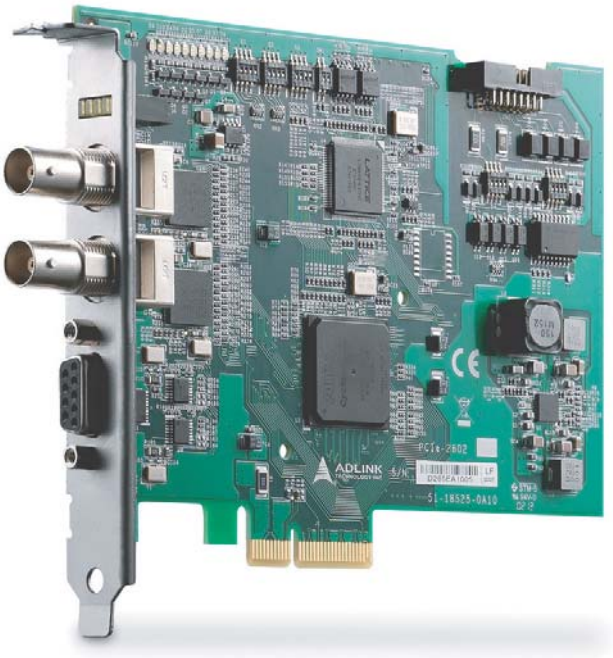
PCIe-2602

3G-SDI Audio/Video Capture Card

User's Manual



Manual Rev.:	3.00
Revision Date:	Aug. 23, 2013
Part No:	50-11251-1010

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Revision History

Revision	Release Date	Description of Change(s)
2.00	June 28, 2013	Initial release
3.00	Aug. 23, 2013	Revised specification

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Preface

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Conventions

Take note of the following conventions used throughout this manual to make sure that users perform certain tasks and instructions properly.



Additional information, aids, and tips that help users perform tasks.



Information to prevent ***minor*** physical injury, component damage, data loss, and/or program corruption when trying to complete a task.



Information to prevent ***serious*** physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.

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1 Introduction

1.1 Overview

The PCIe-2602 3G-SDI Audio/Video Capture Card, based on the PCI Express® x4 interface, enables acquisition of 2 channels 3G-SDI, low latency, and raw video data signals up to 1920x1080P/60fps (frames per second).

Thanks to 3G capability, ADLINK's PCIe-2602 supports high accuracy color format, such as 12 bit 4:4:4 1080i/60fps or 10 bit 4:2:2 1080P/60fps, and when combined with a suitable 75Ω coaxial cable, 3G-SDI signals can be transmitted over 100 m, suiting the PCIe-2602 for medical imaging and intelligent video surveillance and analysis.

The included ViewCreator Pro® utility enables setup, configuration, testing, and system debugging without requiring any software programming. As well, ADLINK's drivers are compatible with Microsoft® DirectShow, reducing engineering efforts and accelerating time to market.

1.2 Features

- Support for 2-CH 3G-SDI video signal, up to 1920 x 1080P/60fps video stream
- Low latency, uncompressed video streaming
- High accuracy color format support, 12 bit 4:4:4 1080i/60fps or 10 bit 4:2:2 1080P/60fps
- Cabling distances up to 100m (w/ compatible 75Ω coaxial cable)
- Directshow support
- RS-485 and Digital I/O provided
- PCI Express x4 compliant signal
- Connection Status LED

1.3 Applications

The PCIe-2602, featuring 3G signal capture ability and support for highly accurate color formatting, is ideal for frame grab function in

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a wide variety of applications, including medical imaging and intelligent video surveillance or analytics.


NOTE:

The PCIe-2602 Function Library Reference can be downloaded from the product's pages at http://www.adlinktech.com

1.4 Specifications

The PCIe-2602 provides 2 BNC connectors that support 2 channels of video and embedded audio, with maximum video data throughput of 2.97Gb/s, with 1.485G and 270M bps supported, and RS-485 and digital I/O simplify connection with other devices.

1.4.1 Software Support

- OS supported: Win 7/XP/8, 32/64-bit
- Software compatibility: Visual C++, C#, Visual Basic.Net, Borland C++ Builder


NOTE:

Microsoft .NET Framework 3.5 must be installed if the OS is Windows 8, to ensure complete installation and proper utility function

1.4.2 Video & Audio

The PCIe-2602 supports the following video and audio formats.

Item	Specification
Color space	Replicates video source

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Item	Specification	
Video input resolution	SD Interlace pattern	525i(720x486i@59.94/60Hz), 625i(720x576i@50Hz)
	HD interlace pattern	1080i50(1920x1080i@50Hz), 1080i60(1920x1080i@59.94/60Hz)
	HD progressive pattern	720p24(1280x720p@24Hz), 720p25(1280x720p@25Hz), 720p30(1280x720p@30Hz), 720p50(128x720p@50Hz), 720p60(128x720p@59.94/60Hz), 1080p24(1920x1080p@23.98/24Hz, 1080p25(1920x1080p@25Hz), 1080p30(1920x1080p@30Hz), 1080p50(1920x1080p@50Hz), 1080p60(1920x1080p@59.94/60Hz)
Supported video sampling	8/10 bit 4:4:4	1080p24, 1080p25, 1080p30, 720p24, 720p25, 720p30*, 720p50, 720p60, 1080i50, 1080i60
	12 bit 4:4:4	1080p24, 1080p25, 1080p30, 1080i50, 1080i60
	8/10 bit 4:2:2	1080p50, 1080p60, 1080p24, 1080p25, 1080p30, 720p24, 720p25, 720p30, 720p50, 720p60, 1080i50, 1080i60
	12 bit 4:2:2	1080p24, 1080p25, 1080p30, 1080i50, 1080i60
	8 bit 4:2:2	525i, 625i
Audio channel	2 channels/port	
Audio sample word length	16/20/24 bits (setting must follow audio source)	

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NOTE:

If the input source is 720p30, 8/10 bit 4:4:4, the PCIe-2602 can only capture the video signal without audio signal. In ViewCreator Pro, adjust Video Format and Color Format to display the image normally. Format in the API GetDetectedSensorFormat (UINT Number, int& Format) will return -1 when the input source is 720p30, 8/10 bit 4:4:4.

1.4.3 Power Consumption

Test Item	Value
DC 3.3V	1.5A
DC 12V	1.2A

1.4.4 Electrical

The following specification includes values for SDI, PCI Express, and digital Input and Output.

Parameter	Min.	Type	Max.	Comment
SDI				
Serial input common mode voltage	--	2.2V	--	
PCI Express				
Differential Input High Threshold for REFCLK and PER			+300mV	Rt=100ohm, VCM=+1.2V
Differential Input Low Threshold for REFCLK and PER	-300mV			
High Differential Output for PET			+300mV	Rt=100ohm, VCM=+1.25 V
Low Differential Output for PET	-300mV			

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Parameter	Min.	Type	Max.	Comment
Input High Threshold for WAKE#, PERST# , SMCLK and SMDAT	+2.0V		+3.45V	
Input Low Threshold for WAKE#, PERST#, SMCLK and SMDAT	-0.3V		+0.8V	
Digital Input				
Number of Channels	4 digital inputs			
Input Resistance	1 KΩ			
Input High Threshold	2V		12V	Test condition: Ta=25℃
Input Low Threshold	0V		0.8V	
Input power dissipation	0W		0.17W	
Input signal Frequency			1kHz	Test condition: Ta=25℃
Digital Output				
Number of Channels	4 digital outputs			
Output sink current			50mA	Test condition: Ta=25℃
Output Type	Open collect/TTL			
Power on status	Open collect mode	TTL mode		
	High Z	High State(+5V)		
Response Time			1kHz	Test condition: Ta=25℃

