obtained by using the FileGetDataDim VI. The starting and ending frame numbers are inclusive. If a single frame is to be read, enter the frame number for both the starting and ending frames.




**Controls and Indicators**

**File Handle** This is the handle by which a specific file is accessed. It must be obtained from the FileOpen VI.

**Start Frame** This is the starting frame of the data in the file to be read. Note that the data area to read into must be large enough to hold all the data requested. If only one frame is to be read, set both Start Frame and End Frame to the same frame number.

**End Frame** This is the ending frame of the data in the file to be read. Note that the data area to read into must be large enough to hold all the data requested. If only one frame is to be read, set both Start Frame and End Frame to the same frame number.

**Image Handle** This is a handle to the data area in which the data is to be read from the file. The handle must have been created using the ImageCreate VI and must match the X/Y dimensions of the data in the file. These dimensions can be retrieved after a file is opened by using the FileGetDataDim VI.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**File Handle** File handle as input, returned.

**Image Handle** Image handle as input, returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

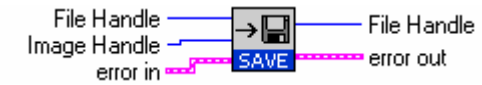
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# FileSaveData

This VI will save the data provided into the file provided. If this is the first frame of data to be saved in this file, the file X/Y dimensions are taken from the frame's X/Y dimensions. If the file is opened in append mode, the original data is kept, the new data is saved to the end of the file and the number of frames value is updated. If the file is opened in new mode, any existing data is destroyed. The file's frame dimensions take on those of the first data set to be stored and all subsequent data stored must match these dimensions. All subsequent frames stored are then appended.




### Controls and Indicators

**File Handle** This is the handle by which a specific file is accessed. It must be obtained from the FileOpen VI.

**Image Handle** This is a handle to the data that is to be saved to file. The handle must have been created using the ImageCreate VI.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**File Handle** File handle as input, returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

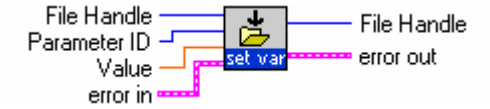
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# FileSetVar

This VI will allow the user to set the value of the specified file object variable.




### Controls and Indicators

**File Handle** The Handle of the File to be accessed. This value must be obtained via a call to FileOpen.

**Parameter ID** This is the ID of the file variable which is to be set. This ID is defined in the SIToolKit (TM) documentation files.

**Value** This is the value to be set in the file variable.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**File Handle** File handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

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# Chapter 4
# Filter Wheel VIs

## FilterWheelCancelOperation

This VI will allow the cancellation of a pending command providing the particular filter wheel allows for this option.


**Controls and Indicators**

**Filter Wheel Handle** The Handle of the Filter Wheel to be accessed. This value must be obtained via a call to FilterWheelOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Filter Wheel Handle** Filter Wheel handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

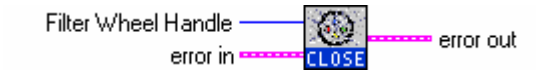
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# FilterWheelClose

This VI closes the Filter Wheel associated with the Filter Wheel Handle. All associated memory will be freed. This function should be called as part of a general cleanup.




### Controls and Indicators

**Filter Wheel Handle** The Handle of the Filter Wheel to be accessed. This value must be obtained via a call to FilterWheelOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# FilterWheelGetFilter

This VI will return the number of the current filter on the filter wheel.


**Controls and Indicators**

**Filter Wheel Handle** The Handle of the Filter Wheel to be accessed. This value must be obtained via a call to FilterWheelOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Filter Wheel Handle** Filter Wheel handle as input returned.

**Filter Number** This is the number of the current filter on the filter wheel.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

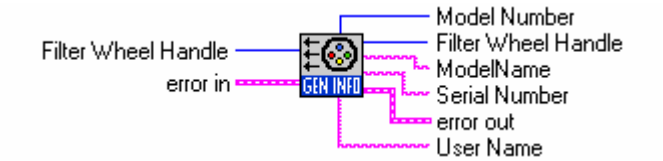
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# FilterWheelGetGeneralInfo

This VI will retrieve information about the filter wheel. This includes a user settable name, the model number of serial number (if available).




**Controls and Indicators**

**Filter Wheel Handle** The Handle of the Filter Wheel to be accessed. This value must be obtained via a call to FilterWheelOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Filter Wheel Handle** Filter Wheel handle as input returned.

**ModelName** This is the user defined model name of the filter wheel. This may not be available on all filter wheels.

**Serial Number** This is the serial number of the filter wheel as obtained from the instrument. This may not be available on all filter wheels.

