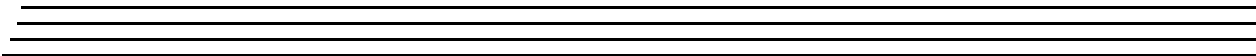
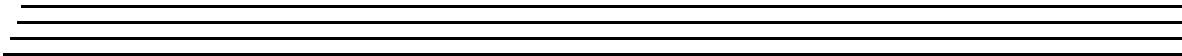
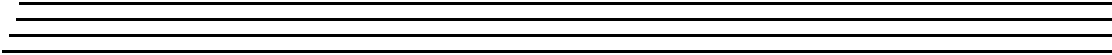




# ***DT-Active Frame Grabber Controls Getting Started Manual***



**Fourth Edition  
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# ***About this Manual***

This manual describes how to install, set up, and use the DT-Active Frame Grabber™ controls to develop application programs for Data Translation® MACH II Series frame grabber boards.

## **Intended Audience**

This manual is intended for engineers, scientists, technicians, or others responsible for developing imaging or machine vision application programs using Microsoft® Visual Basic® or Microsoft Visual C++®.

It is assumed that you are a proficient programmer, that you are experienced programming in the Windows 2000 or Windows XP operating environment on the IBM® PC or compatible computer platform, that you have familiarity with imaging or machine vision principles, and that you have clearly defined your requirements.

## **What You Should Learn from this Manual**

This manual summarizes the properties, methods, and events provided by DT-Active Frame Grabber controls and describes how to use the properties, methods, and events to develop an imaging or machine vision program. Using this manual, you should be able to successfully get started writing an application program.

This manual is intended to be used with the online help for the DT-Active Frame Grabber control that you are using. The online help contains all of the specific reference information for each of the properties, methods, and events.

## Organization of this Manual

This manual is organized as follows:

- [Chapter 1, “Introduction,”](#) describes how to add a DT-Active Frame Grabber control to your project, how to use the example programs and online help, and how to remove the software.
- [Chapter 2, “Summary of Properties, Methods, and Events,”](#) summarizes the properties, methods, and events provided with the DT-Active Frame Grabber controls.
- [Chapter 3, “Programming Flowcharts,”](#) provides programming flowcharts for using the properties, methods, and events provided with the DT-Active Frame Grabber controls.
- [Chapter 4, “Product Support,”](#) describes how to get help if you have trouble using a DT-Active Frame Grabber control.

A glossary and an index complete this document.

## Conventions Used in this Manual

The following conventions are used in this manual:

- Notes provide useful information that requires special emphasis, cautions provide information to help you avoid losing data or damaging your equipment, and warnings provide information to help you avoid catastrophic damage to yourself or your equipment.
- Items that you select or type are shown in **bold**. Property, method, and event names are also shown in bold.
- When navigating the screens, an instruction such as **Configure I Board** means to select “Board” from the drop-down menu under “Configure.”

## Related Information

Refer to the following documentation for more information on using the DT-Active Frame Grabber controls:

- Online help for the DT-Active Frame Grabber control that you are using. The online help contains all of the specific reference information for each of the properties, methods, and events provided by the DT-Active Frame Grabber control. Refer to [page 8](#) for information on how to open the help file.
- Device-specific documentation. Data Translation devices are shipped with a getting started manual and a user's manual. The getting started manual describes how to install the device, how to install the device driver for the device, and how to get started using the device. The user's manual describes the features, specifications, and connector pin assignments of the device, and the property values supported by the device.

Refer to the following documentation for programming information:

- The Microsoft documentation for your operating system.
- The online help for your programming environment.

## Where to Get Help

Should you run into problems installing or using a DT-Active Frame Grabber control, the Technical Support Department is available to provide technical assistance. Refer to [Chapter 4, "Product Support,"](#) for information on how to contact the Technical Support Department. If you are outside the U.S. or Canada, call your local distributor, whose number is listed in your Data Translation product handbook or contact the Data Translation web site ([www.datatranslation.com](http://www.datatranslation.com)).







# ***Introduction***

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## ***What is a DT-Active Frame Grabber Control?***

A DT-Active Frame Grabber control is an ActiveX® control that allows you to develop imaging and machine vision application programs in Visual Basic and Visual C++. You use a DT-Active Frame Grabber control as you would use any other ActiveX or OLE custom control in your Windows application.

Each DT-Active Frame Grabber control provides the following features:

- **Properties, methods, and/or events** – Each DT-Active Frame Grabber control has unique properties, methods, and events, described as follows:
  - Properties represent the variables that allow you to configure the operation. Properties are accessible through the Properties window and through the control's custom Property Pages. Some properties are read-only and provide information about your operation.
  - Methods are tools that you can use in your code to provide run-time control of operations. Some methods are accessible through the control's custom Property Pages.
  - Events are actions that cause code to be executed when an event occurs.
- **Multiple-device support** – DT-Active Frame Grabber controls are hardware-independent. You can add support for new devices, without altering or recompiling code at the application level, by adding a new device driver. You install the device driver separately (in the Windows environment); refer to the getting started manual for your device for more information on installing device drivers.

Note that at the present time, the DT-Active Monochrome Frame Grabber control supports the DT3162 frame grabber board and the DT-Active Camera Link Frame Grabber control supports the DT3145 frame grabber board.

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**Note:** The list of supported devices is constantly expanding. Refer to the Data Translation web site ([www.datatranslation.com](http://www.datatranslation.com)) for information on the devices and device drivers available for use with DT-Active Frame Grabber controls.

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## ***Overview of Tasks***

The following is an overview of the tasks required to install and use a DT-Active Frame Grabber control:

1. Make sure that the DT-Active Frame Grabber control has been installed. Typically, you install the appropriate DT-Active Frame Grabber control when you install the device driver for your imaging device. Refer to your device-specific documentation for installation instructions.
2. Add the DT-Active Frame Grabber control to your project. For more information, refer to the next section.
3. Create your application program. For more information, refer to your programming language documentation.

If you have problems installing or using a DT-Active Frame Grabber control, refer to [page 8](#) for information on accessing the online help, or refer to [Chapter 4, “Product Support,”](#) for information on contacting Data Translation’s Technical Support Department.

# Adding the Control to Your Project



The following sections describe how to add a DT-Active Frame Grabber control to a Visual Basic 6.0 project or a Visual C++ 6.0 project.

## Visual Basic

To add a DT-Active Frame Grabber control to a Visual Basic project, perform the following steps:

1. Select **Project | Components**.  
*The Components dialog box appears.*
2. Click the **Controls** tab.
3. Select the appropriate DT-Active Frame Grabber control(s), then click **OK**.

When the DT-Active Frame Grabber control is loaded, the appropriate icon appears in the toolbox. Refer to the following table.

DT-Active Frame Grabber Control	Icon
Monochrome	
Camera Link	

## Visual C++

To add a DT-Active Frame Grabber control to a Visual C++ project, perform the following steps:

1. Start Microsoft Visual C++ 6.0.
2. Create a new MFC project using the appropriate application wizard. Make sure that you add support for ActiveX controls.
3. Select **Project | Add to Project | Components and Controls**.  
*The Component and Controls Gallery dialog box appears.*
4. Double-click the **Registered ActiveX Controls** folder.
5. Select the appropriate DT-Active Frame Grabber control, then click **Insert**.  
*The program prompts you to insert the component and to confirm the creation of a wrapper class for accessing the control through Visual C++.*
6. If you intend to use DT-Active Frame Grabber control events, use the Class Wizard to add the event handlers.

---

**Note:** Several DT-Active Frame Grabber control methods use enumerated variables. To ensure that these enumerated variables are recognized in Visual C++, make sure that you add the following line to the beginning of your application program:

```
#import "x:\Path\Control.DLL" no_namespace
```

where *x:\Path* is the complete path to the location of the appropriate .DLL file on your system, and *Control* indicates the specific DT-Active Frame Grabber control you are using. For example, if you are using the DT-Active Monochrome Frame Grabber control under Windows 2000, you might use the following line:

```
#import "c:\WINNT\system32\DTFGCTLS.DLL" no_namespace
```

---

## Using the Example Programs

Two simple example programs are shipped with each DT-Active Frame Grabber control (one for Visual Basic and one for Visual C++). The example programs allow you to open a device and acquire image data to an internal memory buffer. You can modify the example programs to suit your particular needs and then compile the code in your particular development environment.

In addition, the DT-Acquire utility programs are provided on the Imaging OMNI CD that ships with your Data Translation device. Use DT-Acquire2 to familiarize yourself with the basic features of the DT-Active Monochrome Frame Grabber control; use DT-AcquireCL to familiarize yourself with the basic features of the DT-Active Camera Link Frame Grabber control. For more information about a DT-Acquire utility program, refer to the getting started manual for your device.

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**Note:** Additional example programs will be provided on the Data Translation web site ([www.datatranslation.com](http://www.datatranslation.com)) as they become available.

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To open the example program in Visual Basic or Visual C++, perform the following steps:

1. Open Visual Basic or Visual C++.
2. For Visual Basic, select **Programs | Data Translation, Inc** from the Windows Start menu, select the name of your imaging device, and then select **VB Example Project**.

For Visual C++, select **Programs | Data Translation, Inc** from the Windows Start menu, select the name of your imaging device, and then select **C++ Example Project**.

3. Compile the program, then run it.

## ***Using the Online Help***

This manual is intended to be used with the online help for the DT-Active Frame Grabber control that you are using. The online help contains all of the specific reference information for each of the properties, methods, and events.

To open the online help, click **Programs | Data Translation, Inc** from the Windows Start menu, select the name of your imaging device, and then select the online help for the DT-Active Frame Grabber control that you are using. To access context-sensitive help while using the DT-Active Frame Grabber control property pages, either highlight a property in the Properties window and then press **F1** or click the Help button in one of the tabs in the property pages. The help topic associated with that property/tab appears.



## Removing the Software

1

If you are having problems with a DT-Active Frame Grabber control, you may want to remove the control and then reinstall it. To remove a DT-Active Frame Grabber control, exit your programming environment, then click **Settings | Control Panel** from the Start menu. Double-click **Add/Remove Programs**. Select the name of your imaging device, and then click **Add/Remove**. All applicable files and file settings are removed.





## ***Summary of Properties, Methods, and Events***

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This chapter provides a summary of the properties, methods, and events used in the DT-Active Monochrome Frame Grabber control and the DT-Active Camera Link Frame Grabber control. For more detailed information, refer to the online help for the control. Refer to [page 8](#) for information on opening the online help.

---

**Note:** The properties described in this chapter are appropriate for Visual Basic only. If you are using Visual C++, use the associated Visual C++ methods instead. For example, to set and/or return the pixel clock source, use the Visual C++ **SetPixelClockSource** and **GetPixelClockSource** methods instead of the Visual Basic **PixelClockSource** property. For more information about Visual C++ methods, refer to the DT-Active Frame Grabber control online help.

