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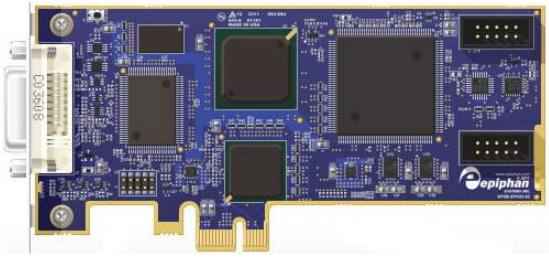
DVI2PCIe™ User Guide



Epiphan Technical Documentation

January 2012

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Product Feedback

We regularly contact our customers to ensure product performance and reliability. We strive to continually enhance our products to accommodate your needs. We welcome your feedback and suggestions for product improvements. You can email your comments to info@epiphan.com.

Specifications

You can go to the Frame Grabbers page of the Epiphan website to get information about DVI2PCIe.

Warranty

All Epiphan Systems products are provided with a 100% return to depot warranty for one year from the date of purchase.

Technical Support

Epiphan is staffed by a professional support team. If, after checking the FAQs for your product on the Epiphan website and re-installing the Epiphan driver software (where applicable), you continue to have outstanding issues, email a problem report to support@epiphan.com. To help us solve the problem efficiently, include the following info:

- Your DVI2PCIe serial number.
- Technical description of the signal source including resolution, refresh rate, synchronization, type of hardware.
- Complete description of the problem you are experiencing.

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1. Table of Contents

1. Introduction

Epiphan Systems' DVI2PCIe™ is Epiphan's capture card internal frame grabber with a single-link DVI/VGA input. It is installed in a video capture workstation's PCI Express (PCIe) slot and transmits captured data to the video capture workstation over the PCIe bus.

DVI2PCIe can capture video from any single link DVI, unencrypted HDMI video, VGA, or BNC/component video source. Full HD can be captured at a capture rate of 30 frames per second for 1080p video and video sources at any resolution up to 1920x1200 are supported. The DVI2PCIe capture card driver is fully compatible with DirectShow in Windows, Video4Linux in Linux, and QuickTime in Mac OS X, and can be used in conjunction with any third party software.

Besides being able to capture from DVI, VGA, HDMI video sources, DVI2PCIe supports DisplayPort, Mini DisplayPort, and Thunderbolt sources using a converter cable, sold separately. Resolutions up to 1920x1200 are supported, with a minimum capture rate of 30 frames per second.

DVI2PCIe is part of Epiphan's complete line of video signal capture products. For more information about all of Epiphan's video signal capture products, please see the Frame Grabbers Overview on the Epiphan website.

Package Contents

Epiphan DVI2PCIe device package includes the following:

1. DVI2PCIe board (with tall PCIe bracket attached)
2. DVI cable
3. DVI-VGA cable

4. DVI-HDMI cable

Package contents for the DVI2PCIe are available on the DVI2PCIe specifications page on the Epiphan website.

2. Installation

This chapter describes how to connect and install an Epiphan PCI frame grabber – DVI2PCIe. Installation of this device is described in the document according to how it is installed into the video capture workstation. The video capture workstation is a computer that runs the drivers and application software for the frame grabber and is used to display and record images captured by the frame grabber.

How to use this document to install DVI2PCIe

Review the **Package Contents** section to make sure you have received everything. Review the **System Requirements** section to select a video capture workstation. The video capture workstation can be running Windows, Mac OS, or Linux.

Use the sections below to install the Epiphan drivers and application for the DVI2PCIe on the video capture workstation, to connect the DVI2PCIe to the video capture workstation, and to begin capturing images.

DVI2PCIe Hardware features

The Epiphan DVI2PCIe frame grabber is a PCIe x4 card that includes a single DVI-I type connector and three activity LEDs. The DVI2PCIe card can be installed in a 4x, 8x or 16x PCIe slot on the motherboard of the video capture workstation.

Figure 1. DVI2PCIe Capture card

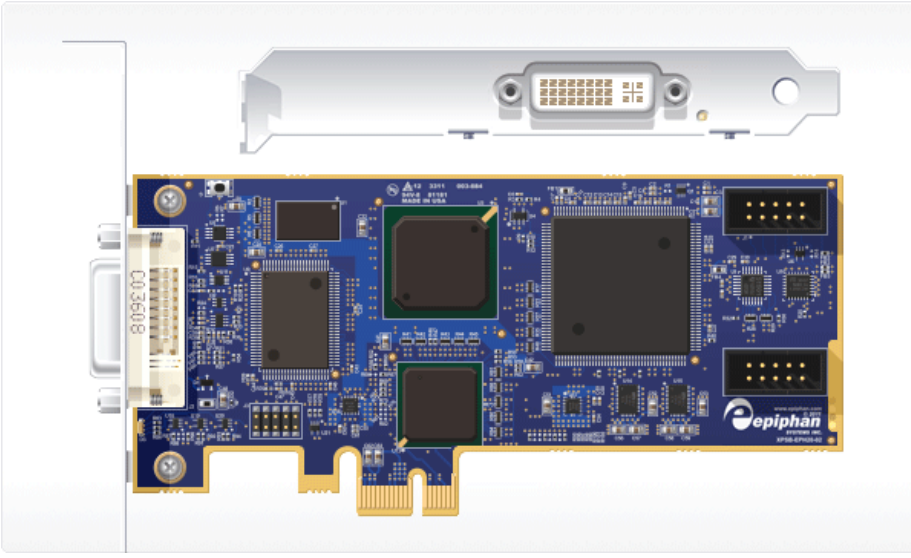


Figure 2. DVI2PCIe connectors and LEDs

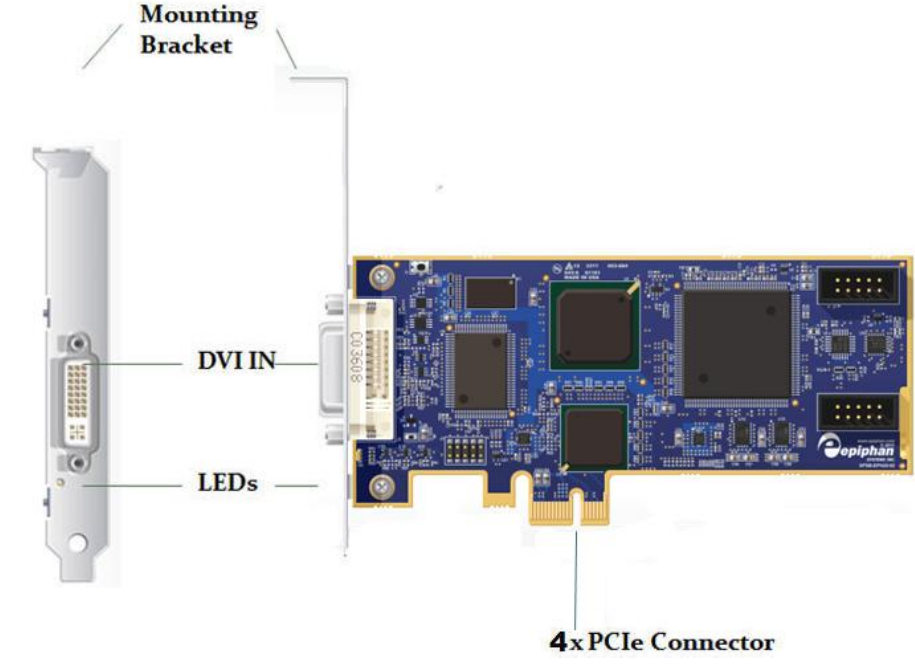
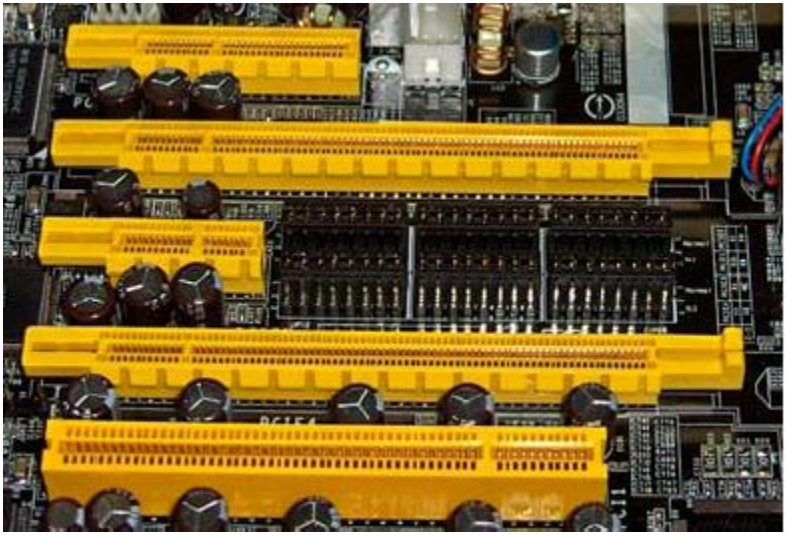


Figure 3 shows an example of different PCIe slots on a single PC motherboard.

Figure 3.PCIe slots (from top to bottom: 4x, 16x, 1x and 16x), compared to a traditional 32-bit PCI slot (bottom)



When installed, the DVI2PCIe card adds a single DVI IN port and three LED indicators on the back of the PC. You can connect a DVI source directly to this DVI IN port using a standard DVI cable. To connect a VGA source, use a VGA to DVI cable. To connect an HDMI source, use an HDMI to DVI cable.

Table 1: LED Descriptions

Interface	Description
LEDs	**Red LED:** During operation the red LED blinks each time the DVI2PCIe captures an image. You can use the red LED as an indicator that the DVI2PCIe is capturing images. **Green and blue LEDs**: When the PC starts up the DVI2PCIe blue LED lights up. A few seconds later the green LED lights up. After about another 20 seconds the blue LED turns off, leaving the green LED on indicating that the device has

	started up and can start capturing images. During operation the blue LED blinks during the signal test operation and when the system tunes the parameters.
DVI In	Connect a DVI, VGA, or HDMI source to the DVI2PCIe card. See the **DVI2PCIe Specifications** on the Epiphan web site for information about the video inputs supported by the DVI2PCIe card.

