

Scion FG LabView VI

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Getting Started

Introduction

This manual describes the Scion FG LabVIEW VI's for Windows. Included with this release are VI's for controlling Scion frame grabber boards packed into a library file (lib), example VI's for demonstrating how to capture images into LabVIEW, and a specialized DLL (sfglv.dll) for interface support. These libraries will only support capture of grayscale frames.

Please take a few moments to read through this manual before you begin using the VI's, as it should answer some questions that you may have. Please contact Scion Corporation should you encounter difficulty at any time, or if you have any questions.

System Requirements

To use the program, you need:

- A Pentium IV or higher processor for use with Microsoft Windows 2000 or Windows XP
- Scion frame grabber board
- 256 Mb of RAM (512 or more MB recommended)
- Scion Frame Grabber Library (scionfg.dll)
- LabVIEW version 8.0 or higher
- NI-IMAQ 3.5

Example VI's

Included are three example VI's that can be modified or used as a reference. They are located in the \Program Files\Scion Corporation\Scion FG LabView VI\ folder.

Snap Example.vi

This example VI will open the frame grabber interface and capture a single image to the image window. The image can then be saved for later use. This example also shows how to use the Set_Gray_Tuning.vi modify the brightness and contrast settings before the capture takes place. It also shows how to set integration, frames to integrate and triggering.

Grab Example.vi

This example will open the frame grabber interface like the above example, but will allow the image to continuously update until the stop button is selected. This example also shows how to use the Set_Gray_Tuning.vi modify the brightness and contrast settings during the capture process. It also shows how to set integration, frames to integrate and triggering while in continuous capture mode.

Grab DMA Example.vi

This example will open the frame grabber interface and start a continuous capture with DMA enabled. With DMA enabled the capture rate is much higher than without DMA. DMA is only supported on the FG-7 frame grabber.

Included VI's

All of the frame grabber control VI's are located in the sfglv.llb library. All of the below VI's can be accessed by going to the "User Libraries" section of the "Functions" palette. This file can also be found in the LabVIEW folder in \user.lib\scion\. Below is a list and a short description of each frame grabber control VI.

Open_Grabber_Interface.vi

Use this to open the interface for the frame grabber board. This will return an interface handle. This must be called before a frame grabber can be opened.

Close_Grabber_Interface.vi

This will close the interface to the frame grabber board. Note that Close_Grabber.vi must be called before this.

Open_Any_Grabber.vi

This will open the first Scion Frame Grabber detected on the bus. The Open_Grabber_Interface.vi must be called prior to calling this. A frame grabber board handle will be returned which can be used to set parameters and settings.

Close_Grabber.vi

This VI will close the currently opened Scion Frame Grabber.

Check_Image_Size.vi

Given the interface handle, frame grabber handle and video mode, this VI will output the correct width and height in pixels.

Get_Frame_Max_Size.vi

Calling this VI will read the maximum supported frame size from the frame grabber board.

Get_Grabber_Info.vi

This VI will get specific information from the frame grabber board. These include frame grabber capability flags, number of buffers, maximum width and height and pixels, and bytes per row.

Get_Product_Desc.vi

This VI will retrieve the product description of the connected frame grabber.

Get_Product_Prefix.vi

The product prefix of the connected frame grabber will be retrieved with this VI.

Get_Vendor_Desc.vi

This VI will retrieve the vendor description of the connected frame grabber.

Get_Vendor_Prefix.vi

The vendor prefix of the connected frame grabber will be retrieved with this VI.

Set_Gray_Tuning.vi

This VI will set the contrast and brightness for use in capturing grayscale frames.

Snap_Image.vi

Use this to snap a single image from the connected frame grabber board. This will take an image from the board and display the image in an IMAQ created image buffer. The Open_Grabber_Interface.vi and the Open_Any_Grabber.vi must be called before this.

Grab_Setup.vi

This will start a standard grab sequence. It will create buffers and pointers to be used in the Grab_Image.vi.

Grab_Setup_DMA.vi

This will start a DMA grab sequence. You must have an FG-7 frame grabber board installed for this to work properly. It will create buffers and pointers to be used in the Grab_Image_DMA.vi.

