

Image Acquisition Toolbox Release Notes

The “Image Acquisition Toolbox 1.9.x Release Notes” on page 1-1 describe enhancements and bug fixes included in the latest version of the Image Acquisition Toolbox. The following topics are discussed in these release notes.

- “New Features” on page 1-2
- “Major Bug Fixes” on page 1-3
- “Upgrading from an Earlier Release” on page 1-4
- “Known Software and Documentation Problems” on page 1-5

The Image Acquisition Toolbox Release Notes also provide information about recent versions of the product, in case you are upgrading from an earlier version.

- “Image Acquisition Toolbox 1.8 Release Notes” on page 2-1
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- “Image Acquisition Toolbox 1.6 Release Notes” on page 4-1
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- “Image Acquisition Toolbox 1.0 Release Notes” on page 7-1

Printing the Release Notes

If you would like to print the release notes, you can link to a PDF version.

Image Acquisition Toolbox 1.9.x Release Notes

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New Features

These release notes cover Image Acquisition Toolbox, version 1.9 and version 1.9.1.

New Features in Version 1.9

Version 1.9 of the Image Acquisition Toolbox introduces the following new features.

- Support for the Matrox Meteor-II/Camera Link framegrabber
(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 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

Version 1.9.1 of the Image Acquisition Toolbox introduces support for the Matrox Helios XCL camera link framegrabber. Note that this device requires Matrox Imaging Library (MIL), version 8.0.

Major Bug Fixes

To view major bug fixes made in R14SP3 and later for the Image Acquisition Toolbox, use the Bug Reports interface on the MathWorks Web site.

Note If you are not already logged in to Access Login, when you link to the Bug Reports interface (see below), you will be prompted to log in or create an Access Login account.

After you are logged in, use this Bug Fixes link. You will see the bug report for the Image Acquisition Toolbox. The report is sorted with fixed bugs listed first, and then open bugs.

For bug fixes added prior to R14SP3, see Chapter 2, “Major Bug Fixes” in the Image Acquisition Toolbox Version 1.8 release notes.

If you are viewing these release notes in PDF form on the MathWorks Web site, you can refer to the HTML form of the release notes on the MathWorks Web site and use the link provided.

Upgrading from an Earlier Release

The following are issues related to upgrading from a previous release.

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

Known Software and Documentation Problems

To view important open bugs in R14SP3 for Image Acquisition Toolbox, use the Bug Reports interface on the MathWorks Web site.

Note If you are not already logged in to Access Login, when you link to the Bug Reports interface (see below), you will be prompted to log in or create an Access Login account.

After you are logged in, use this [Open Bugs](#) link. You will see the bug report for Image Acquisition Toolbox. The report is sorted with fixed bugs listed first, and then open bugs. You can select the Status column to list the open bugs first.

If you are viewing these release notes in PDF form on the MathWorks Web site, you can refer to the [HTML](#) form of the release notes on the MathWorks Web site and use the link provided.

Image Acquisition Toolbox

1.8 Release Notes

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New Features

Version 1.8 of the Image Acquisition Toolbox includes the following new features.

- “User-Customizable Video Preview Window” on page 2-2
- “Support for Format 7 Added to DCAM Adaptor” on page 2-3
- “Getting Information about Native Data Type” on page 2-3
- “Acquiring Data in Single-Precision Format” on page 2-4

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

User-Customizable Video Preview Window

The Image Acquisition Toolbox 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 enables you to 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.