System Requirements

Epiphan's DVI2PCIe frame grabber has the following hardware and software requirements:

Video source	any VESA-compatible VGA, DVI, or HDMI source
Video capture workstation	4x PCIe slot (4x, 8x or 16x are supported)
Processor frequency	2 GHz or faster 32-bit (x86) or 64-bit (x64) processor
RAM memory	2 GB RAM (32-bit and 64-bit)
Available hard disk space	16 GB available hard disk space (32-bit) or 20 GB (64-bit)
Video capture workstation OS	Windows 2000, XP, Vista and Windows 7; Mac OS X 10.4 or more recent. A list of precompiled drivers is available on the Software Download page.

To download the latest versions of the DVI2PCIe's drivers and application, browse to http://www.epiphan.com/products/dvi-frame-grabbers/dvi2pcie/software-download/.

Connecting DVI2PCIe

This section describes how to install the DVI2PCIe and to connect a DVI/VGA/HDMI source to it.

Note: It is recommended that you download and install the latest drivers for the video capture workstation motherboard from the motherboard manufacturer's website before installing the DVI2PCIe Frame Grabber.

To connect the DVI2PCIe card, in addition to the frame grabber itself you need:

- A video capture workstation with an available 4x, 8x or 16x PCIe slot.
- A DVI/VGA/HDMI video source.
- For VGA and HDMI video sources, the appropriate cable to connect the video source input to the DVI IN port.
- To connectDisplayPort, Mini DisplayPort, and Thunderbolt sources to the DVI2PCIe card use the appropriate cables.
- An antistatic wrist strap to protect sensitive electronic components.

To install and connect a DVI2PCIe Frame Grabber:

This procedure describes how to install the DVI2PCIe in a video capture workstation.

1. Shut down and power off the video capture workstation.
2. Disconnect all cables from the video capture workstation.
3. Open the system unit to expose the PCIe slots (usually located at the back of the PC).
4. Attach the antistatic wrist strap to the metal casing of the PC power supply and to your wrist according to the instructions supplied with the wrist strap.

5. Select a PCIe slot and remove the corresponding filler panel from the PC slot opening.
6. Holding the DVI2PCIe card by the edges, align the card edge connector with the PCIe slot.
7. Slide the card mounting bracket into the small slot at the end of the PCIe opening.
8. Applying even pressure at both corners of the card, push the card down until it is firmly seated in the slot.

Caution: Do not use excessive force when installing the card into the PCIe slot. You might damage the card's PCIe connector. If the card does not seat properly when you apply even pressure, remove the card and carefully reinstall it.

9. Secure the card mounting bracket to the system unit using a screw at the top of the mounting bracket.
10. Detach the wrist strap and close the system unit.
11. Power on the video capture workstation.
12. Install the DVI2PCIe drivers and application as described below.

Windows video capture workstation installation

Follow the step-by step procedures in this section if you are going to use a Windows PC as the video capture workstation to view and record images captured by a DVI2PCIe frame grabber.

Note that you should install the drivers and application on the Windows video capture workstation *after* installing the DVI2PCIe in a PCIe slot of the Windows video capture workstation.

To install the Windows drivers and application:

The drivers and application software includes the Epiphan device drivers and the capture application.

1. Find the latest Windows drivers and Epiphan Capture software. Browse to http://www.epiphan.com/products/dvi-frame-grabbers/dvi2pcie/software-download/. Then scroll down to the Windows section of the download page.
2. Download the latest version of the drivers and application that will run on the video capture workstation. Make sure you note the download destination folder.
3. Unzip the downloaded file. Right-click on the .zip file and choose **Extract All**.
4. Run the Setup Utility (setup.exe) and follow the prompts to install the software.
5. The Windows drivers and application software is now installed.

To install the DVI2PCIe in the video capture workstation, refer to the previous section: **Connecting DVI2PCIe**.

Troubleshooting a Windows installation

If you experience any difficulty viewing captured images with the Windows capture application, review the following items prior to contacting technical support.

Confirm that the DVI2PCIe is properly installed in its PCIe slot and confirm that the Windows Device Manager displays the DVI2PCIe status under System Devices > PCIe Bus. Finally, observe the behavior of the frame grabber LED indicators.

If, after following the installation steps, you are still having problems, close all applications and restart the video capture workstation. When the video capture workstation has started up, open the Windows Device Manager to confirm that the frame grabber is detected.

Mac OS X video capture workstation installation

Follow the step-by step procedures in this section if you are going to use a Mac as a video capture workstation to view and record images captured by the frame grabber.

To install the Mac drivers and application:

A single download from the Epiphan web site includes the capture application command line capture application (v2u), the DVI2PCIe system preferences and the QuickTime digitizer (vdig).

1. Find the latest Mac drivers and application software. Browse to http://www.epiphan.com/products/dvi-frame-grabbers/dvi2pcie/software-download/ and scroll down to the Mac section of the download page.
2. Download the latest version of the drivers and application that will run on the video capture workstation. Make sure you note the download destination folder.
3. Double-click on the .dmg file to unpack it if it does not unpack automatically.
4. Double-click on the .pkg file and follow the prompts.
   Note: The final step of the installation requires restarting the video capture workstation.

To install the DVI2PCIe in the video capture workstation, refer to the previous section: **Connecting DVI2PCIe**.

To start the Mac OS capture application:

On the video capture workstation, run the capture application, from the Applications folder, select **DVI2USB.app**. The capture application starts up. If the DVI2PCIe frame grabber is connected and powered on, the capture application should automatically find the frame grabber and begin displaying captured images. If the frame grabber is

operating but not capturing images the device name and serial number should appear in the title bar and the capture application displays **No signal detected**.

Upgrading to the Latest Mac OS X Software Version

From time to time Epiphan makes new versions of all Epiphan frame grabber software available from the Epiphan web site. In most cases you can upgrade the Epiphan software on your Mac OS X video capture workstation by using normal procedures to download the latest version and install it without uninstalling the previous version.

Note: Some versions of the DVI2PCIe user interface do not install a shortcut on the Mac OS X desktop. You can drag the Epiphan icon from the **Applications** folder to your desktop or add it to the Dock after installing a new version of the DVI2PCIe user interface. You may also need to delete older versions of the Epiphan icon.

Finding Software Updates

To find the latest versions of all Epiphan software for Mac OS X, go to http://www.epiphan.com/products/dvi-frame-grabbers/dvi2pcie/software-download/.

On this download page you will find the most recent release of the Epiphan device driver, QuickTime component and DVI2PCIe application compatible with Mac OS X.

3. Windows DVI2PCIe User Interface

This chapter describes common functions and features of the Epiphan DVI2PCIe user interface (Epiphan Capture Tool). It supports the Windows 2000, XP, Vista and 7 versions. This chapter assumes that you have followed the instructions in the chapter 2 of this *User Guide*. To start using this chapter you should have:

- A video signal source started.
- A video capture workstation running Windows with an installed DVI2PCIe card.
- The DVI2PCIe drivers and application installed on the video capture workstation.

Starting the DVI2PCIe User Interface

To start the DVI2PCIe user interface, from the Windows Start menu select **Start > Epiphan Capture Tool**. The DVI2PCIe user interface starts up and looks for the DVI2PCIe card in your PC.

If the DVI2PCIe card is operating, the DVI2PCIe user interface should find it and the image being captured by the DVI2PCIe card should appear on the DVI2PCIe user interface display.

If the DVI2PCIe device is not capturing images, the DVI2PCIe user interface displays **No signal**.

As the DVI2PCIe user interface starts, the following messages may appear on the DVI2PCIe user interface window:

- **Capture device not found** as the DVI2PCIe user interface attempts to connect with DVI2PCIe device.
- **Detecting Video Mode** as the DVI2PCIe user interface connects to a device and then determines the video mode of the device.

- **Tuning Capture Parameters** as the DVI2PCIe user interface synchronizes and tunes capture settings and image adjustments.
- **No Signal Detected** if the DVI2PCIe user interface connects to a DVI2PCIe card that is not connected to an active video source.

If the DVI2PCIe user interface successfully connects to and synchronizes with the DVI2PCIe device, it begins displaying captured images.

Pausing, Copying, Saving, and Printing Images

Once the DVI2PCIe user interface is displaying images captured by the frame grabber, you can pause, copy, save, and print the current image.

To pause and resume the image capture:

1. Select **Pause Capture** from the **Capture** menu or from the toolbar select  .
2. While image capture is paused, the DVI2PCIe user interface stops receiving new images from the device. Pause also pauses video recording, and image recording. While paused, you can save, print, and copy the captured image.
3. To resume image capture select **Resume Capture** from the **Capture** menu or from the toolbar select  . You can use the following procedure to copy the image currently displayed by the DVI2PCIe user interface to the video capture workstation clipboard.

To copy a snapshot of the current image:

1. Select **Copy** from the **Edit** menu or select  from the toolbar. You can also use the key combination **CTRL+C**. The current image is copied to the clipboard.
2. Paste the image into a document or other application as a bitmap image. The image is pasted as a device independent bitmap image.

To save a snapshot of the current image as an image file:

You can use the following procedure to save the current image as a .bmp, .png, or .jpg file on the video capture workstation. You can optionally pause the image capture before saving an image.

1. Select **Save** from the **File** menu or from the toolbar select  or use the key combination **CTRL+S**. The status bar shows the location and name of the saved file.
2. The first time you save an image, the **Save As** dialog appears and you can specify the file name, file type, and location of the saved image file.
3. When you select **Save** again, the DVI2PCIe user interface saves the new image with the same file name and location, overwriting the previously saved file. You can select **Save As** to save the image with a different file name, file type, or location or use the key combination **CTRL+Shift+S**.
4. You can open the saved image file with most bitmap image editing applications.

To print a snapshot of the current image:

You can use the following procedure to print the current image on any printer that is connected to the video capture workstation. You can optionally pause the image capture before printing an image.