**Model Number** This is the model number of the filter wheel as obtained from the instrument. This may not be available on all filter wheels.

**User Name** This is the user name assigned in the filter wheel ini file.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# FilterWheelGetNumFilters

This VI will return the number of filters on the filter wheel associated with the Filter Wheel handle.


### Controls and Indicators

**Filter Wheel Handle** The Handle of the Filter Wheel to be accessed. This value must be obtained via a call to FilterWheelOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Filter Wheel Handle** Filter Wheel handle as input returned.

**Number of Filters** The number of filters available on this filter wheel.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# FilterWheelGetStatus

This VI will get the status of the last command sent to the Filter Wheel associated with the Filter Wheel Handle. This VI should be used especially after all commands that involve any physical movement of filter wheel that may take some amount of time to complete.


### Controls and Indicators

**Filter Wheel Handle** The Handle of the Filter Wheel to be accessed. This value must be obtained via a call to FilterWheelOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Filter Wheel Handle** Filter Wheel handle as input returned.

**Command Status** This is the status of the last command sent to the filter wheel. The return values for this are:

1 = Filter Wheel is ready (command completed)

2 = Filter Wheel is waiting for command to complete

3 = An error has occurred (usually a timeout waiting for a valid response)

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# FilterWheelGetVar

This VI will allow the user to retrieve the value of the specified filter wheel object variable.


### Controls and Indicators

**Filter Wheel Handle** The Handle of the Filter Wheel to be accessed. This value must be obtained via a call to FilterWheelOpen.

**Param ID** This is the ID of the filter wheel variable which is to be set. This ID is defined in the SIToolKit (TM) documentation.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Filter Wheel Handle** Filter Wheel handle as input returned.

**Value** This is the value of the filter wheel variable.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

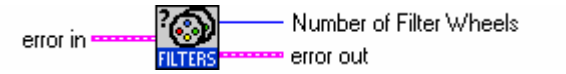
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# FilterWheelInSystem

This VI checks for all filter wheels currently available in the system and returns this number. For a filter wheel to be available, it must be currently supported by the SILV VIs and correctly defined in the ini file.




### Controls and Indicators

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Number of Filter Wheels** This is the number of filter wheels currently available in the system.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

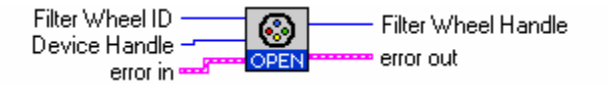
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# FilterWheelOpen

This VI will open the specified filter wheel. The port can be that of a previously opened camera, spectrograph or another filter wheel. If the same port is to be used, provide this device handle.




### Controls and Indicators

**Filter Wheel ID** Enter the device ID of the filter wheel to be opened. If this is 0, the first filter wheel available will be opened. The Device ID can be obtained by calling the FilterWheelRetrieve.vi with an index.

**Device Handle** Optional device handle. The device may be a camera, spectrograph or another filter wheel. This value is used when the devices are using the same port for communications (i.e. Acton InSpectrum or NCL). The optional device must be created first, then its handle passed here. If this value is 0, a new port will be opened specifically for the filter wheel.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Filter Wheel Handle** This is the filter wheel handle returned on successful opening of the camera. This handle is to be used in all other filter wheel VIs.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# FilterWheelReset

This VI will issue a reset command to the filter wheel.


**Controls and Indicators**

**Filter Wheel Handle** The Handle of the Filter Wheel to be accessed. This value must be obtained via a call to FilterWheelOpen.

**Wait Until Done** This is a flag indicating whether the VI should wait for the reset command to complete before returning.

0 = Do Not Wait

1 = Wait

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Filter Wheel Handle** Filter Wheel handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

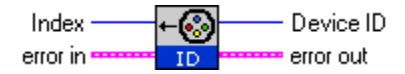
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# FilterWheelRetrieve

This VI is used to obtain the Device ID for a filter wheel. This is done by passing an index representing a filter wheel's place in line. The minimum value for the index is 0 and the maximum is obtained via the FilterWheelsInSystem VI. The Device ID returned is required to identify the filter wheel to be opened via the FilterWheelOpen VI.




### Controls and Indicators

**Index** This is an index number used to retrieve the Device ID for a filter wheel. The range is from 0 to the number of filter wheels in the system (obtained from the FilterWheelsInSystem VI).

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Device ID** The Device ID is returned from the VI. It is required in order to open a filter wheel via the FilterWheelOpen VI.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# FilterWheelSetFilter

This VI will allow the setting of the current filter on the filter wheel.