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1.4.5 Physical

Dimensions	149mm x 111.15mm
Operating Temperature	0˚C to 60˚C
Storage Temperature	-20°C to 80°C
Humidity	5%~95% (non-condensing)
Safety Compliance	CE & FCC

1.5 Schematics, I/O and Indicators

NOTE: All dimensions shown are in mm

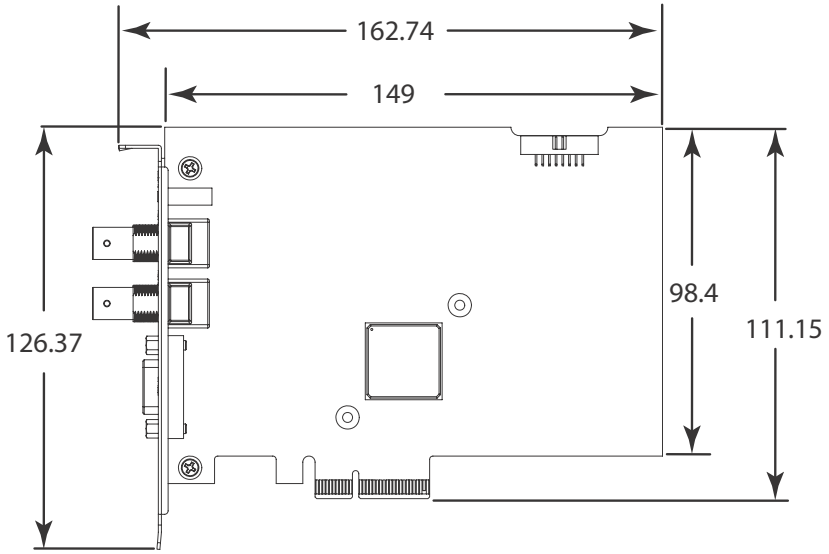


Figure 1-1: PCIe-2602 Schematic Diagram

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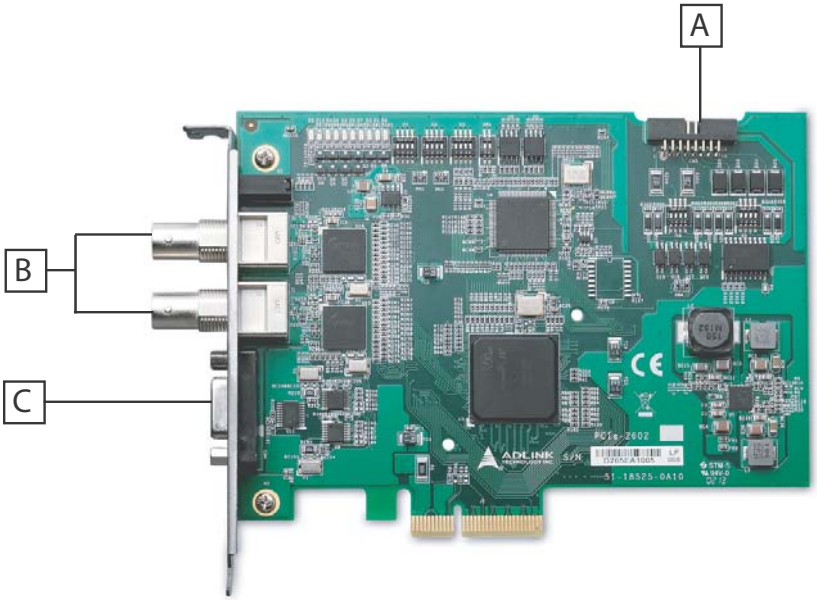


Figure 1-2: PCIe-2602 Board Layout

A	D I/O
B	SDI
C	RS-485

Table 1-1: Board Layout Legend

I/O and indicator panel elements are labeled as follows

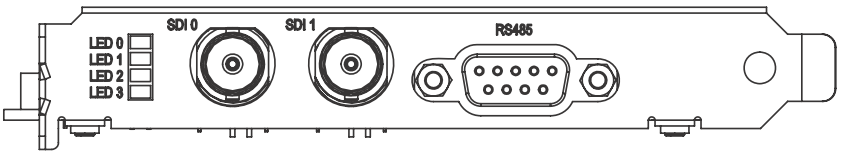


Figure 1-3: I/O & Indicator Panel

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1.5.1 SDI Connector

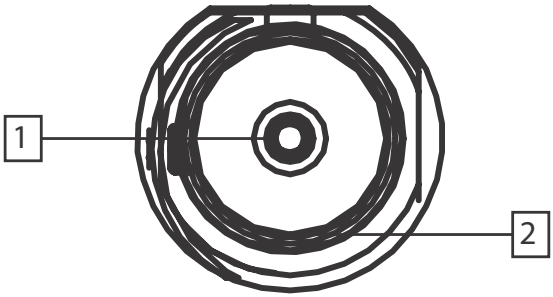


Figure 1-4: SDI Connector

Pin	Function	Type
1	SDI signal	Input
2	SDI signal GND	Reference ground

Table 1-2: SDI Connector Pin Assignment

1.5.2 RS-485 Connector

The PCIe-2602 RS-485 connector is a DSUB-9 male configuration.

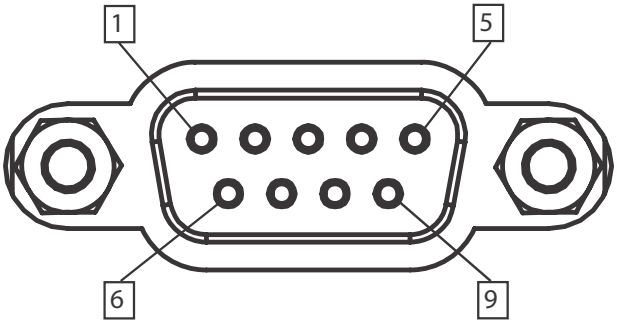


Figure 1-5: RS-485 Connector

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Pin	Function	Type
1	RS485 Channel 1 data+	Dual direction
2	RS485 Channel 1 data-	Dual direction
3	RS485 Channel 2 data+	Dual direction
4	RS485 Channel 2 data-	Dual direction
5	Digital GND	Reference ground
6	Digital GND	Reference ground
7	Digital GND	Reference ground
8	Digital GND	Reference ground
9	Digital GND	Reference ground

Table 1-3: RS-485 Connector Pin Assignment

1.5.3 DI/O (Digital Input/Output) Connector

The PCIe-2602 DI/O connector is a 16 pin-header configuration.

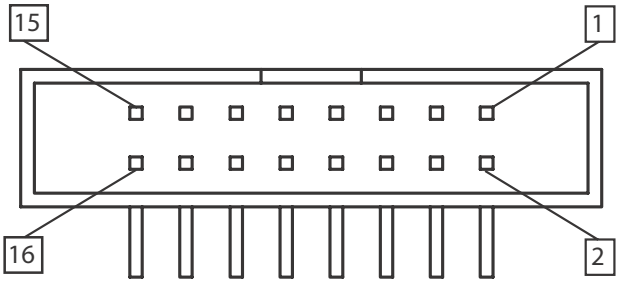


Figure 1-6: DI/O Connector

Pin	Function	Type
1	DI3-	Digital Input channel 3 invert pin
2	DI0+	Digital Input channel 0 non-invert pin
3	DI2-	Digital Input channel 2 invert pin
4	DI1+	Digital Input channel 1 non-invert pin
5	DI1-	Digital Input channel 1 invert pin

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Pin	Function	Type
6	DI2+	Digital Input channel 2 non-invert pin
7	DI0-	Digital Input channel 0 invert pin
8	DI3+	Digital Input channel 3 non-invert pin
9	DO0	Digital Output channel 0
10	GND	Digital Ground
11	DO1	Digital Output channel 1
12	GND	Digital Ground
13	DO2	Digital Output channel 2
14	Clamp	Digital Output Darlington IC clamping voltage
15	DO3	Digital output channel 3

Table 1-4: D I/O Connector Pin Assignments

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External access to the DI/O connector can be provided using ADLINK's separately available D-sub connector cable with external bracket (ADLINK part number: 30-25013-0000).