1. Select **Print** from the **File** menu, select  from the toolbar or use the key combination **CTRL+P**. The current image is sent to the default printer. You can select **Print Setup** from the file menu or use the key combination **CTRL+Shift+P** to select a different printer and set printer options.

Note: You can also configure the DVI2PCIe user interface to invert colors for printing. From the **Tools** menu select **Options,** then select the **Display** tab and select **Invert**

colors for printing. By reversing or inverting the colors of an image, the colors are made complementary of the original value. After performing picture color inversion, black becomes white, yellow becomes blue, red becomes aqua.

Recording Captured Images

You can record captured images as a video file or as a series of image files. Before recording captured images as a series of image files, you must configure the recording options by selecting **Options** from the **Tools** menu, then by selecting the **Recording** tab, and by finally selecting **Record as Images**. You should also select the image file format and other image file settings.

To record captured images as a series of image files:

1. Select **Start Recording** from the **Capture** menu, from the toolbar select  or use the key combination **CTRL+R**. As images are captured by the frame grabber they are recorded as a series of image files according to the image file settings on the **Recording** tab of the **Options** dialog from the**Tools** menu. The Status bar shows the name and location of the last saved file. You can pause recording by using the key combination **CTRL+U,** by selecting **Pause** from the **Capture** menu or  from the toolbar. You can stop recording by selecting repeatedly **Stop Recording** from the **Capture** menu or  from the toolbar. When you stop recording images, the status bar displays the number of image files saved.

To record captured images as a video file:

Before recording captured images as a video file, you must configure the recording options by selecting **Options** from the **Tools** menu, then selecting the **Recording** tab, and finally selecting **Record** as **Video**.

1. Select **Start Recording** from the **Capture** menu or from the toolbar select  .

2. In the **Save as** dialog box enter the file name, select the location for saving the video file, and click **Save**.

   As images are captured by the frame grabber they are recorded to the video file. The status bar shows the name and location of the video file. The status bar also displays the amount of time that the video has been recording and the number of frames (or images) being recorded.

   When the size of the video file reaches the AVI file size limit, see AVI file size limit in the section: **Configuring Recording Options** on how this is set. Based on the configurable behavior in that same section, the DVI2PCIe user interface does one of the following:

   - stops recording
   - starts a new video file and continues recording (**Configuring Recording Options** section describes how to specify the file name)
   - overwrites the original video file and continues recording.

   You can pause a recording by selecting **Pause Capture** from the **Capture** menu or  from the toolbar.
   You can stop recording by selecting **Stop Recording** from the **Capture** menu or  from the toolbar.
   When you stop recording, the Status bar shows the name and location of the saved video file, the amount of time that the video file was recording, and the number of frames or images that were recorded. For example: **Wrote c:\temp\example.avi (85 sec, 464 frames)**.

Menus

This section describes the commands available from the following Windows DVI2PCIe user interface menus:

File Menu

Use the File menu commands to save and print the current image displayed by the DVI2PCIe user interface and to exit the DVI2PCIe user interface.

Save	Save a snapshot of the current image to a file on the video capture workstation. Select a location for the file and select a file format. You can save the snapshot as a bitmap (*.bmp), portable network graphics (*.png), or JPEG (*.jpg) file. The first time you select **Save** after starting the DVI2PCIe user interface, you are prompted for a file name and you can change the file location and format. After saving the first file, every time you select **Save**, the video capture software saves a snapshot using the same file name in the same location replacing the previously saved file. When you select **Save**, the status bar shows the location and name of the saved file.
Save As	Save a snapshot of the current image to a file on the video capture workstation. Using **Save As** you can enter a file name and select a file location and format. **Save As** resets the file name, location, and file format used by the **Save** command and the **Save snapshot** toolbar button. When you select **Save As** the status bar shows the location and name of the saved file.
Print Setup	Configure printer settings used when you select the **Print** command or the **Print snapshot** toolbar button. You can also configure the DVI2PCIe user interface to invert colors for printing. By reversing or inverting the colors of an image, the colors are made complementary of the original value. After performing picture color

	inversion, black becomes white, yellow becomes blue, red becomes aqua. From the **Tools** menu select **Options**, then select the **Display** tab and select **Invert colors for printing**.
Print	Print a snapshot of the current image using the configured printer.
Exit	Close the DVI2PCIe user interface.

Edit Menu

From the Edit menu you can copy a snapshot of the current image. You can also use the key combination **CTRL+C.**

Copy	Copy a snapshot of the current image to the video capture workstation clipboard. You can paste this image into a document or other application as a bitmap image.

View Menu

Use the commands on the **View** menu to control the parts of the DVI2PCIe user interface window that are displayed.

Toolbar	Change the size of the toolbar icons or hide the toolbar. You can select small, large, or huge icons. If the toolbar is hidden, select an icon size to display the toolbar.
Status Bar	Enable or disable displaying the status bar.
Full Screen	Enable full screen mode, **Ctrl+F**.
Image Only	Change the DVI2PCIe user interface to operate in the **Image only** mode. In the **Image only** mode the DVI2PCIe user interface displays the captured image only. The window borders, toolbar, status bar and menu bar are not displayed. Scroll bars are displayed if required. The **Image only** mode can be useful for applications such as

	integrating the DVI2PCIe user interface into a custom system. You can still use all of the shortcut keys to save and print images, start and stop recordings, and to exit from the image-only mode. You can always press **Alt+F4** to exit from the DVI2PCIe user interface. You can also use the --borderless command line option to start the DVI2PCIe user interface in image only mode.

Capture Menu

Use the commands on the capture menu to start, stop or pause the capturing and recording of images. From the capture menu you can also select the device that the DVI2PCIe user interface receives captured images from if you have more than one DVI2PCIe or other Epiphan frame grabbers connected to the network. You can also view image adjustment settings and VGA mode settings for the selected device.

The record functions on the capture menu record the current image as a video or as a series of consecutive image files. Select **Options** from the **Tools** menu and use the settings on the **Recording** tab to configure what the DVI2PCIe user interface records.

Start recording	Start recording the current image to a video file or a series of image files.
Pause capture	Pause or resume image capturing. If you select pause, the DVI2PCIe user interface stops displaying newly captured images and the image captured when you selected Pause is displayed. Pause also pauses the recording of avideo and the saving of image files. Select pause again to resume the displaying of captured images and to resume recording.
Select device	You can use **Select Device** or the key combination **Ctrl+D** to choose the device that the DVI2PCIe user interface receives captured images from. The command finds and lists available DVI2PCIe devices. The list displays the serial number, device type, captured image resolution and frequency or status and

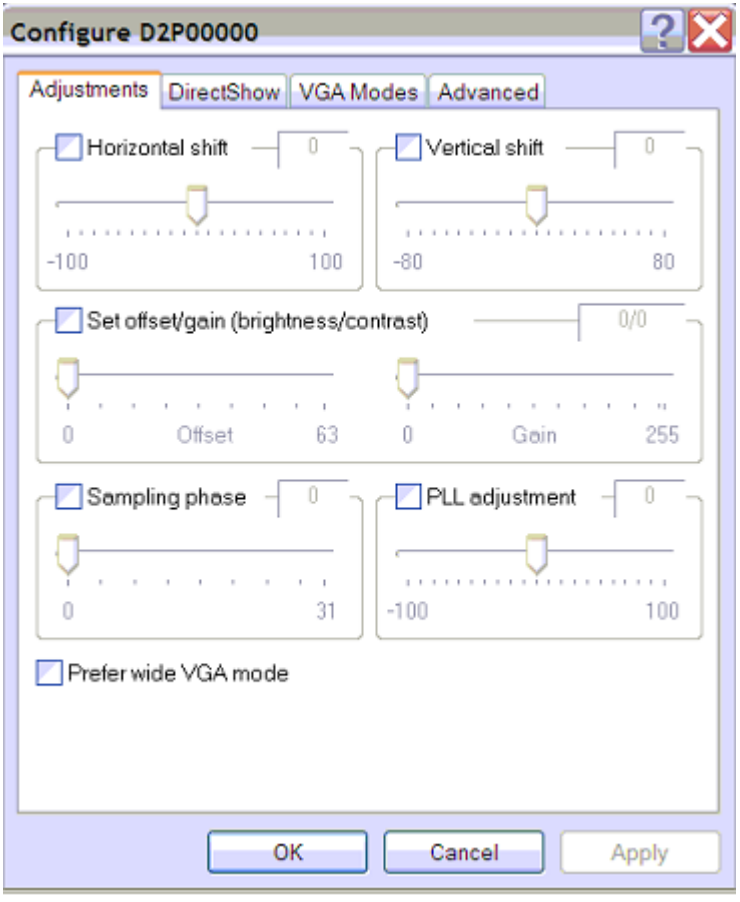
	location of each device. You can also use this command to select the device to configure with the **Configure Device** command.
Connect network device	Connect a device recognized on the network.
Disconnect network device	Disconnect current device.
Recent network devices	Displays a list of recently viewed devices.
Enable audio capture	Not used.
Audio input device	Not used.
Play captured audio	Not used.
Configure device	You can view image adjustments for the selected device. You can configure image adjustments from the Web admin interface or from the Network Discovery Utility. You can also select and configure VGA modes for the selected device. See the following section for more information regarding this function.

Configure Device

This window allows you to perform various image adjustments and select a required VGA mode. The following section illustrates and describes what can be configured using which tab.