### Controls and Indicators

**Filter Wheel Handle** The Handle of the Filter Wheel to be accessed. This value must be obtained via a call to FilterWheelOpen.

**Filter** This is the number of the filter to set as current. The range is from 1 to the number of filters available.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Filter Wheel Handle** Filter Wheel handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# FilterWheelSetVar

This VI will allow the user to set the value of the specified filter wheel object variable.


### Controls and Indicators

**Filter Wheel Handle** The Handle of the Filter Wheel to be accessed. This value must be obtained via a call to FilterWheelOpen.

**Param ID** This is the ID of the filter wheel variable which is to be set. This ID is defined in the SIToolKit (TM) documentation.

**Value** This is the value to be set in the filter wheel variable.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Filter Wheel Handle** Filter Wheel handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

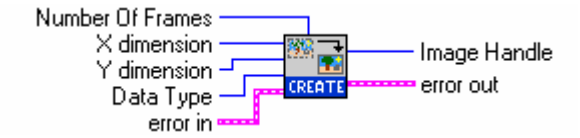
**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# Chapter 5
# Image VIs

## ImageCreate

This VI will create an image space to hold an image of dimensions X and Y, number of frames and of the data type specified. A handle to this image is returned to provide access.




### Controls and Indicators

**X dimension** Number of data points in the X direction.

**Y dimension** Number of data points in the Y direction.

**Data Type** Type of binary representation of the data.

1 = 8-bit signed integer
2 = 16-bit signed integer
3 = 32-bit signed integer
4 = 32-bit floating point
5 = 64-bit floating point
6 = 8-bit unsigned integer
7 = 16-bit unsigned integer
8 = 32-bit unsigned integer

**Number Of Frames** Number of full frames of data X by Y in size.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Image Handle** A handle to the image created is returned to provide access to the image.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# ImageDestroy

This VI will close the image associated with the handle provided. It will free all memory allocated for use by the image.


### Controls and Indicators

**Image handle** Handle to an image. This is obtained via the ImageCreate VI.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# ImageFillData

This VI will fill an image with demo data to allow for testing of VIs without the need for live camera data. The value filled for each point (X,Y) is (Y*100) + X.


### Controls and Indicators

**Image Handle** Handle to an image. This is obtained via the ImageCreate VI.

**Type of Test** Reserved for future use.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Image Handle** Handle to the image returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# ImageGetArrayF32

This VI will return the data from an image in 32-bit Floating Point format.


### Controls and Indicators

**Image Handle** Handle to an image. This is obtained via the ImageCreate VI.

**Z position** This value is the 1-based position in the Z-axis of the frame of data to be returned.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Image Handle** Handle to the image returned.

**Array Float 32** This is the 2-dimensional array of 32-bit Floating Point data returned.

**values** The 32-bit Floating Point value of the array at the indicated indices.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# ImageGetArrayI32

This VI will return the data from an image in 32-bit Integer format.


### Controls and Indicators

**Image Handle** Handle to an image. This is obtained via the ImageCreate VI.

**Z position** This value is the 1-based position in the Z-axis of the frame of data to be returned.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Image Handle** Handle to the image returned.

**Array int 32** This is the 2-dimensional array of 32-bit Integer data returned.

**values** The 32-bit Integer value of the array at the indicated indices.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# ImageGetArrayU16

This VI will return the data from an image in 16-bit Unsigned Integer format.


### Controls and Indicators

**Image Handle** Handle to an image. This is obtained via the ImageCreate VI.

**Z position** This value is the 1-based position in the Z-axis of the frame of data to be returned.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Image Handle** Handle to the image returned.

**Array uint 16** This is the 2-dimensional array of 16-bit Unsigned Integer data returned.

**values** The 16-bit Unsigned Integer value of the array at the indicated indices.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

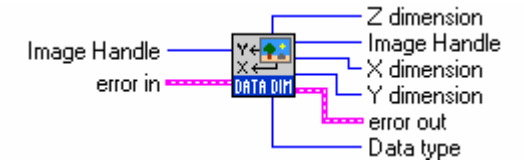
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# ImageGetDimension

This VI will return the 1-based X, Y and Z dimensions and the Data Type of the Image.




### Controls and Indicators

**Image Handle** Handle to an image. This is obtained via the ImageCreate VI.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Image Handle** Handle to the image returned.

**X dimension** This value is the 1-based X dimension of the Image.

**Y dimension** This value is the 1-based Y dimension of the Image.

**Z dimension** This value is the 1-based Z dimension (frames) of the Image.

**Data type** This value is the Data Type of the Image.

4 = 32-bit Floating Point

7 = 16-bit Unsigned Integer

8 = 32-bit Unsigned Integer

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

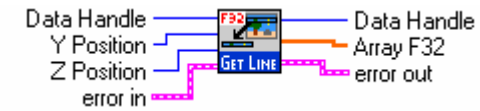
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# ImageGetLineF32

This VI will return a 1-dimensional line of data from an image in 32-bit Floating Point format.