---

## General Imaging

Property/Method Name	Description	Control
<b>OpenDevice</b> method	Opens a device.	Monochrome Camera Link
<b>CloseDevice</b> method	Closes the device previously opened using the <b>OpenDevice</b> method.	Monochrome Camera Link
<b>ActiveDevice</b> property	Closes any open device and opens the device with the specified name; returns the name of the currently open device.	Monochrome Camera Link
<b>GetDeviceName</b> method	Returns the name of the device associated with a device ID.	Monochrome Camera Link
<b>DeviceCount</b> property	Returns the number of available devices.	Monochrome Camera Link
<b>DeviceType</b> property	Returns the type of the active device.	Monochrome Camera Link

## General Imaging (cont.)

Property/Method Name	Description	Control
<b>DeviceBusy</b> property	Returns the state of the active device.	Monochrome Camera Link
<b>DrawXOrigin</b> property	Sets and returns the element in the buffer that represents the x-position of the first pixel to draw in the destination window (x-origin).	Camera Link
<b>DrawYOrigin</b> property	Sets and returns the element in the buffer that represents the y-position of the first pixel to draw in the destination window (y-origin).	Camera Link
<b>StatusMessage</b> property	Returns the status message corresponding to the current device status code.	Monochrome Camera Link
<b>Timeout</b> property	Sets and returns the timeout period used by the software.	Monochrome Camera Link
<b>DisplayMode</b> property	Sets and returns the way that you want to display images when setting up your application (DDI or GDI).	Camera Link
<b>LoadConfigFile</b> method	Opens a device configuration file and applies its settings to the current instance of the control.	Monochrome Camera Link
<b>SaveConfigFile</b> method	Saves the current device configuration to a device configuration file.	Monochrome Camera Link
<b>ShowPropPages</b> method	Displays one or more of the property pages.	Camera Link

## Input Source

Property/Method Name	Description	Control
<b>PixelClockSource</b> property	Sets and returns the pixel clock source.	Monochrome
<b>Calibrate</b> method	Automatically adjusts the quality of the images.	Monochrome
<b>Contrast</b> property	Sets and returns the contrast level for the incoming video.	Monochrome
<b>Brightness</b> property	Sets and returns the brightness level for the incoming video.	Monochrome
<b>HSyncInPolarity</b> property	Sets and returns the polarity of the horizontal (line) sync of an incoming variable-scan video signal.	Monochrome
<b>VSynInPolarity</b> property	Sets and returns the polarity of the vertical (field) sync of an incoming variable-scan video signal.	Monochrome
<b>SyncInSource</b> property	Sets and returns the source of the incoming sync signal.	Monochrome
<b>LineFrequency</b> property	Sets and returns the frequency of an incoming horizontal video line.	Monochrome
<b>VideoInputSource</b> property	Sets and returns the video input source used for acquisitions.	Monochrome
<b>DataFormat</b> property	Sets and returns the data format used.	Camera Link
<b>ActiveLUT</b> property	Sets and returns the look-up table (LUT) that you want to use.	Monochrome Camera Link
<b>LoadLUTFromArray</b> method	Loads a look-up table (LUT) with data from an array.	Monochrome Camera Link
<b>LoadLUTFromFile</b> method	Loads a look-up table (LUT) with data from a file.	Monochrome Camera Link

## Input Source (cont.)

Property/Method Name	Description	Control
<b>SaveLUTToArray</b> method	Saves a look-up table (LUT) with data to an array.	Camera Link
<b>SaveLUTToFile</b> method	Saves a look-up table (LUT) with data to a file.	Camera Link

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## Active Video Area

Property Name	Description	Control
<b>TotalPixelsPerLine</b> property	Sets and returns the total number of pixels in a single horizontal line of video (the number of pixels that are not black).	Monochrome
<b>TotalLinesPerFrame</b> property	Sets and returns the total number of lines in a frame of video.	Monochrome
<b>FirstActivePixel</b> property	Sets and returns the position of the beginning of the active video signal on the line.	Monochrome
<b>FirstActiveLine</b> property	Sets and returns the position of the beginning of the active video signal within the field.	Monochrome
<b>ActivePixelCount</b> property	Sets and returns the number of pixels per line in the active video area (Monochrome) or the number of pixels per line supported by your camera (Camera Link).	Monochrome Camera Link

## Active Video Area (cont.)

Property Name	Description	Control
<b>ActiveLineCount</b> property	Sets and returns the number of lines per frame in the active video area (Monochrome) or the number of active lines supported by your camera (Camera Link).	Monochrome Camera Link
<b>ClampStart</b> property	Sets and returns the clamp start position.	Monochrome
<b>ClampEnd</b> property	Sets and returns the clamp end position.	Monochrome

## Region of Interest

Property Name	Description	Control
<b>ROIHeight</b> property <sup>a</sup>	Sets and returns the number of lines in the ROI that you want to save/acquire.	Monochrome Camera Link
<b>ROILeft</b> property <sup>a</sup>	Sets and returns the position of the first pixel of the ROI that you want to save/acquire.	Monochrome Camera Link
<b>ROITop</b> property <sup>a</sup>	Sets and returns the position of the first line of the ROI that you want to save/acquire.	Monochrome Camera Link
<b>ROIWidth</b> property <sup>a</sup>	Sets and returns the number of pixels in each line of the ROI that you want to save/acquire.	Monochrome Camera Link

- a. For the DT-Active Frame Grabber Camera Link control, this property is used for area-scan operations only.



## Line-Scan Operations

Property Name	Description	Control
<b>LineScanLeft</b> property	Sets and returns the position of the first pixel of the line(s) that you want to acquire.	Camera Link
<b>LineScanWidth</b> property	Sets and returns the number of pixels in the line(s) that you want to acquire.	Camera Link
<b>LineScanFrameHeight</b> property	Sets and returns the number of lines that you want to acquire.	Camera Link
<b>LineScanFrameTrigger Enabled</b> property	Enables and disables the use of the frame trigger.	Camera Link
<b>LineScanFrameTrigger Transition</b> property	Sets and returns the transition type for digital input line 0 when it is used as a frame trigger.	Camera Link

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## Overlay

Property/Method/Event Name	Description	Control
<b>OverlayEnabled</b> property	Enables and disables the use of overlays.	Monochrome Camera Link
<b>OverlayBitmapFile</b> property	Sets and returns the complete path to an overlay bitmap file.	Monochrome Camera Link
<b>OverlayColorKey</b> property	Sets and returns the color key for an overlay bitmap file.	Monochrome Camera Link

## Overlay (cont.)

Property/Method/Event Name	Description	Control
<b>OnUpdateOverlay</b> event	Generated by the control whenever a frame/ROI is acquired; returns the DTOverlay object that holds the overlay information. <sup>a</sup>	Monochrome Camera Link

a. For more information about DTOverlay objects, refer to the online help for your control.

## Trigger

Property Name	Description	Control
<b>TriggerType</b> property	For area-scan mode, sets and returns the type of the ROI trigger. For line-scan mode, sets and returns the type of the line trigger.	Monochrome Camera Link
<b>TriggerTransition</b> property	Sets and returns the transition type for an external trigger.	Monochrome Camera Link

## Camera Control Output

Property Name	Description	Control
<b>TimeGranularity</b> property	Sets and returns the time granularity used by the camera control output signals (in microseconds).	Camera Link
<b>CameraControlOutput1</b> property	Sets and returns the output signal assigned to camera control output line 1.	Camera Link

## Camera Control Output (cont.)

Property Name	Description	Control
<b>CameraControlOutput2</b> property	Sets and returns the output signal assigned to camera control output line 2.	Camera Link
<b>CameraControlOutput3</b> property	Sets and returns the output signal assigned to camera control output line 3.	Camera Link
<b>CameraControlOutput4</b> property	Sets and returns the output signal assigned to camera control output line 4.	Camera Link

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## Sync Output

Property Name	Description	Control
<b>SyncOutEnabled</b> property	Enables and disables the outgoing sync signal.	Monochrome
<b>HSyncOutPulseWidth</b> property	Sets and returns the width of the outgoing horizontal sync pulse.	Monochrome
<b>VSyncOutPulseWidth</b> property	Sets and returns the width of the outgoing vertical sync pulse.	Monochrome
<b>LineFrequency</b> property	Sets and returns the frequency of an outgoing horizontal video line.	Monochrome
<b>SyncOutPolarity</b> property	Sets and returns the polarity of the outgoing sync pulses.	Monochrome

## Expose/Reset Output Pulse

Property Name	Description	Control
<b>ExposeEnabled</b> property	Enables and disables the expose/reset output pulse. <sup>a</sup>	Monochrome Camera Link
<b>ExposePolarity</b> property	Sets and returns the polarity of the expose/reset output pulse. <sup>a</sup>	Monochrome Camera Link
<b>ExposeStartLine</b> property	Sets and returns the start position of the expose/reset output pulse. <sup>a</sup>	Monochrome
<b>ExposeStopLine</b> property	Sets and returns the stop position of the expose/reset output pulse. <sup>a</sup>	Monochrome
<b>VSynchDelay</b> property	Sets and returns the number of lines between the end of the expose/reset output pulse and the beginning of the outgoing vertical sync. <sup>a</sup>	Monochrome
<b>ExposeDelay</b> property	Sets and returns the time delay between the trigger event and the beginning of the expose output pulse. <sup>a, b</sup>	Camera Link
<b>ExposePulseWidth</b> property	Sets and returns the time that the expose output pulse is in its active state (determined by the polarity). <sup>a, b</sup>	Camera Link

a. Applicable to asynchronous reset cameras only.

b. Multiplied by the **TimeGranularity** to determine the value.

## Integrate Output Pulse

Property Name	Description	Control
<b>IntegrateEnabled</b> property	Enables and disables the integrate output pulse. <sup>a</sup>	Camera Link
<b>IntegratePolarity</b> property	Sets and returns the polarity of the integrate output pulse. <sup>a</sup>	Camera Link
<b>IntegratePulseWidth</b> property	Sets and returns the time that the integrate output pulse is in its active state (determined by the polarity). <sup>a, b</sup>	Camera Link
<b>IntegrateDelay</b> property	Sets and returns the time delay between the trigger event and the beginning of the integrate output pulse. <sup>a, b</sup>	Camera Link

a. Applicable to line-scan cameras.

b. Multiplied by the **TimeGranularity** to determine the value.

## Strobe Output Pulse

Property Name	Description	Control
<b>StrobeEnabled</b> property	Enables and disables the strobe output pulse.	Monochrome Camera Link
<b>StrobePolarity</b> property	Sets and returns the polarity of the strobe output pulse.	Monochrome Camera Link
<b>StrobeStartLine</b> property	Sets and returns the start position of the strobe output pulse.	Monochrome
<b>StrobeStopLine</b> property	Sets and returns the stop position of the strobe output pulse.	Monochrome

## Strobe Output Pulse (cont.)

Property Name	Description	Control
<b>StrobePulseWidth</b> property	Sets and returns the time that the strobe output pulse is in its active state (determined by the polarity). <sup>a</sup>	Camera Link
<b>StrobeDelay</b> property	Sets and returns the time delay between the trigger event and the beginning of the strobe output pulse. <sup>a</sup>	Camera Link

a. Multiplied by the **TimeGranularity** to determine the value.