Adjustments tab:

Figure 4. Adjustments tab

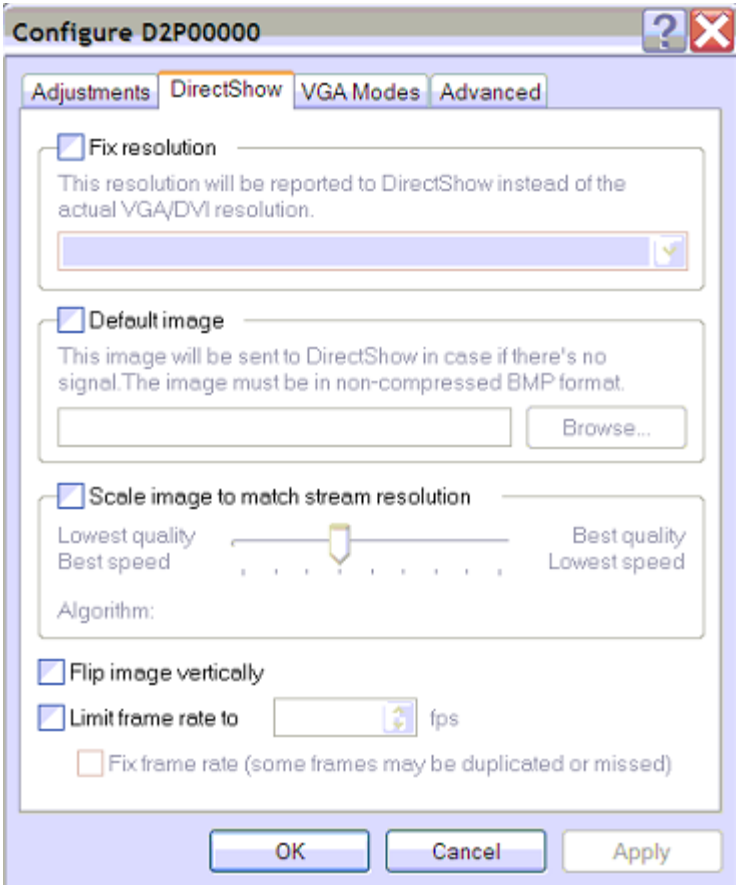


Horizontal shift	Configure horizontal shift to offset the captured image position. For example, a captured image shifted slightly to the right (horizontally) can be corrected with minor adjustments to the horizontal shift settings.

	Increasing or decreasing the value entered in the Horizontal Shift field shifts the image to the right or left.
Vertical shift	Configure vertical shift to offset the captured image position. For example, a captured image shifted slightly downward (vertically) can be corrected with minor adjustments to the vertical shift settings. Increasing or decreasing the value entered in the Vertical Shift field shifts the image up or down.
Set offset/gain (brightness/contrast)	Use the offset and gain controls together to optimize image quality. Increasing offset reduces background noise but also reduces the overall signal. Balance offset and gain to achieve the best quality image. You should adjust these settings by the smallest values possible to achieve the best results. You can compensate for a large change to one by making a large change to the other, but setting both offset and gain to high values can result in poorer video quality.
Sampling phase	Specify optimum sampling phase
PLL adjustment	Configure PLL to adjust the vertical synchronization properties of the image. The PLL adjustment may need to be changed when there is a repetitive distortion or blurriness on the horizontal axis of the image. You can adjust the PLL setting in small steps until a sharper image is displayed.
Prefer wide VGA mode	Allows selecting wide VGA mode

DirectShow tab:

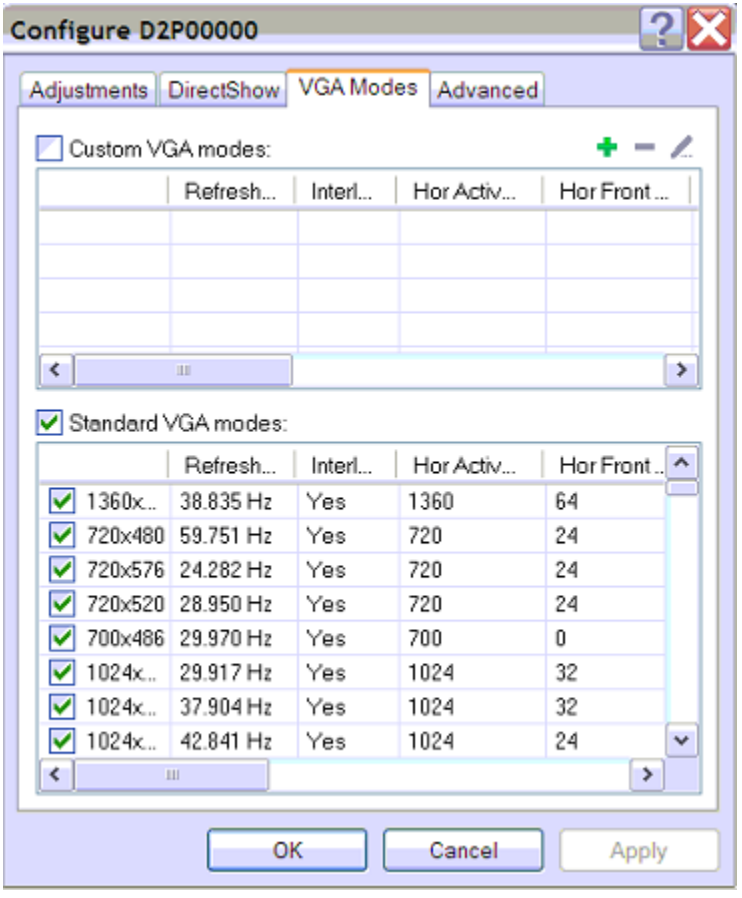
Figure 5. DirectShow tab



Fix resolution	Resolution that is reported to DirectShow
Default image	Image sent to DirectShow if there is no signal
Scale image to match stream resolution	Use the slider to scale the image
Flip image vertically	Select the checkbox to flip the image
Limit frame rate to	Specify the frame rate limit
Fix frame rate	Select the checkbox to fix frame rate

VGA Modes tab:

Figure 6. VGA Modes



Use this tab to select the standard VGA modes that are used during image capturing. The **Standard VGA modes** checkbox allows you to select all standard modes. To apply several modes select the checkboxes near the mode resolution value.

The following parameters are displayed for each mode:

- Refresh rate
- Interlaced
- Horizontal active area

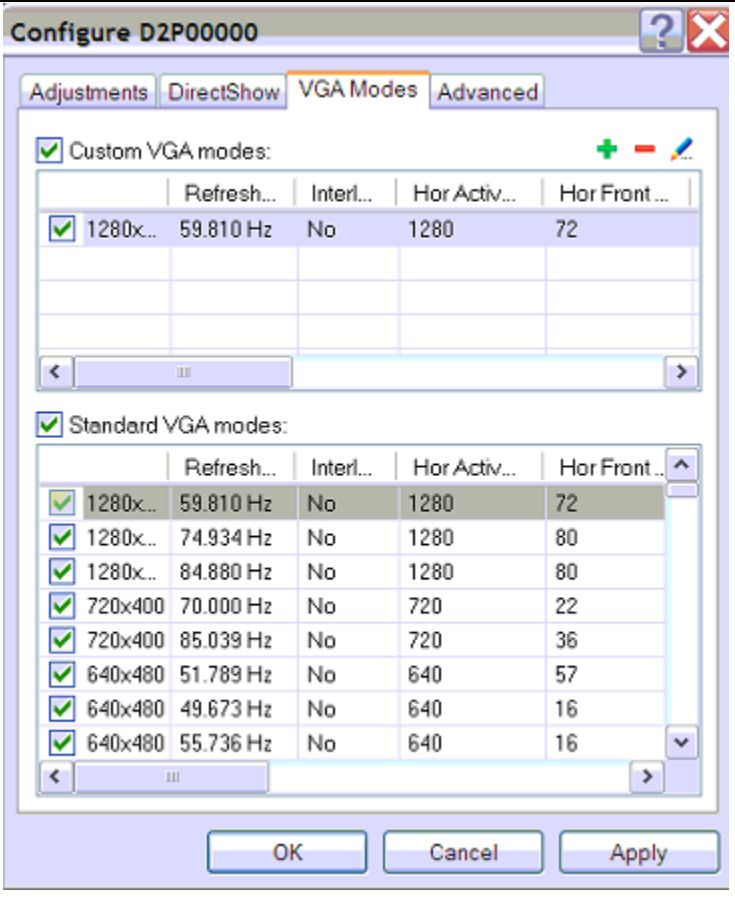
- Horizontal front porch (right border)
- Horizontal sync time (the time the beam needs to get from the far right edge back to the far left)
- Horizontal back porch (left border)
- Hsync polarity
- Vertical active area
- Vertical front porch (bottom border)
- Vertical sync time (the time the beam needs to get from the far bottom edge back to the top)
- Vertical back porch (top border)
- Vsync polarity

To add a custom VGA mode click the green plus sign in the upper right corner of the tab. Enter the following VGA mode details:

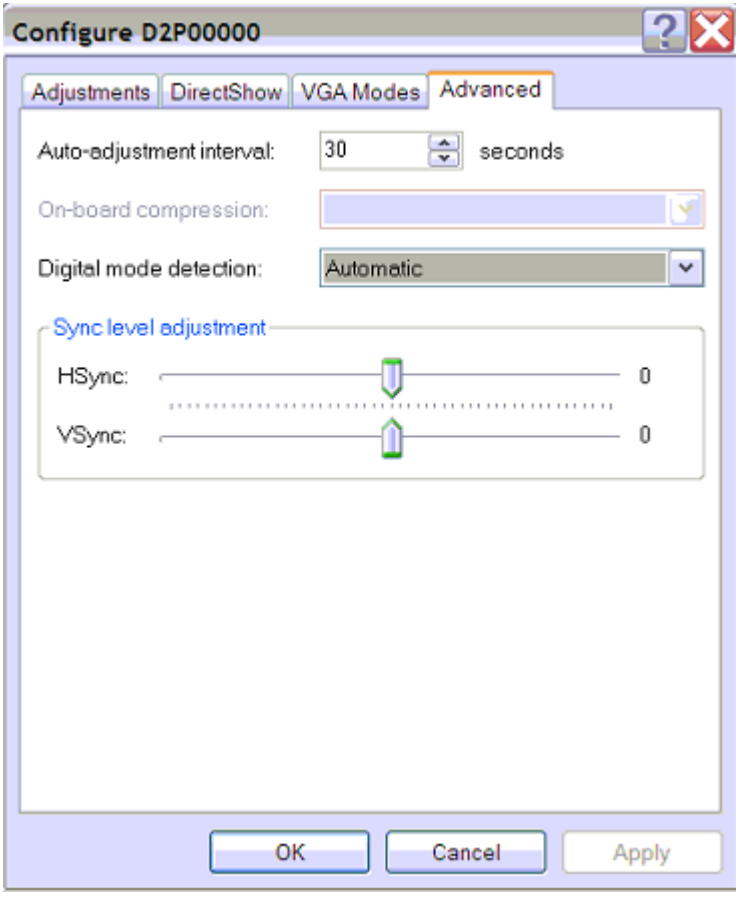
1. Enter number of horizontal pixels
2. Enter number of vertical lines
3. Enter refresh rate
4. Select the **Standard VESA timings** checkbox to use these timings
5. Select the **Interlace** checkbox to apply the interlacing technique.
6. Select the **Reduced blanking** checkbox if necessary. Reducing the DVI pixel clock makes it much easier to transmit the digital image through the cable.
7. Select the **Show horrible technical details** checkbox to see more details about the custom mode.