Grab_Image.vi

Use this in a while loop to get a continuous image on the screen. It is full functional in that it will accept integration option, integrated frames, and trigger.

Grab_Image_DMA.vi

Use this in a while loop to get a continuous image on the screen. This is the DMA version to help give higher frame rates. This requires the FG-7 frame grabber board to operate properly. It is full functional in that it will accept integration option, integrated frames, and trigger.

Grab_End.vi

Use this after the Grab_Image.vi outside the while loop. This will do a clean up of buffers and pointers.

Grab_End_DMA.vi

Use this after the Grab_Image_DMA.vi outside the while loop. This will do a clean up of buffers and pointers.

Return_Code.vi

This is a return or error code module to track any errors encountered.

sfglv.dll Reference

Below is a reference to the commands that are available in the sfglv.dll. This is a reference for advanced users only.

SnapImg

The SnapImg function will take a snapshot image.

```
int SnapImg(  
    DWORD          Interface_Handle,  
    DWORD          Grabber_Handle,  
    unsigned long  LVImagePtr,  
    int            LVLineWidth,  
    unsigned int   Width,  
    unsigned int   Height,  
    unsigned int   Integration,  
    unsigned int   IntFrames,  
    unsigned int   Trigger  
);
```

Parameters

Interface_Handle

Frame Grabber Interface Handle. Open_Grabber_Interface.vi will create this handle.

Grabber_Handle

Grabber Interface Handle. Open_Any_Grabber.vi will create this handle.

LVImagePtr

Address for destination image buffer. Also known as the Pixel Pointer. This address is created from the IMAQ GetImagePixelPtr.vi.

LVLineWidth

Width in pixels of image with border added. This is obtained from IMAQ GetImagePixelPtr.vi.

Width

Width of the actual image in pixels without borders.

Height

Height of the actual image in pixels without borders.

Integration

Integration option can be enabled or disabled.

IntFrames

If Integration is enabled, this will set the number of frames to integrate.

Trigger

Trigger option can be enabled or disabled.

Return Values

If the function succeeds, then function returns `SLV_OK`. If the function does not succeed one of the following codes is returned:

<code>SLV_ERROR</code>	Unsuccessful completion
<code>SLV_NOT_SUPPORTED</code>	Setup option not supported
<code>SLV_ABORT</code>	Frame Aborted
<code>SLV_FRAME_TIMEOUT</code>	Frame capture timed out
<code>SLV_ERROR_GETTING_FRAME</code>	Could not complete frame

Remarks

GrabSetup

The GrabSetup function will create buffers and pointers for the Grab routine to follow.

```
int GrabSetup(  
    DWORD          Interface_Handle,  
    DWORD          Grabber_Handle,  
);
```

Parameters

Interface_Handle

Frame Grabber Interface Handle. Open_Grabber_Interface.vi will create this handle.

Grabber_Handle

Grabber Interface Handle. Open_Any_Grabber.vi will create this handle.

Return Values

If the function succeeds, then function returns SLV_OK. If the function does not succeed one of the following codes is returned:

SLV_ERROR	Unsuccessful completion
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Remarks

Because of the method of capture in the Grab routines, this set of calls can only be used by a single board. Multiple boards are not supported simultaneously.

GrabSetupDMA

The GrabSetupDMA function will create buffers and pointers for the GrabDMA routine to follow.

```
int GrabSetupDMA(  
    DWORD          Interface_Handle,  
    DWORD          Grabber_Handle,  
);
```

Parameters

Interface_Handle

Frame Grabber Interface Handle. Open_Grabber_Interface.vi will create this handle.

Grabber_Handle

Grabber Interface Handle. Open_Any_Grabber.vi will create this handle.

Return Values

If the function succeeds, then function returns SLV_OK. If the function does not succeed one of the following codes is returned:

SLV_ERROR	Unsuccessful completion
SLV_NOT_ENOUGH_MEMORY	Not enough memory

Remarks

Because of the method of capture in the Grab routines, this set of calls can only be used by a single board. Multiple boards are not supported simultaneously. This command can only be used with the FG-7 frame grabber board.