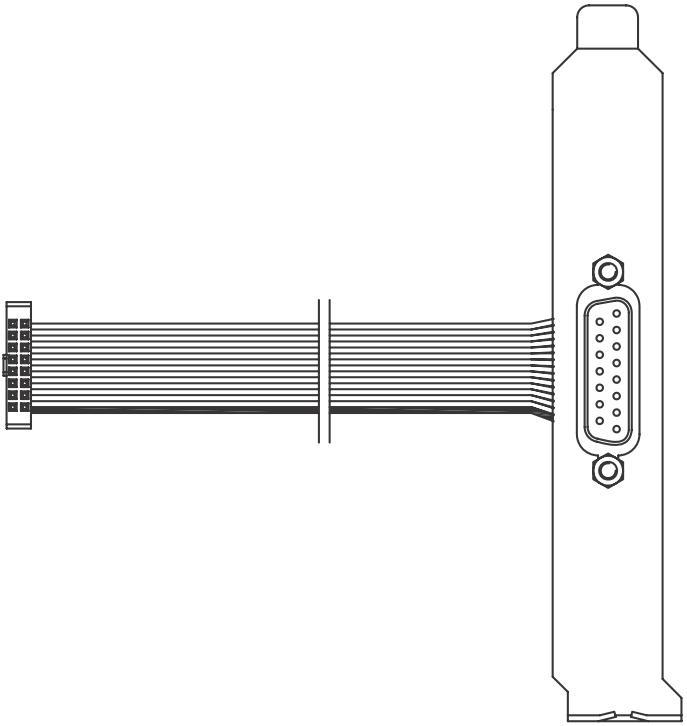


Figure 1-7: D-sub Connector Cable

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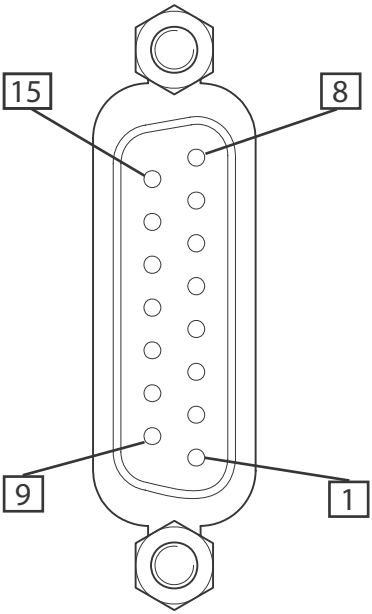


Figure 1-8: D-sub Connector Cable Exterior Connector

Pin	Function	Type
1	DI3-	Input
9	DI0+	Input
2	DI2-	Input
10	DI1+	Input
3	DI1-	Input
11	DI2+	Input
4	DI0-	Input
12	DI3+	Input
5	DO0	Output
13	GND	DO Ground

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Pin	Function	Type
6	DO1	Output
14	GND	DO Ground
7	DO2	Output
15	DO clamp	DO Power
8	DO3	Output

Table 1-5: D-sub Connector Cable Exterior Connector Pin Assignments

1.5.4 LED Indicators

Four LED indicators on the I/O panel indicate SDI signal connection and status.

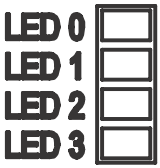


Figure 1-9: LED Indicators

LEDs 0 and 1 indicate status of vertical synchronization signals, while 2 and 3 confirm data verification, as follows.

LED 0	LED 2	Description
Blinking	On	The input signal is identified and channel 0 is functioning normally
Off	Off	No input is detected or the input signal cannot be identified. The connection or cable should be checked, or the input signal format determined to be SDI.

Table 1-6: LEDs 0 and 2 Indicator Legend

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LED 1	LED 3	Description
Blinking	On	The input signal is identified and channel 1 is functioning normally
Off	Off	No input is detected or the input signal cannot be identified. The connection or cable should be checked, or the input signal format determined to be SDI.

Table 1-7: LEDs 1 and 3 Indicator Legend


NOTE:

If a signal is received but unidentified, please check the SDI signal format according to Section 1.4.2 Video & Audio. The PCIe-2602 may support resolutions not listed, please contact ADLINK FAE for support.

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1.5.5 Switch Settings

Switches for digital I/O and card ID settings, allowing identification of individual cards in a multi-card system, are located as follows.

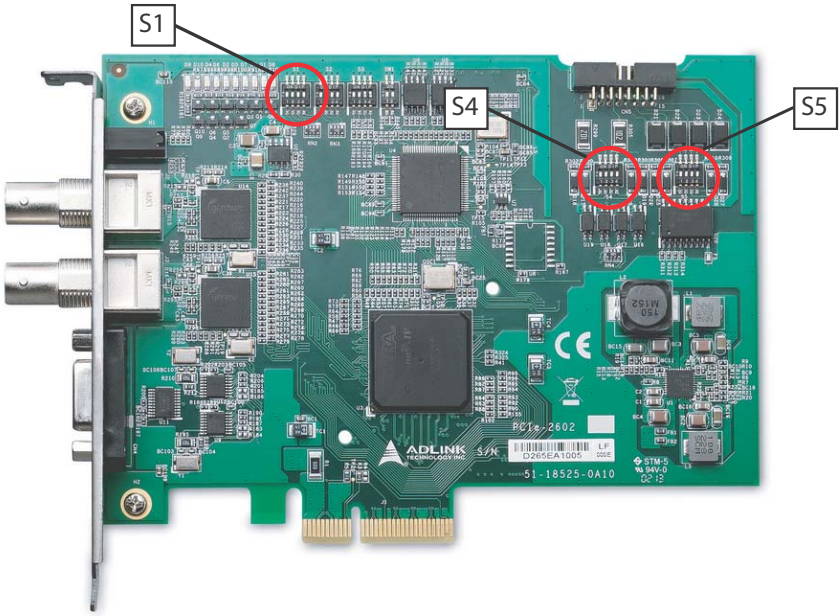


Figure 1-10: Switch Locations

Switch	Function
S1	Card ID Settings
S4-S5	Digital I/O Settings

Table 1-8: Switch Functions

NOTE: Default setting for sliders S1, S4 and S5 is OFF

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Card ID	Slider 1	Slider 2	Slider 3	Slider 4
15	on	on	on	on
14	off	on	on	on
13	on	off	on	on
12	off	off	on	on
11	on	on	off	on
10	off	on	off	on
9	on	off	off	on
8	off	off	off	on
7	on	on	on	off
6	off	on	on	off
5	on	off	on	off
4	off	off	on	off
3	on	on	off	off
2	off	on	off	off
1	on	off	off	off
0	off	off	off	off

Table 1-9: Card ID Switch Settings (S1)

DI Channel	DI Status	Slider	Setting
DI0	Pulled high to +5V	1	On
DI0	Low	1	Off
DI1	Pulled high to +5V	2	On
DI1	Low	2	Off
DI2	Pulled high to +5V	3	On
DI2	Low	3	Off
DI3	Pulled high to +5V	4	On
DI3	Low	4	Off

Table 1-10: D I/O Switch Settings (S4)

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DI Channel	DI Status	Slider	Setting
DO0	Pulled high to +5V	1	On
DO0	Low	1	Off
DO1	Pulled high to +5V	2	On
DO1	Low	2	Off
DO2	Pulled high to +5V	3	On
DO2	Low	3	Off
DO3	Pulled high to +5V	4	On
DO3	Low	4	Off

Table 1-11: D I/O Switch Settings (S5)

1.5.6 Digital I/O Connections

Function block diagrams and connection examples for digital I/O settings follow.