To delete a custom VGA mode click the **red minus** sign in the upper right corner of the tab.

To update the mode details click the **blue pencil** sign .


Configure D2P00000
Adjustments
DirectShow
VGA Modes
Advanced
Custom VGA modes:
Refresh...
Interl...
Hor Activ...
Hor Front ...
1280x...
59.810 Hz
No
1280
72
Standard VGA modes:
Refresh...
Interl...
Hor Activ...
Hor Front ...
1280x... 59.810 Hz No 1280 72
1280x... 74.934 Hz No 1280 80
1280x... 84.880 Hz No 1280 80
720x400 70.000 Hz No 720 22
720x400 85.039 Hz No 720 36
640x480 51.789 Hz No 640 57
640x480 49.673 Hz No 640 16
640x480 55.736 Hz No 640 16
OK
Cancel
Apply

Advanced tab:



Auto-adjustment interval	Specify the interval value
On-board compression	Select his checkbox to enable on-board compression of the incoming signal
Digital mode detection	- Automatic - Single Link - Dual Link
Sync level adjustment	Adjust sync level (HSync and VSync)

Tools Menu

Use the Tools menu to customize basic DVI2PCIe user interface operating settings.

Web Broadcasting	Use this command to broadcast the captured signal,refer to Chapter 5, Web Broadcasting, for more details.
Upload EDID to device	Use this command to upload an extended display identification data (EDID) file to your device. Extended display identification data (EDID) is a data structure provided by a digital display to describe its capabilities to a video source. It is what enables a modern personal computer to know what kinds of monitors are connected to it. EDID is defined by a standard published by the Video Electronics Standards Association (VESA).
Read EDID from device	Use this command to read an extended display identification data (EDID) file from the device.
Measure VGA Mode	When requested by Epiphan technical support, you can use this command to display low-level information about the VGA mode that you are capturing with your Frame Grabber. You can copy this information into an email to send it to Epiphan technical support.
Options	Configure video recording and display settings. See the section, **Capture, Recording, and Display Options** for more information.

Help Menu

Use the Help menu to check for updates and to display information about the version of the DVI2PCIe user interface that you are running.

Note: **Check for Updates** function will only recommend an update if Epiphan recommends that you install a new version. This will happen if the latest version contains significant bug fixes or enhancements. If a new DVI2PCIe user interface version only contains minor changes or if you are running the current version, **Check for Updates** may not recommend that you install a new version and will not display any information.

Toolbar

The toolbar can be used to save, print, or copy the current captured image; to start, pause, and stop the recording of the currently captured image. You can use the **Toolbar** command on the **View** menu to change the size of the toolbar icons or to hide the toolbar. You can select small, large, or huge icons. If the toolbar is hidden, you can select an icon size to display the toolbar.

	Save a snapshot of the current image captured by the DVI2PCIe user interface to a file on the video capture workstation. Select a location for the file and select a file format. You can save the snapshot as a Windows bitmap (*.bmp), portable network graphics (*.png), or JPEG (*.jpg) file.
	Print a snapshot of the current image to the configured printer.
	Copy a snapshot of the current image to the video capture workstation's clipboard. You can paste this image into a document or other application as a bitmap image.
	Start or stop recording the images being captured by the DVI2PCIe user interface. When you start recording, the status bar displays RECORDING

	and also displays information about the image or video file being recorded. When you stop recording, the status bar displays information about the saved image files or video file.
	Pause or resume image capturing. If you select pause, the DVI2PCIe user interface stops displaying captured images. Pause also pauses the recording of a video and the saving of image files. Select pause again to resume the displaying of captured images and to resume the recording of a video.
	Enable web broadcasting of the captured signal. Refer to Chapter 5, Web Broadcasting, for details.

Status Bar

The status bar displays information about the DVI2PCIe user interface:

- The location and file name of image or video files saved while recording.
- Recording status. “RECORDING” means that the DVI2PCIe user interface is recording captured images.
- The data rate is the rate (in MB/s, KB/s, Mbps, and Kbps) that the DVI2PCIe user interface is receiving data from the device capturing images.
- The frame rate that the DVI2PCIe user interface is operating at in frames per second (fps).
- The number of frames or images that the DVI2PCIe user interface has displayed since the DVI2PCIe user interface was last started. The number of frames is only visible if you select **Number of captured frames** on the status bar from the **Display** tab of the **Options** dialog. The number of frames stops incrementing and starts flashing if you have paused the image capture. Use the **Reset counter button** to reset the number of frames from the **Display** tab of the **Options** dialog.
- The VGA mode and refresh rate of the video source.

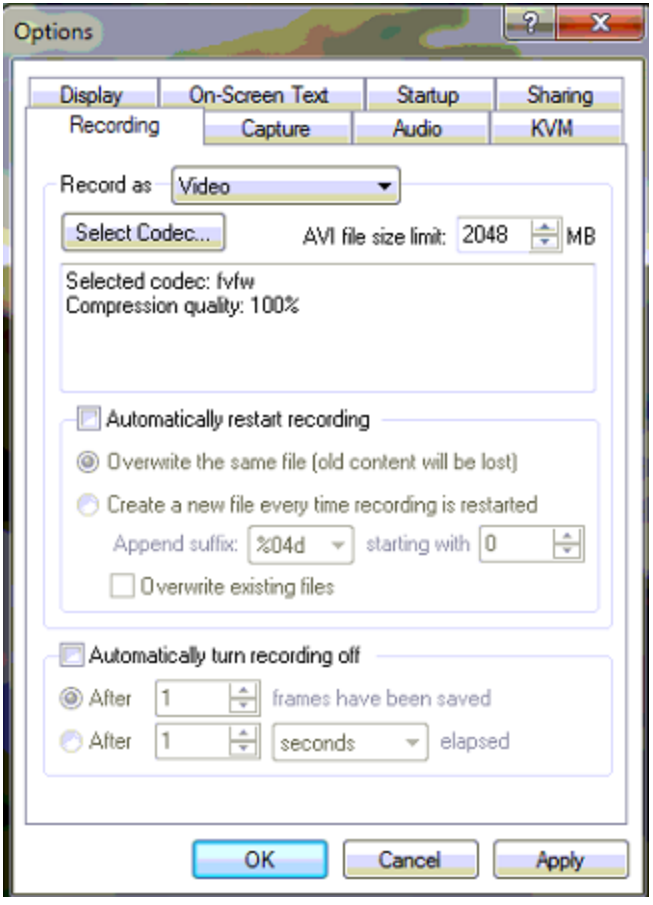
Capture, Recording, and Display Options

This section introduces the options available from the **Tools** menu when you select the **Options** command. These options control how the DVI2PCIe user interface records images, displays images. Note that this application is common to a number of different products. The **KVM** tab functionalities are not applied to the DVI2PCIe product.

Configuring Recording Options

To control how the DVI2PCIe user interface records captured images, select **Options** from the **Tools** menu and then select the **Recording** tab. You can record captured images as a series of consecutively saved graphic files or as a video file. How the DVI2PCIe user interface records images when you start recording from the Toolbar or the capture menu depends on how you set the recording options.

Figure 7. The Recording tab of the Options window



You can select the following options:

Record as	Specify whether video or images are recorded.
Select Codec	Select the codec that is applied for compressing the signal.
AVI file size limit	Specify the size limit of the .AVI file where the data is recorded to.
Automatically restart recording	Select the checkbox to restart recording automatically. This checkbox enables the five fields below.
Overwrite the same file (old	After the video file size limit is reached, delete

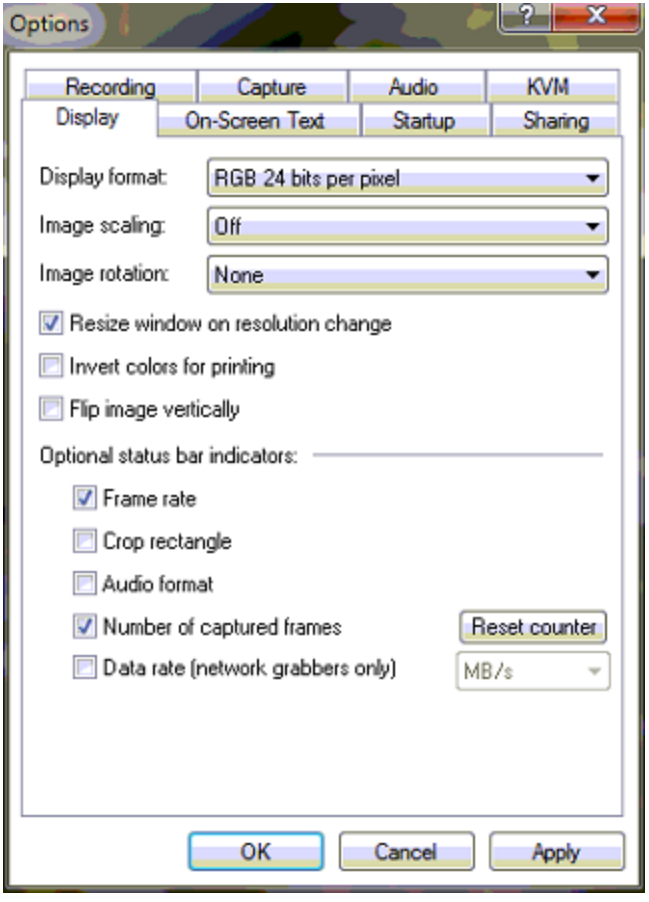
content will be lost)	the original file and start recording a new video file with the same name. If you select this option the original saved video data is lost.
Create a new file every time recording is restarted	After the video file size limit is reached, start a new video file. You can use the append suffix setting to create a unique name for the new file or files.
Append suffix…	When you start a video recording session you are prompted to enter a file name. If the file exceeds the AVI file size limit, the DVI2PCIe user interface starts another file named with the original file name appended with a sequential numeric suffix. Use the append suffix options to specify the format of this suffix. Each suffix starts with a % sign and can include the following characters: 02, 04, 06, or 08 indicates the number of digits to use in numbering the suffix. You can specify 2, 4, 6, or 8 digits. “d” means decimal numbers are used in the suffix. “X” means hexadecimal numbers are used in the suffix. The suffix %02d means the saved file names would end with two-digit decimal numbers, for example: 01, 02, 03, ..., 10, 11 and so on. The suffix %04X means the saved file names would end with 4-digit hexadecimal numbers, for example: 0001, 0002, 0003, ..., 000A, 000B and so on.
…starting with	Enter the starting number used in the file name