## Acquisition

Property/Method/Event Name	Description	Control
<b>AcquireType</b> property	Sets and returns the type of acquisition that you want to perform.	Monochrome Camera Link
<b>AcquireMem</b> method	Acquires one or more frames/ROIs (in area-scan mode) or lines/frames (in line-scan mode) to internal memory buffers, displaying the data in a window, if desired.	Monochrome Camera Link
<b>StopAcquire</b> method	Stops the current acquisition.	Monochrome Camera Link
<b>GetBuffer</b> method	Returns the DTBuffer object associated with a buffer ID. <sup>a</sup>	Monochrome Camera Link
<b>GetBufferCount</b> method	Returns the number of available DTBuffer objects. <sup>a</sup>	Monochrome Camera Link
<b>OnAcquireComplete</b> event	Generated by the control when the acquisition is complete.	Monochrome Camera Link

## Acquisition (cont.)

Property/Method/Event Name	Description	Control
<b>OnFrameComplete</b> event	Generated by the control whenever a buffer of data is acquired; returns the DTBuffer object that holds the most recently acquired frame/ROI. <sup>a</sup>	Monochrome Camera Link
<b>OnFramesComplete</b> event	Generated by the control whenever a number of buffers of data is acquired; returns the DTEnumBuffers object that holds the most recently acquired buffers. <sup>b</sup>	Camera Link
<b>OnAsyncError</b> event	Generated by the control whenever an error occurs during an asynchronous acquisition; returns the DTErrInfo object that holds the error information. <sup>c</sup>	Monochrome Camera Link

a. For more information about DTBuffer objects, refer to the online help for your control.

b. For more information about DTEnumBuffers objects, refer to the online help for your control.

c. For more information about DTErrInfo objects, refer to the online help for your control.

## Digital I/O

Property/Method/Event Name	Description	Control
<b>InputLineCount</b> property	Returns the number of digital input lines supported by the device.	Monochrome Camera Link
<b>OutputLineCount</b> property	Returns the number of digital output lines supported by the device.	Monochrome Camera Link
<b>ReadDigitalInputPattern</b> method	Returns the state (high or low) of all the digital input lines.	Monochrome Camera Link
<b>WriteDigitalOutputPattern</b> method	Sets the state (high or low) of all the digital output lines.	Monochrome Camera Link
<b>InputLineEventMask</b> property	Sets and returns a bit mask, indicating the digital input lines that you want to use to generate state-change events.	Monochrome Camera Link
<b>OnInputBitsChanged</b> event	Generated by the control whenever a digital input bit that has been configured to generate a state-change event changes state.	Monochrome Camera Link





## ***Programming Flowcharts***

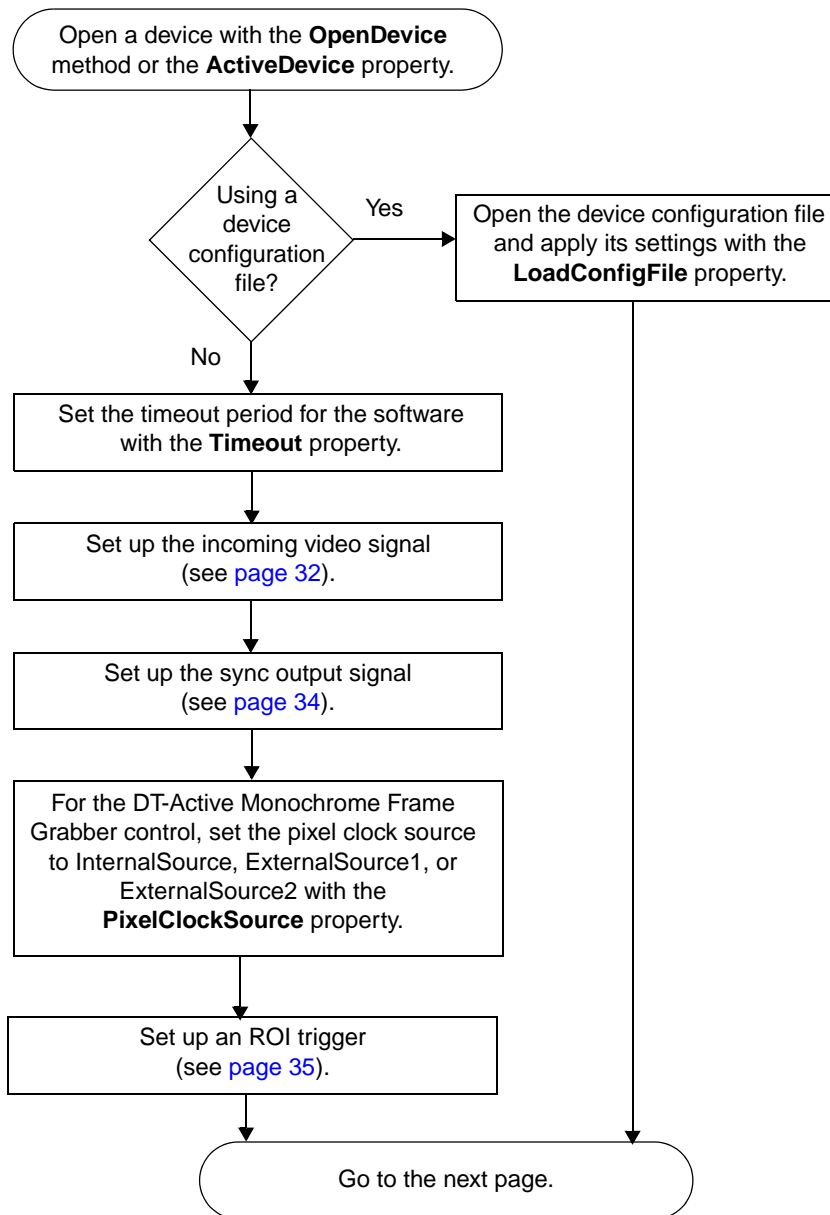
This chapter provides a series of flowcharts showing an overview of the steps required to perform each of the operations supported by the DT-Active Frame Grabber controls. Although the flowcharts do not show error/status checking, it is recommended that you check for error/status messages after using each property, method, or event.