### Controls and Indicators

**Data Handle** Handle to an image. This is obtained via the ImageCreate VI.

**Z Position** This value is the 1-based position in the Z-axis of the frame of data from which the line of data is to be returned.

**Y Position** This value is the 1-based position in the Y-axis of the line of data to be returned.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Data Handle** Handle to the image returned.

**Array F32** This is the 1-dimensional line of 32-bit Floating Point data returned.

**Value** The 32-bit Floating Point value of the line at the indicated indices.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# ImageGetLineI32

This VI will return a 1-dimensional line of data from an image in 32-bit Integer format.


### Controls and Indicators

**Data Handle** Handle to an image. This is obtained via the ImageCreate VI.

**Z Position** This value is the 1-based position in the Z-axis of the frame of data from which the line of data is to be returned.

**Y Position** This value is the 1-based position in the Y-axis of the line of data to be returned.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Data Handle** Handle to the image returned.

**Array i32** This is the 1-dimensional line of 32-bit Integer data returned.

**Value** The 32-bit Integer value of the line at the indicated indices.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# ImageGetLineU16

This VI will return a 1-dimensional line of data from an image in 16-bit Unsigned Integer format.


### Controls and Indicators

**Data Handle** Handle to an image. This is obtained via the ImageCreate VI.

**Y Position** This value is the 1-based position in the Y-axis of the line of data to be returned.

**Z Position** This value is the 1-based position in the Z-axis of the frame of data from which the line of data is to be returned.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Data Handle** Handle to the image returned.

**Array u16** This is the 1-dimensional line of 16-bit Unsigned Integer data returned.

**Value** The 16-bit Unsigned Integer value of the line at the indicated indices.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

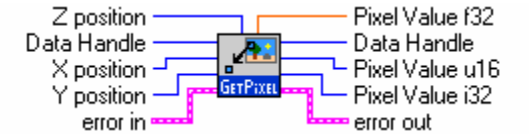
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# ImageGetPixel

This VI will return a single data item based on the X, Y and Z positions provided. The value of the data will be converted from the image data type into all valid data types and returned as separate values. Note that truncation may occur especially converting from floating point to integer from a higher number of bits to a lower number of bits and from unsigned to signed data types.




### Controls and Indicators

**Data Handle** Handle to an image. This is obtained via the ImageCreate VI.

**X position** This value is the 1-based position in the X-axis of the data to be returned.

**Y position** This value is the 1-based position in the Y-axis of the data to be returned.

**Z position** This value is the 1-based position in the Z-axis of the data to be returned.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Data Handle** Handle to the image returned.

**Pixel Value u16** This value is the 16-bit Unsigned Integer representation of the requested data point.

**Pixel Value i32** This value is the 32-bit Signed Integer representation of the requested data point.

**Pixel Value f32** This value is the 32-bit Floating Point representation of the requested data point.

**Pixel Value u8** This value is the 8-bit Unsigned Integer representation of the requested data point.

**Pixel Value i8** This value is the 8-bit Signed Integer representation of the requested data point.

**Pixel Value i16** This value is the 16-bit Signed Integer representation of the requested data point.

**Pixel value u32** This value is the 32-bit Unsigned Integer representation of the requested data point.

**Pixel Value f64** This value is the 64-bit Floating Point representation of the requested data point.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

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# Chapter 6
# Pulser VIs

## PulserClose

This VI closes the Pulser associated with the Pulser Handle. All associated memory will be freed. This function should be called as part of a general cleanup.


### Controls and Indicators

**Pulser Handle** Handle of the Pulser to close. This handle must have been obtained via the PulserOpen VI.

**error in (no error)** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

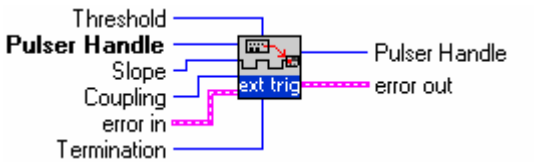
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# PulserExternalTrigger

This VI will set the trigger mode to External and setup all the values necessary to run the pulser in this mode.




### Controls and Indicators

**Pulser Handle** Handle of the Pulser to access. This handle must have been obtained via the PulserOpen VI.

**Threshold** This value sets the required height the applied trigger must be to trigger the pulser. This value must be in Volts.