	suffixes in decimal format. If the suffixes include hexadecimal numbering this decimal number is automatically converted to hexadecimal. For example, if you named the video file VID, set the suffix to %02d and set starting with to 1, the video file names would be VID.avi, VID01.avi, VID02.avi, etc.
Overwrite existing files	If you select overwrite existing files, files are saved according to the video file recording options. Existing files are replaced with the new files. If you do not select overwrite existing files, the file number in the suffix of the file name is incremented until a file can be saved without overwriting an already saved file.
Automatically turn recording off	Specify under what conditions recording turns off automatically.
After … frames have been saved	Enter a number of frames.
After … elapsed	Enter a number of time units elapsed.

Configuring Display Options

To change display options from the **Tools** menu, select **Options** and then select the **Display** tab.

Figure 8. The Display tab of the Options window



The following display options are available:

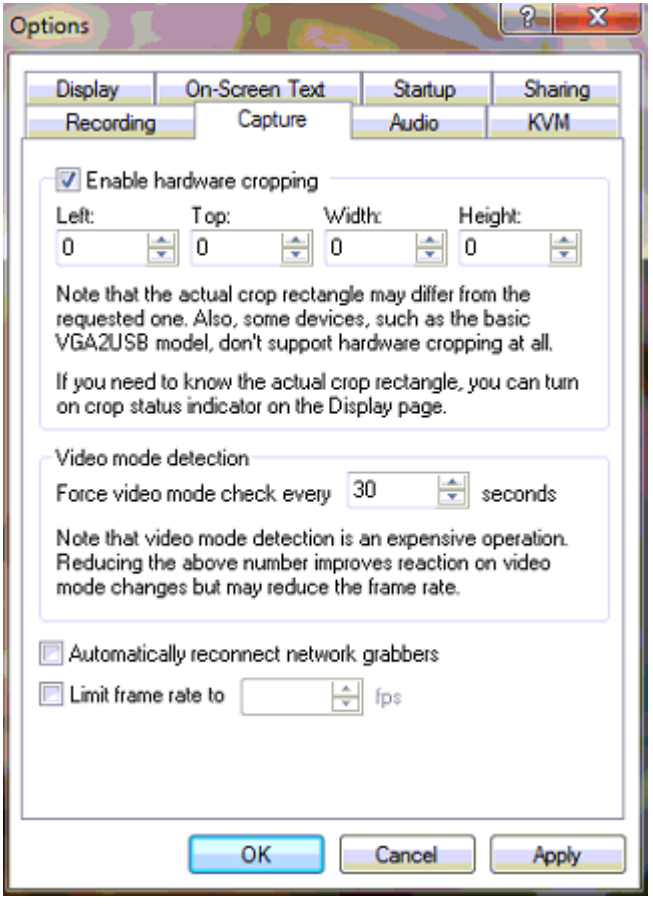
Display format	Specify the format video or image are displayed in
Image scaling	Specify whether the image should be scaled and how
Image rotation	Specify whether the image should be rotated and how
Resize window on resolution change	Select the checkbox to resize window when the image resolution is changed
Invert colors for printing	Select the checkbox to change dark colors

	to light colors and light colors to dark colors
Flip image vertically	Flip the image at its vertical axis
Select the check boxes below to add optional indicators to the status bar…	
Frame rate	Displays frame rate
Crop rectangle	Displays crop status
Audio format	Not used.
Number of captured frames	Displays number of captured frames
Data rate (network grabbers only)	Displays data rate

Configuring Capture Options

Use this tab to configure multiple capture options.

Figure 9. The Capture tab of the Options window



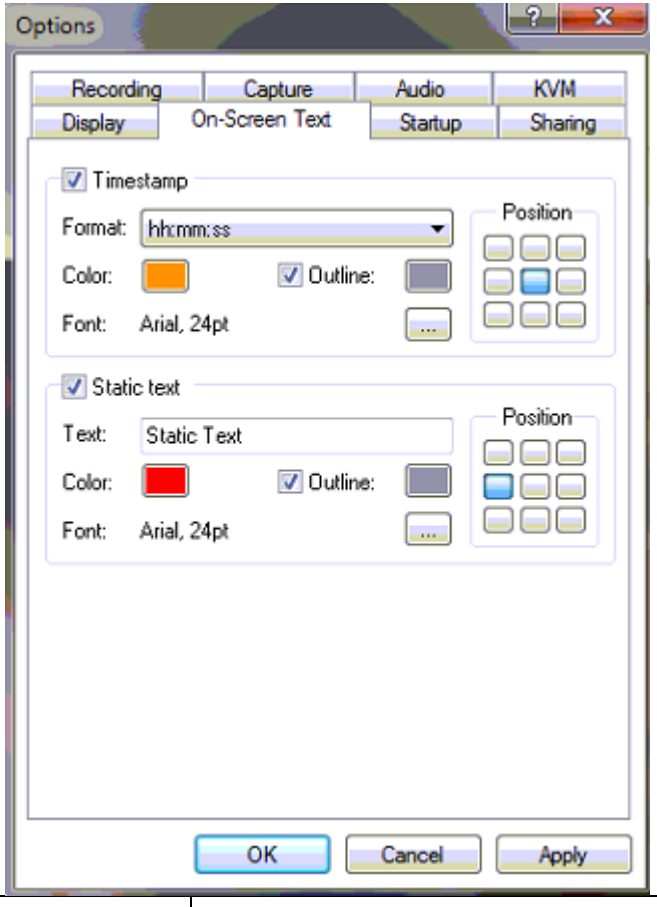
Enable hardware cropping	Select this checkbox to enable cropping functionality
Left, Top, Width, Height	Enter the values for the crop rectangle
Force video mode detection	Specify how often the application indicates the type of the video signal being received.

	Note that although frequent video mode detection decreases reaction time when changing video mode, it may reduce the frame rate.
Automatically reconnect network grabbers	Select this checkbox to restore connection with the remote frame grabbers in case the connection has been lost. Otherwise the system connects to the local frame grabber, if one exists or displays a warning “No frame grabbers found”. In this case you need to restore connection manually.
Limit frame rate to	Setup the maximum frame rate for the video signal

Setting On-Screen Text Parameters

By using this tab you can timestamp the captured video and add some static text.

Figure 10. The On-Screen Text tab of the Options window



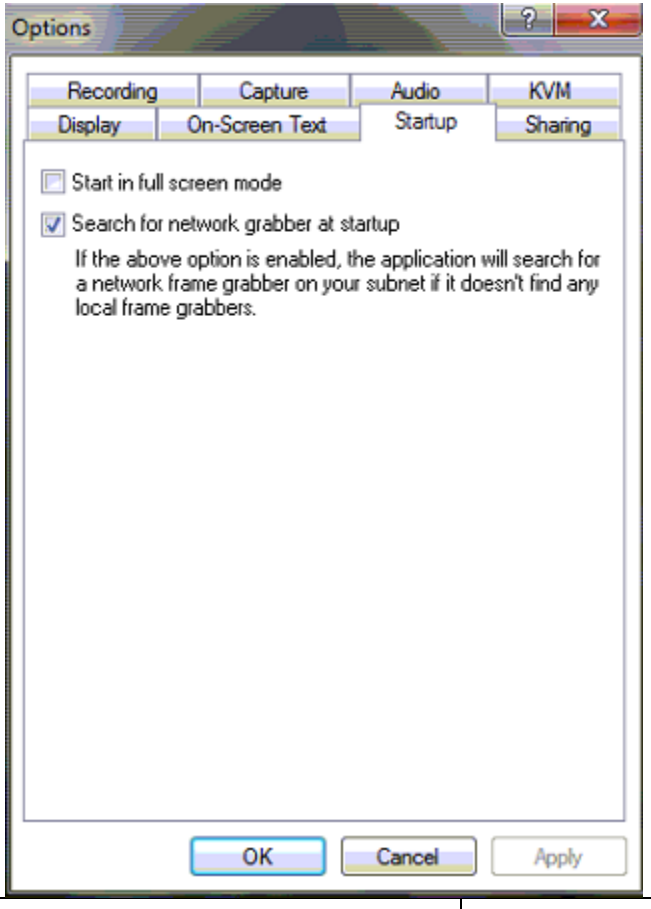
Timestamp	Select this checkbox to enable setting timestamp parameters
Static text	Select this checkbox to enable setting static text parameters
Format	Specify the timestamp format
Color	Set the color
Font	Set the font and the font size
Position	Set the position for the timestamp or text

Outline	Add an outline to the timestamp or text

Configure Startup

Use this tab to specify what actions the application should perform during startup.