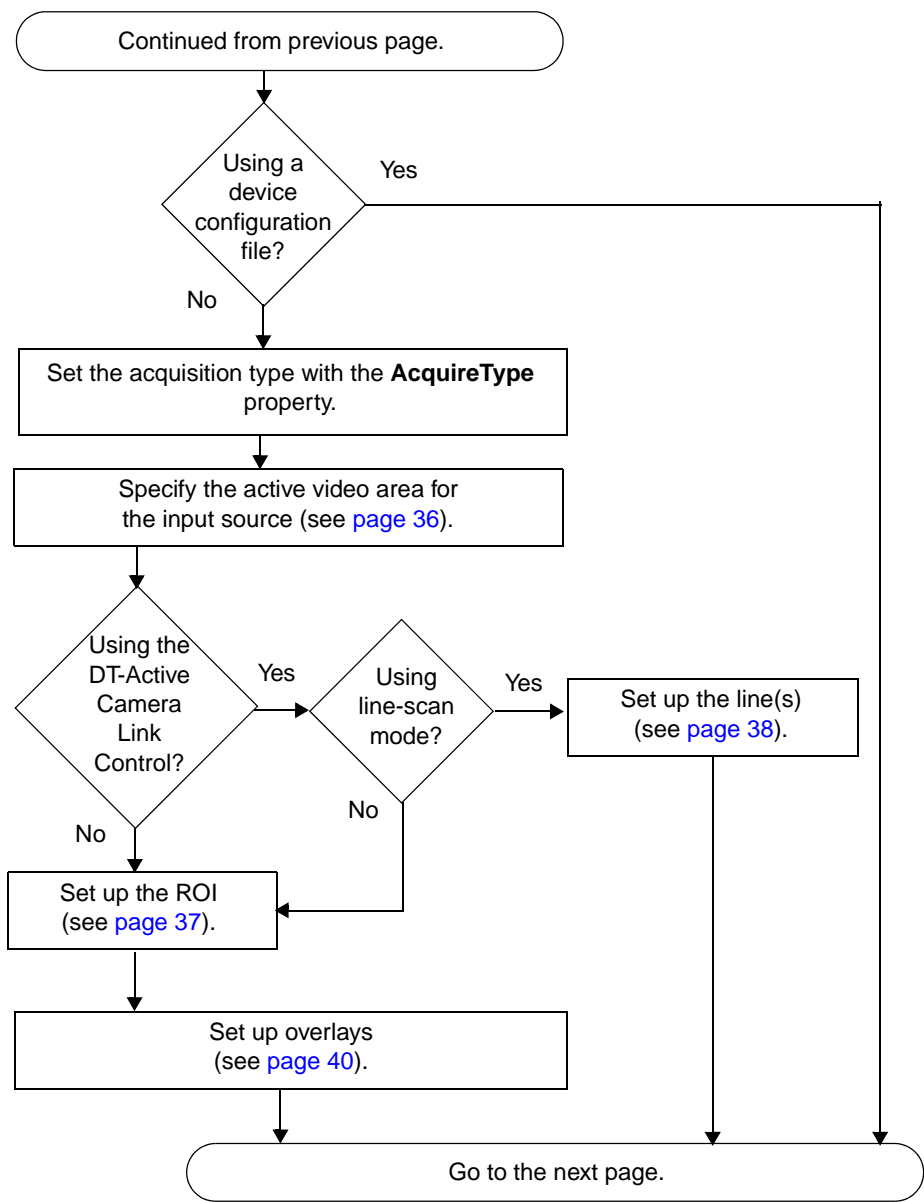
---

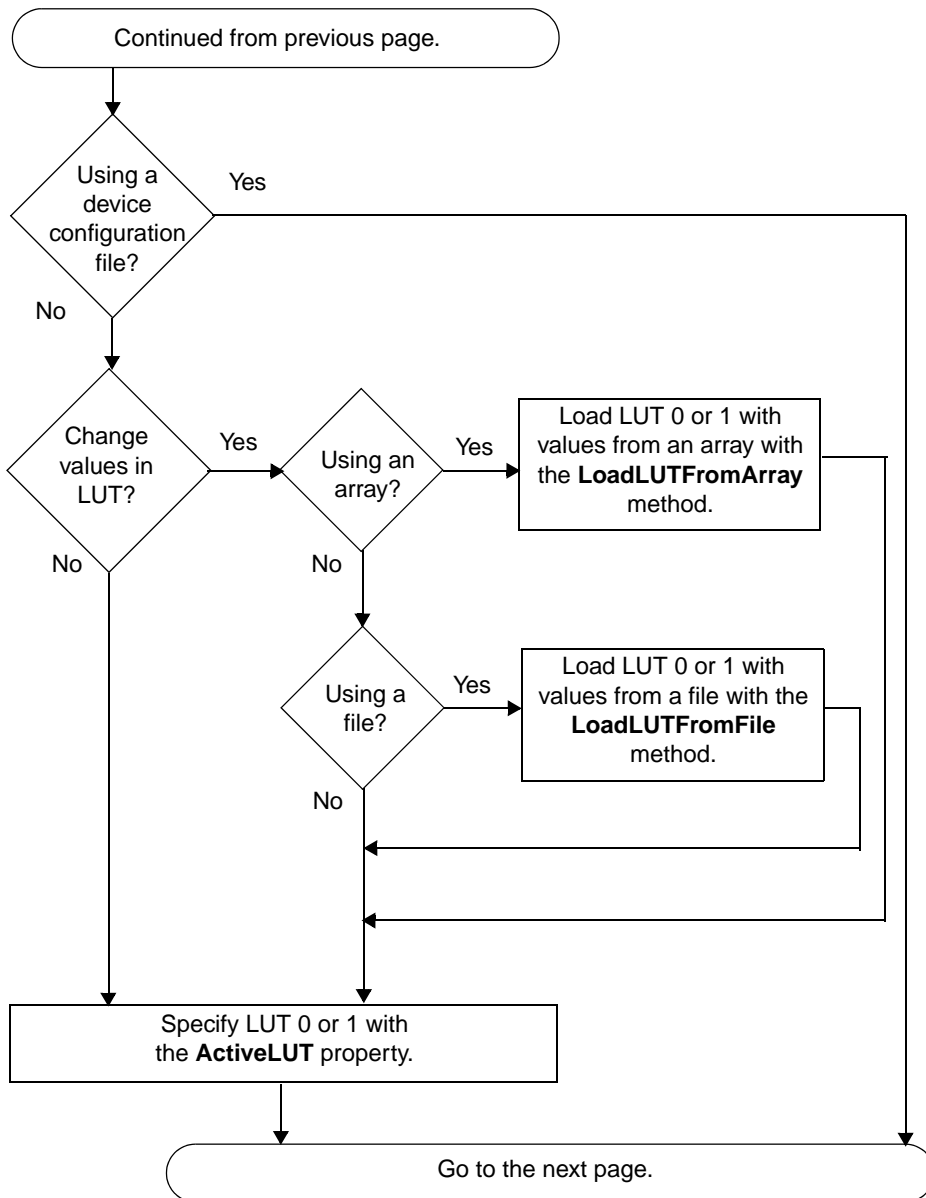
**Notes:** The properties described in this chapter are appropriate for Visual Basic only. If you are using Visual C++, use the associated Visual C++ methods instead. For example, to set and/or return the pixel clock source, use the Visual C++ **SetPixelClockSource** and **GetPixelClockSource** methods instead of the Visual Basic **PixelClockSource** property. For more information about Visual C++ methods, refer to the online help for your control.

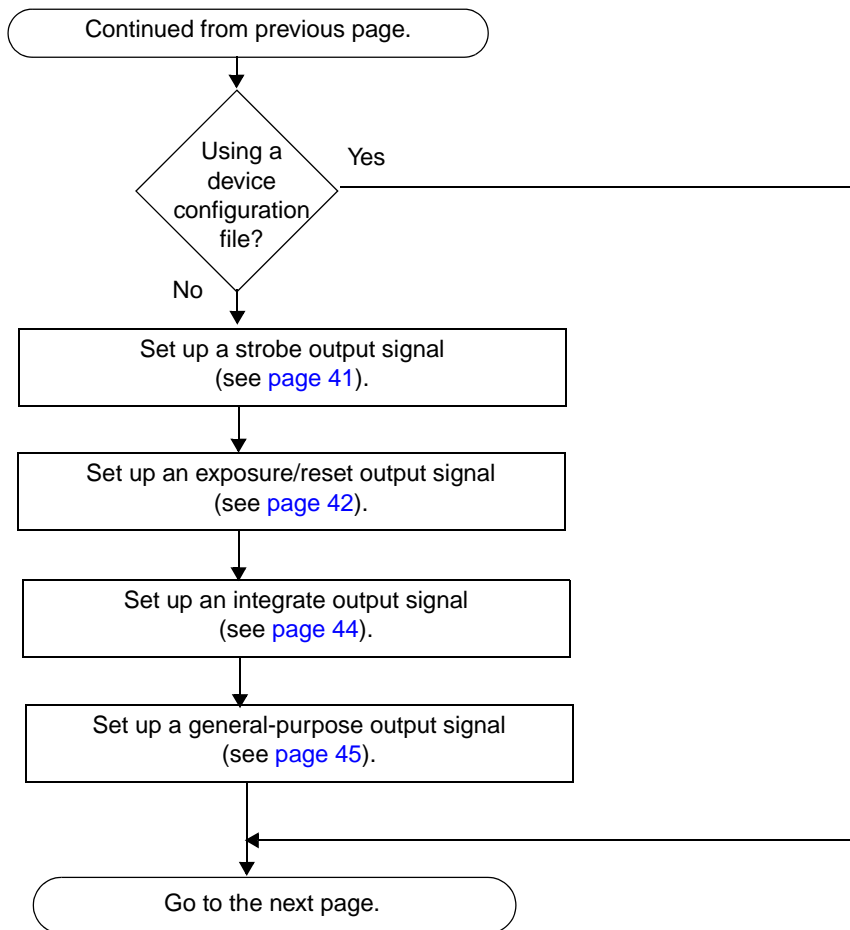
Some of the steps may not be required for the device/control that you are using. For example, if you are using a DT3145 frame grabber board with the DT-Active Camera Link Frame Grabber control, you do not set the pixel clock source. For more information about the steps that are required for your device/control, refer to the user's manual for your device.