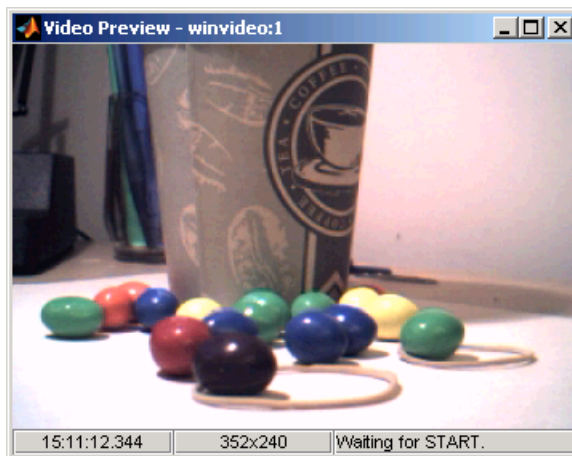


Figure 2-1: New Video Preview Window

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 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 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 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 Errors When ROIPosition Is Set for Matrox Meteor-II/1394

You can now preview data from the Matrox Meteor-II/1394 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 Blockset. The fixes include:

- 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 an Earlier Release

The following are issues related to upgrading from a previous release.

Update of the IFC Libraries Used with Coreco Devices

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

Known Software and Documentation Problems

This section describes some known software problems with this release of the Image Acquisition Toolbox.

- “General Issues”
- “Generic Windows Image Acquisition Devices” on page 2-9
- “Matrox Devices” on page 2-10
- “Data Translation Devices” on page 2-11
- “Image Acquisition Blockset” on page 2-12

General Issues

- Warning messages indicating that the toolbox was unable to allocate memory can be displayed multiple times under the following scenario:
 - a 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 steps 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 the [Previewing Data in Custom GUIs](#) section of the [User's Guide](#). 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 re-enable the MATLAB Handle Graphics based Video Preview window. To manually re-enable the new Video Preview window, execute the following commands:

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

Generic Windows Image Acquisition Devices

- You cannot create multiple video input objects for the same device when the device is active. The toolbox will issue 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 Devices

- Matrox's 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, 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 Matrox's 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 Users 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 datatranslation.com.
- 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> <ul style="list-style-type: none"> • For standard RS170 and CCIR monochrome formats, at least 2 MB of nonpaged memory • For standard NTSC and PAL color formats, at least 8 MB <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 Blockset

The following are known issues with the Image Acquisition Blockset.

- 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 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 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 Image Acquisition Toolbox function `imaqreset` has no effect.
- No support for DV camcorders — The Image Acquisition Blockset does not currently support DV camcorders. Attempting to access the Image Acquisition Blockset 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 Microsoft's `AMCAP.EXE` utility. The `AMCAP.EXE` utility is included with the Image Acquisition Toolbox 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.

Image Acquisition Toolbox

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New Features

Version 1.7 of the Image Acquisition Toolbox adds support for the following hardware.

- **Matrox Meteor-II/1394** — The Matrox adaptor now supports Matrox's Meteor-II/1394 adapter board for digital video acquisition. The Meteor-II/1394 board supports IEEE 1394 video cameras based on the IIDC Digital Camera Specification using Matrox Imaging Library (MIL)

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

Limitations of Matrox Meteor-II/1394 Support

The support for the Matrox Meteor-II/1394 board includes the following limitations:

- Automatic mode for properties is not supported.
- DCAM absolute properties are not supported.

These settings are not exposed by the Matrox MIL library and are therefore unavailable.

Known Issue with the Matrox Meteor-II/1394 Support

The Matrox Meteor-II/1394 board provides only limited support for the `ROIPosition` property. You can define a region-of-interest using the `ROIPosition` property, specifying the value as a four-element vector of the form

[XOffset YOffset Width Height]

However, for the Meteor-II/1394 board, the value of the `XOffset` and `YOffset` elements of the position vector must be 0 (zero).

Known Software and Documentation Problems

This section describes some known software problems with this release of the Image Acquisition Toolbox.

- “General Issues”
- “Generic Windows Image Acquisition Devices” on page 3-4
- “Matrox Devices” on page 3-5
- “Data Translation Devices” on page 3-6
- “Image Acquisition Blockset” on page 3-7

General Issues

- The preview window might distort displayed images when running MATLAB on a computer with an 8-bit display. Note, however, that the quality of the data logged is not affected.
- Warning messages indicating that the toolbox was unable to allocate memory can be displayed multiple times under the following scenario.
 - a Preview window is opened.
 - 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 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'`.