Figure 11. The Startup tab of the Options window



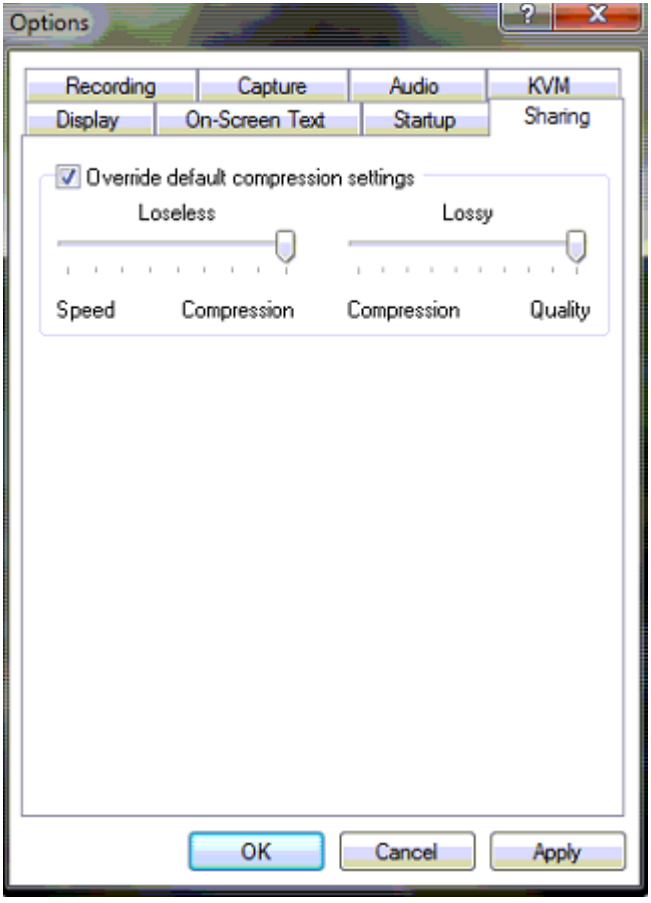
Start in full screen mode	When the application starts, it resizes to the current resolution of the screen
Search for network grabber at startup	The application searches for a network grabber on your subnet if it does not find

	any local frame grabbers

Sharing

Use this tab to change web broadcasting compression. Select **Override default compression settings** and adjust the **Lossless** and **Lossy** settings.

Figure 12. Web broadcasting compression options



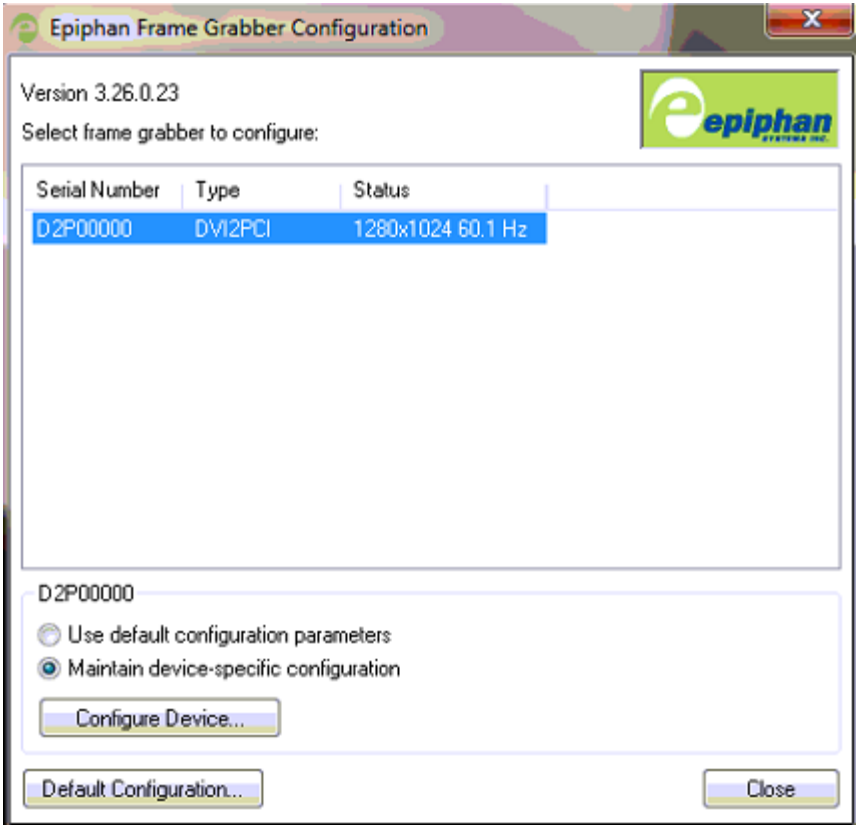
Lossless compression	Lossless compression compresses the images being

	broadcasted without reducing image quality. Increasing lossless compression can use a considerable amount of the video capture workstation's CPU resources.
Lossy compression	Lossy compression compresses the images being broadcasted by reducing image quality. Lossy compression is not as CPU intensive as lossless compression.

Configuring DVI2PCIe from the Control Panel

Your DVI2PCIe card can be configured from the Control Panel using the Epiphan Frame Grabbers icon. Here you can verify the device's serial number, type and status as well as setup configuration parameters.

Figure 13. Frame Grabber Configuration Window



To edit the default configuration of the device:

1. Click the **Default Configuration** button. It is similar to the Tools > Options > Configure command in the Epiphan Capture Tool.
2. Edit parameters.
3. After editing click OK and select the **Use default configuration parameter** radio button to activate settings. Then click **Close**.

To maintain device-specific configuration:

1. Click the **Configure Device…** button. It is similar to the Tools > Options > Configure command in the Epiphan Capture Tool.
2. Edit parameters.

3. After editing click OK and select the **Maintain device-specific configuration** radio button to activate settings. Then click **Close**.

4. Mac OS X DVI2PCIe User Interface

This chapter describes the functions and features of the DVI2PCIe user interface (Epiphan Capture Tool) for Mac OS X. You can use the Mac OS X version of the Epiphan DVI2PCIe user interface to configure a DVI2PCIe and to record video captured by the DVI2PCIe.

This chapter assumes that DVI2PCIe has been properly installed. Please refer to the section: **Connecting DVI2PCIe**. To start using this chapter you should have:

- Selected a video capture workstation running Mac OS X with installed DVI2PCIe.
- A connected video source.

Starting the Mac OS X DVI2PCIe user interface

Start the DVI2PCIe user interface as you would start any other application installed on the video capture workstation.

As the application starts the message **Capture Device not Found** appears on the DVI2PCIe user interface window. Now proceed and do the following:

1. Select **Open Network Grabber** from the **File** menu.
2. Select the arrow beside the **Network Address** box to open the list of networked devices.
3. Select a device and select connect.

The following messages may appear in the capture window.

- **Detecting Video Mode** as the DVI2PCIe user interface starts up and attempts to connect with the frame grabber.
- **Tuning Capture Parameters** if the DVI2PCIe user interface finds the frame grabber and begins synchronizing and tuning capture settings and image adjustments

- **No Signal Detected** if the DVI2PCIe user interface cannot connect to the frame grabber or if the frame grabber is not connected to an active video source.

Figure 14. DVI2PCIe user interface window (Mac OS X)

If the DVI2PCIe user interface successfully connects to and synchronizes with the frame grabber, the DVI2PCIe user interface window begins displaying captured images.

Title Bar	Displays the Epiphan product name, screen resolution and refresh rate of the video source.
Toolbar	Use the icons on the toolbar to save, copy or print the currently captured image, to record video, override image adjustments, select devices for connection or to show information about the device.

Menus

This section describes the commands available from the DVI2PCIe user interface menus for Mac OS X.

File Menu

Use the **File** menu commands to save the current image, to print the current image, to open new capture windows and to start a recording. Also included are the commands to connect to other frame grabbers on the network and to disconnect to any available frame grabber.

New Capture Window	Opens another capture window. The window opens displaying the same image as the original window. You can open a different device in each capture window. Having a large number of Capture Windows open simultaneously can eventually slow performance on the video capture workstation.
Open Network Grabber	Connect to a DVI2PCIe device on the network.
Recent Network Grabbers	Select from the list of recently opened frame grabber devices.
Disconnect Network Grabber	Disconnect the DVI2PCIe user interface from a DVI2PCIe device. The device serial number will be shown next to the Disconnect menu item. If you have multiple capture windows open, make sure you select the capture window containing the device you want to disconnect.
Record Movie	Record captured video in a file
Save Image	Save a snapshot of the current image to a file on the video capture workstation. Select a name and a location for the file and select a file format. You can save the snapshot as a bitmap (*.bmp), portable network graphics (*.png), JPEG (*.jpg) file, or tiff (*.tiff) file.
Page Setup	Configure the printer settings used when you select the Print command or the Print toolbar button.
Print	Print a snapshot of the current image to the configured printer.

Edit Menu

From the **Edit** menu you can copy a snapshot of the current image.

Copy	Copy a snapshot of the current image to the video capture workstation clipboard.

View Menu

Use the commands on the **View** menu to control what information is displayed in the DVI2PCIe user interface window.

Show Device Information	View the information about hardware type, location, serial number, video mode, and frame rate
Hide Device Information	Hide the information about hardware type, location, serial number, video mode, and frame rate
Adjustment Controls	Display the Adjustments tab (refer to **25**for details
Enter Full Screen	Enter full screen mode

Tools Menu

Use the **Tools** menu to customize basic DVI2PCIe user interface operating settings.

Show VGA Mode Information	View low-level VGA mode information
Upload EDID to Device	Use this command to upload an extended display identification data (EDID) file to your device. Extended display identification data (EDID) is a data structure provided by a digital display to describe its capabilities to a video source. It is what enables a modern personal computer to know what

	kinds of monitors are connected to it. EDID is defined by a standard published by the Video Electronics Standards Association (VESA).
Read EDID from Device	Use this command to read an extended display identification data (EDID) file from the device.

Window menu

Minimize	Minimize the window.
Zoom	Zoom in on your screen.
Bring all to Front	Brings all of the windows of the current application to the front.

Help menu

Search	Search DVI2PCIe Help

Toolbar

Use the toolbar to save, copy, print the current captured image, to override image adjustments, or to show information about the device.

