

Image Acquisition Toolbox™ Release Notes



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Image Acquisition Toolbox™ Release Notes

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R2022b

Version: 6.7

New Features

Bug Fixes

Compatibility Considerations

Support added for GigE Vision 2.1 hardware

The GigE Vision® interface in Image Acquisition Toolbox™ now supports acquisition from GigE Vision version 2.1 compliant cameras. You can connect to GigE Vision 2.1 hardware using the `gige` adaptor with the `videoinput` object or using the `gigecam` object.

To use the `gige` adaptor or `gigecam` object, you must have the Image Acquisition Toolbox Support Package for GigE Vision Hardware installed.

Functionality being removed or changed

Image Acquisition Tool app has been removed

Errors

The **Image Acquisition Tool** app (`imaqtool`) has been removed. Use **Image Acquisition Explorer** (`imageAcquisitionExplorer`) instead. The new **Image Acquisition Explorer** app has expanded workflows.

R2022a

Version: 6.6

New Features

Bug Fixes

Compatibility Considerations

New Image Acquisition Explorer app

The **Image Acquisition Explorer** app provides a user interface to acquire images and video from cameras and frame grabbers.

Launch this app from the **Apps** tab, under the **Image Processing and Computer Vision** section. You can also call the `imageAcquisitionExplorer` command in the Command Window.

You can use this app to perform the following actions.

- Preview live video data from your image acquisition hardware.
- Configure device-specific properties and acquisition settings such as video format, region of interest, and hardware trigger.
- Save image snapshot and video recording data to a file or to the MATLAB® workspace.
- Visualize and analyze saved data by launching Image Processing Toolbox™ apps.
- Generate a MATLAB script for app interactions that uses the `videoinput` interface.

For more information, see [Acquisition Using Image Acquisition Explorer](#).

Compatibility Considerations

The **Image Acquisition Tool** app (`imaqtool`) will be removed in a future release. Use **Image Acquisition Explorer** (`imageAcquisitionExplorer`) instead.

Functionality being removed or changed

Image Acquisition Tool app will be removed

Warns

The **Image Acquisition Tool** app (`imaqtool`) will be removed in a future release. Use **Image Acquisition Explorer** (`imageAcquisitionExplorer`) instead. The new **Image Acquisition Explorer** app has expanded workflows.

R2021b

Version: 6.5

New Features

Bug Fixes

Support added for GenICam GenTL compliant frame grabbers

The GenICam™ GenTL interface in Image Acquisition Toolbox now supports GenICam GenTL compliant frame grabber hardware. This support is provided through the `gentl` adaptor on the `videoinput` object.

To use the `gentl` adaptor, you must have the Image Acquisition Toolbox Support Package for GenICam Interface installed.

R2021a

Version: 6.4

New Features

Bug Fixes

videoinput supports full bit depth preview

The `videoinput` object now has a property `PreviewFullBitDepth` that allows you to capture preview data from your device in its full bit depth. Capturing full bit depth preview data is supported only when the value of the `ReturnedColorspace` property is set to `'grayscale'`.

- The default value of `PreviewFullBitDepth` is `'off'`, indicating that the image data in the preview window is scaled down from its bit depth to 8-bit.
- You can set the value of `PreviewFullBitDepth` to `'on'` to capture the image data in the preview window in its full bit depth.

gige adaptor supports image acquisition with dropped frames

The GigE Vision camera adaptor (`gige`) with the `videoinput` object now allows you to continue acquiring frames when the acquisition drops a frame. Previously, the acquisition stopped and MATLAB returned an error when the acquisition dropped a frame.

The `gige` adaptor has the properties `IgnoreDroppedFrames` and `NumDroppedFrames`, which indicate whether the acquisition can continue with dropped frames.

- The default value of `IgnoreDroppedFrames` is `'off'`, indicating that the acquisition stops when it encounters a dropped frame.
- You can set the value of `IgnoreDroppedFrames` to `'on'` to continue acquisition with dropped frames.
- If `IgnoreDroppedFrames` is `'on'`, the `NumDroppedFrames` property keeps track of the number of frames dropped while the acquisition is running.

R2020b

Version: 6.3

New Features

Bug Fixes

Compatibility Considerations

Image Acquisition Toolbox Support Package for Velodyne LiDAR Sensors is being moved to Lidar Toolbox

The Image Acquisition Toolbox Support Package for Velodyne LiDAR[®] Sensors is now in Lidar Toolbox[™] and being renamed Lidar Toolbox Support Package for Velodyne LiDAR Sensors in R2020b. You can still use all the same functionality if you have the support package and Lidar Toolbox installed.

For information about using lidar, see the Lidar Toolbox Support Package for Velodyne LiDAR Sensors documentation that is included in the support package.

Compatibility Considerations

To continue using Velodyne LiDAR sensors in MATLAB, you must install Lidar Toolbox and the Lidar Toolbox Support Package for Velodyne LiDAR Sensors.

Enhanced property support for Point Grey cameras

The Point Grey adaptor (`pointgrey`) used with the `videoinput` object now has the following property enhancements:

- Ability to change properties while the acquisition is running
- Changing the value of a property also dynamically updates the constraint values of other properties that depend on it

For more information about these property enhancements, see [Use Advanced Property Support with Point Grey Camera](#).

R2020a

Version: 6.2

Bug Fixes

Compatibility Considerations

Image Acquisition Toolbox Support Package for QImaging Hardware is being removed

Image Acquisition Toolbox Support Package for QImaging® Hardware is being removed in R2020a. You can still use QImaging cameras with Image Acquisition Toolbox, but you must install the QImaging adaptor DLL and any required drivers separately.

Compatibility Considerations

You can still use QImaging cameras with the toolbox. To do so, install the QImaging adaptor DLL and any required drivers from the QImaging website.

For more information on the required files for QImaging cameras, see QImaging Camera Support from Image Acquisition Toolbox.

Image Acquisition Toolbox Support Package for Hamamatsu Hardware is being removed

Image Acquisition Toolbox Support Package for Hamamatsu Hardware is being removed in R2020a. You can still use Hamamatsu cameras with Image Acquisition Toolbox, but you must install the Hamamatsu adaptor DLL and any required drivers separately.

Compatibility Considerations

You can still use Hamamatsu cameras with the toolbox. To do so, install the Hamamatsu adaptor DLL and any required drivers from the Hamamatsu website.

For more information on the required files for Hamamatsu cameras, see Hamamatsu Camera Support from Image Acquisition Toolbox.

R2019b

Version: 6.1

New Features

Bug Fixes

macvideo adaptor supports lower video resolution

The `macvideo` adaptor now supports lower video resolutions of the default video format. The default format and supported resolutions depend on the camera specifications. The other OS generic video adaptors, `winvideo` and `linuxvideo`, already support multiple resolutions.

See the supported resolutions by viewing information on the cameras accessible through the `macvideo` adaptor from a macOS computer.

```
>> hwinfo = imaqhwinfo('macvideo');  
>> hwinfo.DeviceInfo
```

```
ans =
```

```
struct with fields:
```

```
    DefaultFormat: 'YCbCr422_1280x720'  
    DeviceFileSupported: 0  
    DeviceName: 'FaceTime HD Camera'  
    DeviceID: 1  
    VideoInputConstructor: 'videoinput('macvideo', 1)'  
    VideoDeviceConstructor: 'imaq.VideoDevice('macvideo', 1)'  
    SupportedFormats: {'YCbCr422_1280x720' 'YCbCr422_192x144' 'YCbCr422_480x360'}
```

The `SupportedFormats` property now includes lower resolutions of the default format, such as `'YCbCr422_192x144'` and `'YCbCr422_480x360'`.

You can create a `videoinput` object using one of the lower resolutions.

```
>> vid = videoinput('macvideo',1,'YCbCr422_192x144');
```

R2019a

Version: 6.0

New Features

Bug Fixes

Velodyne LiDAR support

Support has been added for the Velodyne LiDAR sensor. You can connect to and stream point clouds from the following Velodyne LiDAR models:

- HDL-32E sensor
- VLP-32C Ultra Puck sensor
- VLP-16 Puck sensor
- VLP-16 Puck Lite sensor
- VLP-16 Puck Hi-Res sensor

The LiDAR support is available through the Image Acquisition Toolbox Support Package for Velodyne LiDAR Sensors. You access the point cloud data using the `velodynelidar` object. You can preview and read point clouds from the supported LiDAR sensors.

For information about using the lidar support, see the Image Acquisition Toolbox Support Package for Velodyne LiDAR Sensors documentation that is included in the support package.

GigE Vision hardware support GenICam upgrade

The GigE Vision support has been upgraded to use GenICam version 3.1.0.

Addition of Read All Frames option in block and system object

Read All Frames Option in From Video Device Block

A **Read All Frames** option has been added to the Block Parameters dialog box of the From Video Device block. It is not selected by default. Select it to capture all available image frames. When this option is not selected, the block takes the latest snapshot of one frame, which is the equivalent of the `getsnapshot` function in the toolbox. When the option is selected, the block buffers the acquired images. The block still gives you one frame, the oldest from the buffer, every timestep and ensures that no frames are lost. This option is the equivalent of the `getdata` function in the toolbox.

Read All Frames Option in `imaq.VideoDevice` System Object

A `ReadAllFrames` property has been added to the `imaq.VideoDevice` function. Use it to specify whether to read one image frame or all available frames. Set to `'on'` to capture all available image frames. When set to the default of `'off'`, the system object takes a snapshot of one frame, which is the equivalent of the `getsnapshot` function in the toolbox. When the option is on, all available image frames are captured, which is the equivalent of the `getdata` function in the toolbox.

R2018b

Version: 5.5

New Features

Bug Fixes

Hamamatsu Cameras: Support for ORCA-Flash4.0 cameras

Support has been added for the Hamamatsu ORCA-Flash4.0 cameras.

Dalsa Driver Upgrade

The Teledyne DALSA® Sopera support now uses driver version 8.3.

R2018a

Version: 5.4

New Features

Bug Fixes

Enhancements to `imaqhwinfo` function

The `imaqhwinfo` function now returns more information when you get an error.

If you run the function by itself, and you do not have any support packages installed, you are directed to the Add-Ons page to install support packages. You are also directed to this information about installing support packages and what support packages are available: Image Acquisition Support Packages for Hardware Adaptors.

If you run the function with an adaptor name and do not have that support package installed, you are directed to the appropriate support package in Add-Ons, and also get a link to the troubleshooting section of the documentation for that specific adaptor. For example, if you are using DirectShow compliant WinVideo hardware (using the `winvideo` adaptor) such as a webcam, and you try:

```
imaqhwinfo('winvideo')
```

You may get the error message:

```
No devices were detected for the 'winvideo' adaptor. For troubleshooting device detection issues, click here.
```

That link goes directly to the troubleshooting topic about WinVideo devices. If you get an error from `imaqhwinfo('hamamatsu')`, the error links to the troubleshooting topic about Hamamatsu hardware. Each adaptor type has a custom message that links to the information about that specific adaptor.

The troubleshooting information for each adaptor type covers steps you can try if you cannot connect to your camera or cannot acquire images when you connect. It includes information specific to each adaptor.

Performance Improvement of Acquisition of RGB Frames

There is a performance improvement in the acquisition of frames from RGB cameras or when using an RGB colorspace in multicolorspace cameras.

R2017b

Version: 5.3

New Features

Bug Fixes

Point Grey Cameras: Includes support for FlyCapture2 SDK 2.11 upgrade

The Point Grey support was upgraded, and now uses FlyCapture version 2.11.

GigE Vision hardware support and GenICam GenTL hardware support upgrades

The GigE Vision support has been upgraded to use GenICam version 3.0.1.

The GenICam GenTL support has been upgraded to use GenTL version 1.5.

New removeEnumValue Function in Image Acquisition Toolbox Adaptor Kit

A new function is introduced for the Image Acquisition Toolbox Adaptor Kit. The `removeEnumValue` function is used to remove an enum value from the list of possible enum values. It removes a value from the list of enum constraints in an enum property present in the `videosource` object. This is similar to the `addEnumValue` function, which adds a value to the enum constraint.

This syntax shows the usage of the new function.

```
propinfo->removeEnumValue(int value, const char* value);
```

where `propinfo` is of type: `imaqkit::IPropInfo*`

R2017a

Version: 5.2

New Features

Bug Fixes

GStreamer Upgrade for Linux Video

The Image Acquisition Toolbox Linux[®] support now uses the GStreamer library version 1.0. It previously used version 0.10.

