

Epiphan DVI2PCIe Duo



Release 3.30.7.8
June 21, 2019

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Thank you for choosing Epiphan!

At Epiphan Video (“Epiphan”), product function and quality are our top priority. We make every effort to make sure that our products exceed your expectations.

Product feedback

Your feedback is important! We regularly contact our customers to ensure our products meet your performance and reliability requirements. We strive to continually enhance our products to accommodate your needs. Please let us know how you think we can improve our products by emailing your suggestions to info@epiphan.com.

Specifications

Go to the DVI2PCIe Duo product page on the Epiphan website to get the most recent product specifications and additional information about DVI2PCIe Duo.

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’s products are backed by our professional support team. If you are having issues with your product, please gather details about your system and contact our team by:

- Emailing support@epiphan.com
- Live chat via the link on our support site <https://www.epiphan.com/support/>
- Phone toll free at 1-877-599-6581 or call +1-613-599-6581

Be sure to include as much information about your problem as possible. Including:

- Problem description
- Details of the video or audio source (type, connection, resolution, refresh rate, etc.)
- Product serial number
- Product firmware version (if applicable, from web admin interface)
- Product LED lights

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DVI2PCIe Duo Release notes

Firmware update 3.30.7.8 for DVI2PCIe Duo is a maintenance release that contains stability and performance enhancements. Update your device to take advantage of the improvements offered in this latest firmware update.

IMPORTANT NOTE: This firmware update 3.30.7.8 is the final update to include a windows 32-bit driver version for DVI2PCIe Duo.

Fixed RGB colors from SDI sources that were inverted

DVI2PCIe DUO no longer inverts RGB colors from SDI sources on Ubuntu 18.04 , 14.15.0-22, and Windows 10 (64-bit) 1709 systems.

Removed an RGB color from Linux drivers

Removed an inverted color from Linux drivers: Raw rgb565be and 16-bit RGB 5-6-5 BE

Removed the Web broadcasting demo feature

The Web broadcasting demo feature has been removed from the Epiphan Capture Tool and the icon no longer appears in the tool bar.

Recommended video codec (March 2019)

An update was made in this user guide to replace the ffdshow video codec recommended in the Quick start to the x264vfw codec in the K-Lite (Mega) video codec pack.

FCC compliance statement updated in user guide (April 2020)

Compliance statement was added in this user guide for ICES-003 of the ISED rules for Innovation, Science and Economic Development Canada; as well as an added FCC caution statement.

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Start here

Use the topics in this section of the user guide to get started quickly with your DVI2PCIe Duo.

Review [What's in the box?](#), get a system overview in [What is DVI2PCIe Duo?](#), ensure your system meets the [System requirements](#) and get your capture card installed and working right away using the [Quick start](#)

What is DVI2PCIe Duo?

DVI2PCIe Duo™ is Epiphan's internal (PCIe) dual-link DVI-I / SDI (3G-SDI, HD-SDI and SD-SDI) video capture card. It captures images and video from single-link and dual-link DVI-I, VGA, and unencrypted HDMI and SDI video sources and digitizes them on your workstation via the motherboard's PCIe bus.



The video capture workstation can record and/or stream the resulting uncompressed diagnostic-quality images and videos. On Windows, both audio and video capture is supported for HDMI and SDI sources. An optional A/V kit can be installed to capture S-Video/composite, analog audio and balanced TRS audio. DVI2PCIe Duo captures full HD at 60 frames per second and captures and streams audio and HD video sources with resolutions up to 2048×2048 when connected to a DVI-I dual link connector.

DVI2PCIe Duo captures video and audio from any dual-link or single link DVI, unencrypted HDMI, or VGA source and, at the same time from a 3G-SDI, HD-SDI or SD-SDI source.