Grab

If placed in a LabVIEW While loop the Grab function will continuously grab frames to the image buffer.

```
int Grab(  
    DWORD          Interface_Handle,  
    DWORD          Grabber_Handle,  
    unsigned long  LVImagePtr,  
    int            LVLineWidth,  
    unsigned int   Width,  
    unsigned int   Height,  
    unsigned int   Integration,  
    unsigned int   IntFrames,  
    unsigned int   Trigger  
);
```

Parameters

Interface_Handle

Frame Grabber Interface Handle. Open_Grabber_Interface.vi will create this handle.

Grabber_Handle

Grabber Interface Handle. Open_Any_Grabber.vi will create this handle.

LVImagePtr

Address for destination image buffer. Also known as the Pixel Pointer. This address is created from the IMAQ GetImagePixelPtr.vi.

LVLineWidth

Width in pixels of image with border added. This is obtained from IMAQ GetImagePixelPtr.vi.

Width

Width of the actual image in pixels without borders.

Height

Height of the actual image in pixels without borders.

Integration

Integration option can be enabled or disabled.

IntFrames

If Integration is enabled, this will set the number of frames to integrate.

Trigger

Trigger option can be enabled or disabled.

Return Values

If the function succeeds, then function returns SLV_OK. If the function does not succeed one of the following codes is returned:

SLV_ERROR	Unsuccessful completion
SLV_NOT_SUPPORTED	Setup option not supported
SLV_ABORT	Frame Aborted
SLV_FRAME_TIMEOUT	Frame capture timed out
SLV_ERROR_GETTING_FRAME	Could not complete frame

Remarks

Because of the method of capture in the Grab routines, this set of calls can only be used by a single board. Multiple boards are not supported simultaneously.

GrabDMA

If placed in a LabVIEW While loop the Grab function will continuously grab frames to the image buffer using the DMA ability of the FG-7 frame grabber.

```
int Grab(  
    DWORD           Interface_Handle,  
    DWORD           Grabber_Handle,  
    unsigned long   LVImagePtr,  
    int             LVLineWidth,  
    unsigned int    Width,  
    unsigned int    Height,  
    unsigned int    Integration,  
    unsigned int    IntFrames,  
    unsigned int    Trigger  
);
```

Parameters

Interface_Handle

Frame Grabber Interface Handle. Open_Grabber_Interface.vi will create this handle.

Grabber_Handle

Grabber Interface Handle. Open_Any_Grabber.vi will create this handle.

LVImagePtr

Address for destination image buffer. Also known as the Pixel Pointer. This address is created from the IMAQ GetImagePixelPtr.vi.

LVLineWidth

Width in pixels of image with border added. This is obtained from IMAQ GetImagePixelPtr.vi.

Width

Width of the actual image in pixels without borders.

Height

Height of the actual image in pixels without borders.

Integration

Integration option can be enabled or disabled.

IntFrames

If Integration is enabled, this will set the number of frames to integrate.

Trigger

Trigger option can be enabled or disabled.

Return Values

If the function succeeds, then function returns SLV_OK. If the function does not succeed one of the following codes is returned:

SLV_ERROR	Unsuccessful completion
SLV_NOT_SUPPORTED	Setup option not supported
SLV_ABORT	Frame Aborted
SLV_FRAME_TIMEOUT	Frame capture timed out
SLV_ERROR_GETTING_FRAME	Could not complete frame

Remarks

Because of the method of capture in the Grab routines, this set of calls can only be used by a single board. Multiple boards are not supported simultaneously. This command can only be used with the FG-7 frame grabber board.

GrabEndDMA

The GrabEnd ends the grab routines by releasing all buffers and memory addresses.

```
int GrabEnd(  
    DWORD Interface_Handle,  
    DWORD Grabber_Handle  
);
```

Parameters

Interface_Handle

Frame Grabber Interface Handle. Open_Grabber_Interface.vi will create this handle.

Grabber_Handle

Grabber Interface Handle. Open_Any_Grabber.vi will create this handle.

Return Values

If the function succeeds, then function returns SLV_OK. If the function does not succeed one of the following codes is returned:

SLV_BUFFER_RELEASE_ERROR	Problems releasing buffers
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Remarks

Because of the method of capture in the Grab routines, this set of calls can only be used by a single board. Multiple boards are not supported simultaneously. This command can only be used with the FG-7 frame grabber board.

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