Generic Windows Image 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 users 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 may 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 the preview window is repeatedly opened and closed.

- Previewing is known to max out the CPU, making MATLAB unresponsive. It is recommended that users use a low resolution to reduce the CPU load.

Matrox Devices

- Matrox's MIL or MIL-Lite library is required and must be installed before using 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, 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 Matrox's 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 8MB 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 Users 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 datatranslation.com.
- Data Translation drivers allow for the reservation of nonpaged, nonvolatile memory. Set this value as follows:

Devices	Reserved Memory Recommendations
3120, 313x, and 3152	<p>Nonpaged reserved memory must be greater than the size of four incoming images. Recommended values are</p> <ul style="list-style-type: none"> • For standard RS170 and CCIR monochrome formats, at least 2 MB of non-paged memory • For standard NTSC and PAL color formats, at least 8 MB <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 if 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 Blockset

The following are known issues with the Image Acquisition Blockset.

- Invalid devices in **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 Image Acquisition Toolbox function `imaqreset` has no effect.
- No support for DV camcorders — The Image Acquisition Blockset does not support DV camcorders at this time. Attempting to access the Image Acquisition Blockset while a DV camcorder is connected to your system will cause MATLAB to hang. This will be addressed in a future release.
- Invalid formats in **Input video format** list — The formats included in the **Input video format** list in the Block Parameters dialog box are derived from the first device listed in the mask. If you change the selected device, the list of formats is not updated. Thus, the list can contain formats that are not supported by the specified device. In a future release, the block will update the formats in the **Input video format** list when the device changes.
- Duplicate entries in **Input video format** list — The **Input video format** list in the Block Parameters dialog box can contain duplicate entries. This will be corrected 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 Microsoft's `AMCAP.EXE` utility. The `AMCAP.EXE` utility is

included with the Image Acquisition Toolbox 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.

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New Features

Version 1.6 of the Image Acquisition Toolbox includes the following new features, added since Version 1.5.

- “New Image Acquisition Blockset” on page 4-2
- “DCAM Adaptor Now Supports Absolute Values” on page 4-3
- “Performance Enhancements” on page 4-4

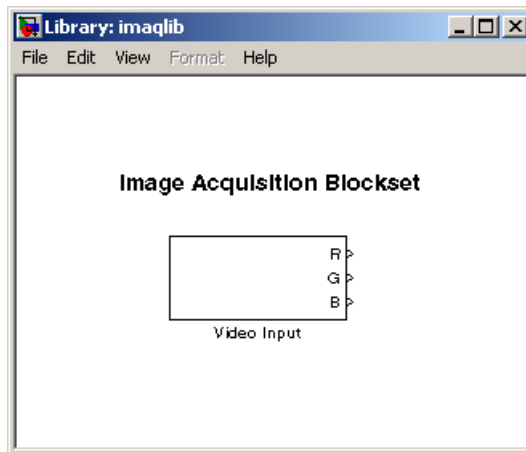
New Image Acquisition Blockset

The Image Acquisition Toolbox now includes a Simulink blockset, called the Image Acquisition Blockset. The blockset contains one block: the Video Input block. You can use this block to bring live video data into a simulation. (For information about some limitations of the blockset, see “Image Acquisition Blockset” on page 4-12.)

To open the Image Acquisition Blockset library, enter

```
imaqlib
```

at the MATLAB prompt. MATLAB displays the contents of the blockset in a separate window.



DCAM Adaptor Now Supports Absolute Values

The DCAM adaptor now supports properties that let you specify the value of a property as an absolute value, if the device supports that capability for a particular feature.

As defined by the IIDC DCAM specification, the values specified for properties can be interpreted as either relative or absolute. Relative values only have meaning in relation to a device-specific reference point. For example, if you set the shutter speed property to 4000, this value might be interpreted as 4000 seconds for one device, but 4000 milliseconds for another device. Previously, the DCAM adaptor device-specific properties only supported relative values.