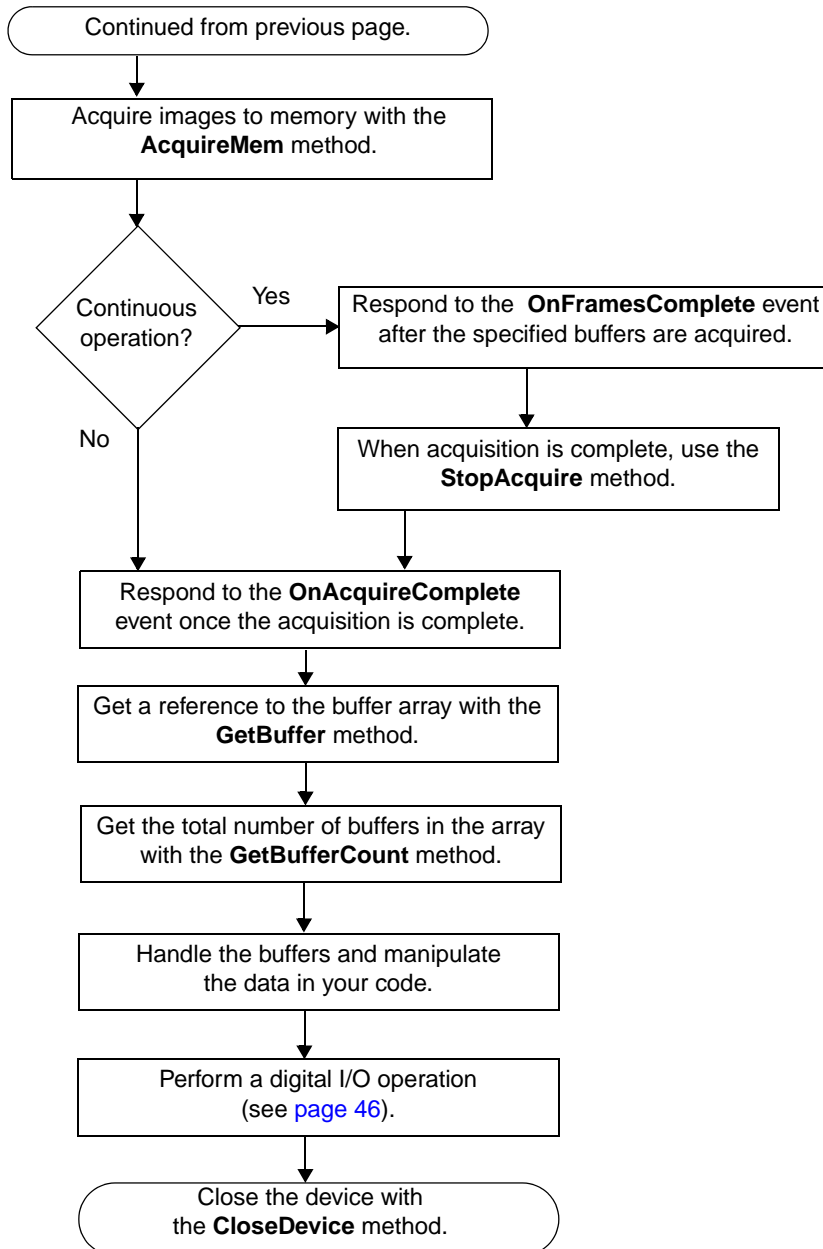
---



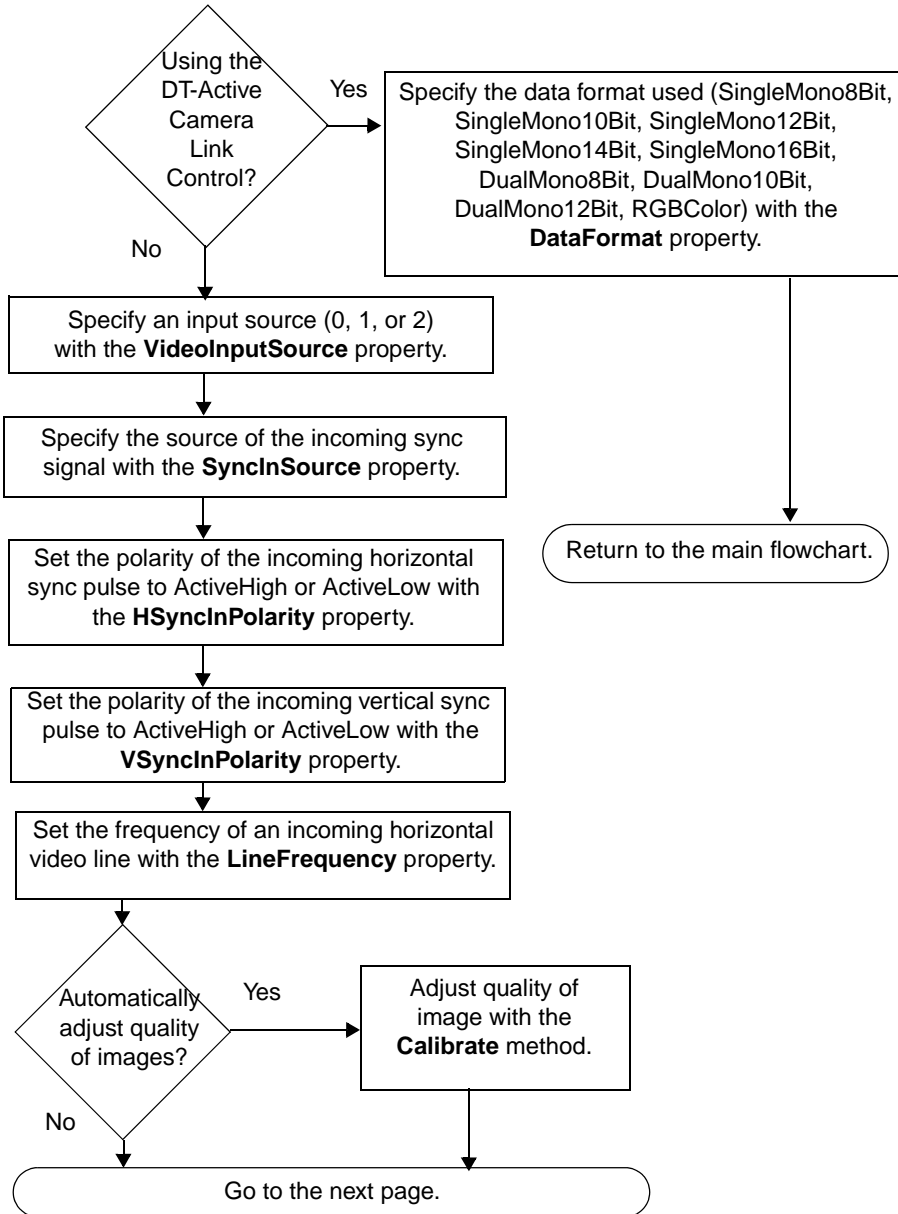






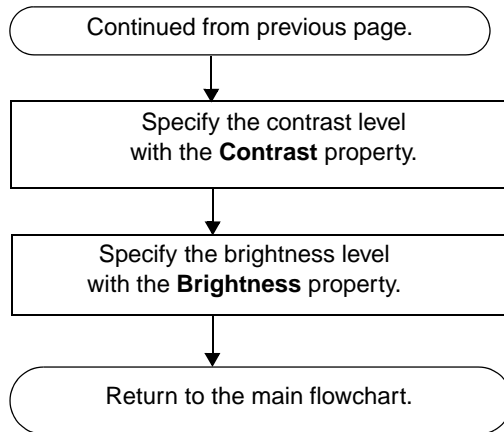


## Set up the Incoming Video Signal

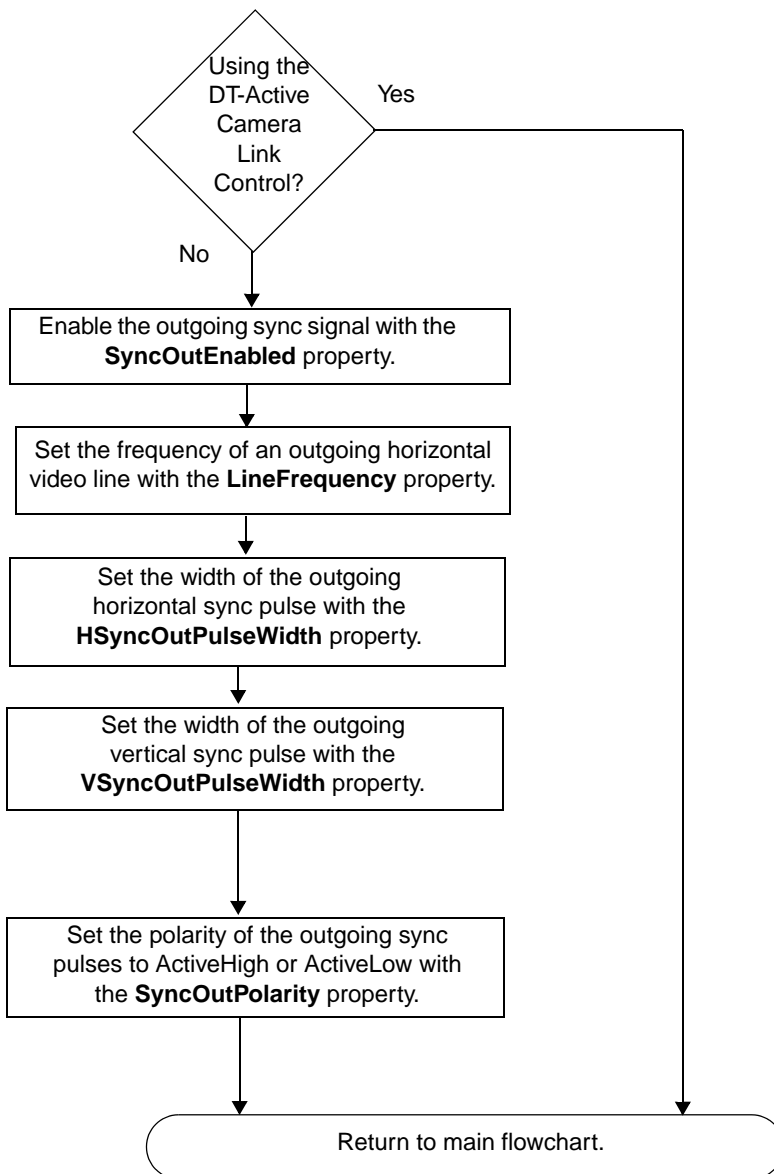




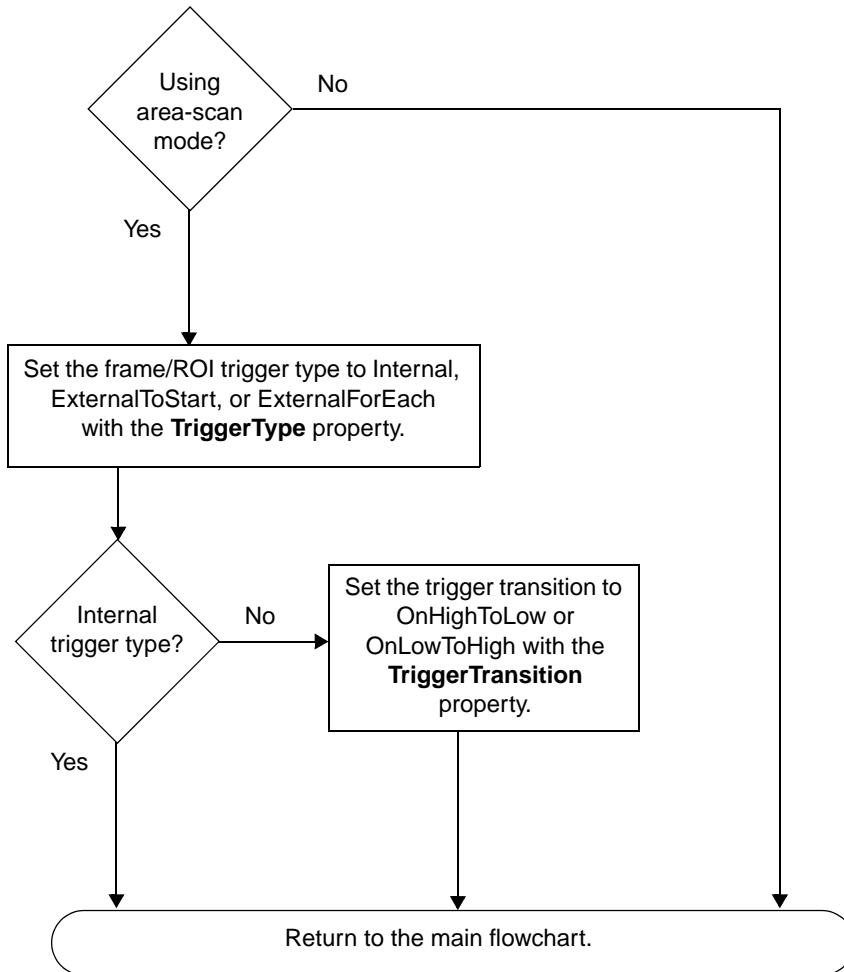
### ***Set up the Incoming Video Signal (cont.)***