R2016b

Version: 5.1

New Features

Bug Fixes

Compatibility Considerations

Kinect for Windows v2: View a skeleton using joint indices metadata

Two additional metadata fields were added:

- `ColorJointIndices` - A matrix of x- and y-coordinates for 25 joints in pixels relative to the color image for the six possible bodies.
- `DepthJointIndices` - A matrix of x- and y-coordinates for 25 joints in pixels relative to the depth image for the six possible bodies.

These fields enable the use of the skeletal viewer function. For an example, see “Use Skeleton Viewer for Kinect V2 Skeletal Data.”

To use either Kinect® for Windows V1 or V2, install the Image Acquisition Toolbox Support Package for Kinect for Windows Sensor.

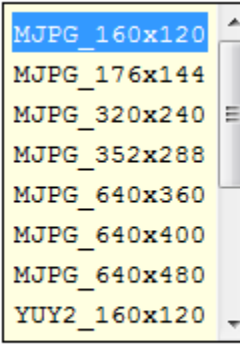
Advanced tab completion for functions

To get a list of options you can use for a function argument, press the **Tab** button after entering a function on the command line. The list expands and you can scroll to choose a property or value. For example, when you create the `videoinput` object, you can get a list of supported formats:

```
v = videoinput('winvideo',1,
```

When you press **Tab** after the Device ID (1 in this example), the list of formats displays, as shown here.

```
--
>>
>>
>>
>>
>>
>>
>>
>>
>>
>>
>>
>>
>>
>>
>> v = videoinput('winvideo',1,
```



Similarly, if you pressed **Tab** just after the first parentheses, a list of available adaptors would appear. The format for the object constructor function is:

```
v = videoinput('adaptorName',deviceID,'VideoFormat')
```

When you press **Tab** where an argument should appear, you get the list of options for that argument.

You can also get the values for property-value pairs, which can be used on the `videoinput` function after the first three required fields. For example,

```
v = videoinput('winvideo',1,'RGB1024x768','LoggingMode',
```

Press **Tab** after typing `LoggingMode` to get the possible values for that property, which are `'memory'`, `'disk'`, and `'disk&memory'`.

Many of the other toolbox functions also have tab completion. For example, when using the `getdata` function you can specify the data type using tab completion.

```
data = getdata(obj,10,
```

Press **Tab** after typing the number of frames (10 in this example) to get the possible values for the data types, such as `'uint8'` or `'double'`, since data type is the next input `getdata` takes after number of frames.

Property change for Point Grey cameras

For Point Grey cameras using USB Format_7 mode, the property `FrameRatePercentage` should no longer be used. A new `FrameRate` property is now available for setting the frame rate for the acquisition.

Compatibility Considerations

The `FrameRatePercentage` property should no longer be used. If you have code that uses it, you will get a warning. It will be removed in a future release. If you are trying to control the frame rate, use the new `FrameRate` property.

Macintosh Video adaptor now uses AV Foundation Libraries instead of QuickTime

The OS Generic Video Adaptor on Mac (`macvideo`) now uses Apple AV Foundation Libraries instead of QuickTime. The use of the Macintosh Video adaptor previously required that you have QuickTime installed on your computer. QuickTime is no longer required. Now you need to have the AV Foundation Libraries installed on your computer.

Change in Image Acquisition Toolbox Demo Adaptor build requirement

A good way to get a quick introduction to adaptors and custom adaptor development is by looking at the demo adaptor that is included with the Image Acquisition Toolbox Adaptor Kit. It is a functioning adaptor that does not require any hardware. You can build the demo adaptor and run it to get familiar with how an adaptor works.

To build the demo adaptor, you need to use a compiler that supports C++ version 11 or greater. For more information about the Demo Adaptor, see [Looking at the Demo Adaptor](#).

Support Package Installation via Add-Ons Explorer: Install, manage, and update support packages

You can now install support packages using the MATLAB **Add-Ons** menu. You can also use **Add-Ons** to update installed support package software or update the firmware on third-party hardware.

Installing a Support Package

To install an Image Acquisition Toolbox support package:

On the MATLAB **Home** tab, in the **Environment** section, click **Add-Ons > Get Hardware Support Packages**.

In the Add-On Explorer, scroll to the **Hardware Support Packages** section, and click **show all** to find your support package.

You can refine the list by selecting **Imaging/Cameras** in the **Refine by Hardware Type** section on the left side of the Explorer.

Select the support package for your adaptor. The table in Image Acquisition Support Packages for Hardware Adaptors shows the names of the support packages for each adaptor type.

Uninstalling a Support Package

To uninstall support packages:

On the MATLAB **Home** tab, in the **Environment** section, click **Add-Ons > Manage Add-Ons**.

Updating a Support Package

To update existing support packages:

On the MATLAB **Home** tab, in the **Environment** section, click **Add-Ons > Check for Updates > Hardware Support Packages**.

For more information about using Add-On Explorer, see Get Add-Ons.

R2016a

Version: 5.0

New Features

Bug Fixes

Compatibility Considerations

Kinect for Windows v2: Acquire images, depth maps, skeleton data, and related metadata

The Image Acquisition Toolbox now supports Kinect for Windows V2. The toolbox also continues to support Kinect for Windows V1. To use either Kinect for Windows V1 or V2, you need to install the Image Acquisition Toolbox Support Package for Kinect for Windows Sensor.

The Kinect V2 support includes the following supported hardware:

- Kinect for Windows V2 Sensor
- Kinect for Windows Developer Bundle
- Kinect Sensor for Xbox One
- Kinect Adapter for Windows

Kinect for Windows V2 offers new features, such as:

- Higher resolution capabilities, including three times more depth fidelity and a cleaner depth map
- Wider depth and color field of view
- A 25-point skeleton for each of up to six people (Kinect V1 has 20 joints)
- Open and closed hand gestures recognition
- Bio-correct skeletal joints (particularly hip, shoulder, and spine)
- Higher confidence for joints and more points for hands

Note The Kinect V1 sensor runs on Windows® 7 and above, and the Kinect V2 Sensor runs on Windows 8 and above.

For information about installing the support package, see [Installing the Kinect for Windows Sensor Support Package](#).

Support Package Documentation

The Kinect for Windows documentation (for both V1 and V2) is now part of the support package. When you install the Image Acquisition Toolbox Support Package for Kinect for Windows Sensor, you can access the documentation from the support package.

USB3 Vision: Use USB3 Vision compliant hardware through the GenICam GenTL interface

The Image Acquisition Toolbox now supports USB3 Vision compliant hardware through the GenICam GenTL interface, using supported GenTL producers. This support is used through the `gentl` adaptor with the `videoinput` object.

Enhanced Properties: Use enhanced properties support such as dynamic accessibility in the GigE Vision and GenICam GenTL interfaces

The Image Acquisition Toolbox has added GenICam property enhancements for the GigE Vision (`gige`) and GenICam GenTL (`gentl`) adaptors used with the `videoinput` object. These features were already included in the `gigecam` object.

- Ability to change properties while the acquisition is running
- Dynamic accessibility
- Dynamic constraints
- Grouped selector properties

For more details about these features, see [Use Advanced Property Support in the GigE Vision and GenICam GenTL Interfaces](#).

Change properties while the acquisition is running

This ability is useful for properties that you want to change dynamically, such as exposure time. For example, you can now do this:

```
% Create the videoinput object using the GigE adaptor
vid = videoinput('gige')

% Get the video source
src = getselectedsource(vid);

% Set the frames per trigger on the source
vid.FramesPerTrigger = Inf;

% Start acquiring frames
start(vid)

% Change the exposure time during the acquisition
src.ExposureTime = 4;
```

Previously, changing the exposure time after starting the acquisition resulted in an error.

Dynamic accessibility

Device-specific properties are now dynamically accessible. If you display the device-specific properties (using `disp`, `get`, or `propinfo` functions), properties that previously did not show up now show up with labels.

The `propinfo` function includes a new field called `Accessible`, which is a read-only boolean property. A `disp` on a property which has `Accessible` set to 0 results in “Currently not accessible.” To enable accessibility, set `Accessible` to 1. For example, if you have the `ReverseY` property set to `Accessible`, the following:

```
propinfo(src, 'ReverseY')
```

would result in a `disp` showing:

```
Accessible: 1
```

Dynamic constraints

If you change a property that results in a constraint change for another property, the other property gets updated dynamically.

For an example of this feature, see Use Advanced Property Support in the GigE Vision and GenICam GenTL Interfaces.

Grouped selector properties

In both the Image Acquisition Tool and the command line, selector properties are now grouped. In the tool, you can see the groupings in the **Device Properties** tab. In the property display on the command line, the related properties are grouped - the selector property is listed, with its possible values appearing below it.

For example, in previous versions of the toolbox, for a GainSelector with possible values of Red, Blue, and Green and Gain property, the gain properties displayed as follows:

```
>> vid = videoinput('gige')
>> src = getselectedsource(vid)
...
...
RedGain = 0.4
BlueGain = 0.2
GreenGain = 0.1
...
```

They now display as separate values on one selector property instead:

```
>> vid = videoinput('gige')
>> src = getselectedsource(vid)
...
...
GainSelector = 'Red'
Gain = 0.2
...
```

Compatibility Considerations

The grouping of selector properties results in a compatibility consideration because of the change in how selector properties are displayed. There are now fewer properties since some are shown as a single selector property with separate values, whereas they used to be separate properties.

If you have any scripts containing code that references the previous, separate properties, you need to change the code to reflect them as values on the selector property. Setting and getting properties that belong to a selector using the previous composite-name style is no longer supported. For example, RedGain no longer works. Instead use GainSelector set to Red, as shown in the previous example.

GigE Vision Support Package: Documentation now part of support package

The GigE Vision documentation is now part of the support package. When you install the Image Acquisition Toolbox Support Package for GigE Vision Hardware, you can access the documentation from the support package.

32-bit hardware and drivers no longer supported

In R2016a, 32-bit MATLAB is no longer supported. Drivers that are not supported on 64-bit Windows are no longer supported. For Image Acquisition Toolbox, that means that in R2016a, Matrox® 7, Matrox 8, Teledyne DALSA IFC, and Data Translation® frame grabbers are no longer supported.

Compatibility Considerations

Matrox 7 and 8

Since 32-bit MATLAB is no longer supported in R2016a, the Matrox Imaging Library (MIL/MIL-Lite) versions 7 and 8 are no longer available. You can no longer use those Matrox drivers.

Note that Matrox versions 9 and 10 are supported on 64-bit Windows.

Teledyne DALSA IFC Hardware

The Teledyne DALSA IFC hardware support, using the `dalsai fc` adaptor, is no longer supported in R2016a. You can no longer use the `dalsai fc` adaptor.

Note that Teledyne DALSA Sopera hardware, using the `dalsasopera` adaptor, is supported on 64-bit Windows.

Data Translation Frame Grabbers

The Data Translation Frame Grabbers support, using the `dt` adaptor, is no longer supported starting in R2016a. You can no longer use the `dt` adaptor. You can migrate to using a driver-hardware combination that is supported on 64-bit Windows.

Functionality Being Removed or Changed

Functionality	Result	Use Instead	Compatibility Considerations
Matrox driver versions 7 and 8	error	Matrox version 9 and 10	See “Matrox 7 and 8” in “32-bit hardware and drivers no longer supported” on page 14-5
Teledyne DALSA IFC Hardware	error	Teledyne DALSA Sopera hardware	See “Teledyne DALSA IFC Hardware” in “32-bit hardware and drivers no longer supported” on page 14-5
Data Translation Frame Grabbers	error	A driver-hardware combination that is supported on 64-bit Windows	See “Data Translation Frame Grabbers” in “32-bit hardware and drivers no longer supported” on page 14-5

R2015aSP1

Version: 4.9.1

Bug Fixes

R2015b

Version: 4.10

New Features

Bug Fixes

Compatibility Considerations

Error added for removal of imaqmem function

An error has been added for the removal of the `imaqmem` function in this release of the toolbox. You will receive an error message if you use the function.

Compatibility Considerations

The `imaqmem` function has been removed. Starting in R2015b, you will receive this error:

```
Error: IMAQMEM has been removed. It is recommended that you do not limit the frame memory limit for the toolbox. To check memory usage, use MEMORY for Windows platforms or your operating system commands such as "top" for UNIX platforms.
```

If you have any code that uses this function, remove it to avoid the error.

Removal of 32-bit MATLAB

In R2016a, 32-bit MATLAB will no longer be supported. Drivers that are not supported on 64-bit Windows will no longer be supported. For Image Acquisition Toolbox, that means that in R2016a, Matrox 7, Matrox 8, Teledyne DALSA IFC, and Data Translation frame grabbers will no longer be supported.

In R2015b, you will receive a warning that these features will be unavailable in the following release.