Save

Use this button () to save a copy of the current image. The following information will be requested when this toolbar icon is clicked.

Save As	Enter the file name for saving data
Where	Enter the path where the file is saved
Format	Select the format for the recorded file

Copy

Use this button () to copy the snapshot of the image to the workstation's clipboard.

Print

Use this button () to specify printing settings and print the image.

Record

Click this button () to start the recording of a captured video.

Adjust

This button () allows configuring horizontal/vertical shift to offset the captured image position. Select the checkboxes to adjust shifting automatically. Please refer to the **Configure Device** section for details.

Info

Click this button () to display information about the frame grabber, its location, serial number and image characteristics.

Devices

Click this button () to display all frame grabber devices that are currently available on the network.

Setting QuickTime Options for Recording Videos

Before starting to record videos, saving images or printing images, you should configure the Epiphan QuickTime integration options by opening **System Preferences**, selecting Epiphan under **Other**, and configuring the QuickTime settings.

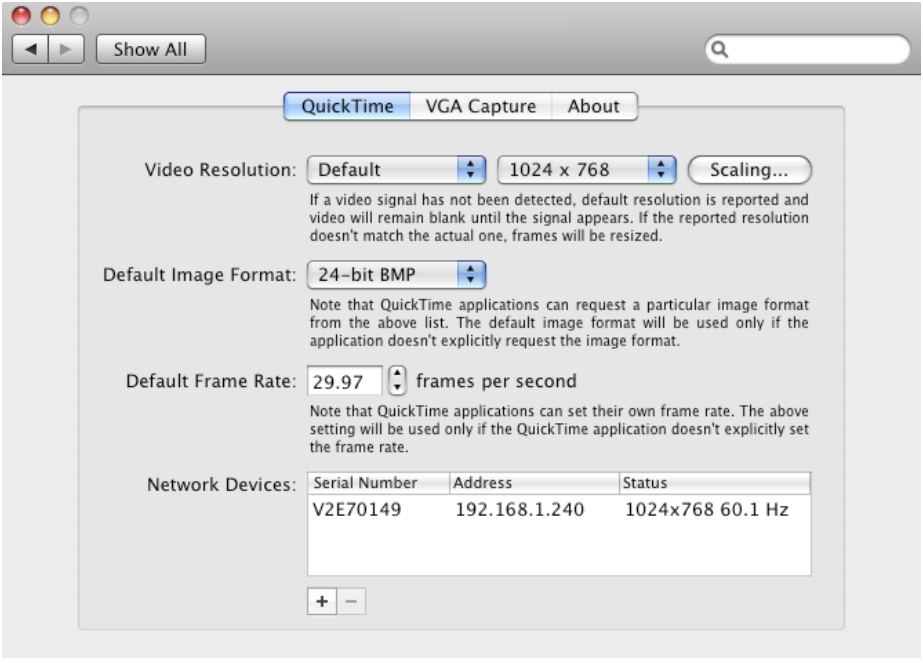
You can also select **About** to view information about the current software and driver versions.

To add or remove a network device

1. To add a device, select the plus sign at the bottom left of the window.
2. Enter the IP Address of the device you want to add or click on the triangle beside the Network Address box and select the device from the list of networked devices.
3. Select Connect.

4. To remove a device select the device and select the minus sign.

Figure 15. QuickTime Options for Recording Videos



Configure the following QuickTime recording options:

Video resolution	Select a video resolution option: **Actual**: The actual resolution of the video source as reported to QuickTime. No scaling is performed. If, at any point during a recording session, no signal is detected an error will occur that could interrupt the recording session. **Default**: If a video signal is not detected, the default resolution is reported and the video remains blank until a signal is detected. If the default resolution does not match the actual resolution, images are

	resized to the default resolution. **Fixed**: The same resolution is reported to QuickTime, regardless of the actual resolution of the image and whether or not a video signal is present. All images are scaled to the fixed resolution. For Default or Fixed resolution, you can select the resolution to use.
Scaling	Select a Scaling Algorithm. When Video Resolution is set to Default or Fixed, you can move the slider to select a scaling algorithm from a set of algorithms that range from Lowest quality and Best speed to Best quality and Lowest speed. You can choose from: • Nearest pixel • Fast bilinear • Weighted average • Bilinear • Luma bicubic, chromabilinear • Bicubic • Lanczos • Natural bicubic spline • Sinc
Default Image Format	Select a Default Image Format. The Default Image Format will only be used if the QuickTime

	compatible application doesn't specifically request an image format.
Default Frame Rate	Usually you can set the frame rate in the QuickTime-compatible video recording application. If you cannot set the frame rate in the application, set the default frame rate that the Epiphan device driver sends to QuickTime. This default frame rate is only used if the application does not explicitly set the frame rate.
Network Devices	Add or remove Epiphan devices connected to the network. The Display shows the serial number, IP address and status (screen resolution and refresh rate of the video source) of each device. To add devices select the plus sign. To delete devices, select the minus sign.

5. Web Broadcasting

You can use the information in this chapter to share or broadcast the images captured by your DVI2PCIe card over the Internet. Note that web broadcasting is available only on video capture workstations running Windows.

To broadcast captured images over the Internet, the video capture application sends captured images to an Epiphan web broadcasting portal. Each web broadcast session is labelled with the serial number of the DVI2PCIe card that is capturing the images. The card's serial number appears on the video capture application title bar.

Web broadcasting sends the currently captured image only. You cannot broadcast saved recordings and the DVI2PCIe's web broadcasting feature does not include sound.

Note: The web broadcasting feature included with the Epiphan video capture application is intended as a demonstration only and has a 10-hour time limit.

It is important to note that the images broadcasted over the Internet are not secure. Potentially anyone can view the web broadcast if they know the correct URL. The web broadcasting supported by the video capture application is a relatively limited feature. Epiphan's broadcasting products provide a richer web broadcasting feature set.

To set the display format for web broadcasting

1. Open the DVI2PCIe capture tool application on a video capture workstation running Windows.
2. From the **Tools** menu select **Options**.
3. Select the **Display** tab.
4. Set Display Format to RGB 24 bits per pixel.
5. Optionally limit the frame rate to reduce the number of images sent over the Internet reducing the amount of bandwidth being used. Depending on your

requirements you may not have to change any other display settings. Refer to section, **Configuring Display Options** for all available display settings.

6. Select OK to save your changes.

Starting a web broadcasting session

No special setup is required for web broadcasting except that the video capture workstation must be able to connect to the Internet. The video capture workstation can be connected directly to the Internet or to a LAN that is connected to the Internet.

Before broadcasting captured images over the Internet you need to set the display format to 24 bits per pixel. Please refer to the previous section **To set the display format for web broadcasting**.

To start a web broadcast:

1. Connect the Epiphan Frame Grabber to the video source that you want to broadcast and to the video capture workstation.
2. Start the Epiphan capture tool application.
3. Select **Web Broadcasting** from the **Tools** menu or from the toolbar select  .

   The **Start web broadcasting** dialog appears.

Figure 16. Start web broadcasting dialog

Viewing a web broadcasting session

You can view a web broadcasting session from a web browser running under Windows 2000, XP, Vista and 7 versions. The following browsers are now supported: Internet Explorer, Firefox, Opera, Chrome, Safari. Mobile browsers are also supported if the mobile device is compatible with Java SE. The working station and web browser should be running the most recent version of the Java plug-in. You can download the plug-in's latest version from http://www.java.com.

To view a web broadcast:

1. Open a web browser and browse to the required URL , for example: http://www.vga2web.com/D2P00000. This URL is supplied by the vg2web application and can be advertised to potential viewers of the broadcast.

   A second web browser window appears displaying the message **Applet is loading. Please wait…** The broadcasted image should appear within 10 to 20 seconds.

The first web browser window in which the web broadcast URL address was entered, displays a message indicating that the web presentation has been opened in a new window. You can also use the first window to refresh the broadcast or re-open the broadcast window if it is accidentally closed.

Changing web broadcasting compression and performance

Normally you should not need to change the default web broadcasting compression settings. The default settings reduce the amount of Internet bandwidth used for web broadcasting by applying a combination of lossless and lossy compression to the images being broadcasted.

To change the web broadcasting compression, from the **Tools** menu of the DVI2PCIe capture tool select **Options** and then select **Sharing**. Select **Override default compression** settings and adjust the **Lossless** and **Lossy** settings.

Troubleshooting web broadcasting performance

Here are three typical reasons for adjusting web broadcasting compression:

- If you have a slow Internet connection or if viewers of the web broadcasts notice delays you can increase lossless or lossy compression to reduce Internet bandwidth usage.
- If viewers of the web broadcast notice poor image quality you can reduce the amount of lossy compression.
- If the video capture workstation CPU usage is too high during web broadcasts or if viewers of the web broadcasts notice delays and you have determined that the delays are not caused by low Internet bandwidth. The delays could be caused by high CPU usage on the video capture workstation resulting in the video capture workstation not being able to process all image

data. Lossless compression increases CPU usage, so you can reduce CPU usage during web broadcasting by reducing lossless compression.

Note: You cannot change web broadcasting compression during a web broadcast. You must stop the broadcast, adjust the settings and then start the broadcast again.

Changes made to default web broadcast compression settings are only visible to viewers of the web broadcast. Changing these settings does not change how the video capture application displays, records, or prints captured images.

6. List of Figures

Environmental Information

The equipment that you bought has required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.
In order to avoid the dissemination of those substances in our environment and to diminish the pressure on the natural resources, we encourage you to use the appropriate take-back systems. Those systems will reuse or recycle most of the materials of your end life equipment in a sound way.
The crossed-out wheeled bin symbol invites you to use those systems. If you need more information about collection, reuse and recycling systems, please contact your local or regional waste administration. You can also contact us for more information on the environmental performance of our products.

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference
(2) This device must accept any interference received, including interference that may cause undesired operation.

Marking by the symbol CE indicates compliance of this device with EMC directive of the European Community and meets or exceeds the following technical standard.

EN 55022 - Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment.

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