**Slope** This value determines whether the pulser will be triggered on the positive-going or negative-going edge of the applied trigger.

0 = Negative Slope

1 = Positive Slope

**Coupling** This value determines whether the trigger will be ac or dc coupled.

0 = AC Coupled

1 = DC Coupled

**Termination** This value determines whether the trigger applied to the pulser will see a termination impedance of 50 Ohms or High Impedance.

0 = 50 Ohms

1 = High Impedance

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Pulser Handle** Pulser handle returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

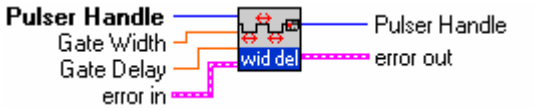
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# PulserGateWidthDelay

This VI will set the gate width and delay values for repetitive pulsing in microseconds.




### Controls and Indicators

**Pulser Handle** Handle of the Pulser to close. This handle must have been obtained via the PulserOpen VI.

**Gate Width** This value is the width of the gate pulse in microseconds.

**Gate Delay** This value is the delay of the gate pulse in microseconds.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Pulser Handle** Pulser handle returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# PulserGetVar

This VI will return the value of the specified pulser object variable.


### Controls and Indicators

**Pulser Handle** Handle of the Pulser to access. This handle must have been obtained via the PulserOpen VI.

**Parameter ID** This is the ID of the pulser variable that is to be returned. This ID is defined in the SIToolKit (TM) header file SIPulser.h.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Pulser Handle** Pulser handle returned.

**Value** This is the value of the pulser variable returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

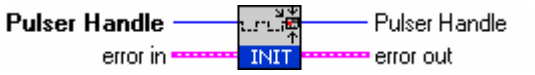
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# PulserInit

This VI will initialize the pulser to prepare it for operation. Any information that needs to be downloaded to the pulser will be done at this time.




### Controls and Indicators

**Pulser Handle** Handle of the Pulser to access. This handle must have been obtained via the PulserOpen VI.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Pulser Handle** Pulser handle returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# PulserInternalTrigger

This VI will set the trigger mode to Internal and setup all the values necessary to run the pulser in this mode.


### Controls and Indicators

**Pulser Handle** Handle of the Pulser to access. This handle must have been obtained via the PulserOpen VI.

**Freq** This value is the frequency for the internal trigger in Hz.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Pulser Handle** Pulser handle returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# PulserOnChipAccum

This VI will allow the setup of on-chip accumulation. This means that a number of gated exposures will take place and the charge from each exposure will accumulate before the CCD chip is read. This function is not available on all pulsers.


### Controls and Indicators

**Pulser Handle** Handle of the Pulser to access. This handle must have been obtained via the PulserOpen VI.

**Accumulation** This value is the number of gated exposures that will be done before the CCD chip is read. The charge from each exposure will accumulate on the CCD.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Pulser Handle** Pulser handle returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

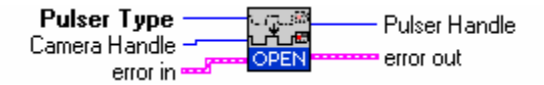
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# PulserOpen

This VI will open a pulser and associate it with a camera. This VI is required before any access to a pulser can occur.




### Controls and Indicators

**Pulser Type** This is the type of pulser that is to be opened. The following values are valid:

2 = Roper Scientific's PTG

**Camera Handle** The handle of the Camera to be associated with this pulser. This value must be obtained via a call to CameraOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Pulser Handle** This is a handle to the pulser. It is required for all future access to the pulser.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# PulserSetVar

This VI will allow the user to set the value of the specified pulser object variable.


### Controls and Indicators

**Pulser Handle** Handle of the Pulser to access. This handle must have been obtained via the PulserOpen VI.

**Parameter ID** This is the ID of the pulser variable which is to be set. This ID is defined in the SIToolKit (TM) header file SIPulser.h.

**Value** This is the value to be set in the pulser variable.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Pulser Handle** Pulser handle returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

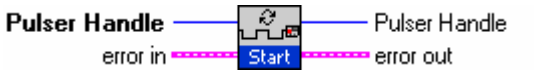
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# PulserStart

This VI will start the pulser. All settings should have already been done via the PulserInit VI.




### Controls and Indicators

**Pulser Handle** Handle of the Pulser to access. This handle must have been obtained via the PulserOpen VI.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Pulser Handle** Pulser handle returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# PulserStop

This VI will stop the pulser.