Compatibility Considerations

Matrox 7 and 8

Since 32-bit MATLAB will no longer be supported in R2016a, the Matrox Imaging Library (MIL/MIL-Lite) versions 7 and 8 will no longer be available at that point. In this release, you will receive the following warning when you use those Matrox drivers.

```
Warning: The 32-bit version of MATLAB will no longer be available starting in MATLAB R2016a. Matrox 7 and 8 are only supported on 32-bit Windows. Migrate to using a driver-hardware combination that is supported on 64-bit Windows.
```

Note that Matrox versions 9 and above are supported on 64-bit Windows.

Teledyne DALSA IFC Hardware

The Teledyne DALSA IFC hardware support, using the `dalsaiifc` adaptor, will no longer be available starting in R2016a. In this release, you will receive the following warning when you use that adaptor.

```
Warning: The 32-bit version of MATLAB will no longer be available starting in MATLAB R2016a. Teledyne DALSA IFC is only supported on 32-bit Windows. Migrate to using a driver-hardware combination that is supported on 64-bit Windows.
```

Note that Teledyne DALSA Sopera hardware is supported on 64-bit Windows.

Data Translation Frame Grabbers

The Data Translation Frame Grabbers support, using the dt adaptor, will no longer be available starting in R2016a. In this release, you will receive the following warning when you use that adaptor.

Warning: The 32-bit version of MATLAB will no longer be available starting in MATLAB R2016a. Data Translation Frame Grabbers are only supported on 32-bit Windows. Migrate to using a driver-hardware combination that is supported on 64-bit Windows.

R2015a

Version: 4.9

New Features

Bug Fixes

Improved Linux hardware support and stability with Ubuntu

The Linux hardware support using the Linux Video adaptor (`linuxvideo`) has been upgraded to work on later versions of Ubuntu. You can now use the 13.04 and higher distribution of Ubuntu with the toolbox.

IP camera support added to MATLAB

You can use the MATLAB IP Camera support to bring live images into MATLAB. Images can be from any Internet Protocol Camera that supports Motion JPEG stream over HTTP with basic authentication support. IP cameras, also referred to as netcams or network cameras, are increasingly popular in live image processing applications.

With simple MATLAB functions you can preview your image, acquire single snapshots from the camera, and optionally set up a loop of acquired images. The `ipcam` function creates the IP Camera object that is used to acquire images, and the `snapshot` function returns a single image from the camera.

IP Camera support is available only through a hardware support package. Download and install the necessary files using the Support Package Installer, which you open by typing `supportPackageInstaller` in MATLAB. On the **Select support package to install** screen, select IP Cameras from the list.

You can use MATLAB IP Camera support on the following platforms:

- Microsoft® Windows 32-bit and 64-bit
- Mac OS X 64-bit
- Linux

You do not need Image Acquisition Toolbox for this feature, as it is available in MATLAB. For more information about the IP camera support, see the MATLAB Support Package for IP Cameras documentation, which is available when you download the support package.

R2014b

Version: 4.8

New Features

Bug Fixes

Compatibility Considerations

Improved interface for GigE Vision compliant cameras

The Image Acquisition Toolbox now includes a separate interface for use with GigE Vision cameras. The new interface focuses on optimizing for GigE Vision cameras and supports more GigE-specific functionality.

You can continue to use the existing GigE Vision adaptor (`gige`) with the `videoinput` object. The new interface provides a new object, `gigecam`, to use instead of the `videoinput` object.

The new interface takes advantage of GigE properties and features, and is now more consistent with GenICam standard for how properties are displayed and how selector properties are managed. Benefits include:

- Designed for GigE Vision cameras
- Allows use of GigE camera commands
- Better handling of GigE Vision camera properties
- Uses GigE Vision advanced property features

For information about using the new GigE interface, see [GigE Vision Acquisition: gigecam Object vs. videoinput Object and Acquire Images from GigE Vision Cameras](#).

Improved interface and MIL 10 support for Matrox devices

The Image Acquisition Toolbox now includes a separate interface for use with Matrox frame grabbers. The new interface focuses on optimizing for Matrox frame grabbers and supports the Matrox MIL 10 Configuration utility.

You can continue to use the existing Matrox adaptor (`matrox`) with the `videoinput` object. The new interface provides a new object, `matroxcam`, to use instead of the `videoinput` object.

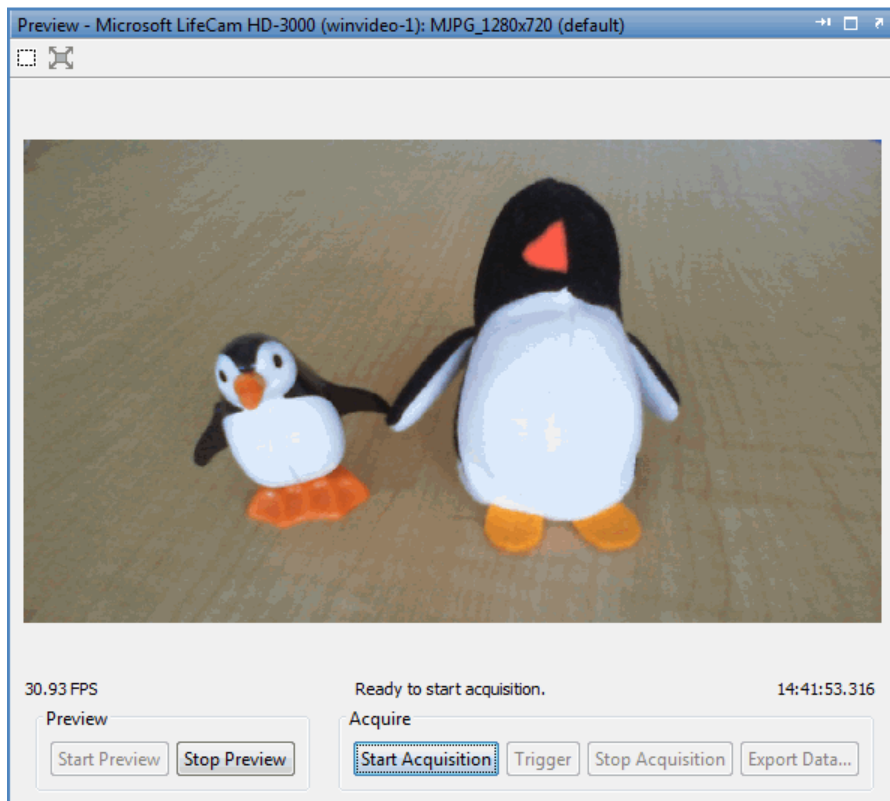
The new interface offers several benefits:

- More robust support for a wider configuration of supported devices. Supports more device configurations than the `videoinput matrox` adaptor.
- Added support for the MIL 10.
- Supports newer devices.

For information about using the new Matrox interface, see [Matrox Acquisition - matroxcam Object vs videoinput Object and Acquire Images from Matrox Frame Grabbers](#).

Frames Per Second added to Preview window

Frames per second has been added to the display of the Image Acquisition Toolbox **Preview** window and the **Preview** panel of the Image Acquisition Tool (`imaqtool`). This is the rate at which frames are being acquired, displayed as a moving average, with two decimal points. This allows you to see the frames per second while you are previewing.



In the example shown here, the **Preview** panel of the Image Acquisition Tool is showing that frames are being acquired at an average of 30.93 FPS. The **Preview** panel also displays device, resolution, acquisition status, and the timestamp. The toolbox stand-alone **Preview** window shows those properties as well.

Warning added for future removal of imaqmem function

A warning has been added for the removal of the `imaqmem` function in a future release of the toolbox. You will receive a warning message if you use the function.

Compatibility Considerations

The `imaqmem` function is being removed. In R2014b the function still works, but you get a warning. In R2015a, the function will be removed, and you will get an error. For R2014b, you get this warning:

Warning: IMAQMEM will be removed in a future release. It is recommended that you do not limit the frame memory limit for the toolbox. To check memory usage, use `MEMORY` for Windows platforms or your operating system commands such as `"top"` for UNIX platforms.

If you have any code that uses this function, remove it to avoid the warning and the error in the future.

R2014a

Version: 4.7

New Features

Bug Fixes

Compatibility Considerations

Support packages for hardware adaptors via the Support Package Installer

The existing support for all supported hardware, such as GigE Vision and Windows Video, is now available via the Support Package Installer. This is the same functionality for acquiring images using all supported cameras that has always been part of the Image Acquisition Toolbox.

With previous versions of the Image Acquisition Toolbox, the files for all of the adaptors were included in your installation. Starting with version R2014a, each adaptor is available separately through the Support Package Installer. All of the support packages contain the necessary MATLAB files to use the toolbox with your adaptor. Some also contain third-party files, such as drivers or camera set-up utilities. Offering the adaptor files via the Support Package Installer allows us to provide the most up to date versions of files.

To open the Support Package Installer, type `supportPackageInstaller` in MATLAB. Then on the **Select support package to install** screen, select your adaptor, for example `GigE Vision Hardware` or `OS Generic Video Interface`, from the list.

Note For any cameras that use the Windows Video (`winvideo`), Macintosh Video (`macvideo`), or Linux Video (`linuxvideo`) adaptors, use the support package called `OS Generic Video Interface`. The correct files will be installed, depending on your operating system.

The following table shows the support package name for each adaptor. In the Support Package Installer, on the **Select support package to install** screen, select your adaptor using the name listed in the table.

Adaptor Name	Support package name in list	Contents
Windows Video (<code>winvideo</code>)	OS Generic Video Interface	MATLAB files to use Windows Video, Macintosh Video, or Linux Video cameras with the toolbox. The correct OS files will be installed, depending on your system.
Kinect for Windows (<code>kinect</code>)	Kinect for Windows Sensor	MATLAB files to use Kinect for Windows cameras with the toolbox Third party files - Kinect for Windows Runtime
QImaging (<code>qimaging</code>)	QImaging Hardware	MATLAB files to use QImaging cameras with the toolbox Third party files - QImaging QCam
DALSA IFC (<code>dalsaifc</code>)	Teledyne DALSA IFC Hardware	MATLAB files to use DALSA IFC cameras with the toolbox

Adaptor Name	Support package name in list	Contents
DALSA Sopera (dalsasopera)	Teledyne DALSA Sopera Hardware	MATLAB files to use DALSA Sopera cameras with the toolbox
GigE Vision (gige)	GigE Vision Hardware	MATLAB files to use GigE Vision cameras with the toolbox
Matrox (matrox)	Matrox Hardware	MATLAB files to use Matrox cameras with the toolbox
DCAM (dcam)	DCAM Hardware	MATLAB files to use DCAM cameras with the toolbox Third party files - CMU DCAM on Windows driver file
GenICam GenTL (gentl)	GenICam Interface	MATLAB files to use GenTL cameras with the toolbox
Point Grey (pointgrey)	Point Grey Hardware	MATLAB files to use Point Grey cameras with the toolbox Third party files - Point Grey FlyCapture
Linux Video (linuxvideo)	OS Generic Video Interface	MATLAB files to use Windows Video, Macintosh Video, or Linux Video cameras with the toolbox. The correct OS files will be installed, depending on your system.
Macintosh Video (macvideo)	OS Generic Video Interface	MATLAB files to use Windows Video, Macintosh Video, or Linux Video cameras with the toolbox. The correct OS files will be installed, depending on your system.
Data Translation (dt)	Data Translation Frame Grabbers	MATLAB files to use Data Translation hardware with the toolbox
Hamamatsu (hamamatsu)	Hamamatsu Hardware	MATLAB files to use Hamamatsu cameras with the toolbox
National Instruments (ni)	NI Frame Grabbers	MATLAB files to use NI hardware with the toolbox Third party files - NI-IMAQ file