Digital Input

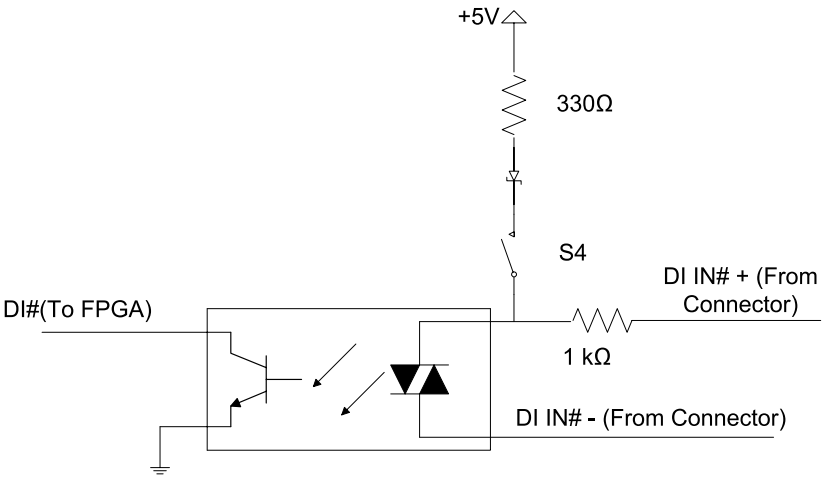
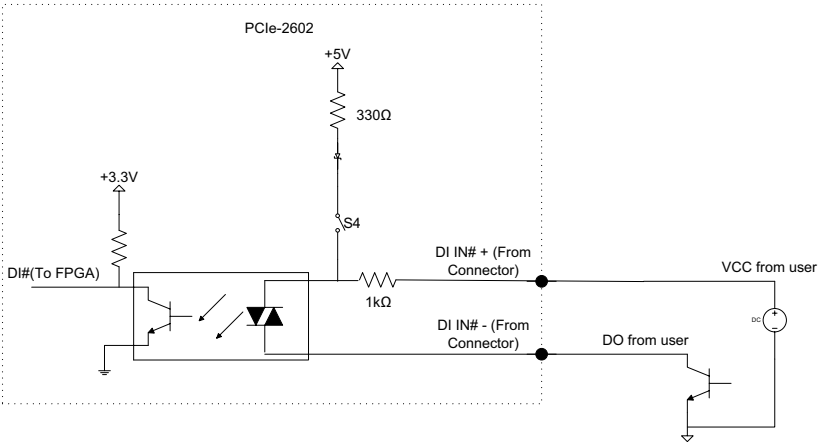


Figure 1-11: PCIe-2602 Digital Input Functional Block Diagram

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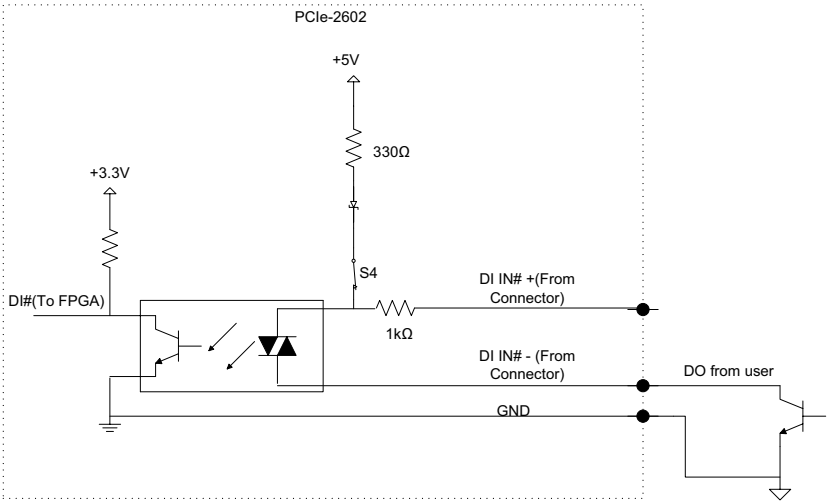
In the following, varying situations are illustrated in which channel # of digital input is connected, where # is 0 to 3.



API (DI Status)	DO Status from User
1	High Z
0	Low

Figure 1-12: Sinking DI: Slider # of Switch 4 OFF

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API (DI Status)	DO Status from User
1	High Z
0	Low

Figure 1-13: Sourcing DI: Slider # of Switch 4 is ON

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Digital Output

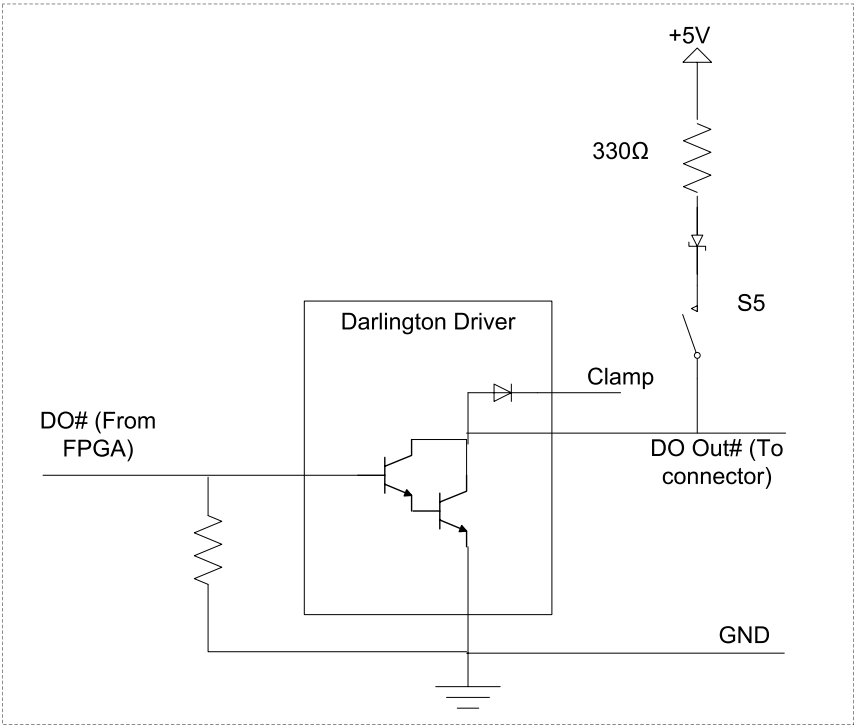
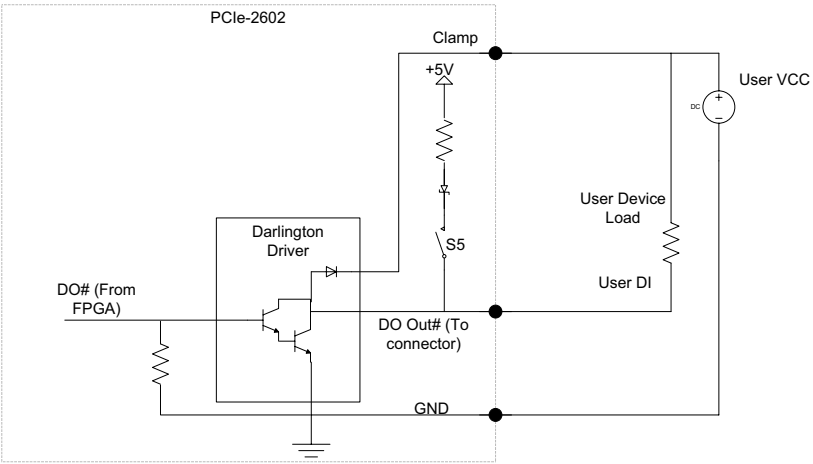