### Controls and Indicators

**Pulser Handle** Handle of the Pulser to access. This handle must have been obtained via the PulserOpen VI.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Pulser Handle** Pulser handle returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# Chapter 7
# Spectrograph VIs

## SpectCancelOperation

This VI will send a cancel command to the spectrograph. The actions of a cancel may vary depending on the spectrograph. Some may complete the last command, some may end the last command immediately while others may not support this function at all.


### Controls and Indicators

**Spectrometer Handle** The Handle of the Spectrograph to be accessed. This value must be obtained via a call to SpectOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Spectrometer Handle** Spectrograph handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# SpectClose

This VI closes the Spectrograph associated with the Spectrograph Handle. All associated memory will be freed. This function should be called as part of a general cleanup.


### Controls and Indicators

**Spectrometer Handle** The Handle of the Spectrograph to be accessed. This value must be obtained via a call to SpectOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Spectrometer Handle** Spectrograph handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

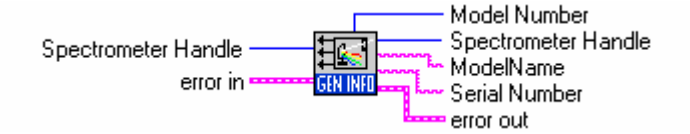
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# SpectGetGeneralInfo

This VI will return the Model Name, Model Number and Serial Number of the spectrometer as read from the instrument. Note that some instruments may not provide access to one or more of these items.




### Controls and Indicators

**Spectrometer Handle** The Handle of the Spectrograph to be accessed. This value must be obtained via a call to SpectOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Spectrometer Handle** Spectrograph handle as input returned.

**ModelName** This is the model name of the spectrograph as reported from the instrument.

**Serial Number** This is the serial number of the spectrograph as reported from the instrument.

**Model Number** This is the model number of the spectrograph as reported from the instrument.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

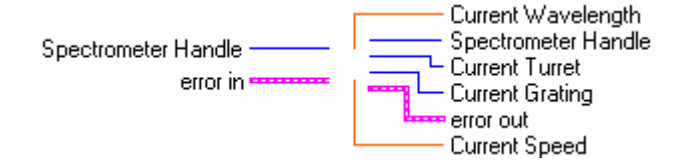
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# SpectGetGratingInfo

This VI will return the settings related to the current turret and grating.




### Controls and Indicators

**Spectrometer Handle** The Handle of the Spectrograph to be accessed. This value must be obtained via a call to SpectOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Spectrometer Handle** Spectrograph handle as input returned.

**Current Turret** This is the number of the current turret installed. The range is from 1 to the number of turrets available on the particular spectrograph. Usually, the turret must be manually changed by the user but the number must then be set in the appropriate INI file for the spectrograph type.

**Current Grating** This is the grating that is currently being used. This is 1-based with a minimum of 1 and maximum of the number of gratings per turret.

**Current Wavelength** This is the wavelength at which the grating is currently set.

**Current Speed** This is the speed at which the grating is currently set.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# SpectGetMirrorInfo

This VI will get the position of the spectrometer mirror specified,


**Controls and Indicators**

**Spectrometer Handle** The Handle of the Spectrometer to be accessed. This value must be obtained via a call to SpectOpen.

**Mirror** The mirror number which is to be accessed

1 = Entrance

2 = Exit

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Spectrometer Handle** Spectrometer handle as input returned.

**Position** The position of the specified mirror.

1 = Front

2 = Side

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# SpectGetSlitInfo

This VI will return the current position and speed for the spectrometer slit specified. Note that slit speed may not be valid for all spectrometers.


### Controls and Indicators

**Spectrometer Handle** The Handle of the Spectrometer to be accessed. This value must be obtained via a call to SpectOpen.

**Slit** The slit number for which information is returned.

1 = Front Entrance

2 = Side Entrance

3 = Front Exit

4 = Side Exit

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Spectrometer Handle** Spectrometer handle as input returned.

**Position** The current position of the slit in units defined by the spectrometer, i.e. Acton is um.

**Speed** The current speed of the slit in units defined by the spectrometer. This VI may not be valid for all spectrometers.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# SpectGetStatus

This VI will get the status of the last command sent to the Spectrograph associated with the Spectrograph Handle. This VI should be used especially after all commands which involve any physical movement of spectrograph components such as a grating, mirror or slit


### Controls and Indicators

**Spectrometer Handle** The Handle of the Spectrograph to be accessed. This value must be obtained via a call to SpectOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Spectrometer Handle** Spectrograph handle as input returned.

**Command Status** This is the status of the last command sent to the spectrograph. The return values for this are:

1 = Spectrograph is ready (command completed)

2 = Spectrograph is waiting for command to complete

3 = An error has occurred (usually a timeout for a valid response)

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# SpectGetVar

This VI will return the value of the specified spectrograph object variable.