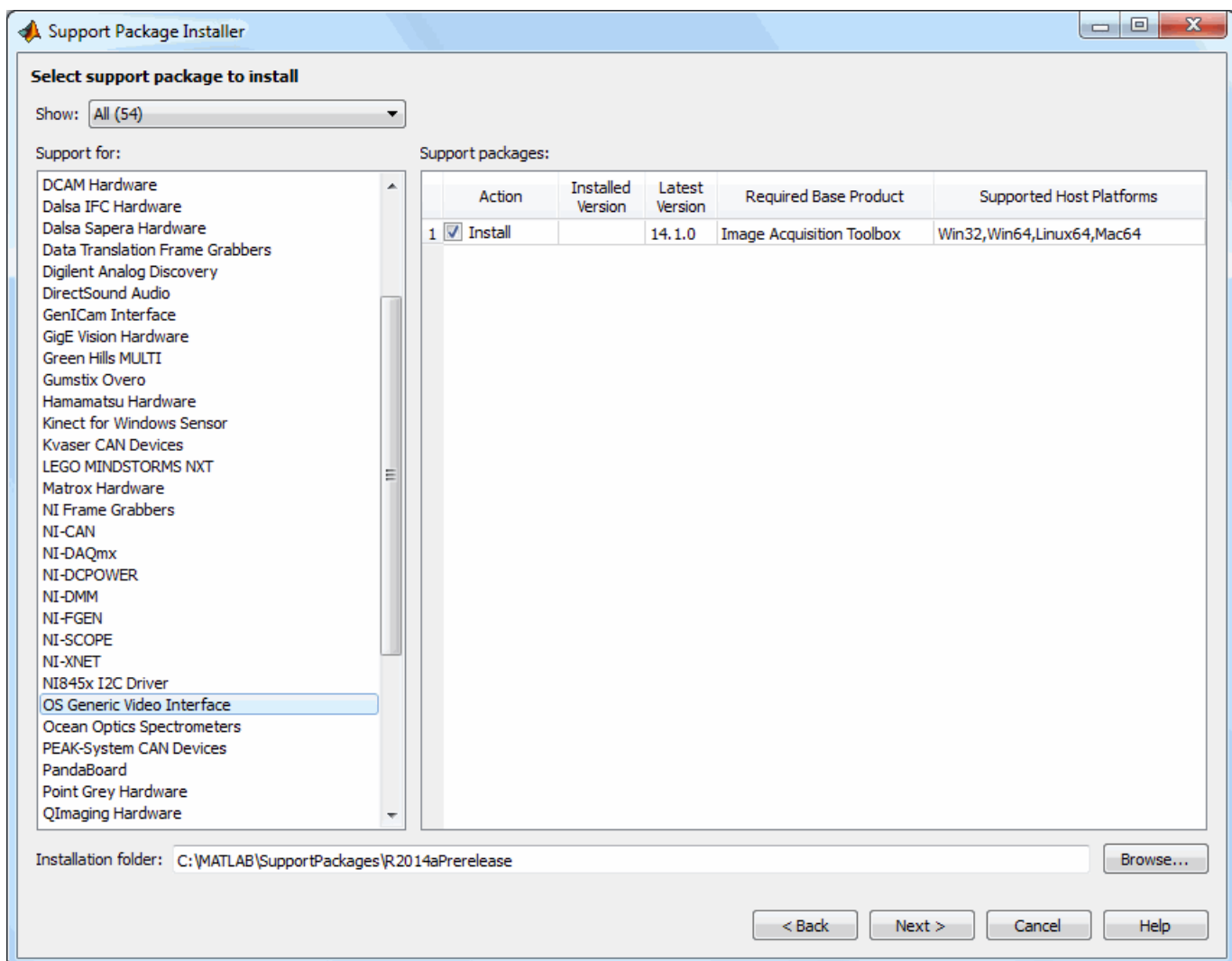
For information on installing the support packages, see Installing the Support Packages for Image Acquisition Toolbox Adaptors.

Compatibility Considerations

With previous versions of the Image Acquisition Toolbox, the files for all of the adaptors were included in your installation. Starting with version R2014a, each adaptor is available separately through the Support Package Installer.

To use the cameras or frame grabbers you have been using with the toolbox, you must install the support package for the adaptor that your camera uses. If you use multiple adaptors, you need to install the support package for each one you use. For example, if you have a Webcam on a Windows system and a Matrox camera, you would need to install the OS Generic Video Interface support package for the winvideo adaptor for the Webcam and the Matrox Hardware support package for the matrox adaptor.

Run the Support Package Installer as explained above and use the adaptor name in the table to install the correct package(s) that you need. To install more than one package, run the Support Package Installer multiple times, once for each adaptor. The following graphic shows the installer choice for the OS Generic Video Interface support package. You can also see some of the other adaptors showing in the list.



For information on installing the support packages, see [Installing the Support Packages for Image Acquisition Toolbox Adaptors](#).

Support for Point Grey USB3 cameras

The Point Grey support has been expanded to include support for Point Grey USB 3 cameras.

The Point Grey support now includes:

- USB 3
- FireWire
- GigE[®] Vision
- USB 2
- Bumblebee[®] 2

R2013b

Version: 4.6

New Features

Bug Fixes

Compatibility Considerations

Image Acquisition Simulink block and System object support for Kinect for Windows skeletal tracking data

The From Video Device block now includes support for the Kinect for Windows skeletal tracking data. This is used to return skeleton information in Simulink during simulation and code generation. You can output metadata information in normal, accelerator, and deployed simulation modes. Each metadata item in the **Selected Metadata** list becomes an output port on the block. For more information about using the skeletal metadata in the block, see From Video Device.

The VideoDevice System object™ now includes support for the Kinect for Windows skeletal tracking data. You can return Kinect for Windows skeleton data using the VideoDevice System object on the Kinect Depth sensor. For information about how to do this, see the “Kinect for Windows Metadata” section of Using VideoDevice System Object to Acquire Frames.

Additional Kinect for Windows support, including raw Bayer and IR data, accelerometer data, color camera property control, and IR emitter control

The Kinect for Windows support includes some new features.

- Additional formats supported on the color device, including infrared and raw Bayer
- Added IR switch support
- Added accelerometer reading
- Additional color image properties supported, such as gain and brightness
- Added skeletal metadata to depth image

Additional Formats

Three new formats have been added to the Kinect color sensor. In addition to the various color formats that were already supported, two raw Bayer formats have been added: RawBayer_1280x960 and RawBayer_640x480.

The color sensor also now supports infrared using the Infrared_640x480 format. The infrared stream allows you to capture frames in the dark.

For more details on these new formats and all supported formats, see Data Streams Returned by the Kinect.

IR Switch

You can now control whether the IR switch is on or off for the depth sensor, using the IREmitter property. An advantage of this property is that by turning the infrared off, you can avoid depth detection degradation that can occur when multiple sensors are used together. If the depth stream is running and the IR emitter is set to off, it will return blank frames. See Acquiring Image and Skeletal Data Using Kinect for more information on setting properties.

Accelerometer

You can now get acceleration data from the color and depth sensors. This property returns a 1x3 array of accelerometer data. The data is updated while the device is previewing or running. It returns x, y, and z values of acceleration in gravity units g. See Acquiring Image and Skeletal Data Using Kinect for more information on setting properties.

Additional Properties on the Color Sensor

Additional device-specific properties are available for the color sensor. Some of them allow you to control image properties based on ambient lighting conditions.

The new properties include:

- `AutoExposure` - controls whether other related properties are activated.
- `FrameInterval` - indicates the frame interval in units of 1/10,000 of a second.
- `ExposureTime` - indicates the exposure time in increments of 1/10,000 of a second.
- `Gain` - indicates a multiplier for the RGB color values.
- `PowerLineFrequency` - option for reducing flicker caused by the frequency of a power line.
- `BacklightCompensation` - configures backlight compensation modes to adjust the camera to capture data dependent on environmental conditions.
- `Brightness` - indicates the brightness level.
- `AutoWhiteBalance` - use to enable or disable the white balance setting.
- `WhiteBalance` - indicates color temperature in degrees Kelvin.
- `Gamma` - indicates the gamma measurement.
- `Contrast` - indicates the contrast level.
- `Hue` - indicates the hue measurement.
- `Saturation` - indicates the saturation level.
- `Sharpness` - indicates the sharpness level.

See *Acquiring Image and Skeletal Data Using Kinect* for more information on setting these properties.

Skeletal Metadata on Depth Image

As part of the initial release of the Kinect for Windows support, skeleton data was returned on the image coordinates. In this release, you can now get this data on the depth image coordinates.

Two additional metadata were added to allow this support - `JointDepthIndices`, which shows skeleton joint coordinates, and `PositionDepthIndices`, which shows position coordinates. For information on how to access the skeletal metadata, see *Acquiring Image and Skeletal Data Using Kinect*.

Image Acquisition System object support for MATLAB Compiler

The `VideoDevice System` object now includes support for MATLAB Compiler™.

Support for M420 format from UVC webcams

The M420 format is now supported in the Image Acquisition Toolbox UVC webcam support. UVC webcams are supported using the `winvideo` adaptor. This now includes support for the M420 format, which is a YUV packed format.

Conversion of error and warning message identifiers

For R2013b, some error and warning message identifiers have changed in the Image Acquisition Toolbox software. The error message identifiers that have changed have to do with device-specific property use.

Compatibility Considerations

If you have scripts or functions that use message identifiers that changed, you must update the code to use the new identifiers. Typically, message identifiers are used to turn off specific warning messages, or in code that uses a try/catch statement and performs an action based on a specific error identifier.

For example, the `<'illustrative:old:ID'>` identifier has changed to `<'new:similar:ID'>`. If your code checks for `<'illustrative:old:ID'>`, you must update it to check for `<'new:similar:ID'>` instead.

To determine the identifier for a warning, run the following command just after you see the warning:

```
[MSG,MSGID] = lastwarn;
```

This command saves the message identifier to the variable MSGID.

To determine the identifier for an error, run the following command just after you see the error:

```
exception = MException.last;  
MSGID = exception.identifier;
```

Note: Warning messages indicate a potential issue with your code. While you can turn off a warning, a suggested alternative is to change your code so it runs warning-free.

Changes to device-specific property behavior

As a result of changing the property support in the toolbox, several incompatibilities are introduced for the behavior of device-specific properties.

Compatibility Considerations

Device-specific properties are no longer case-insensitive. In previous releases, they were case-insensitive, so code containing property names would work whether the case matched or not. Now that property names are case-sensitive, you must make sure that the case of all the letters of the property name is correctly upper or lower cased, to match the actual name.

For example, previously, the following code would work for the property Hue, even though Hue has an upper-case H.

```
vid = videoinput('winvideo', 1);  
src = getselectedsource(vid);  
src.hue
```

```
ans =  
    0.5
```

This code will no longer work. You will now get an error stating there is no property hue. To fix this, simply use the proper case, changing it to Hue.

Compatibility Considerations

Device-specific properties no longer allow for property completion. In previous releases, you could use the first letter of a property name and allow property completion to complete the name. This no longer works, so you must use the full name of properties in code.

For example, previously, the following code would work for the property Hue.

```
vid = videoinput('winvideo', 1);
src = getselectedsource(vid);
src.H

ans =

    0.5
```

In this case, the H was completed to Hue. This code will no longer work. You will now get an error stating there is no property H. To fix this, simply use the full property name, changing it to Hue.

Changed property support results in changes for adaptor writers

As a result of changing the property support in the toolbox, several incompatibilities are introduced for adaptor writers. This only applies to anyone writing an adaptor using the Image Acquisition Toolbox Adaptor Kit. If you have any code that refers to the following items, you should change your code as indicated below.

Compatibility Considerations

There are changes to implementing get and set support for engine properties.

— If you are using the `getEnginePropContainer` method to get the property container, the return type has changed to `imaqkit::IEnginePropContainer*` instead of `imaqkit::IPropContainer*`.

— If you are using set listener for an engine property, the set listener classes for these properties should now inherit from

```
imaqkit::IEnginePropPostSetListener
```

instead of

```
imaqkit::IPropPostSetListener
```

— The virtual functions required to be implemented have a different signature. Notify signatures change to

```
notify(imaqkit::IEnginePropInfo *propertyInfo, void* newValue)
```

instead of

```
void notify(imaqkit::IPropInfo *propertyInfo, void* newValue)
```

Please see the demo adaptor for more information.

— Creating properties through the IMDF file is no longer supported for `imaqkit::IPropFactory`.

R2013a

Version: 4.5

New Features

Bug Fixes

Compatibility Considerations

Kinect for Windows sensor support for acquiring images, depth maps, skeleton data, and related metadata

The new Kinect for Windows adaptor allows you to do image acquisition using a Kinect for Windows device. Kinect for Windows devices are often used in the fields of automotive IVS, robotics, human-computer interaction (HCI), security systems, entertainment systems, game design, and civil engineering. They can be used for analyzing skeletons, 3D mapping, gesture recognition, human travel patterns, sports and games, etc.

The Kinect for Windows adaptor is supported on 32-bit and 64-bit Windows.