Figure 1-14: PCIe -2602 Digital Output Functional Block Diagram

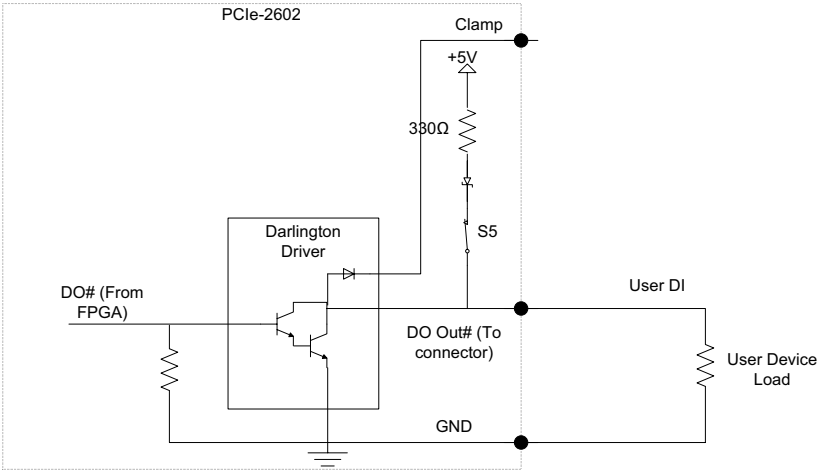
In the following, varying situations are illustrated in which channel # of digital output is connected, where # is 0 to 3.

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API (DO Output)	DO Out# to Connector
1	Low(0V)
0	High Z

Figure 1-15: Sinking DO: Slider # of Switch 5 is OFF



API(DO Output)	DO Out# to Connector
1	Low (0V)
0	High (+5V)

Figure 1-16: Sourcing DO: Slider # of Switch 5 is ON

1.5.7 RS-485 Connection

PCIe-2602 supports RS-485 protocol

To avoid signal reflections, each bus segment must be blanked at its physical beginning and end with the characteristic impedance. A resistor, Rt, is installed for this purpose, with – 130Ω ± 2% the

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recommended value. Detailed connection of the Rt is as follows. PCIe-2602 supports BUS topology.

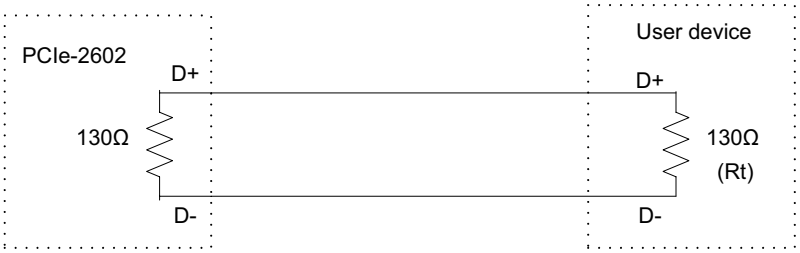


Figure 1-17: RS-485 Connection

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2 Getting Started

2.1 Unpacking Checklist

Before unpacking, check the shipping carton for any damage. If the shipping carton and/or contents are damaged, inform your dealer immediately. Retain the shipping carton and packing materials for inspection. Obtain authorization from your dealer before returning any product to ADLINK. Ensure that the following items are included in the package.

- PCIe-2602 unit
- Quick Start Guidel



OEM versions with non-standard configuration, functionality, or packaging may vary according to individual requirements.

2.2 Installation

The following describes installation of the PCIe-2602 module on the PCI express bus.

1. Remove the computer cover according to the computer manual..



A vacant PCI express slot is required for installation of the PCIe-2602 module; if none is available, remove a PCI express board and note the slot number.

2. Remove the slot cover (if any).
3. Carefully position the PCIe-2602 in the selected PCI express slot. If installing in a tower computer, align the board with the board slots.
4. Press the board firmly but carefully into the connector.
5. Anchor the board with the screw.
6. Connect the SDI source and PCIe-2602 with the BNC coaxial cable.

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7. Power up the computer.


NOTE:

The PCIe-2602 can be installed in a PCI Express x4, x8, or pcie PCIe x16 slot.

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Appendix A ViewCreator Pro Utility

The included ViewCreator Pro utility provides simple yet powerful setup, configuration, testing, and debugging of your vision system.

NOTE:

ViewCreator Pro is available for Windows XP/7/8 systems only, with recommended screen resolution exceeding 800x600. Microsoft .NET Framework 3.5 must be installed if the OS is Windows 8, to ensure complete installation and proper utility function

ViewCreator Pro provides

- 32/64-bit compatibility under Windows XP/Vista/7 DirectShow driver
- Access to and configuration of PCIe-2602 cards
- Video picture adjustment
- Image file (BMP or JPG) viewing and saving
- Access to general purpose I/O

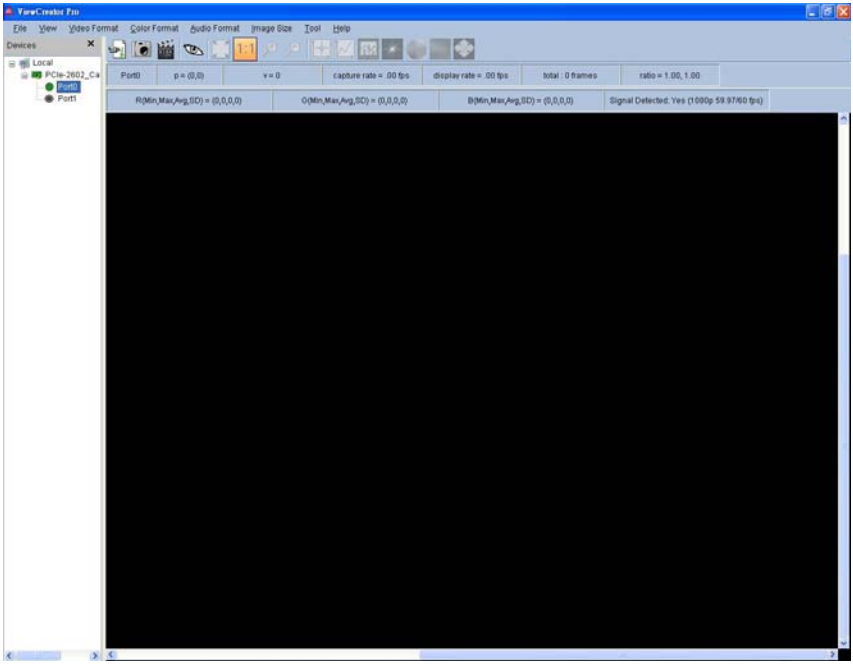


Figure A-1: ViewCreator Pro Interface

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The ViewCreator Pro interface provides a variety of panels and toolbars, allowing comprehensive task performance in all areas of function.