### Controls and Indicators

**Spectrometer Handle** The Handle of the Spectrograph to be accessed. This value must be obtained via a call to SpectOpen.

**Param ID** This is the ID of the spectrograph variable which is to be set. This ID is defined in the SIToolKit (TM) documentation.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Spectrometer Handle** Spectrograph handle as input returned.

**Value** This is the value of the spectrograph variable returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

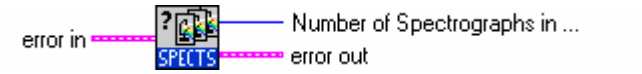
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# SpectInSystem

This VI checks for all spectrographs currently available in the system and returns this number. For a spectrograph to be available, it must be currently supported by the SILV VIs.




### Controls and Indicators

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Number of Spectrographs in system** This is the number of spectrographs currently available in the system.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# SpectOpen

This VI will open the specified spectrograph. The port can be that of a previously opened camera, if the same port is to be used, by providing a camera handle.


### Controls and Indicators

**Spectrometer ID** Enter the device ID of the spectrograph to be opened. If this is 0, the first spectrograph available will be opened. The Device ID can be obtained by calling the SpectroRetrieve.vi with an index.

**Camera Handle** Optional camera handle. This value is used when the camera and spectrograph are using the same port for communications (i.e. Acton InSpectrum). The camera must be created first, then its handle passed here. If this value is 0, a new port will be opened specifically for the spectrograph.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Spectrometer Handle** This is the spectrograph handle returned on successful opening of the camera. This handle is to be used in all other spectrograph VIs.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# SpectReset

This VI will send a reset command to the spectrograph. This is usually done to reset the instrument to factory settings. In some instruments, this may take several minutes to complete.


### Controls and Indicators

**Spectrometer Handle** The Handle of the Spectrograph to be accessed. This value must be obtained via a call to SpectOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Spectrometer Handle** Spectrograph handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

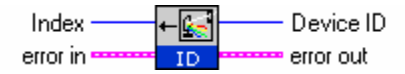
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# SpectRetrieve

This VI is used to obtain the Device ID for a spectrograph. This is done by passing an index representing a spectrograph's place in line. The minimum value for the index is 0 and the maximum is obtained via the SpectInSystem VI. The Device ID returned is required to identify the spectrograph to be opened via the SpectOpen VI.




### Controls and Indicators

**Index** This is an index number used to retrieve the Device ID for a spectrograph. The range is from 0 to the number of spectrographs in the system (obtained from the SpectInSystem VI).

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Device ID** The Device ID is returned from the VI. It is required in order to open a spectrograph via the SpectOpen VI.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# SpectSetGrating

This VI will change the current grating to the one specified. The number of gratings available will depend on the gratings per turret. This command should always be followed by the SpectGetStatus VI as changing the grating can take up to several minutes depending on the spectrograph.


### Controls and Indicators

**Spectrometer Handle** The Handle of the Spectrograph to be accessed. This value must be obtained via a call to SpectOpen.

**Grating Number** This is the grating is to changed to. This is 1-based with a minimum of 1 and maximum of the number of gratings per turret.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Spectrometer Handle** Spectrograph handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# SpectSetGratingSpeed

This VI will set the speed at which the grating is moved from one wavelength to another. Valid values will depend on the type of spectrograph used.


### Controls and Indicators

**Spectrometer Handle** The Handle of the Spectrograph to be accessed. This value must be obtained via a call to SpectOpen.

**Grating Speed** This is the speed at which the grating moves from one wavelength to another. Valid speeds depend on the type of spectrograph being used.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Spectrometer Handle** Spectrograph handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

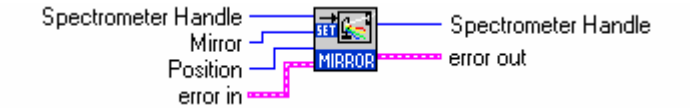
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# SpectSetMirror

This VI will set the position of the spectrometer mirror specified.




### Controls and Indicators

**Spectrometer Handle** The Handle of the Spectrometer to be accessed. This value must be obtained via a call to SpectOpen.

**Mirror** The mirror number for which the setting is to be made.

1 = Entrance

2 = Exit

**Position** The position to which the mirror is to be moved.

1 = Front

2 = Side

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Spectrometer Handle** Spectrometer handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

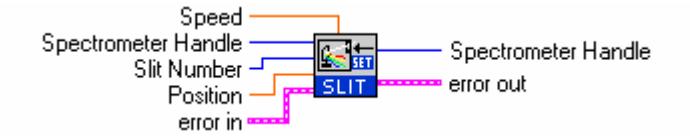
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# SpectSetSlit

This VI will set the position and speed of the spectrometer slit specified. Note that slit speed may not be valid for all spectrometers.