## Set up the Sync Output Signal



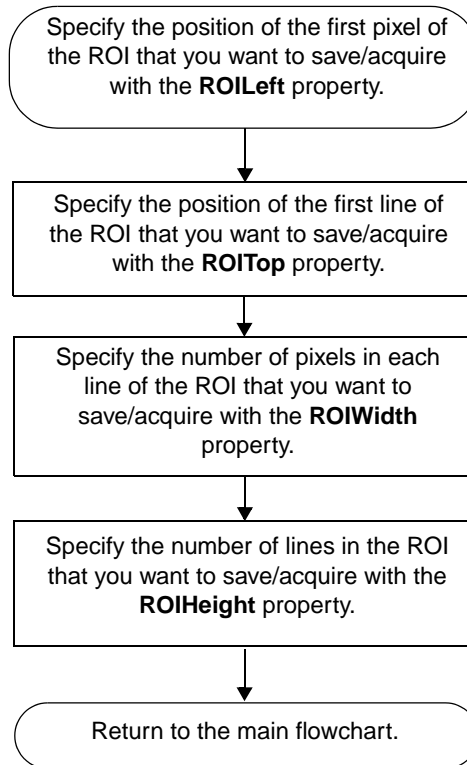
## Set up the Acquisition Trigger



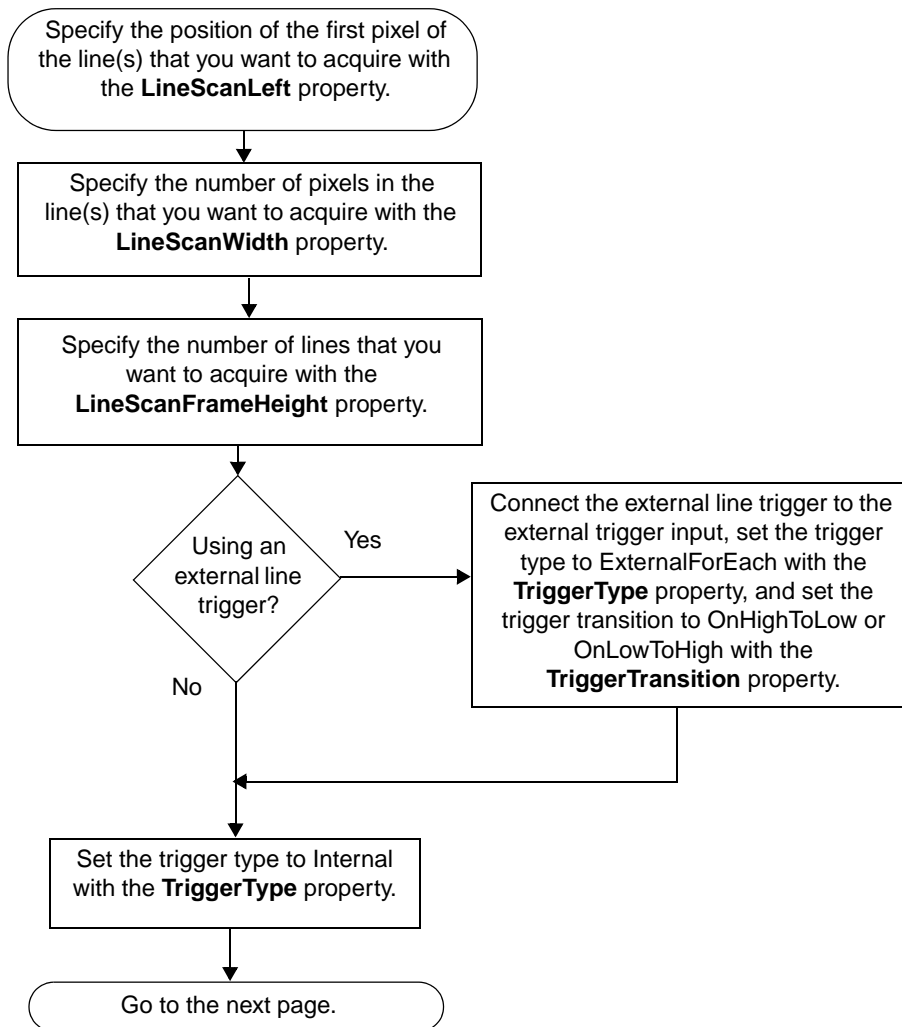
## Specify the Active Video Area

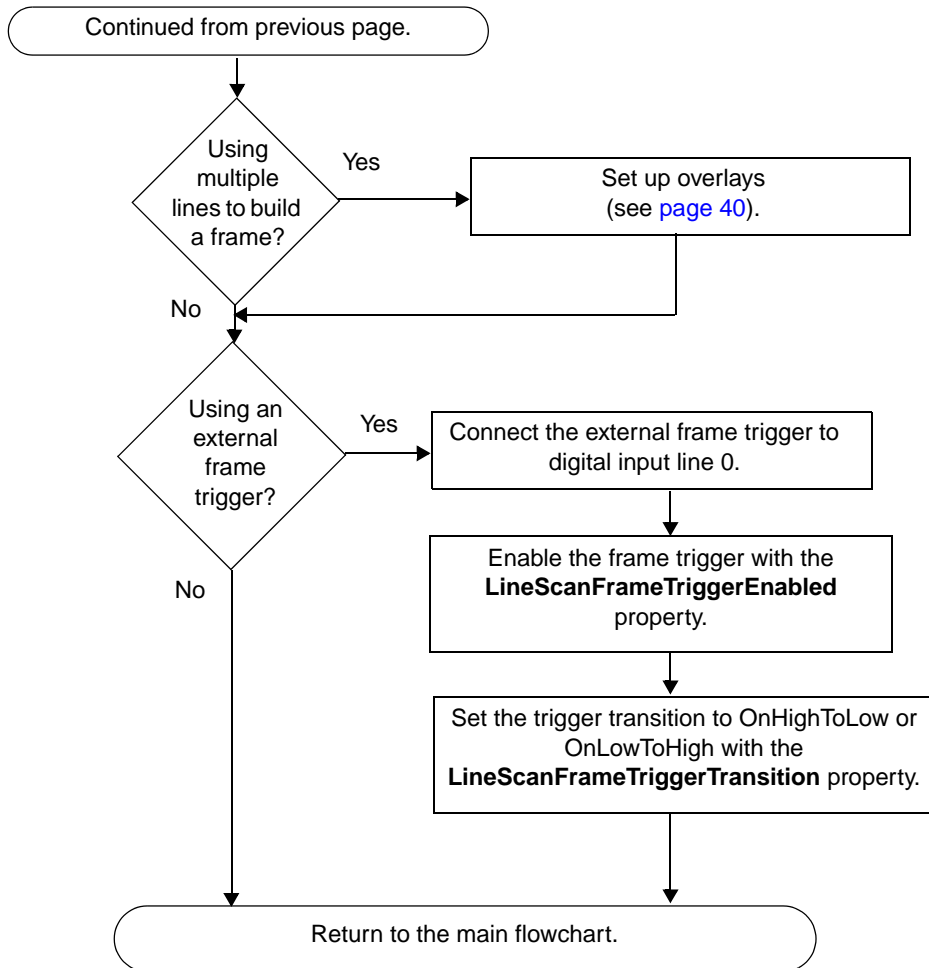


## Set up the ROI

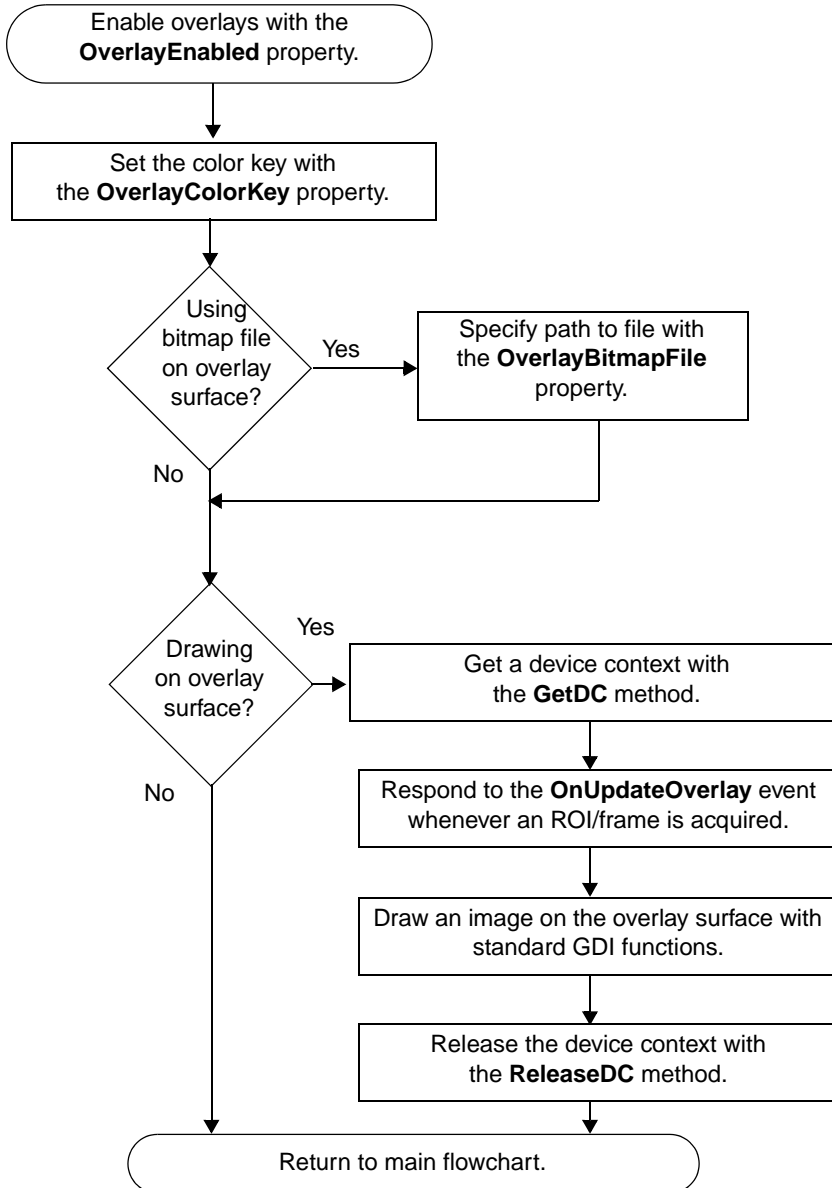


## Set up the Line(s) for a Line-Scan Operation



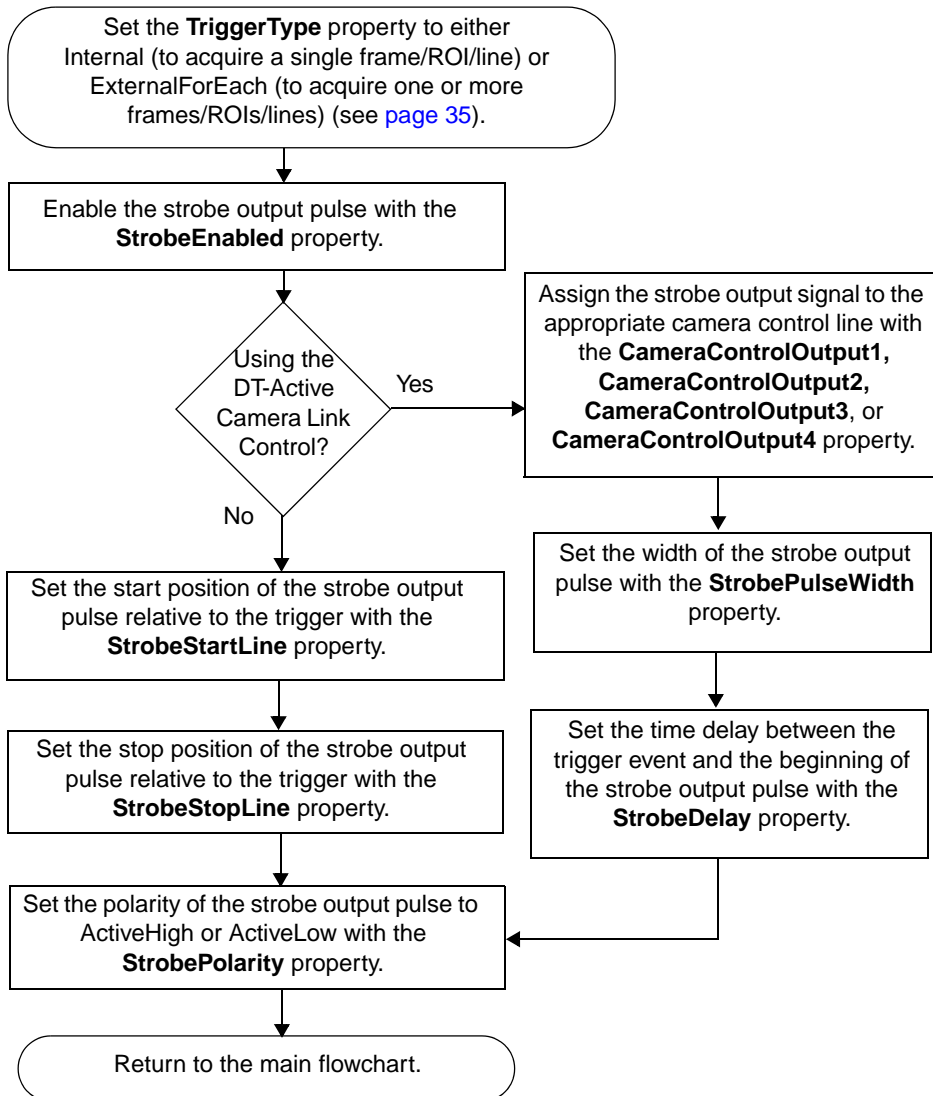
**Set up the Line(s) for a Line-Scan Operation (cont.)**