A.0.1 Devices Panel

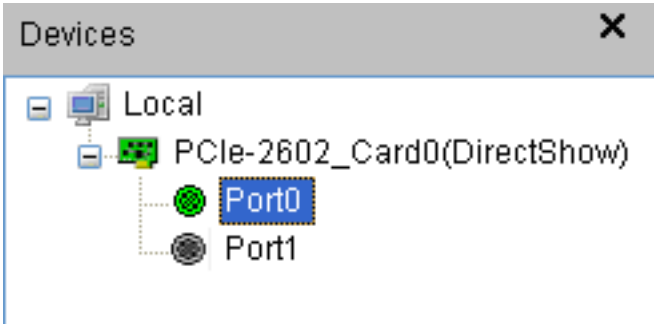


Figure A-2: Devices Panel

Panel Item	Function
Local	Lists cards on the local system supported by ViewCreator Pro
Active Device	The device to which all operations will apply
Inactive Device	Currently inactive devices which can be activated by selection from this menu
Active port	The port to which all operations will apply
Inactive port	Currently inactive port which can be activated by selection from this menu

Table A-1: Devices Panel Items

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A.0.2 Tool Panel

Tool	Button	Function
ContinueGrab		Toggles continuous acquisition of images
SnapShot		Captures a single image
Hide/Show Image		Toggles display of the image
FitSize		Resizes the image to fit the display area
OriginalSize		Restores the image to original size
ZoomIn		Increases image closeup
ZoomOut		Decreases image closeup
FocusCross		Displays blue crosshairs at any selected point on the image, the pixel values of which are displayed on the Status Panel
Focus Value		(See FocusValue Operating Details)
Histogram		Opens a window showing the histogram of the display region
Fourier Transform		Opens a window showing the Fourier-Transformed image

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Tool	Button	Function
HSI Conversion		Opens a window showing the HSI values along the selected line on the image
YCbCr Enable		Transforms the image to YCbCr color space, toggling YCbCr Enable/Y Enable (CbCr=128)/ CbCr Enable (Y=0)/YCbCr Disable
Image Flip		Toggles No Flip/Flip X axis (horizontal)/Flip Y axis (vertical)
Record		Toggles Record function (Function supports only 4:2:2 8-bit video input)

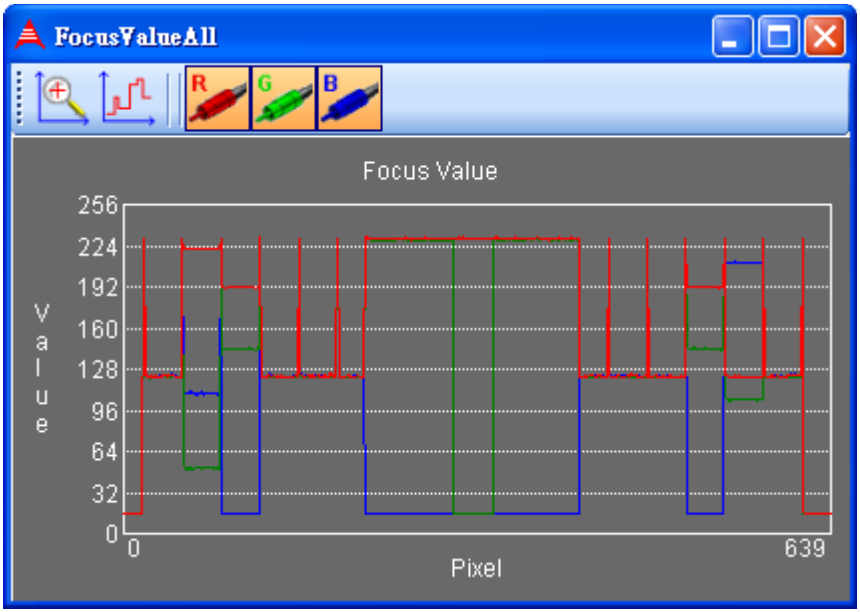
Table A-2: Tool Panel Controls

FocusValue Operating Details

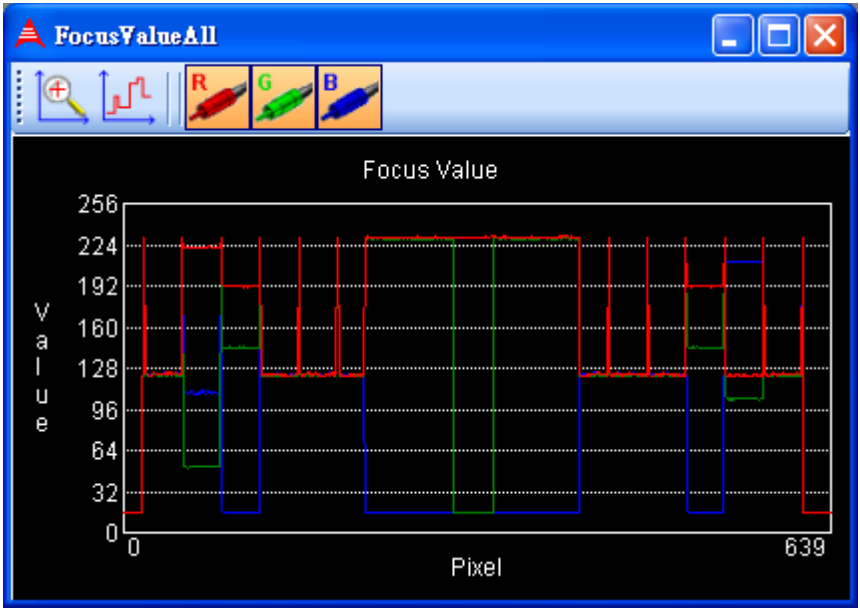
A Focus Value window opens, displaying pixel values along a selected horizontal line of the image, which is displayed as red. Selecting the displayed image allows movement of the selected line.

If acquisition is in progress, the background color of the window is gray. The chart updates immediately once an image is acquired. The x-axis region is determined by the number of horizontal pixels shown in the display panel.

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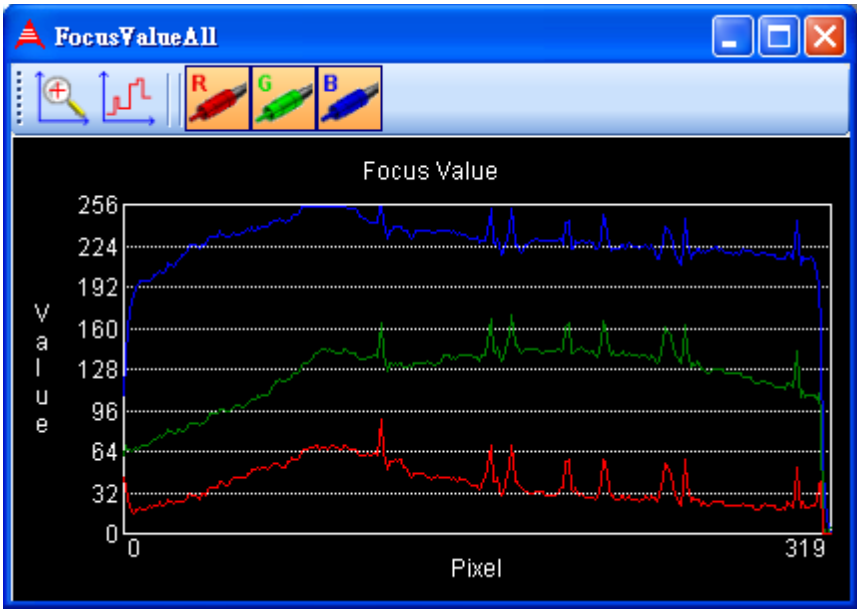

FocusValueAll
R
G
B
Focus Value
256
224
192
160
128
96
64
32
0
Value
0
639
Pixel

When acquisition is complete, the background color of the window changes to black. X-axis size is the width of the entire image.