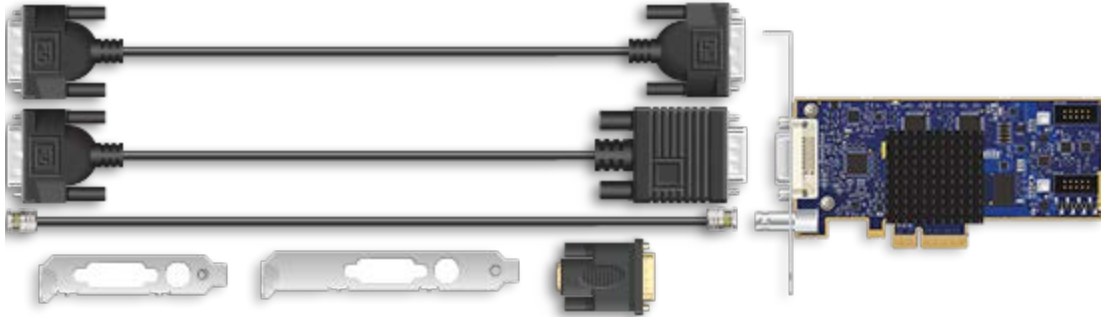
Using the included Epiphan Capture Tool, DVI2PCIe Duo captures full 1080p HD at 60 frames per second and supports resolutions up to 2560×1600. Note in all cases the SDI video signal is captured in RGB 24-bit color and in the case of YUV 4:2:0 chroma sub-sampling, it is converted to this new color space.

The DVI2PCIe Duo capture card is fully compatible with DirectShow in Windows and Video4Linux in Linux. This means you can use it with a number of different third party applications for capturing, recording and streaming video.

DVI2PCIe Duo is part of Epiphan's complete line of video and audio signal capture products. For more information about all Epiphan's video signal capture products, refer to the [products](#) page on the Epiphan Video website.

What's in the box?

The DVI2PCIe Duo package includes the following



1. DVI2PCIe Duo PCIe capture card (read more, [Physical attributes](#))
2. One 3G compliant SDI cable
3. One DVI-I cable
4. One VGA to DVI cable
5. One HDMI to DVI adapter
6. One regular-height bracket
7. One low-profile bracket

Table 1 Description of included cables (images for identification only, color and appearance may vary)







Image	Name	Description
	SDI cable	Connects SDI sources to the video grabber.
	DVI-I cable	Connects DVI sources to the video grabber.

Image	Name	Description
 A black cable with a white DVI-I connector on one end and a blue VGA connector on the other.	VGA to DVI cable	Connects VGA (or Component, if used with a converter) signals to the video grabber.
 A black plastic adapter with an HDMI connector on one side and a DVI-I connector on the other.	HDMI to DVI adapter	Connects HDMI sources to the DVI-I cable for connection to the video grabber.
 A small, silver metal bracket with a DVI-I connector on one end and a hole for a screw on the other.	Low profile bracket	For use with low-profile cases. Connect the capture card to this end bracket.
 A larger, silver metal bracket with a DVI-I connector on one end and a hole for a screw on the other.	Full height bracket	For use with regular-height cases. Attach the capture card to this end bracket.

System requirements

System requirements are the technical essentials your computer needs to work with your Epiphan video grabber. System requirements to use DVI2PCIe Duo are:

Video source	Any VESA-compatible VGA, DVI or HDMI or 3G-SDI, HD-SDI or SD-SDI source. (DVI2PCIe Duo cannot capture from HDCP encrypted sources)
Video capture workstation	A computer with: <ul style="list-style-type: none"> • a 4x PCIe slot (4x, 8x and 16x are supported)
Video capture workstation operating system	Windows 10 A list of precompiled linux drivers (kernel 3.5 or later) is available on the Support page under Software .
RAM	Minimum recommended value: 4 GB
Available hard disk space	16 GB (32-bit OS) or 20 GB (64-bit OS)
Airflow	DVI2PCIe Duo has a minimum required airflow of 140 LFM (0.7 m/s).
Temperature / Thermal	DVI2PCIe Duo can operate at an internal temperature up to 80 C (use the API to determine the current temperature).