Doing image acquisition with a Kinect for Windows device is similar to using other cameras and adaptors, but with several key differences:

- The Kinect for Windows device has two separate physical sensors, and each one uses a different DeviceID in the `videoinput` object. The Kinect for Windows color sensor returns RGB image data. The Kinect for Windows depth sensor returns depth and skeletal data. For information about Kinect for Windows device discovery and the use of two device IDs, see [Detecting the Kinect Devices](#).
- The Kinect for Windows device returns four data streams. The Image stream is returned by the color sensor and contains color data in various color formats. The depth stream is returned by the depth sensor and returns depth information in pixels. The skeletal stream is returned by the depth sensor and returns metadata about the skeletons. There is also an audio stream, but this is unused by the Image Acquisition Toolbox. The audio stream can be used by DSP System Toolbox™ though. For more information on the streams, see [Data Streams Returned by the Kinect](#).
- The Kinect for Windows can track up to six people. It can provide full tracking (all 20 joint locations) on two people, and partial tracking on up to four more.
- In the Image Acquisition Toolbox, skeletal metadata is accessed through the depth sensor object. For an example that shows how to access the skeletal metadata, see [Acquiring Image and Skeletal Data Using the Kinect](#). For an example showing simultaneous acquisition, see [Acquiring from the Color and Depth Devices Simultaneously](#).

Note The Kinect adaptor is intended for use only with the Kinect for Windows sensor.

Kinect for Windows Runtime

In order to use the Kinect for Windows support in the Image Acquisition Toolbox, you must have version 1.6 or higher of the Kinect for Windows Runtime installed on your system. If you already have it installed, you do not need to do anything more. If you do not have it installed, you need to install it following the procedure in [Installing the Kinect for Windows Runtime](#). After you complete this process, you can acquire images using the Kinect for Windows with the Image Acquisition Toolbox, as described in the sections referred to above.

Two new VideoWriter profiles for disk logging

When you log acquisition data to disk using either the command-line toolbox or Image Acquisition Tool, there are now two additional VideoWriter profiles for the saved data. In addition to Motion JPEG 2000, Archival, Motion JPEG AVI, Uncompressed AVI, and MPEG-4, you can use the two new formats:

-
- 'Grayscale AVI' — Uncompressed AVI file with grayscale video. Only used for monochrome devices.
 - 'Indexed AVI' — Uncompressed AVI file with indexed video. Only used for monochrome devices.

For more information on disk logging and these formats, see Logging Your Data.

Dynamic update of read-only GenICam properties

For GenICam properties for the GigE Vision (`gige`) and GenTL (`gentl`) adaptors, double properties that were previously read-only were only initialized at the creation of the `videoinput` object. This meant that properties such as temperature were not live. The toolbox now supports reading the actual value of the camera each time that `get` is called on the `videosource` for those properties. This dynamic use of properties is especially useful in cases where the value is likely to change (like temperature).

GigE PacketSize automatically configured

For the GigE Vision (`gige`) adaptor, the default value of the `PacketSize` property on the `videosource` has changed from 1514 to be much closer to what is the maximum allowed by your camera and network configuration. The toolbox now does an automatic intelligent configuration of this value. This should lead to increased performance and lower CPU load.

Due to this optimization of `PacketSize`, you may need to adjust your `PacketDelay` accordingly.

Sapera LT 7.20 required for DALSA support

Sapera LT 7.20 is now required for the Teledyne DALSA adaptor that is available for Sapera 7.x.

White balance vector changed for DCAM

The order of the `WhiteBalance` vector was reversed in R2012a for the DCAM adaptor.

Compatibility Considerations

The order of red and blue in the `WhiteBalance` vector was reversed in R2012a for the DCAM adaptor. So if you have any code that was written for R2012a or R2012b, you should adjust your code.

For example if you are using the `dcam` adaptor, and you had this code in R2012a or R2012b:

```
set(src, 'WhiteBalance', [red blue])
```

you will need to change it to:

```
set(src, 'WhiteBalance', [blue red])
```


R2012b

Version: 4.4

New Features

Bug Fixes

Compatibility Considerations

New adaptor for Point Grey FireWire, GigE Vision, USB 2, and Bumblebee 2 cameras

A new adaptor type is introduced for Point Grey cameras. The support includes the following types of Point Grey devices:

- FireWire
- GigE Vision
- USB 2
- Bumblebee 2

For information on troubleshooting, see Point Grey Hardware.

Simplified installation and configuration for GigE Vision devices

GigE Vision support requires GenICam. Prior to R2012b, you had to install and configure GenICam as part of the GigE adaptor setup. Now, you no longer need to install or configure GenICam, because it has been integrated into the toolbox.

Performance improvement to GigE Vision adaptor on Mac OS X

There is a significant improvement in the GigE Vision support on the Mac OS X platform. It now performs as well as the Windows implementation. If you are using the toolbox with GigE Vision cameras on Mac OS X, you will notice a marked improvement in the performance.

Matrox Orion HD support

Support has been added for additional Matrox hardware:

- Orion HD

GigE Packet Size property change

The `PacketSize` property has been changed from an enumeration with a set of possible values to an integer with a range of values. This lets you to choose your own value for the packet size.

To provide more flexibility in choosing a packet size for stream packets in the GigE adaptor, the `PacketSize` property now accepts an integer. Working values depend on networking card, drivers, and network configuration.

Compatibility Considerations

As a countermeasure for backward compatibility, we will automatically convert enumerations to integers so that any code using one of the previous enumeration values will still work. In R2012b you will see a warning, in R2013a you will get an error with explanation, and in R2013b an error with no explanation.

If you try to use a string value that represents a number, you will receive this warning:

Warning: The PacketSize value should be a positive integer rather than a numeric string. Attempting to set the PacketSize to a numeric string will not be supported in a future release.

Fixed possible GigE camera detection problem on Windows XP

In R2012a there was a regression where some GigE Vision cameras sometimes failed to be detected on Windows XP systems when more than one Ethernet card was being used.

This has been corrected in R2012b and this scenario now works properly.

R2012a

Version: 4.3

New Features

Bug Fixes

Compatibility Considerations

GenTL Support for GigE Vision, USB, and FireWire Devices

A new adaptor type, GenTL, is now available for GigE Vision, USB, and FireWire cameras.

Windows 64 Support on DCAM

The DCAM adaptor support is now extended to 64-bit Windows.

VideoDevice System Object

The Image Acquisition Toolbox introduces the VideoDevice System Object, which allows single-frame image acquisition and code generation from MATLAB.

You use the `imaq.VideoDevice` function to create the System Object. It supports the same adaptors and hardware that the `videoinput` object supports; however, it has different functions and properties associated with it. For example, the System Object uses the `step` function to acquire single frames.

For more information on using the System Object, use this command in MATLAB:

```
help imaq.VideoDevice
```

From Video Device Block Enhancements

Several enhancements have been added to the From Video Device block for doing image acquisition in Simulink®. Options for setting color space and Bayer Sensor Alignment are now included in the block properties.

New Hardware Support - National Instruments

Support has been added for additional National Instruments™ hardware.

- PCIe-1433
- PXIe-1435

Test Suite for Third-Party Adaptor Developers and Camera Vendors

As part of the Image Acquisition Toolbox Adaptor Kit, we now offer a test suite for third-party adaptor developers and camera vendors to test adaptors and hardware against the toolbox.

DCAM Adaptor Improvement

Support has been added for strobe outputs to the DCAM adaptor on Windows.

Linuxvideo Adaptor Improvement

Improved support has been added for V4L1 cameras with the linuxvideo adaptor when using the V4L1 compatibility library provided by the libv4l project.

Invisible Properties in GigE Vision Adaptor Are No Longer Exposed

In the GigE adaptor, invisible properties (those designated as such by camera vendors) should not be shown. They have been, but are now not available.

Compatibility Considerations

Device-specific invisible properties that previously existed may no longer exist. If you had not used any invisible properties, you will not be affected by this change. If you had used them, you will receive an error.

QImaging Color Wheel Property Change

In the QImaging adaptor, `black` has been removed as a valid value for the Color Wheel property.

Compatibility Considerations

You can no longer use `black` as a value for the Color Wheel property. This value is never allowed by the driver anyway, so it is unlikely to be used in any code. If you do use it, you will now receive an error.

Change ObjectConstructor Property Name

When you use the `imaqhwinfo` function, with adaptor name and device ID, the information returned includes a field called `ObjectConstructor`. For example, if you ran this code:

```
imaqhwinfo('winvideo',1)
```

for a `videoinput` object you created with adaptor `winvideo` and Device ID of 1, one of the lines of the output was:

```
ObjectConstructor: 'videoinput('winvideo',1)'
```

The `ObjectConstructor` property name has been changed to `VideoInputConstructor`. So the output now looks like this:

```
VideoInputConstructor: 'videoinput('winvideo',1)'
```

This change was made because there is now a second object type, the new `VideoDevice System` object. The object constructor field for that object is called `VideoDeviceConstructor`.

Compatibility Considerations

The field previously called `ObjectConstructor` in `imaqhwinfo` output, is now called `VideoInputConstructor`. It is unlikely that any code would use this name, but if you have code that uses it, you will need to update it to the new name.

R2011b

Version: 4.2

New Features

Bug Fixes

Compatibility Considerations

VideoWriter in Image Acquisition Tool

Support for VideoWriter has been added to the disk logging for the Image Acquisition Tool. This was added to the Image Acquisition Toolbox (command-line) in version R2011a, and is now also available in the Image Acquisition Tool.

This provides additional codecs, including MJPEG2000, and large file support.

For more information on using VideoWriter for logging, see [Logging Your Data](#) or the Desktop Help for the **Logging** tab in the Tool.

New Hardware Support - QImaging

The QImaging support has been upgraded to use the version 2.x of the QImaging drivers.

The toolbox supports the use of the QImaging scientific cameras, including the following:

- EXi Aqua
- EXi Blue
- Retiga-4000DC
- Retiga-2000DC
- Retiga-SRV
- Retiga-4000R
- Retiga-2000R
- Rolera-MGi Plus
- Rolera EM-C²
- Rolera-XR
- QIClick
- QICAM Fast

Support for GigE Vision on Macintosh

The GigE Vision toolbox support has been extended to include the Macintosh 64-bit platform. You can now use the GigE Vision adaptor on Windows, Linux, and Mac platforms.

For information on configuring a GigE Vision device on the Mac platform, see the Mac subsections of [Network Adaptor Configuration Notes](#) and [Software Configuration](#).

GigE Vision Upgrade to GenICam 2.2

The GigE Vision adaptor now uses the GenICam 2.2 driver. This is an upgrade from version 2.0.

As a result of the version upgrade, environment variables have changed for the GenICam installation. See [Software Configuration](#) for the updated environment variable examples.

Additional Properties in GigE Vision for Packet Loss

If you have a slower computer and experience packet loss using the GigE Vision adaptor, you can now set a packet delay to avoid overloading the computer. This is useful in solving the performance issue if you cannot achieve your camera's frame rate.

The new `PacketDelay` property will initially be set to use the value that is your camera's default value. You can then adjust the value if needed. The `TimeStampTickFrequency` property is read-only but is available for calculating the actual packet delay value is being used.

For more information on the new `PacketDelay` property and how to calculate packet delay, see this solution:

<https://www.mathworks.com/support/solutions/en/data/1-F36R0R/index.html>

GigE Vision Property Removal

In R2011a, support for non-standard vendor-specific properties for GigE Vision hardware was added to the toolbox. As part of this support, the `AcquisitionMode` property was accidentally exposed. However, this property did not work - you could set the property, but the toolbox would reset it every time an acquisition started. Therefore the property is being removed.

Compatibility Considerations

The `AcquisitionMode` property is being removed, since it was not meant to be exposed. If you used this property in R2011a, you should remove it from your scripts. Using the property will result in an error, which can be avoided by removing the use of the property from any code or scripts.

If you need to modify how an acquisition is performed, you can use standard toolbox triggering properties, such as `FramesPerTrigger`, `TriggerRepeat`, etc.

R2011a

Version: 4.1

New Features

Bug Fixes

Compatibility Considerations

GigE Vision Enhancements

Support for vendor-specific properties is now available in the GigE Vision adaptor. In addition to the general source properties, you can now use most vendor-specific properties that your hardware supports.

You can use these vendor-specific properties both in the command-line toolbox, and the Image Acquisition Tool. In the Image Acquisition Tool, they are available on the **Device Properties** tab. You can also access them when using the From Video Device block, using the **Edit Properties** button on the Source Block Parameters dialog box.

You can get property help for device-specific properties using the `imaqhelp` function. See `imaqhelp` for more information.

Added VideoWriter and New Codecs to Disc Logging

Support for VideoWriter has been added to the disc logging for the toolbox. This provides additional codecs, including MJPEG2000, and large file support.

Note that this support is only available in the command-line toolbox. It is not supported in the Image Acquisition Tool.