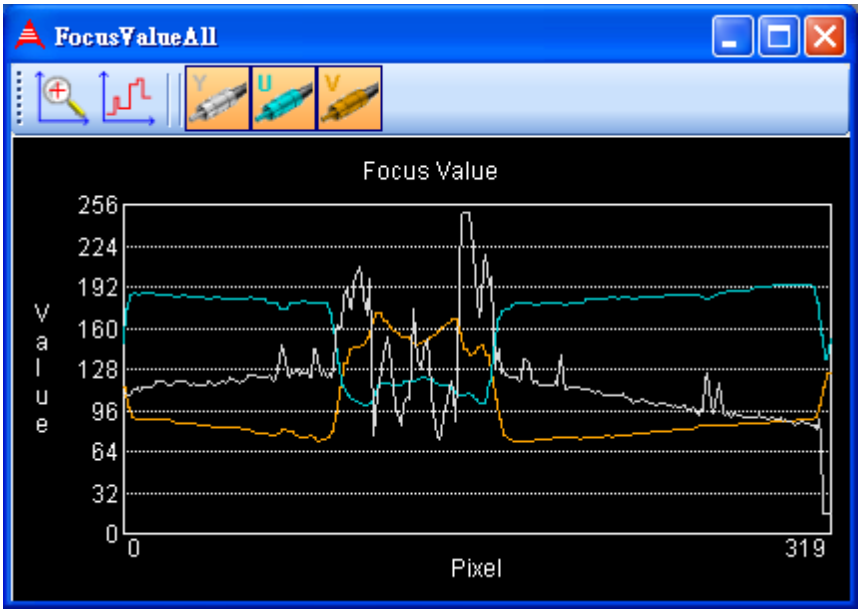


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If the image is chromatic, three curves, individually representing red, green, and blue are shown.



If the color format of captured image is YUV, three curves individually representing Y, U, and V are shown.



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FocusValue Tools

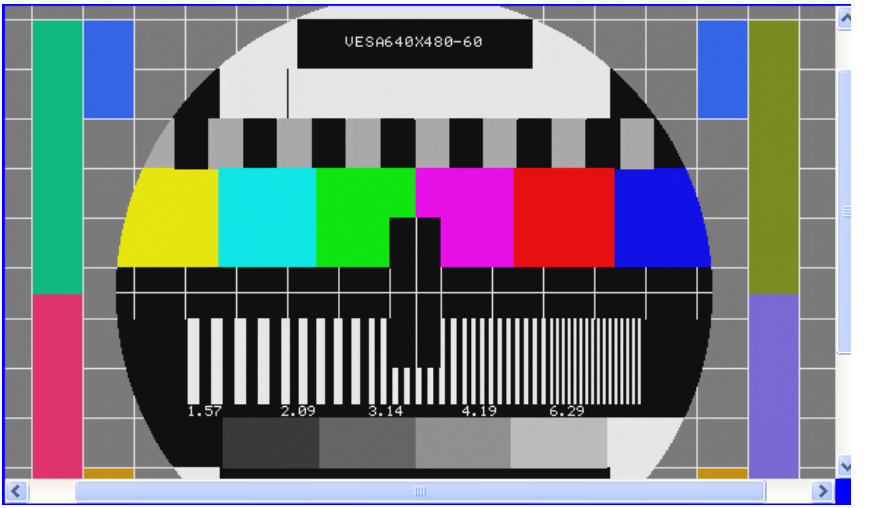
Tool	Button	Function
Zoom In		Increases closeup on the area in the FocusValue window bound by the green rectangle, which can be resized by dragging the side borders
Differential		Displays slope of the line for the area in the FocusValue window bound by the green rectangle, which can be resized by dragging the side borders
Show/Hide Red Values		Toggles display of red pixel values.
Show/Hide Green Values		Toggles display of green pixel values.
Show/Hide Blue Values		Toggles display of blue pixel values.
Show/Hide Y Values		Toggles display of Y pixel values.
Show/Hide U Values		Toggles display of U pixel values.
Show/Hide V Values		Toggles display of V pixel values.

Table A-3: FocusValue Tools

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A.0.3 Display Panel

Captured images are displayed on this panel as shown.



A.0.4 Status Panel

Displays image acquisition, signal, and image statistics, as shown.



Figure A-3: Status Panel

Top Row (L to R)	Bottom Row (L to R)
Selected port and channel	Red component statistics
Cursor position	
Pixel value	Green component statistics
Capture rate	
Display rate	Blue component statistics
Total captured frames	
Display magnification (horizontal & vertical ratios)	Signal detection status

Table A-4: Status Panel Display Categories

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A.0.5 Display Menu

Allows selection of desired video format based on SDI(BNC).

The SDI menu is shown open as an example.

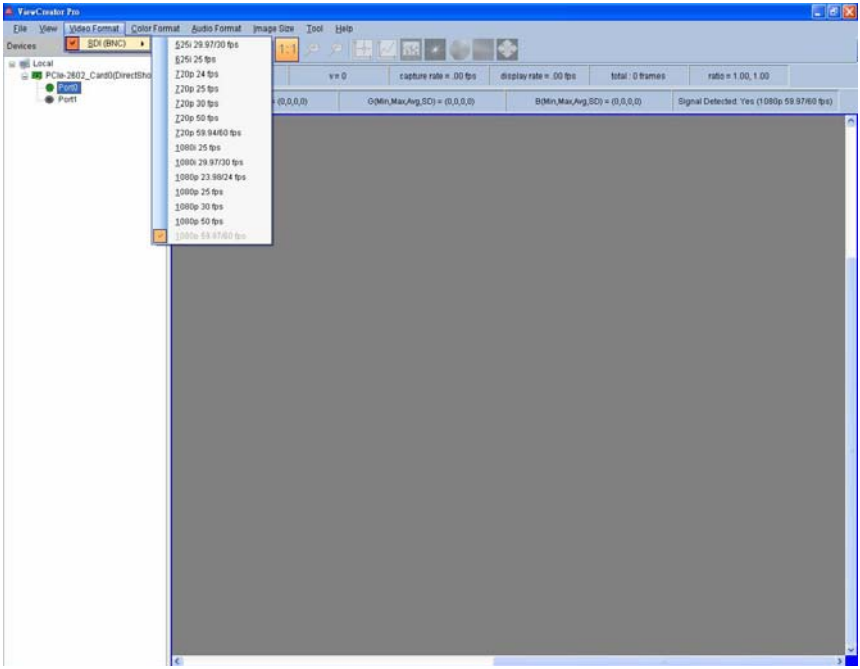


Figure A-4: SDI Display Menu

Format	Resolution
525i 29.97/30 fps	720 x 486
625i 25 fps	720 x 576
720p 24 fps	1280 x 720
720p 25 fps	1280 x 720
720p 30 fps	1280 x 720
720p 50 fps	1280 x 720
720p 59.94/60 fps	1280 x 720

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Format	Resolution
1080i 25 fps	1920 x 1080
1080i 29.97/30 fps	1920 x 1080
1080p 23.98/24 fps	1920 x 1080
1080p 25 fps	1920 x 1080
1080p 30 fps	1920 x 1080
1080p 50 fps	1920 x 1080
1080p 59.97/60 fps	1920 x 1080

Table A-5: SDI (BNC) Available Formats

A.0.6 Color Format Menu

Sets the captured image to the selected color format.

YCbCr 4:2:2 8bit (YUY2)
YCbCr 4:4:4 8bit (YUV8)
RGB 4:4:4 8bit (RGB24)
YCbCr 4:2:2 10bit (YU10)
YCbCr 4:4:4 10bit (YUV10)
RGB 4:4:4 10bit (GBR30)
YCbCr 4:2:2 12bit (YU12)
YCbCr 4:4:4 12bit (YUV12)
RGB 4:4:4 12bit (RGB36)

Table A-6: Available Color Formats

A.0.7 Audio Format Menu

Sets the audio format, with available Sample Rates and Channels variable according to the input selected.