To provide more precise control, the IIDC DCAM specification also defines absolute values, where the units are specified as part of the definition. For example, the DCAM specification defines the units for shutter speed property as seconds. So, if you specify a value of 0.10032 for this property, any DCAM device that supports absolute values would interpret the value as 100.32 milliseconds. To find out the units used with a feature that supports absolute values, see Appendix B of the IIDC 1394-based DCAM specification or check the documentation that came with your device.

New Properties

To support both absolute and relative values, the DCAM adaptor now provides additional device-specific properties. If a device supports absolute values for a particular feature, the DCAM adaptor creates a property, using the same feature name as the relative property but with the word “Absolute” appended to it. For example, if a device supports both relative and absolute values for shutter speed, the DCAM adaptor creates properties named Shutter and ShutterAbsolute.

When it creates an absolute value property, the DCAM adaptor also creates a property to control the type of value the device uses. This property has the same name as the feature with the word “Control” appended to it. For example, if the DCAM adaptor created the ShutterAbsolute property, it also creates a ShutterControl property.

If you set either the relative or absolute properties, the corresponding mode property is set to 'manual'. For example, if you set the ShutterAbsolute property, the value of the ShutterMode property changes to 'manual'. Setting the control property has no effect on the mode property.

Performance Enhancements

Because of a number of enhancements to the way that the toolbox handles video frames, you might notice increased performance in the following areas:

Note The actual performance improvement achieved depends on factors such as video format, resolution, and CPU speed.

- Faster acquisition with the `getdata`, `peekdata`, and `getsnapshot` functions.
- Previewing should consume less CPU overhead.
- Frame handling during acquisition should be faster.

Major Bug Fixes

This release includes the following major bug fix.

- For long acquisitions, the metadata information reported from `getdata` was sometimes incorrect. This included reporting the wrong values for the `AbsTime` and `FrameNumber` fields of the `getdata` metadata structure. This has been fixed.

Upgrading from a Previous Release

The following are some changes from previous releases.

- The `FieldStart` property for the Coreco PC-Vision device has been removed. To specify which field the device uses as the first field for an interlaced video signal, use the `StartingField` property.
- The way the toolbox determines the default value of device-specific properties for Matrox devices has changed. In some cases, the initial value of the property at object creation time (and the default value returned by the `propinfo` function) might be different than what was returned in previous releases. To ensure that properties that are important to your application have the value you expect, you should explicitly set them. Do not depend on the default value.

Known Software and Documentation Problems

This section describes some known software problems with this release of the Image Acquisition Toolbox.

- “General Issues”
- “Generic Windows Image Acquisition Devices” on page 4-8
- “Matrox Devices” on page 4-10
- “Data Translation Devices” on page 4-11
- “Image Acquisition Blockset” on page 4-12

General Issues

- The preview window might distort displayed images when running MATLAB on a computer with an 8-bit display. Note, however, that the quality of the data logged is not affected.
- Warning messages indicating that the toolbox was unable to allocate memory can be displayed multiple times under the following scenario.
 - a Preview window is opened.
 - 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 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'`.

Generic Windows Image 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 users 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 may 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.)
- Some TV tuner cards might not honor the value of the FrameGrabInterval property. The ATI TV Wonder VE card is known to have this problem.

- While accessing a TV tuner card, a blue screen crash can occur if the preview window is repeatedly opened and closed.
- Some TV tuner cards may not be able to access video formats such as YVU9 or YV12. Although the `imqhwinfo` function might report these formats as supported, attempts to acquire from them can fail. The ATI TV Wonder VE card is known to have this problem.
- Previewing is known to max out the CPU, making MATLAB unresponsive. It is recommended that users use a low resolution to reduce the CPU load.