For more information on using VideoWriter, see *Acquiring Image Data > Logging Image Data to Disk > Logging Data to Disk Using VideoWriter* in the Image Acquisition User's Guide.

New Hardware Support — Matrox

Support has been added for additional Matrox hardware.

Support has also been added for Matrox hardware on 64-bit Windows.

In addition to the Solios and Helios families of frame grabbers, the Radient family is now supported. This includes support for these new boards:

- Radient eCL
- Solios eV-CL

New Hardware Support — Dalsa

Support has also been added for DALSA hardware on 64-bit Windows.

Support has been added for additional DALSA hardware:

- Xcelera-CL LX1 Base
- Xcelera-CL PX4 Dual
- Xcelera-CL PX4 Full
- Xcelera-CL PX4 SE
- Xcelera-CL + PX8 Full (Preliminary)
- Xcelera-HS PX8 (Preliminary)
- Xcelera-LVDS PX4

-
- XRI-1600
 - Xcelera-AN LX1 Quad

Changes in Coreco and Sapera Support

The following changes have been made in order to update DALSA support for 64-bit operating systems and for Windows 7:

- Rename the `coreco` adaptor to `dalsa`.
- Drop support for custom errors when using Sapera 5.
- Transition support for the IFC adaptor to a new adaptor called `dalsai fc`.

Compatibility Considerations

The `coreco` adaptor has been renamed `dalsa`.

The `imaqhwinfo` and `videoinput` commands will detect if a user uses the adaptor name `coreco`, and will replace it with `dalsa`. This will be accompanied by a warning.

Loading of saved resources in `.mat`, `.iat`, and `.mdl` files will be transitioned to the new name in the same manner, and also be accompanied by a warning.

Support for custom errors when using Sapera 5 is discontinued, in order to better support Sapera 6 and 7.

In R2008b the toolbox discontinued support of version 5 of Sapera and began to generate an error if it was used. This error no longer appears, and the old adaptor will not load.

Support for the IFC adaptor is transitioned to a new adaptor called `dalsai fc`.

The original `coreco` adaptor could be used for both IFC and Sapera. In order to support upgrades to the current `dalsa` adaptor, we have broken out the IFC support into a separate adaptor called `dalsai fc`.

The `imaqhwinfo` and `videoinput` commands will detect if a user specifies the adaptor name `coreco` and `dalsai fc` is loadable on the system, then it will replace it with `dalsai fc`. This will be accompanied by a warning.

Loading of saved resources in `.mat`, `.iat`, and `.mdl` files is transitioned to the new name in the same manner, and is accompanied by a warning.

GigE Vision Triggering Properties Now Device-Specific

In order to allow for vendor-specific properties to be supported in the GigE Vision adaptor, triggering properties will be set as device-specific properties. This affects only customers who adopted the use of the GigE adaptor that was released in R2010b and who are using hard-coded calls to `triggerconfig` for hardware triggering. You will now be able to set up more advanced triggering properties using the vendor-specific properties that your hardware supports.

Compatibility Considerations

If you used a general `TriggerCondition` property value such as `FallingEdge` or `RisingEdge`, or a `TriggerSource` property value such as `Line1-FrameStart`, you need to use a device-specific property going forward.

For example, you might now use a `TriggerCondition` property value such as `DeviceSpecific` and a `TriggerSource` property value such as `DeviceSpecific`, and then set the `FrameStartTriggerSource` device-specific property to `Line1`, `FrameStartTriggerMode` to `On`, and `FrameStartTriggerActivation` to `RisingEdge`.

If you continue to use the general `triggerconfig` values, you will get a warning, though the toolbox attempts to set device-specific values for you.

An example warning:

```
Warning: With the current version of the GigE Vision adaptor, hardware triggering has changed. However, we will attempt to configure the hardware trigger as specified.
```

In R2011a, the old trigger configurations are removed and a warning is issued, as described above, and the toolbox sets device-specific properties if it can detect them. In a future release, the toolbox will error if an old trigger configuration is used.

R2010b

Version: 4.0

New Features

Bug Fixes

GigE Vision Support

GigE Vision hardware is now supported.

For information on installing and configuring GigE Vision devices, see [Configuring GigE Vision Devices](#).

For troubleshooting information, see [GigE Vision Hardware](#).

Linux Support

The Image Acquisition Toolbox software and the Image Acquisition Tool are now supported for use on Linux systems.

For troubleshooting information, see [Linux Video Hardware](#) and [Linux DCAM IEEE 1394 Hardware](#).

Deployable Code Generation in the From Video Device Block

The Image Acquisition Toolbox software's Simulink block, the From Video Device block, now supports deployable code generation. You can generate code from the block.

This enables models containing the From Video Device block to run successfully in Accelerator, Rapid Accelerator, External, and Deployed Modes. The block also now supports the use of the `packNGo` function from the Real-Time Workshop® software.

For more information, see [Code Generation](#).

Macintosh Support

The Image Acquisition Toolbox software and the Image Acquisition Tool are now supported for use on Macintosh systems.

For troubleshooting information, see [Macintosh Video Hardware](#) and [Macintosh DCAM IEEE 1394 Hardware](#).

New Matrox Hardware Support

Support has been added for the following Matrox hardware:

- Solios GigE
- Helios eD/XD
- Solios eA
- Solios eCL
- Morphis
- Morphis QxT
- Vio

For the latest information about supported hardware, visit the Image Acquisition Toolbox product page at the MathWorks Web site www.mathworks.com/products/imaq.

R2010a

Version: 3.5

New Features

Bug Fixes

Compatibility Considerations

Session Log in the Image Acquisition Tool

The new session log dynamically records every action you perform in the Image Acquisition Tool. The corresponding command-line functionality for actions on a `videoinput` object or `videosource` object is reflected in the log. The title displays the name of the device, as shown in the **Hardware Browser**.

You can save the contents of the session log to a MATLAB code file or copy it to another source. For more information, see [Saving and Copying the Image Acquisition Tool Session Log](#).

Additional Export Location in the Image Acquisition Tool

You can now export data to an `.avi` file after it has been acquired. Previously you could export data to a MAT-file, the MATLAB Workspace, or a tool in the Image Processing Toolbox (Image Tool, Image File, or Movie Player). Now you can also export to an `.avi` file and set `.avi` file options, such as compression, on the export.

For more information, see [Exporting Data in the Image Acquisition Tool](#).

Support for Additional DCAM Trigger Modes

You can now use all trigger modes and all trigger inputs supported by DCAM cameras, as of R2010a. Previous toolbox releases supported only trigger mode `0`. Support for the additional trigger modes and inputs will not affect any existing code you may be using.

For information on the additional trigger modes, including use of parameters, see [Setting DCAM-Specific Trigger Modes](#).

Disk Logging on Windows Vista 64-bit Platforms

When using Windows Vista™ 64-bit platforms, if you used disk logging to an `.avi` file, you could see a crash if there was no colormap set. With other versions of Windows, you could see corrupted data.

Compatibility Considerations

Now if you use disk logging to an `.avi` file without setting a colormap, you will get a warning and a default grayscale colormap will be set in order to avoid this problem.

WhiteReference Property Ignored for Matrox Devices

In previous versions of the Matrox adaptor, the properties `WhiteReference`, `BlackReference`, and `InputGain` could all be used. Starting in R2010a, the `WhiteReference` property will be ignored.

This applies to the following devices:

- Matrox Helios XA
- Matrox Odyssey XA
- Matrox Solios XA

Compatibility Considerations

The first phase of deprecating this property is that the `WhiteReference` property will be ignored. You should use the `BlackReference` property and the `InputGain` property. You will receive a warning if you use the `WhiteReference` property and it will be ignored. The warning specifies that you can use `BlackReference` property and the `InputGain` property together.

The second phase of the deprecation, in a future release, is that you will receive an error. The third stage, in a future release, will be removal of the property.

R2009b

Version: 3.4

New Features

Bug Fixes

Custom getter in the Adaptor Kit

You can now query properties from a camera in the adaptor kit using the custom getter. This allows you to return the current value of a dynamically changing property, and execute a function when you get the property value.

Suppose you have a camera that has a cooler to control the temperature of the camera. You may need to make an acquisition when it reaches a certain temperature. You could use the custom getter to query the temperature property of the camera.

This custom getter functionality works for properties that have an underlying storage type of `double`, `int`, `double array`, and `int array`.

See *Querying Device Properties* in the Image Acquisition Toolbox Adaptor Kit User's Guide for information on this feature.

R2009a

Version: 3.3

New Features

Bug Fixes

Compatibility Considerations

Windows 64 Support

Support for 64-bit versions of Windows for the following adaptors has been added:

- National Instruments
- Hamamatsu
- QImaging
- Winvideo

Note The Image Acquisition Toolbox software does not impose any restrictions on the Windows 64 support for the above listed vendors. However, the vendors may impose restrictions. If you encounter any problems, please see your vendor or driver documentation.

Image Acquisition Tool Enhancements

Minor enhancements have been added to the Image Acquisition Tool, including the ability to register third-party adaptors.

To register a third-party adaptor, click **Tools > Register a Third-Party Adaptor** on the Image Acquisition Tool menu.

New Hamamatsu Hardware Support

Support has been added for the following Hamamatsu hardware:

- 1394b S800 ORCA-R2
- C9300-221

For the latest information about supported hardware, visit the Image Acquisition Toolbox product page at the MathWorks Web site www.mathworks.com/products/imaq.

Bug Fix: Changing ROI Now Affects the Frame Rates for QImaging Devices

A previous bug where you could not increase the frame rate by specifying the region of interest for QImaging devices is fixed. It is now possible to increase the frame rate by specifying the region of interest.

For example, the following code where `ROIPosition` is changed would now affect the frame rate:

```
video_object =videoinput('qimaging',1,'MON016_512x512');
set(video_object,'ROIPosition',[XOffset, YOffset, Width, Height]);
start(video_object);
for i=1:number_of_frames
    tic
    trigger(video_object);
    wait(video_object,15,'logging');
    elapsedTime = elapsedTime + toc;
    frameNumber = frameNumber + 1;
end
```

Property Removed from Matrox Helios XA and Solios XA Boards

Support for the `TriggerFormat` property is being removed for the following Matrox boards:

- Helios XA
- Solios XA

Compatibility Considerations

Customers who use the `TriggerFormat` property for these boards are affected. This property is no longer supported. The trigger format can be specified in the DCF camera configuration file created by Matrox Intellicam.

Bug Fix: Trigger Names for Matrox Helios XA and Solios XA Boards Fixed

The trigger names for the Helios XA boards were not correct. The timer trigger sources for the Solios XA and the Helios XA boards were also not correct. In both cases, they were using the XCL trigger names.

These have been corrected and now the XA boards are using the XA triggers and the XCL boards are using the XCL triggers.

Compatibility Considerations

Customers who were using the old trigger names will need to update their code to use the correct trigger names.

Bug Fix: Image Acquisition Tool Disk Logging Now Works on Systems with Non-US Locales

There was a bug that prevented the Image Acquisition Tool from working properly when used on systems with non-US locales and when using the disk logging feature. Now when you use the disk logging feature on a non-US system, it will work properly.

New Trigger Configuration Names for Some DALSA Sopera Boards

In previous releases of the Sopera adaptor, some boards had trigger sources `trigger3`, `trigger4`, and `trigger5`. In the current release of the Sopera driver, these trigger sources have actual names. Note that the sources `trigger1` and `trigger2` correspond with actual inputs on the board, while trigger sources 3, 4, and 5 do not.

Compatibility Considerations

The only customers that will be impacted are those that were using previously supported boards and the improper trigger source names. These boards are:

- x64-CL iPro

- x64-LVDS
- x64 Full
- x64 Dual

For these boards, in R2008b the trigger sources use their actual names:

- **trigger3** - boardSync
- **trigger4** - toBoardSync
- **trigger5** - cameraControlToBoardSync

In R2008b if you attempt to set the trigger source to trigger3-5, you will receive a warning and the new trigger source name will be used. In R2009a, you will receive an error message, and in R2009b, you will receive the standard invalid trigger source error message.

Note that the old names will only show up in the warning, and will not show up in the output from `triggerinfo` or `triggerconfig`.

Loading saved objects is not an issue. Potentially an object saved in R2008a would not load in R2009a or beyond once the warning message is turned into an error. However, trigger configurations of `videoinput` objects are not saved. Therefore trigger configurations which will be invalid in R2009a will not be saved for objects in R2008a or earlier.

R2008b

Version: 3.2

New Features

Bug Fixes

Compatibility Considerations

Interactive ROI Tool

You can now select a region of interest (ROI) interactively while previewing your image data in the Image Acquisition Tool. The interactive tool lets you select and adjust a region of interest in the **Preview Window** while previewing. The drag-and-draw mechanism makes setting a region of interest much easier and faster.