Install the capture card

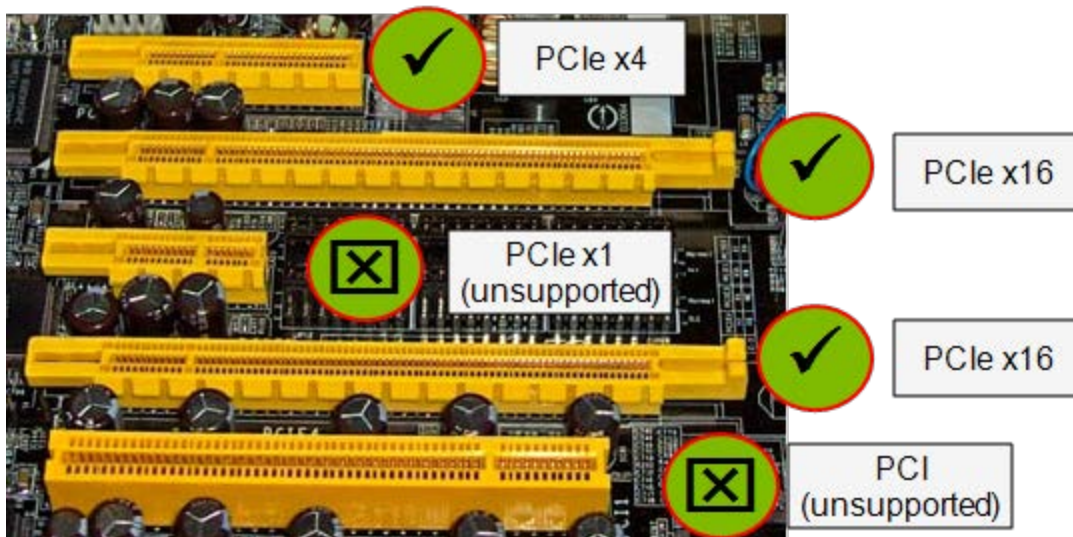
This section helps you install your capture card in the video capture workstation.

Install the capture card:



Static electricity can harm delicate components inside your computer. To prevent static damage, discharge static electricity from your body before you touch the video capture card or any of your computer's components. The best way to do this is with the supplied anti-static wrist band, following the instructions supplied with the wrist strap.

1. Turn off your video capture workstation by initiating a proper shutdown command via the installed operating system.
2. Turn off power completely using the power switch near the power supply at the back of the case (if available).
3. Open the case.
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. Find a free x4, x8 or x16 PCIe slot and remove the blank expansion slot plate.



6. (If required) Attach the full-height or half-height bracket to your DVI2PCIe Duo. If you're using the optional AV kit, use the brackets that come with that kit instead.
7. Holding the DVI2PCIe Duo card by the edges, align the card edge connector with the PCIe slot.

8. Position the card mounting bracket to fit into the slot PCIe opening at the back of the computer chassis.
9. Apply even pressure at both corners and push the card down until you hear a click.



Do not use excessive force when installing the card into the PCIe slot. You may 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.

10. Secure the bracket to the chassis using a screw or lever, depending on your specific chassis design.
11. Detach the wrist strap and close the system unit.
12. Turn on the video capture workstation. You're now ready to install drivers and the Epiphan Capture Tool.

Quick start

Use this quick start to get up and running quickly with your DVI2PCIe Duo on Windows capture workstations. You can also use these procedures to install firmware updates. For Linux systems, see [DVI2PCIe Duo on Linux](#).

Before you get started:

- Have all required cables, components, and adapters (if needed), see [What's in the box?](#).
- Ensure your capture workstation meets the [System requirements](#).
- Have a video source, such as a camera, computer, tablet, or phone and ensure that the content isn't HDCP protected. For Windows systems, ensure there's audio and video on the same source cable if using HDMI or SDI sources.
- Internet access to download drivers from the Epiphan website.
- Administrator privileges for your capture workstation.
- (Optional) Have already installed the video capture card in your capture workstation, see [Install the capture card](#).

Install the video grabber drivers

We recommend installing the video grabber drivers after installing the capture card; however, you can install the drivers before you physically [Install the capture card](#) in the capture workstation.

1. Log into your capture workstation using an account with administrator privileges. If your workstation is on a domain, ensure that you log into the local administrator account on the workstation and not an account on the domain.
2. Using a web browser on your capture workstation, go to your video grabber's [Support page under Software](#) and download the appropriate driver for your system's operating system.



For Windows 10 operating systems, choose either the 64-bit or 32-bit driver as required for your particular operating system. If you don't know which driver version you need, see this Microsoft knowledge base article for help <https://support.microsoft.com/en-us/kb/827218>.

3. When the download is complete, open the download destination folder.
4. (Optional) Close any unnecessary windows and shut down programs that are running on the workstation. Note that overly restrictive security software can block the installation of device drivers. In that case, consult your system administrator for the procedures to allow the driver update on the capture workstation.