Matrox Devices

- Matrox's MIL or MIL-Lite library is required and must be installed before using 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, 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 Matrox's 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 8MB 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 Users 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 datatranslation.com.
- Data Translation drivers allow for the reservation of nonpaged, nonvolatile memory. Set this value as follows:

Devices	Reserved Memory Recommendations
3120, 313x, and 3152	<p>Nonpaged reserved memory must be greater than the size of four incoming images. Recommended values are</p> <ul style="list-style-type: none"> • For standard RS170 and CCIR monochrome formats, at least 2 MB of non-paged memory • For standard NTSC and PAL color formats, at least 8 MB <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 if 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 Blockset

The following are known issues with the Image Acquisition Blockset.

- Invalid devices in **Device name** menu — When you first open the Video Input block mask, MATLAB searches your computer and lists all of the available devices in the **Device name** menu in the Block Parameters dialog box. If you disconnect or change the cameras connected to the computer while MATLAB is running, the mask will not reflect these hardware changes. The menu will continue 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 Image Acquisition Toolbox function `imaqreset` has no effect.
- No support for DV camcorders — The Image Acquisition Blockset does not support DV camcorders at this time. Attempting to access the Image Acquisition Blockset while a DV camcorder is connected to your system will cause MATLAB to hang. This will be addressed in a future release.
- Invalid formats in **Input video format** menu — The list of formats displayed in the **Input video format** menu in the Block Parameters dialog box is derived from the first device listed in the mask. If you change the selected device, the list of formats in this menu is not updated. Thus, the menu can contain formats that are not supported by the specified device. In a future release, the block will update the list of formats in the **Input video format** menu when the device changes.
- Duplicate entries in **Input video format** menu — The **Input video format** menu in the Block Parameters dialog box can contain duplicate entries. This will be corrected 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 Microsoft's `AMCAP.EXE` utility. The `AMCAP.EXE` utility is included with the Image Acquisition Toolbox 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.

Image Acquisition Toolbox

1.5 Release Notes

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New Features

The Image Acquisition Toolbox 1.5 includes the following new features, added since Version 1.1.

Additional Hardware Support

The Image Acquisition Toolbox provides support for specific image acquisition devices by providing adaptors that enable a connection between MATLAB and devices. The toolbox supports devices from specific hardware vendors, such as Matrox or Data Translation, or for general categories of devices, such as consumer-level video devices that support a connection via DirectX or Video for Windows drivers.

This release provides support for the following additional vendors and device categories.

- Coreco Imaging, Inc. image acquisition devices, including the PC2-Vision, the PCVision, the PCVisionplus, the PC-RGB and the PC-DIG.
- Matrox CronosPlus
- Digital cameras that comply with the IIDC 1394-based Digital Camera (DCAM) Specification

New Utility Functions

The toolbox includes the following new utility functions.

- `isrunning` — Determines if a video input object is running
- `islogging` — Determines if a video input object is logging
- `obj2mfile` — Saves a video input object by creating an M-file containing the commands necessary to recreate the object

Changes to Existing Functions

The toolbox includes the following enhancements to existing functions and properties.

- You can now specify the color space of the returned image data by setting the value of the `ReturnedColorSpace` property.
- The `imaqmem` function can now retrieve specific fields by fieldname.

-
- `flushdata` now accepts an array of video input objects
 - The `wait` function can now wait until an object stops running or logging. Previously, this function only waited until an object stopped running.

Major Bug Fixes

The Image Acquisition Toolbox 1.5 includes several important bug fixes made since Version 1.1. This section describes the particularly important Version 1.5 bug fixes.

If you are viewing these Release Notes in PDF form, please refer to the HTML form of the Release Notes, using either the Help browser or the MathWorks Web site and use the link provided.

Limitations from Previous Versions Lifted

The following are limitations that existed in previous versions of the toolbox that are no longer issues.

- Matrox acquisition devices that support image scaling now scale images correctly for any selected video source object. Previously, the toolbox only honored the `XScaleFactor` and `YScaleFactor` properties of the first video source object.
- DV devices, such as camcorders, were limited to the default 'dvsd' format provided by the device. Additional formats are now available for these devices.
- DV devices, such as camcorders, no longer experience a short lag between the preview window display, and what is actually captured by the device.