For more information on this feature see [Setting a Region of Interest Interactively](#).

Additional Export Locations

You can export data that has been acquired in memory in the Image Acquisition Tool to a MAT-file or the MATLAB Workspace. In R2008b you can export to additional locations, including Image Tool and Image File for single-frame acquisitions, and Movie Player for multiple-frame acquisitions. These three options are provided by the Image Processing Toolbox software.

For more information on exporting data, see [Exporting Data](#).

New .avi File Save Option

In the Image Acquisition Tool, when you log an acquisition to disk, it is saved as an .avi file. In version R2008b an option was added to automatically increment the .avi file names. This is useful if you want to acquire multiple videos of one or more subjects. For example, a lab technician may want to acquire 10 seconds of video on a group of five different cultures and save them for later analysis. The technician may want resulting file names such as `sample_0001.avi`, `sample_0002.avi`, etc. This new option allows for automatic file name incrementing like this example.

For more information on logging data to .avi files, see [Disk Logging](#).

Improved Device Properties Tab

The **Device Properties** tab in the Image Acquisition Tool is used to set device-specific properties. In R2008b, the **Device Properties** pane has been improved. Most properties now feature a slider for setting the value, in addition to the capability of setting it manually. You can adjust the slider while previewing and see the results dynamically.

Property help was also added in the pane. Right-click a property name and select **What's This?** to see the help on that property.

For more information on setting device properties, see [Setting Device-Specific Parameters](#).

Preview Window Has 16-Bit Data Support

The Image Processing Toolbox Preview window and the Preview window that is built into the Image Acquisition Tool now support the display of up to 16-bit image data. The Preview window was designed to only show 8-bit data, but many cameras return 10-, 12-, 14-, or 16-bit data. The Preview window display now supports these higher bit-depth cameras.

Additional DALSA Hardware Support

Support has been added for the following new DALSA hardware:

-
- X64 Xcelera-CL PX4 Dual
 - X64 Xcelera-CL PX4 Full
 - X64-CL-Express
 - PC2-Comp Express

For the latest information about supported hardware, visit the Image Acquisition Toolbox product page at the MathWorks Web site www.mathworks.com/products/imaq.

The Image Processing Toolbox Software Required to Use the Image Acquisition Toolbox Software

The Image Acquisition Toolbox product, including the Image Acquisition Tool, now requires you to have a license for the Image Processing Toolbox product starting in R2008b.

If you already have the Image Processing Toolbox product, you do not need to do anything.

If you do not have the Image Processing Toolbox product, the Image Acquisition Toolbox software R2008a and earlier will continue to work. If you want to use R2008b or future releases, and you have a current active license for the Image Acquisition Toolbox software, you can download the Image Processing Toolbox product for free. New customers will need to purchase both products to use the Image Acquisition Toolbox product.

If you have any questions, please contact MathWorks customer service.

New Trigger Configuration Names for Some DALSA Sopera Boards

In previous releases of the Sopera adaptor, some boards had trigger sources `trigger3`, `trigger4`, and `trigger5`. In the current release of the Sopera driver, these trigger sources have actual names. Note that the sources `trigger1` and `trigger2` correspond with actual inputs on the board, while trigger sources 3, 4, and 5 do not.

Compatibility Considerations

The only customers that will be impacted are those that were using previously supported boards and the improper trigger source names. These boards are:

- x64-CL iPro
- x64-LVDS
- x64 Full
- x64 Dual

For these boards, in R2008b the trigger sources will use their actual names:

- **trigger3** - boardSync
- **trigger4** - toBoardSync
- **trigger5** - cameraControlToBoardSync

In R2008b if you attempt to set the trigger source to `trigger3-5`, you will receive a warning and the new trigger source name will be used. In R2009a, you will receive an error message, and in R2009b, you will receive the standard invalid trigger source error message.

Note that the old names will only show up in the warning, and will not show up in the output from `triggerinfo` or `triggerconfig`.

Loading saved objects is not an issue. Potentially an object saved in R2008a would not load in R2009a or beyond once the warning message is turned into an error. However, trigger configurations of `videoinput` objects are not saved. Therefore trigger configurations which will be invalid in R2009a will not be saved for objects in R2008a or earlier.

R2008a

Version: 3.1

New Features

Bug Fixes

Compatibility Considerations

New Hamamatsu Hardware Support

Support has been added for the following new hardware:

- Hamamatsu C9100-13

For the latest information about supported hardware, visit the Image Acquisition Toolbox product page at the MathWorks Web site www.mathworks.com/products/imaq.

National Instruments RTSI Support

Some National Instruments boards support RTSI, which is a real-time system interface that allows you to use multiple boards together. This feature involves hardware synchronization. The Image Acquisition Toolbox software now supports use of the RTSI functionality in National Instruments boards that are supported by the toolbox.

Corrected Spelling of Two QImaging Device-Specific Property Values - Phase 3

In release R2007a, the following QImaging device-specific property values were changed to correct the spelling:

- The fan speed property value `ThreeQuater` is now correctly spelled `ThreeQuarter`.
- The readout speed property value `2M5` is now correctly spelled `2.5M`.

Compatibility Considerations

In R2007a, use of the incorrect spelling produced a warning. In R2007b, use of the incorrect spelling produced an error. In this release, the incorrectly spelled property name will no longer work.

For detailed information on the property spelling changes and the new error, see [Compatibility Considerations for R2007a](#) on page 33-2.

R2007b

Version: 3.0

New Features

Bug Fixes

Compatibility Considerations

Introduction of the Image Acquisition Tool

The functionality of the Image Acquisition Toolbox software is now available in a desktop application. You connect directly to your hardware in the tool and can preview and acquire image data. You can log the data to MATLAB in several formats, and also generate an AVI file, right from the tool.

The Image Acquisition Tool provides a desktop environment that integrates a preview/acquisition area with acquisition parameters so that you can change settings and see the changes dynamically applied to your image data.

You can open the Image Acquisition Tool by doing one of the following:

- Type `imaqtool` at the MATLAB command line.
- Select **Start > Toolboxes > Image Acquisition > Image Acquisition Tool** from MATLAB.

Support for National Instruments Hardware

The Image Acquisition Toolbox software now supports image hardware from National Instruments. The following hardware is supported:

- PCI-1405, PCI-1407, PCI-1409, PCI-1410, PCI-1411, PCI-1422, PCI-1424, PCI-1426, and PCI-1428
- PCIe-1427, PCIe-1429, and PCIe-1430
- PXI®-1407, PXI-1409, PXI-1411, PXI-1422, and PXI-1428

For the latest information about supported hardware, visit the Image Acquisition Toolbox product page at the MathWorks Web site www.mathworks.com/products/imaq.

Corrected Spelling of Two QImaging Device-Specific Property Values - Phase 2

In the previous release, R2007a, the following QImaging device-specific property values were changed to correct the spelling:

- The fan speed property value `ThreeQuater` is now correctly spelled `ThreeQuarter`.
- The readout speed property value `2M5` is now correctly spelled `2.5M`.

Compatibility Considerations

In R2007a, use of the incorrect spelling produced a warning. In this release, R2007b, use of the incorrect spelling will produce an error.

For detailed information on the property spelling changes and the new error, see Compatibility Considerations for R2007a on page 33-2.

R2007a

Version: 2.1

New Features

Bug Fixes

Compatibility Considerations

New Image Acquisition Toolbox Simulink Block

A new Simulink block, the From Video Device block, allows Simulink users to acquire image and video data streams from image acquisition devices such as cameras and frame grabbers in order to incorporate the image data into a Simulink model. The new block also offers the ability to configure and preview the acquisition directly from Simulink.

Compatibility Considerations

The former Image Acquisition Toolbox block, the Video Input block, is obsolete. If you have models that use the Video Input block, you should change them to use the new From Video Device block, which offers additional functionality and features.

New Hardware Support

- **Support for additional QImaging devices** - Retiga 2000RV, Retiga 4000RV, and Rolera MGi.
- **Support for additional Matrox devices** - Helios XA and Solios XA.

For the latest information about supported hardware, visit the Image Acquisition Toolbox product page at the MathWorks Web site www.mathworks.com/products/imaq.

Improved DCAM Driver

The Image Acquisition Toolbox software now uses an improved DCAM adaptor, which uses version 6.4.2 of the CMU DCAM driver. The new driver supports 1394B firewire and DCAM 1.3.1. It also supports new frame rates of 120 and 240 frames per second.

Corrected Spelling of Two QImaging Device-Specific Property Values

The following QImaging device-specific property values have changed to correct the spelling:

- The fan speed property value `ThreeQuater` is now correctly spelled `ThreeQuarter`.
- The readout speed property value `2M5` is now correctly spelled `2.5M`.

Compatibility Considerations

Fan Speed Property

Some QImaging video input source objects have a fan speed property if the camera supports it. If they do, one of the possible values is $\frac{3}{4}$ speed. This property value was misspelled as `ThreeQuater` instead of `ThreeQuarter` (when the QImaging adaptor was introduced in the Image Acquisition Toolbox software Version 1.9, Release 2006a). The change allows the correct spelling to work instead of causing an error.

VIDEOINPUT objects: When loaded from MAT files, any misspelling will be silently corrected. You could notice the value is different if you inspect the `FanSpeed` property. Misspellings saved in R2006a/R2006b would load seamlessly in R2007a (backward compatible). Corrected spellings saved in R2007a, however, would error (not load) in R2006a/R2006b (forward incompatible).

SET: The misspelling will be obsoleted over several releases. In R2007a both spellings will be supported (backward compatible) but the misspelling will generate a warning. In the next significant

release (IAT v2.1+1), the warning will be changed to an error that suggests correct spelling. In the following significant release (IAT v2.1+2), the error will become the standard incorrect property value response. Corrections written in R2007a would error in R2006a/R2006b (forward incompatible).

GET: Will return the correctly spelled value, even if `set` is called with the misspelling.

Readout Speed Property

Most/all QImaging video input source objects have a readout speed property. If they do, one of the possible values is 2.5 MHz. This property value was misspelled as 2M5 instead of 2.5M (when the QImaging adaptor was introduced in the Image Acquisition Toolbox software Version 1.9, Release 2006a). The change will allow the correct spelling to work instead of erroring.

VIDEOINPUT objects: When loaded from MAT files, any misspelling will be silently corrected. You could notice the value is different if you inspect the `Readout` property. Misspellings saved in R2006a/R2006b would load seamlessly in R2007a (backward compatible). Corrected spellings saved in R2007a, however, would error (not load) in R2006a/R2006b (forward incompatible).

SET: The misspelling will be obsoleted over several releases. In R2007a both spellings will be supported (backward compatible) but the misspelling will generate a warning. In the next significant release (IAT v2.1+1), the warning will be changed to an error that suggests correct spelling. In the following significant release (IAT v2.1+2), the error will become the standard incorrect property value response. Corrections written in R2007a would error in R2006a/R2006b (forward incompatible).

GET: Will return the correctly spelled value, even if `set` is called with the misspelling.

R2006b

Version: 2.0

Bug Fixes

New Hardware Support

- Hamamatsu hardware support.

(For the latest information about supported hardware, visit the Image Acquisition Toolbox product page at the MathWorks Web site www.mathworks.com/products/imaq.)

R2006a

Version: 1.10

Bug Fixes

New Hardware Support

- Support for additional Coreco boards.
- Support for the Coreco Sopera driver. The Image Acquisition Toolbox software now supports both the Coreco IFC driver and the Coreco Sopera driver.
- Support for additional Matrox boards.
- Support for QImaging devices.

For the latest information about supported hardware, visit the Image Acquisition Toolbox product page at the MathWorks Web site www.mathworks.com/products/imaq.

Support for Bayer Color Space

Native Bayer Demosaicing support has been added.

This new color space setting will interpolate Bayer pattern encoded images into standard RGB images. If your camera uses Bayer filtering, the Image Acquisition Toolbox software now supports the Bayer pattern and can return color if desired.

R14SP3

Version: 1.9.x

Bug Fixes

New Features in Version 1.9

New features introduced in this version are:

- Support for the Matrox Meteor-II/Camera Link frame grabber

For the latest information about supported hardware, visit the Image Acquisition Toolbox product page at the MathWorks Web site www.mathworks.com/products/imaq.

- Significant improvements to the Video Input block for use with Simulink
- Improved performance of the Video Preview window (the version built with Handle Graphics® components)

In addition, this version includes the inaugural release of the Image Acquisition Toolbox Adaptor Kit, Version 1.0. The adaptor kit is a C++ framework for developing hardware adaptors. You can use this kit to add support for additional hardware to the toolbox.