## Set up Overlays

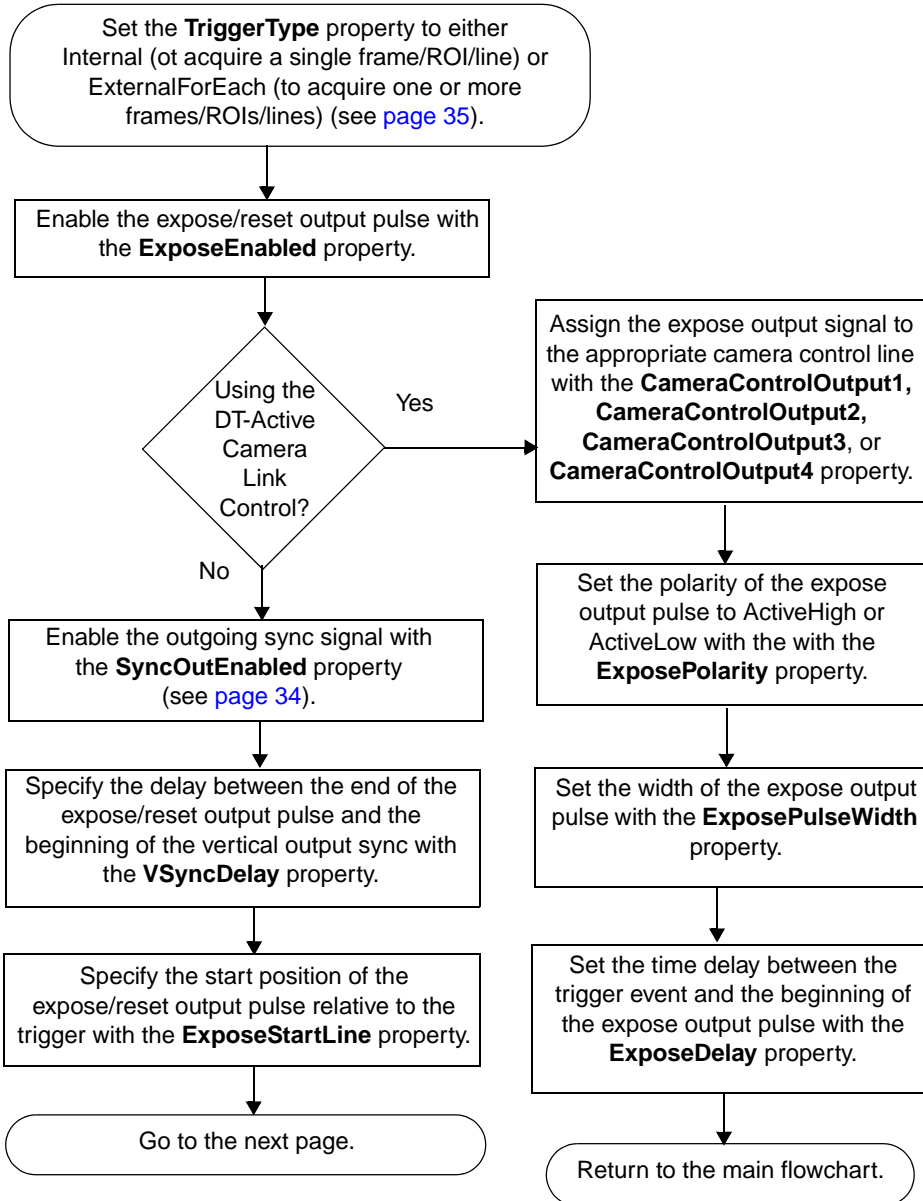


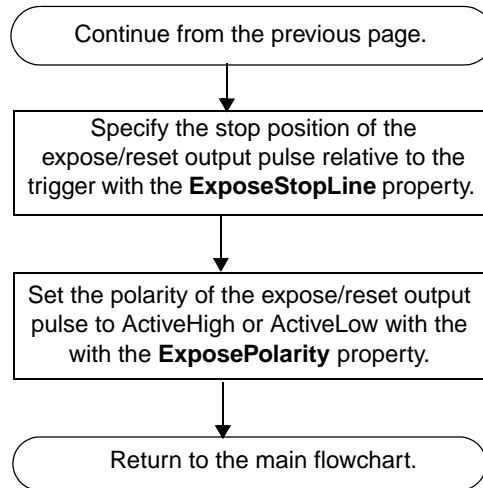


## Set up a Strobe Output Signal

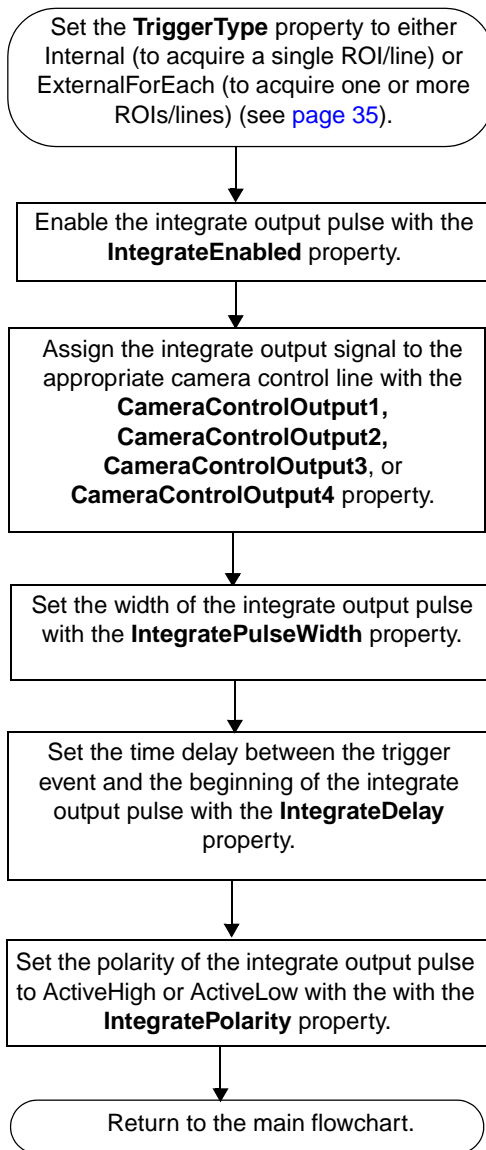


## Set up an Expose/Reset Output Signal

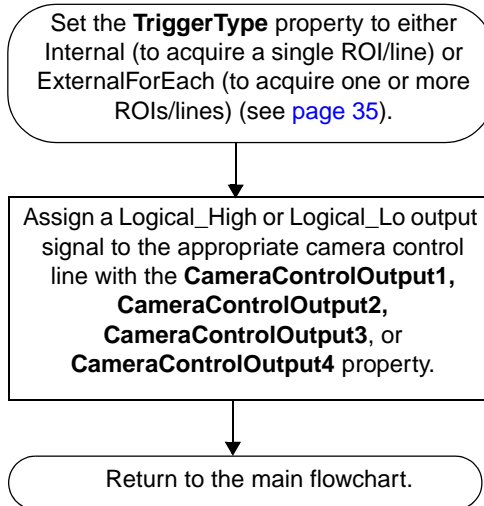


**Set up an Exposure/Reset Output Signal (cont.)**

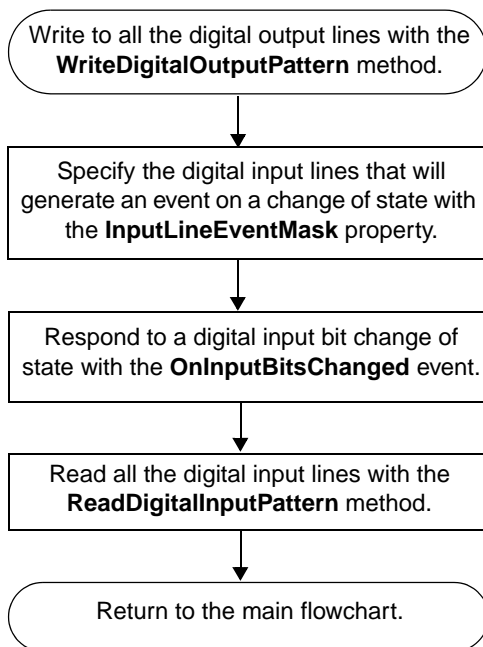
## Set up an Integrate Output Signal



## ***Set up a General-Purpose Output Signal***



## ***Perform a Digital I/O Operation***





## ***Product Support***

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## **General Checklist**

Should you experience problems using a DT-Active Frame Grabber control, perform the following steps:

1. Read all the appropriate sections of this manual. Make sure that you have added any “Read This First” information to your manual and that you have used this information.
2. Check the Imaging OMNI CD for a README file. If present, read this file for the latest installation and configuration information.
3. Make sure that you have installed the device driver, DT-Active Frame Grabber control, and other software for your device properly. For information, refer to the getting started manual for your device.
4. Make sure that you have installed your device properly. For information, refer to the getting started manual for your device.

---

**Note:** If you are still having problems, follow the instructions provided in the next section.

---



## ***Service and Support***

If you have difficulty using a DT-Active Frame Grabber control, the Data Translation Technical Support Department is available to provide technical assistance.

### **Telephone Technical Support**

For the most efficient service, please complete the form on [page 50](#) and be at your computer when you call for technical support. The information on the form helps to identify specific system and configuration-related problems and to replicate the problem in house, if necessary.

You can reach the Technical Support Department by calling (508) 481-3700 x1001. Have your contract number and serial number available when you call.

If you are located outside the USA, call your local distributor. The name and telephone number of the nearest distributor are provided in the Data Translation catalog.

