Release Notes for Image Acquisition Toolbox™

How to Contact MathWorks

www.mathworks.com	Web
comp.soft-sys.matlab	Newsgroup
www.mathworks.com/contact_TS.html	Technical Support

suggest@mathworks.com	Product enhancement suggestions
bugs@mathworks.com	Bug reports
doc@mathworks.com	Documentation error reports
service@mathworks.com	Order status, license renewals, passcodes
info@mathworks.com	Sales, pricing, and general information

508-647-7000 (Phone)

508-647-7001 (Fax)

The MathWorks, Inc.
3 Apple Hill Drive
Natick, MA 01760-2098

For contact information about worldwide offices, see the MathWorks Web site.

Release Notes for Image Acquisition Toolbox™

Trademarks

Patents

Contents

R2011a

R2010b

R2010a

R2009b

R2009a

R2008b

R2008a

R14SP2

R2012b

Version: 4.4

New Features: Yes

Bug Fixes: Yes

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
Compatibility Considerations: Yes

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: Yes
Bug Fixes: Yes

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
Compatibility Considerations: Yes

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
Compatibility Considerations: Yes

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
Compatibility Considerations: Yes

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: Yes
Bug Fixes: Yes

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-C^2
- 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:

http://www.mathworks.com/support/solutions/en/data/1-F36R0R/index.html

GigE Vision Property Removal
Compatibility Considerations: Yes

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: Yes
Bug Fixes: Yes

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
Compatibility Considerations: Yes

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 `dalsaifc`.

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 `dalsaifc`.

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 `dalsaifc`.

The `imaqhwinfo` and `videoinput` commands will detect if a user specifies the adaptor name `coreco` and `dalsaifc` is loadable on the system, then it will replace it with `dalsaifc`. 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
Compatibility Considerations: Yes

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: Yes
Bug Fixes: Yes

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: Yes
Bug Fixes: Yes

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
Compatibility Considerations: Yes

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.

47

`WhiteReference` **Property Ignored for Matrox Devices**
Compatibility Considerations: Yes

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 a error. The third stage, in a future release, will be removal of the property.

R2009b

Version: 3.4
New Features: Yes
Bug Fixes: Yes

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: Yes
Bug Fixes: Yes

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,'MONO16_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
Compatibility Considerations: Yes

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

- Helios XA

- Soios 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
Compatibility Considerations: Yes

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.

57

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 Sapera Boards
Compatibility Considerations: Yes

In previous releases of the Sapera adaptor, some boards had trigger sources `trigger3`, `trigger4`, and `trigger5`. In the current release of the Sapera 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: Yes
Bug Fixes: Yes

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 in the Image Acquisition Toolbox documentation.

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 in the Image Acquisition Toolbox documentation.

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 in the Image Acquisition Toolbox documentation.

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 in the Image Acquisition Toolbox documentation.

Preview Window Has 16-Bit Data Support

The Image Acquisition 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 Sapera Boards
Compatibility Considerations: Yes

In previous releases of the Sapera adaptor, some boards had trigger sources `trigger3`, `trigger4`, and `trigger5`. In the current release of the Sapera 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.

69

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: Yes
Bug Fixes: Yes

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
Compatibility Considerations: Yes

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.

R2007b

Version: 3.0
New Features: Yes
Bug Fixes: Yes

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
Compatibility Considerations: Yes

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.

R2007a

Version: 2.1
New Features: Yes
Bug Fixes: Yes

New Image Acquisition Toolbox Simulink Block
Compatibility Considerations: Yes

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
Compatibility Considerations: Yes

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 ¾ 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
New Features: No
Bug Fixes: Yes

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
New Features: No
Bug Fixes: Yes

New Hardware Support

- Support for additional Coreco boards.

- Support for the Coreco Sapera driver. The Image Acquisition Toolbox software now supports both the Coreco IFC driver and the Coreco Sapera 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
New Features: No
Bug Fixes: Yes

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: Yes
Bug Fixes: No

User-Customizable Video Preview Window

The Image Acquisition Toolbox software includes a new open-architecture reimplementation 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 103

- "Matrox Matrox Devices" on page 105

- "Data Translation Devices" on page 106

- "Image Acquisition Block Library" on page 107

General Issues

- Warning messages indicating that the toolbox was unable to allocate memory can be displayed multiple times under the following scenario:

  1 The Video Preview window is open.

  2 The `imaqmem` function is used to limit memory to a very small amount.

  3 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 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.

105

- 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 `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	Nonpaged reserved memory must be greater than the size of four incoming images. Recommended values are: 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 You can change this value in the DT driver properties; see the Data Translation *User's Guide* for your hardware for more information.
3152-LS 3153 3154	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:

Devices	Reserved Memory Recommendations
3155 3157	total = FramesPerTrigger * FrameGrabInterval where `FramesPerTrigger` and `FrameGrabInterval` are properties of the video input object. Refer to the Image Acquisition Toolbox documentation for more information on these properties.

- 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 Image Acquisition Toolbox 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.

108