New Features in Version 1.9.1

This version introduces support for the Matrox Helios XCL camera link frame grabber. Note that this device requires Matrox Imaging Library (MIL), Version 8.0.

Upgrading from an Earlier Release

The following issue is related to upgrading from a previous release:

- The Helios XCL requires Matrox Imaging Library (MIL), Version 8.0.

R14SP2

Version: 1.8

New Features

User-Customizable Video Preview Window

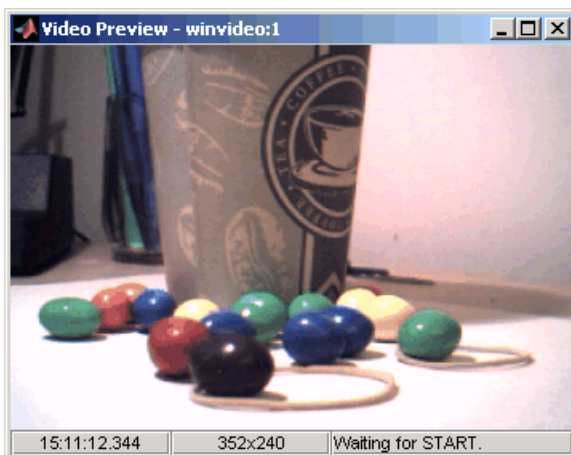
The Image Acquisition Toolbox software includes a new open-architecture reimplementaion of the Video Preview window. The new Video Preview window provides the same capabilities as its predecessor: it displays a live preview of the video stream from a particular video input object, with information about the video resolution, video frame timestamp, and the status of the video input object.

In addition, because this previewing capability is built using standard MATLAB Handle Graphics features, you can access the video data using standard Handle Graphics techniques. For example, you can now use the `preview` function to direct the live preview video stream to any Handle Graphics image object. This lets you include the previewing capability in GUIs of your own creation.

To start the Video Preview window, use the `preview` function, as follows:

```
vid = videoinput('winvideo');
preview(vid)
```

The Video Preview window displays a preview of the live video stream being provided by the device.



Stopping the Live Preview Video Stream

The toolbox includes a new function, `stoppreview`, that you can use to stop the live preview video stream for a specific video input object. For example, the following code stops the preview video stream started in the previous example:

```
stoppreview(vid)
```

Support for Format 7 Added to the DCAM Adaptor

The Image Acquisition Toolbox DCAM adaptor now supports DCAM Format 7 (also called partial scan format). When creating a video input object with the DCAM adaptor, the prefix `F7_` identifies Format 7 video formats in the list of formats returned by `imaqhwinfo`.

Getting Information About the Native Data Type

With this release, `imaqhwinfo` now includes information about the native data type of a device, based on the video format used to create the video input object.

To get this information, call the `imaqhwinfo` function specifying a video input object as an argument. `imaqhwinfo` returns a structure containing information about the object and this structure now contains a `NativeDataType` field that contains this information.

Acquiring Data in Single-Precision Format

The `getdata` function can now return image data in single-precision format.

Major Bug Fixes

Version 1.8 of the Image Acquisition Toolbox software includes the following bug fixes.

DCAM Monochrome 16-Bit Formats Returned as Big-Endian

The DCAM adaptor now correctly returns data in Mono 16-bit format as big-endian, as specified in the DCAM specification (1.30). Previously, the DCAM adaptor returned Mono 16-bit data in little-endian.

Preview No Longer Produces Errors when ROIPosition Is Set for Matrox Meteor-II/1394

You can now preview data from the Matrox Meteor-II/1394 board after configuring the `ROIPosition` property. Previously, previewing produced the following error:

```
??? matrox: DigControl Error  
Value is out of range  
(Error detected on 1394 system)
```

Miscellaneous Fixes to Video Input Block

This release includes several fixes to the Video Input block in the Image Acquisition Block Library. The fixes include the following:

- The Source Block Parameters dialog box now updates the **Input video format** list when you change the selected device.
- The Source Block Parameters dialog box no longer contains duplicate entries in the **Input video format** list.

Upgrading from a Previous Release

The following issue is related to upgrading from a previous release.

Update of the IFC Libraries Used with Coreco Devices

The Image Acquisition Toolbox software now requires Version 5.8.0 of the IFC libraries when you are working with Coreco devices.

Known Software and Documentation Issues

This section describes some known software issues with Version 1.8:

- “General Issues” on page 37-4
- “Matrox Matrox Devices” on page 37-5

- “Data Translation Devices” on page 37-6
- “Image Acquisition Block Library” on page 37-6

General Issues

- Warning messages indicating that the toolbox was unable to allocate memory can be displayed multiple times under the following scenario:
 - a The Video Preview window is open.
 - b The `imaqmem` function is used to limit memory to a very small amount.
 - c Hardware trigger executes, initiating an acquisition.

To prevent this problem, close the Video Preview window.

- You might encounter a problem logging data to an AVI file. For example, the value of the `DiskLoggerFrameCount` property might remain at 0 (zero). To remedy this problem, try changing the value of the AVI file object's `Compression` property to `'none'`.

Video Preview Window Performance Issues

The Video Preview window may experience performance issues when previewing large images or when previewing image data from multiple devices. If performance problems occur, or MATLAB appears to stop responding, the following actions may help alleviate some of these issues:

- Try reducing the size of the image being previewed. You can reduce the size by either:
 - Using the `ROIPosition` property to configure a smaller resolution
 - Resizing the preview window such that the entire image is not visible
 - Creating a custom preview window GUI by following the example in `Previewing Data in Custom GUIs` in the `Image Acquisition Toolbox User's Guide` documentation. Doing so will allow you to scale the image size down when the preview window is resized.
- Avoid previewing multiple video input objects simultaneously. In general, for best performance, preview only one video input object at a time.

If performance issues persist, you can disable the new Video Preview window and use the preview window included in previous releases. Use the following commands to disable the new Video Preview window. Note, however, that when you disable the new Video Preview window, the Handle Graphics customization features of the preview function will be unavailable.

```
imaqreset  
imaqmex('feature', '-useObsoletePreview', true)
```

Restarting MATLAB will reenable the MATLAB Handle Graphics based Video Preview window. To manually reenable the new Video Preview window, execute the following commands:

```
imaqreset  
imaqmex('feature', '-useObsoletePreview', false)
```

Generic Windows Acquisition Devices

- You cannot create multiple video input objects for the same device when the device is active. The toolbox issues an error. For example:

```
vid = videoinput('winvideo', 1);  
preview(vid)  
newvid = videoinput('winvideo', 1, 'RGB24_160x120');
```

??? Cannot access information on the image acquisition device. One or more arguments are invalid. Make sure no other objects or applications are accessing the same device.

If you close the preview window, you can create the object.

```
closepreview(vid)
newvid = videoinput('winvideo', 1, 'RGB24_160x120');
preview(newvid)
```

- There are known issues with the USB Creative WebCam drivers that can lead to crashes and computer reboots. It is recommended that you only install one of these devices per system.
- Some device drivers, most commonly Video for Windows (VFW) drivers, might request a device to be selected via a dialog box. By choosing a device from the dialog box, you can associate an image acquisition object with an installed device.

TV Tuner Devices

The following list covers known issues with TV Tuner Devices (devices with an `AnalogVideoFormat` video source property):

- Video input objects associated with a TV tuner card like the ATI Rage Theater Video Capture card might be created with an invalid analog format selected. To correct this, modify the value of the `AnalogVideoFormat` property on the currently selected video source object. (Use the `getselectedsource` function to retrieve the currently selected video source object.)
- While accessing a TV tuner card, a blue screen crash can occur if you repeatedly open and close the Video Preview window.

Matrox Matrox Devices

- The Matrox MIL or MIL-Lite Library is required and must be installed before you can use the toolbox.
- The Gencout program, which is related to the Genesis board, will start when you first try to use the toolbox. This causes MATLAB to lose focus. To work around this behavior, uninstall the Genesis Native Library. Gencout is not used by the Image Acquisition Toolbox software, but it is installed by default by the installation program for the Genesis drivers.
- It is recommended that MIL's nonpaged reserved memory be greater than the size of four incoming images. You can change this value using the Matrox MIL Configuration utility, provided with MIL.
 - For standard RS170 and CCIR monochrome formats, at least 2 MB of nonpaged memory is recommended.
 - For standard NTSC and PAL color formats, at least 8 MB is recommended.
- Two- and four-band images are not supported. Dual-channel video, however, is supported via a DCF file if the resulting image is a single band.
- UARTs are not supported.
- If the device supports exposure timers, they are exposed as video source object properties using the prefix `Timer`. These properties are implemented using the manual bypass exposure model as described in the *Matrox MIL User's Guide*. Do not set these parameters while the object is previewing or running, to avoid invalid combinations of parameters while the object is accessing the device.
- User digital inputs are not currently supported. User digital output values are exposed as video source object properties using the prefix `UserOutputBit`.

Data Translation Devices

- You should update device drivers to Imaging Omni CD 2.2 drivers. These drivers are available from the support page at the Data Translation web site.
- Data Translation drivers allow for the reservation of nonpaged, nonvolatile memory. Set this value as follows:

Devices	Reserved Memory Recommendations
3120 313x 3152	<p>Nonpaged reserved memory must be greater than the size of four incoming images. Recommended values are:</p> <p>For standard RS170 and CCIR monochrome formats, at least 2 MB of nonpaged memory</p> <p>For standard NTSC and PAL color formats, at least 8 MB</p> <p>You can change this value in the DT driver properties; see the Data Translation <i>User's Guide</i> for your hardware for more information.</p>
3152-LS 3153 3154 3155 3157	<p>Nonpaged reserved memory must be greater than the size of the total number of frames provided by the hardware for a whole trigger. Use this equation to determine the size of the total number of frames:</p> $\text{total} = \text{FramesPerTrigger} * \text{FrameGrabInterval}$ <p>where <code>FramesPerTrigger</code> and <code>FrameGrabInterval</code> are properties of the video input object. Refer to the Image Acquisition Toolbox documentation for more information on these properties.</p>

- Line scan mode for the 3152-LS is not supported.
- For the 3152-LS, 3153, 3154, 3155, and 3157 devices in immediate trigger mode, the last image frame of a trigger and the first image frame of the next trigger might not be adjacent frames in the incoming video; that is, one or more frames might be dropped between triggers.
- The 3152 might require certain color depths from your video card in order to fully function. To determine whether the proper color depth is selected, start `DTAcquire` (provided with your hardware) and verify that both 'Passthru' and 'Single Frame Acquire' function properly. If 'Passthru' fails, try using a different color depth, e.g., 24-bit truecolor instead of 32-bit truecolor.

Image Acquisition Block Library

The following are known issues with the Image Acquisition Block Library:

- Support limited to Windows video devices compatible with DirectX® — The Video Input block only supports Windows video devices that are compatible with DirectX. To determine whether a device is DirectX compatible, use the `AMCAP.EXE` utility included with the Image Acquisition Toolbox software in the `toolbox\imaq\imaq` directory. You can also download this utility from the MathWorks FTP site.

<ftp://ftp.mathworks.com/pub/tech-support/solutions/s1-1B4VP/AMCap.exe>

- Invalid devices in the Device name list — When you first open the Video Input block mask, MATLAB searches your computer and populates the Device name list in the Block Parameters dialog box with all the image acquisition devices available on your system. If you disconnect or change the device connected to the computer while MATLAB is running, the mask will not reflect

these hardware changes. The Device name list continues to list the devices initially found when the mask was first opened. The only way to update this list is to restart MATLAB; using the function `imaqreset` has no effect.

- No support for DV camcorders — The Image Acquisition block library does not currently support DV camcorders. Attempting to access the Image Acquisition block library while a DV camcorder is connected to your system will cause MATLAB to hang. This will be addressed in a future release.
- Support only for RGB24 formats — The Video Input block only supports RGB24 formats. Other video formats, such as RGB8 and Y422, cause an error when the model is run. This will be corrected in a future release.
- No preview or configuration capabilities — The Video Input block does not support a preview window, nor does it provide access to device configuration parameters. To configure a device or see a preview of the acquired data, you must use utility programs supplied with the device or third-party applications, such as the Microsoft `AMCAP.EXE` utility. The `AMCAP.EXE` utility is included with the Image Acquisition Toolbox software in the `toolbox\imaq\imaq` directory. Any device configuration performed using a third-party application will affect the device in the Simulink model.

Note Make sure to close whatever third-party application you use for previewing or configuration before running your Simulink model.