### Controls and Indicators

**Spectrometer Handle** The Handle of the Spectrometer to be accessed. This value must be obtained via a call to SpectOpen.

**Slit Number** The slit number for which the settings are to be made.

1 = Front Entrance

2 = Side Entrance

3 = Front Exit

4 = Side Exit

**Position** The position to set the slit to in units defined by the spectrometer, i.e. Acton is um.

**Speed** The speed to set the slit to in units defined by the spectrometer. This VI may not be valid for all spectrometers.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Spectrometer Handle** Spectrometer handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# SpectSetup

This VI will establish communications with the spectrograph.


### Controls and Indicators

**Spectrometer Handle** The Handle of the Spectrograph to be accessed. This value must be obtained via a call to SpectOpen.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Spectrometer Handle** Spectrograph handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# SpectSetVar

This VI will set the value of the specified spectrograph object variable


### Controls and Indicators

**Spectrometer Handle** The Handle of the Spectrograph to be accessed. This value must be obtained via a call to SpectOpen.

**Param ID** This is the ID of the spectrograph variable which is to be set. This ID is defined in the SIToolKit (TM) documentation.

**Value** This is the value to be set in the spectrograph variable.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Spectrometer Handle** Spectrograph handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# SpectSetWavelength

This VI will move the current grating to the specified wavelength value in nm. This command should always be followed by a GetStatus loop to be sure the movement is completed before issuing the next command.


### Controls and Indicators

**Spectrometer Handle** The Handle of the Spectrograph to be accessed. This value must be obtained via a call to SpectOpen.

**Wavelength** Wavelength value in nm to which the current grating is to be moved.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Spectrometer Handle** Spectrograph handle as input returned.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

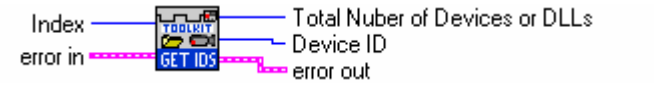
**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# Chapter 8
# Toolkit VIs

## GetDeviceIds

This VI will return a device ID for a SIToolKit (TM) component based on the index (1-based) provided. In all cases, the total number of components is also returned. Use an index of 0 to first find the total number of components.




### Controls and Indicators

**Index** This value is the index (1-based) into the list of components that are currently in use. Use an index of 0 to get the total number of components present.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Total Number of Devices or DLLs** This value is the total number of components currently in use by the SIToolKit (TM). This value is always returned for any index.

**Device ID** This is the device ID of the component currently loaded at the index position provided.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# InitToolkit

This VI will initialize the Scientific Imaging Toolkit. During initialize, the toolkit will determine which optional devices and functionalities are available. This VI must be called before any other SI Toolkit VIs.


### Controls and Indicators

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# ToolKitIsError

This VI will check if an error, warning or no error as occurred in the Scientific Imaging Toolkit. One of the uses of this VI is to halt execution if an error is issued but to continue if a warning is issued.


**Controls and Indicators**

**Reserved** Reserved.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Error Flag** This is the return flag:

1 = Error

0 = Warning or No Error

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# ToolKitVersions

This VI will return the version and device ID of a SIToolKit (TM) component based on the index parameter. As there is no fixed order for loading of the components, this VI should be used in conjunction with the GetDeviceIDs VI to determine which component's version is being returned.


### Controls and Indicators

**Index** This value is used to determine which SIToolKit (TM) component's version is to be returned. An index of 0 returns the version of the ToolKit. Subsequent indices will return the versions of whichever components are present. To determine which component's version is returned, the Device parameter of the component is also returned.

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**Device** This is the device number of the component whose version has been returned.

**Versions** This is the cluster of version numbers in hierarchical order.

**Major Version** This is the major version number that will change when a release contains very significant modifications and/or additions.

**Minor Version** This is the minor version number that will change for any official release.

**External Build** This version will change whenever the software leaves the factory (external) whether it is an official release or not. This includes Alpha and Beta releases.

**Internal Build** This version will change for every complete rebuild of the software that will remain internal to the factory.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

# UninitToolkit

This VI will uninitialize the SIToolKit(TM) and free any memory allocated by it.


### Controls and Indicators

**error in** The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**error out** The **error out** cluster passes error or warning information out of a VI to be used by other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**status** The **status** boolean is either TRUE (X) for an error, or FALSE (checkmark) for no error or a warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**code** The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

**source** The **source** string describes the origin of the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.