Sampling Rate	48 kHz
Sample Bits	16 bit 20 bit 24 bit
Channels	2.0 (2)

Table A-7: Available Audio Formats

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A.0.8 Image Size Menu

Top-down

Enables top-down image display.

Top-down function, when enabled, may improve capture efficency in computers experiencing low frame rate due to performance.

Auto Detect

Automatically detects image resolution

A.0.9 Tool Menu

DI/O

Sets and retrieves digital input/output status, select digital output and digital input conditions.

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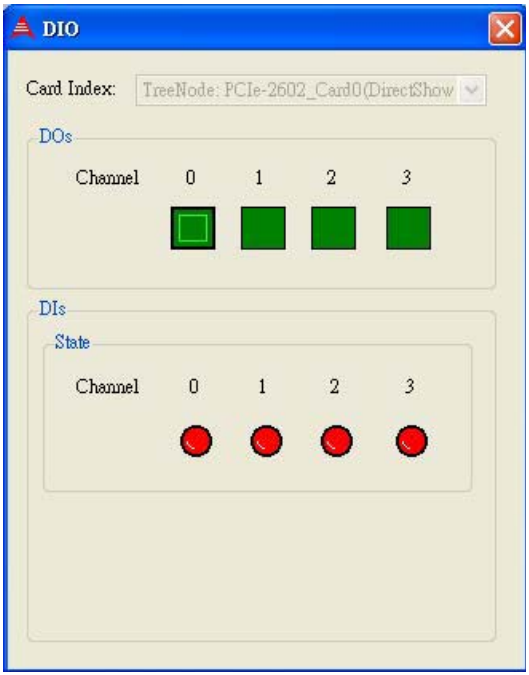


Figure A-5: DI/O Dialog

A.0.10 Help Menu

About Device

Displays card ID, hardware version, firmware version, driver version, and utility version information.

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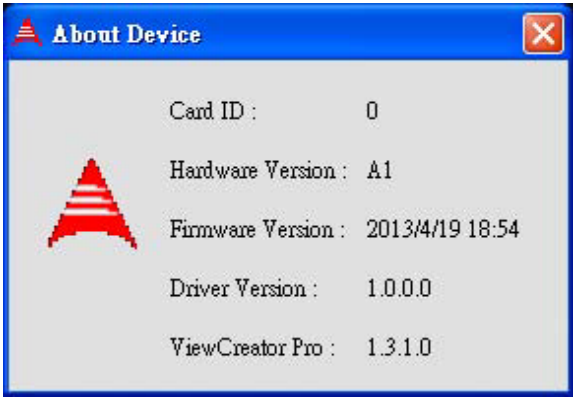


Figure A-6: About Device Dialog

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Appendix B PCIe-2602 Benchmark

PCIe-2602 delivers 2-CH 1080P/60 fps raw video data requiring PCIe X4 or more. If bandwidth is insufficient, abnormal images may be generated or frames lost. In some systems, the bandwidth of PCIe slots may be shared. When frame capture rate deviates from that expected, check the PCIe slot setting in the computer user manual or BIOS.

B.1 Recommended System Configuration

CPU	Intel i5 or above
RAM	4GB
OS	Win XP/7/8 (Microsoft .NET Framework 3.5 is needed for Win 8)

B.2 Benchmarks

B.2.1 Test 1

Motherboard	NuPRO-E330			
Backplane	EBP-9E2			
CPU	Intel® Core™ i7 860 2.8GHz			
Memory	1GB X 2			
OS	Win7 Pro 32 bit			
Input signal	1080p 60fps,YUV 4:2:2, 10 bit			
Card ID	0 (PCIe x16 slot)		1 (PCIe x 4 slot)	
Channel number	0	1	0	1
Captured Frame Rate (fps)	60	60	60	60

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B.2.2 Test 2

Platform	MXC-6300			
CPU	Intel® Core™ i7 3610QE 2.30GHz			
Memory	8GB X2			
OS	WinXP Professional 32 bit			
Input signal	1080p 60fps,YUV 4:2:2, 10 bit			
Card#	0 (PCIe x8 slot)		1 (PCIe x8 slot)	
Channel#	0	1	0	1
Captured Frame Rate (fps)	60	60	60	60

B.2.3 Test 3

Motherboard	GIGA-X58A-UD3R			
CPU	Intel® Core™ i7 920 2.67GHz			
Memory	4GB X 1			
OS	Win7 Pro 32 bit			
Input signal	1080p 60fps,YUV 4:2:2, 10 bit			
Card ID	0 (PCIe x16 slot)		1 (PCIe x16 slot)	
Channel Number	0	1	0	1
Captured Frame Rate (fps)	60	60	60	60

B.2.4 Test 4

Motherboard	ASUS P6TSE	
CPU	Intel® Core™ i7 920 2.67GHz	
Memory	2GB X 1	
OS	Win7 Ultimate 32 bit	
Input signal	1080p 60fps,YUV 4:2:2, 10 bit	
Card ID	0 (PCIe x16 slot)	1 (PCIe x16 slot)

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Channel Number	0	1	0	1
Captured Frame Rate (fps)	60	60	60	60

B.2.5 Test 5

Motherboard	ASUS P8P67			
CPU	Intel® i5 2400			
Memory	2GB X 1			
OS	Win7 Pro 32 bit			
Input signal	1080p 60fps,YUV 4:2:2, 10 bit			
Card ID	0 (PCIe x16 slot)		NA	
Channel Number	0	1	NA	NA
Captured Frame Rate (fps)	60	60	NA	NA

NOTE:

The PCIe PCIe x16 slot setting is changed to “X4 mode” via BIOS.

B.2.6 Test 6

Motherboard	GIGA-X58A-UD7					
CPU	Intel® Core™ i7 950 3.07 GHz					
Memory	2GB X 2					
OS	Win7 Pro 32 bit					
Input signal	1080p 60fps,YUV 4:2:2, 10 bit					
Card ID	0 (PCIe x16 slot)		1 (PCIe x16 slot)		2 (PCIe x16 slot)	
Channel Number	0	1	0	1	0	1
Captured Frame Rate (fps)	60	60	60	60	60	60

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Important Safety Instructions

For user safety, please read and follow all **instructions**, **WARNINGS**, **CAUTIONS,** and **NOTES** marked in this manual and on the associated equipment before handling/operating the equipment.

- Read these safety instructions carefully.
- Keep this user's manual for future reference.
- Read the specifications section of this manual for detailed information on the operating environment of this equipment.
- When installing/mounting or uninstalling/removing equipment:
  - Turn off power and unplug any power cords/cables.
- To avoid electrical shock and/or damage to equipment:
  - Keep equipment away from water or liquid sources;
  - Keep equipment away from high heat or high humidity;
  - Keep equipment properly ventilated (do not block or cover ventilation openings);
  - Make sure to use recommended voltage and power source settings;
  - Always install and operate equipment near an easily accessible electrical socket-outlet;
  - Secure the power cord (do not place any object on/over the power cord);
  - Only install/attach and operate equipment on stable surfaces and/or recommended mountings; and,
  - If the equipment will not be used for long periods of time, turn off and unplug the equipment from its power source.

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- Never attempt to fix the equipment. Equipment should only be serviced by qualified personnel.

A Lithium-type battery may be provided for uninterrupted, backup or emergency power.



Risk of explosion if battery is replaced with one of an incorrect type. Dispose of used batteries appropriately.

- Equipment must be serviced by authorized technicians when:
  - The power cord or plug is damaged;
  - Liquid has penetrated the equipment;
  - It has been exposed to high humidity/moisture;
  - It is not functioning or does not function according to the user's manual;
  - It has been dropped and/or damaged; and/or,
  - It has an obvious sign of breakage.

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Getting Service

Contact us should you require any service or assistance.

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