Known Software and Documentation Problems

This section also describes some known software problems with this release of the Image Acquisition Toolbox.

- General issues
- Issues with generic Windows image acquisition devices
- Issues with Matrox image acquisition devices
- Issues with Data Translation acquisition devices

General Issues

- The preview window might distort displayed images when running MATLAB on a computer with an 8-bit display. Note, however, that the quality of the data logged is not affected.
- Warning messages indicating that the toolbox was unable to allocate memory may be displayed multiple times under the following scenario.
 - a Preview window is opened
 - 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 preview window.

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

Generic Windows Image Acquisition Devices

- There are known issues with the USB Creative WebCam drivers that may lead to crashes and computer reboots. It is recommended that users 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.

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- Some TV tuner cards may not be able to access video formats such as YVU9 or YV12. Although the `imaqhwinfo` function may report these formats as supported, attempts to acquire from them may fail. The ATI TV Wonder VE card is known to have this problem.
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around this behavior, uninstall the Genesis Native Library. Gencout is not used by the Image Acquisition Toolbox, but it is installed by default by the installation program for the Genesis drivers.

- It is recommended that MIL's non-paged, reserved memory be greater than the size of 4 incoming images. This value can be changed using Matrox's MIL Configuration utility, provided with MIL.
 - For standard RS170 and CCIR monochrome formats, at least 2MB of non-paged memory is recommended.
 - For standard NTSC and PAL color formats, at least 8MB 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 Users 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

- Device drivers should be updated to Imaging Omni CD 2.2 drivers. These drivers are available from the support page at datatranslation.com.

- Data Translation drivers allow for the reservation of non-paged, non-volatile memory. This value should be set as follows:

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- The 3152 may require certain color depths from your video card in order to fully function. To determine if 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 Toolbox

1.1 Release Notes

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Enhancements

The Image Acquisition Toolbox, Version 1.1, includes the following enhancements.

- Region-of-Interest (ROI) configurations using the `ROIPosition` property are now supported for all hardware devices.
- A troubleshooting utility is now included in the `MATLABROOT/toolbox/imaq/imaq` directory called `AMCap.exe`. This utility can be used to verify that Windows video devices are working properly.
- Enhanced memory management is now provided to optimize image frame storage efficiency.
- A warning is issued when accessing Windows video hardware using an incorrect DirectX version.

Major Bug Fixes

The Image Acquisition Toolbox 1.1 includes several bug fixes made since Version 1.0. This section describes the particularly important Version 1.1 bug fixes.

- A memory leak associated with running peekdata has been fixed.
- The toolbox now stops acquisition hardware when you use Ctrl+C to interrupt the getsnapshot function.
- When using Matrox DCF camera files, the toolbox now configures all video source objects according to the camera file settings.
- A MATLAB segmentation fault that occurred when using old versions of the Matrox MIL library has been fixed. The toolbox now displays a message instead.
- A segmentation fault associated with accessing the Data Translation 3157 frame grabber has been fixed.

Image Acquisition Toolbox 1.0 Release Notes

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Introduction to the Image Acquisition Toolbox

The Image Acquisition Toolbox 1.0 is a new product from The MathWorks that enables you to connect to an image acquisition device from within a MATLAB session. Based on MATLAB object technology, the Image Acquisition Toolbox provides functions for creating objects that represent the connection to the device.

For example, the following command creates an object `vid` associated with a Matrox frame grabber. (Use the `imaqhwinfo` function to retrieve the object constructor syntax for the device installed on your system.)

```
vid = videoinput('matrox');
```

Using the properties of the `vid` object, you can control various aspects of the connection to the device.

For more information about the capabilities of the Image Acquisition Toolbox, refer to the documentation.

Software and Hardware Requirements

The toolbox requires the device drivers for the installed image acquisition hardware. For the most up-to-date list of supported hardware, go to the Image Acquisition Toolbox product page (www.mathworks.com/product/imaq).