**Information Required for Technical Support**

Name: \_\_\_\_\_ Phone \_\_\_\_\_

Contract Number: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Data Translation hardware product(s): \_\_\_\_\_

serial number: \_\_\_\_\_

configuration: \_\_\_\_\_

Data Translation device driver - SPO number: \_\_\_\_\_

version: \_\_\_\_\_

Data Translation software - SPO number: \_\_\_\_\_

serial number: \_\_\_\_\_ version: \_\_\_\_\_

PC make/model: \_\_\_\_\_

operating system: \_\_\_\_\_ version: \_\_\_\_\_

Windows version: \_\_\_\_\_

processor: \_\_\_\_\_ speed: \_\_\_\_\_

RAM: \_\_\_\_\_ hard disk space: \_\_\_\_\_

network/number of users: \_\_\_\_\_ disk cache: \_\_\_\_\_

graphics adapter: \_\_\_\_\_ data bus: \_\_\_\_\_

I have the following devices and applications installed in my system: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

I am encountering the following problem(s): \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

and have received the following error messages/codes: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

I have run the device diagnostics with the following results: \_\_\_\_\_

\_\_\_\_\_

You can reproduce the problem by performing these steps:

1. \_\_\_\_\_

\_\_\_\_\_  
2. \_\_\_\_\_

\_\_\_\_\_  
3. \_\_\_\_\_

\_\_\_\_\_

## E-Mail and Fax Support

You can also get technical support by e-mailing or faxing the Technical Support Department, as follows:

- **E-mail** – You can reach Technical Support at the following address: [tsupport@datx.com](mailto:tsupport@datx.com)
- **Fax** – Photocopy and complete the form on [page 50](#), then fax the form to Technical Support at (508) 481-8620

## World-Wide Web

For the latest tips, software fixes, and other product information, you can reach the Technical Support Department from the Data Translation web site. You can access the web site at <http://www.datatranslation.com>.



# Glossary

## **Active Line Count**

For the DT3162 frame grabber board, a line of data in the active video area (the part of the incoming signal containing valid data). The first active line defines the top of the active video area.

For the DT3162 frame grabber board, the number of lines of data supported by your camera. Refer to your camera documentation for more information. The height of the ROI that you want to acquire must be less than or equal to the Active Line Count.

## **Active Video Area**

The part of the incoming video signal that contains valid video data (no blanking or sync information). It is the visible portion of the incoming video signal.

Each line of video in the active video area contains horizontal sync information, blanking information, and active video. Pixel measurements are relative to the horizontal reference point, which is defined as the beginning of the horizontal sync. In the horizontal video signal, blanking occurs during the horizontal sync and image border periods, which are defined by the front porch (before the horizontal sync) and back porch (after the horizontal sync).

Each field of video in the active video area contains vertical sync information, blanking information, and lines of active video. Line measurements are relative to the vertical reference point, which is defined as the beginning of the vertical sync.

See also total video area.

## **Asynchronous**

An asynchronous function returns control to the caller before the operation completes.

**Brightness Level**

A value that you can use to move the entire grayscale range up and down, making the digitized video lighter or darker.

**Buffer**

A location in internal memory that is intended to hold one acquired ROI, one acquired line, or one acquired frame of multiple lines.

**Channel**

The analog-to-digital converter on the device through which the video signal passes. If your device supports multiple channels, you can receive multiple video signals at the same time (one on each channel). See also video input source.

**Clamp Period**

A period when the device adjusts the input voltage from the camera by shifting the input signal to 0 V. The active video area following the blanking period is then referenced to that shift. You can specify the start of the clamp period and the end of the clamp period.

**Composite Signal**

A signal in which the video and synchronization signals are combined in a single signal.

**Contrast Level**

A value that you can use to emphasize the differences between light and dark. By adjusting the contrast level, you can stretch or contract the range of the incoming video.

**DDI**

DirectDraw Interface. One of the display modes that determines the way that you want to display images when setting up your application. Typically, you will use DDI mode; it is faster and requires less system memory. See also GDI.

**Device**

A frame grabber board, such as the DT3162, DT3145, or other hardware used to acquire images.

**Device Context**

Referred to as a DC. A DC is a Windows Graphical Device Interface (GDI) object. Refer to your Windows documentation for more information.

**Expose/Reset Pulse**

A digital output pulse generated by some devices to control the resetting or the exposure time of an asynchronous reset camera. The exposure time is the amount of time that the shutter is open. You can specify the polarity of the pulse (high-going or low-going), the time delay from a trigger event to the start of the exposure, and the length of time the shutter is open. The expose output signal is typically used in area-scan mode. Note that for the expose/reset pulse to work as programmed, you must adjust the physical settings on your camera appropriately.

For the DT3162 frame grabber board, the expose/reset pulse is connected to your camera through a Camera Interface Module (CIM). For the DT3145 frame grabber board, the expose output pulse is connected to your camera through the camera link connector.

**External Trigger**

A trigger that is connected to the device through a dedicated external line.

**Field**

The collection of horizontal lines between two consecutive vertical sync signals. For interlaced images, two fields (odd and even) make up a single frame.

## Frame

For the DT3162 frame grabber board, a collection of video data. An interlaced frame consists of an odd field and an even field, where one field is drawn in the first pass and the other field is drawn in the next pass. A noninterlaced frame (progressive scan) consists of the complete frame, where all lines are drawn in a single pass.

For the DT3145 frame grabber board, the definition of a frame depends on whether you are using area-scan mode or line-scan mode. In area-scan mode, a frame is the portion of the video that is defined by the `Frame_Valid` and `Line_Valid` signals; the portion of the frame that you want to acquire is determined by the **ROILeft**, **ROIWidth**, **ROITop**, and **ROIHeight** properties. In line-scan mode, a frame is a series of lines acquired into a single buffer. You can use these frames built from multiple lines in frame-based software packages, such as DT Vision Foundry and GLOBAL LAB Image/2.

## Frame Trigger

A trigger that allows you to control the acquisition of frames in line-scan mode. On the DT3145 frame grabber board, the frame trigger input is provided through digital input line 0 (pin 1 of connector J2). You can access this signal using the STP15 screw terminal panel. The frame trigger must have a minimum pulse width of 10  $\mu$ s.

## GDI

Graphics Display Interface. One of the display modes that determines the way that you want to display images when setting up your application. If you receive an error when acquiring very large ROIs/lines/frames (typically, larger than 2K x 2K), you can try reducing the size of the ROI/line/frame, increasing the memory in your graphics card, updating the driver for your graphics card, or changing the display mode to GDI. See also DDI.



**Identity LUT**

A look-up table in which the pixel data is passed through the LUT unchanged. For example, for 8-bit data, a pixel input value of 255 has an output value of 255.

**Integrate Pulse**

A digital output pulse generated by some devices to control the exposure time of a line-scan camera. The integrate time is the amount of time that the shutter is open. You can specify the polarity of the pulse (high-going or low-going), the time delay from a trigger event to the start of the integrate pulse, and the length of time the shutter is open. The integrate output signal is typically used in line-scan mode. Note that for the integrate pulse to work as programmed, you must adjust the physical settings on your camera appropriately.

For the DT3145 frame grabber board, the integrate pulse is connected to your camera through the camera link connector.

**Interlaced Frame**

A frame in which two consecutive fields of the video signal are acquired to create a complete frame. The odd field contains lines 1, 3, 5, and so on, of the video signal. The even field contains lines 2, 4, 6, and so on, of the video signal. One field is drawn in the first pass and the other field is drawn in the next pass.

**Inverse LUT**

A look-up table in which the image is reversed. For example, for 8-bit data, a pixel input value of 255 has an output value of 0.

## **Line**

For the DT3162 frame grabber board, the area between two consecutive horizontal sync signals.

For the DT3145 frame grabber board, the portion of the video that is defined by the Line\_Valid signal. In line-scan mode, the portion of the line that you want to acquire is determined by the **LineScanWidth** and **LineScanLeft** properties. In area-scan mode, the portion of the line that you want to acquire is determined by the **ROIWidth** and **ROILeft** properties.

## **Look-up Table**

A hardware feature of the device that you can use to change the value of an incoming pixel or affect the displayed image. When the LUT receives an input pixel value, it modifies this value according to the corresponding value in the LUT. Also called a LUT.

The DT3162 and DT3145 frame grabber boards have two built-in hardware look-up tables numbered 0 and 1. By default, LUT 0 is loaded with an "identity" table and LUT 1 is loaded with an "inverse" table. The "identity" table maps the data through unchanged. The "inverse" table inverts the image (black becomes white and white becomes black).

The DT3162 video circuitry generates 10-bit data values (0 to 1023). The board uses the look-up table to convert these 10-bit values to corresponding 8-bit values (0 to 255) that are sent to the PC. The DT3162 look-up table has 1024 entries corresponding to all possible 10-bit input values. Each of these entries contains a number between 0 and 255, which is the 8-bit output value that is generated for the corresponding input value.

On the DT3145 frame grabber board, it is recommended that you use the LUTs shipped with the board and the LUTs provided with your camera.

## **LUT**

A look-up table.

**Noninterlaced Frame**

A frame in which all lines (the complete frame) are acquired in a single pass. A noninterlaced frame is also referred to as a progressive scan.

**Overlay**

A means by which you can place or overlay an image on top of the frames in your image. The overlay is always an additional (and therefore removable) part of the frame. Anything that is drawn in the color key that you specify is invisible (transparent); anything that is drawn in any other color key is opaque.

**Progressive Scan**

A frame in which all lines (the complete frame) are acquired in a single pass. A progressive scan is also referred to as a noninterlaced frame.

**ROI**

Region of interest. An ROI is applicable in area-scan mode only.

For the DT3162 frame grabber board, an ROI is the portion of the acquired frame that you want to store in a buffer for processing. The top of the ROI is the first line of video relative to the active video area. The left side of the ROI is the first pixel of video relative to the active video area. The width of the ROI is the number of pixels per line of video. The height of the ROI is the number of lines per frame.

For the DT3145 frame grabber board, an ROI is the portion of the video that you want to acquire. The top of the ROI is the first line of video, the left side of the ROI is the first pixel of video, the width of the ROI is the number of pixels per line of video, and the height of the ROI is the number of lines of video.

**Source**

For the DT3162 frame grabber board, the input line on the device through which the video signal is received. See also channel.

For the DT3162 frame grabber board, the Camera Link camera.

You can receive a video signal from only one source at a time.

**Strobe Pulse**

A digital output pulse generated by some devices to control an attached strobe light. You can specify the polarity of the pulse (high-going or low-going), the time delay from a trigger event to the start of the pulse, and the width of the pulse.

**Synchronous**

A synchronous function returns control to the caller after the operation completes.

**Timeout Period**

The length of time that the device driver waits from the software call that starts an acquisition to the acquisition of the first ROI, line, or frame of multiple lines. If an ROI/line/frame is not acquired within this time period, the device driver generates a timeout error and terminates the operation. Note that the timeout period always starts with a software call, even if an external trigger is used.

**Total Video Area**

The video image area is composed of pixels and lines of video. The total video area is the complete set of horizontal and vertical input lines from which you extract the active video area and the region of interest (ROI) within the active video area that you want to acquire. The total video area includes all parts of the signal, including nonvisual portions such as horizontal and vertical blanking information. (Blanking information is the data not included in the active video area; it contains sync and other information.)

The total video area is as wide as the total pixels per line (the entire area between two consecutive horizontal sync signals) and as tall as the total lines per frame.

**Variable-Scan Signal**

A signal whose components, such as pixel clock, back porch start, first active pixel, and total lines per field, vary depending on your camera.

**Video Input Source**

For the DT3162 frame grabber board, the input line on the device through which the video signal is received. See also channel.

For the DT3162 frame grabber board, the Camera Link camera.

You can receive a video signal from only one source at a time.



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