5. Extract all driver files and install the drivers and the Epiphan Capture Tool on your Windows workstation.
 - a. Right-click on the .zip file and **Extract All**.
 - b. From the extracted files folder, right-click on **setup.exe** and select **Run as administrator**.
 - c. Click **Install** and follow the prompts to install the drivers. The Epiphan Capture Tool is installed at the same time as the drivers.



Installation may fail for computers inheriting security permissions from a Windows domain, even when the installer is run as administrator. In that case, contact your local IT team for assistance with installation.

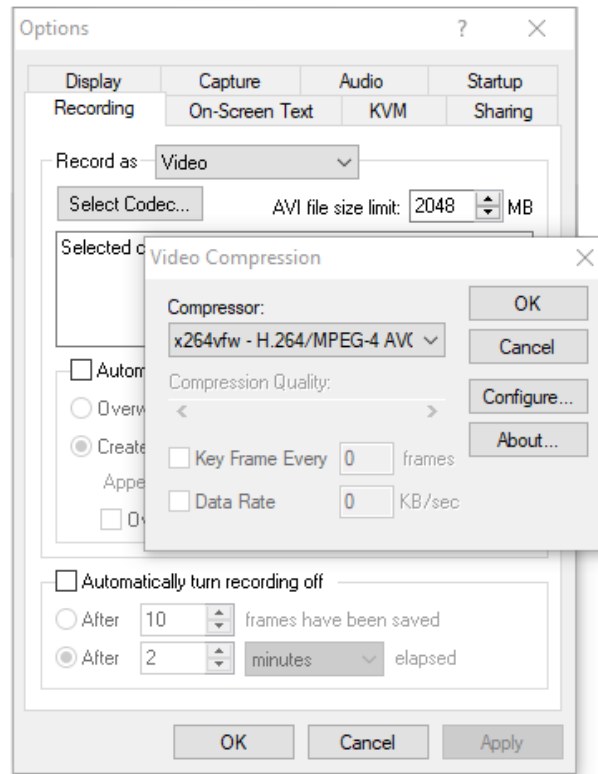
6. Restart the capture workstation after the installation completes.

Install the video codec for Windows and set video compression options

For Windows operating systems, we recommend installing the K-Lite (Mega) video codec pack. This codec pack adds video compression options for recording video using the Epiphan Capture Tool. Recording video without compression consumes a large amount of disk space, especially when recording at higher resolutions and isn't recommended. We've tested and found that codec x264vfw in this codec pack is the better choice for use with your video grabber.

To install the K-Lite (Mega) video codec pack on your Windows capture workstation:

1. Log into your capture workstation using an account with administrator privileges and launch the Epiphan Capture Tool.
2. From the **Tools** menu, select **Options...** and ensure that **Display format** on the Display tab is set to **RGB 24 bits per pixel** (default).
3. Using a web browser on your capture workstation, download the K-Lite (Mega version) video codec pack (32-bit and 64-bit versions are included):
 - [K-Lite \(Mega\) video codec pack](#)
4. Locate the executable file that was downloaded, then double-click the file and follow the prompts to install the K-Lite (Mega) codec pack for your Window's version. Use the **Normal** installation mode and accept the default options. Click **Finish** when the codec pack has finished installing.
5. From the **Tools** menu in the Epiphan Capture Tool, select **Options...** and click the **Recording tab**.
6. From the **Recording tab**, set the **Record as** field to **Video** and click **Select Codec**.
7. In the Compressor drop down, select **x264vfw - H.264/MPEG-4 AVC compression** and click **OK**.



For most common installations, use the default settings for the video compression codec. You are not required to configure the video compression parameters.

- Click **Apply** to save your changes. Click **OK** until you've exited all the configuration menus.

Connect the video source

Now that the drivers and video codec are installed, you're ready to begin capturing!

If you haven't already installed your capture card, see [Install the capture card](#).

You can connect a DVI source directly to the capture card's **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 the HDMI to DVI adapter (provided).



Optionally, you can use a high-quality VGA or DVI splitter to split the VGA or DVI signal between an external monitor and the frame grabber in order to control the output signal quality.

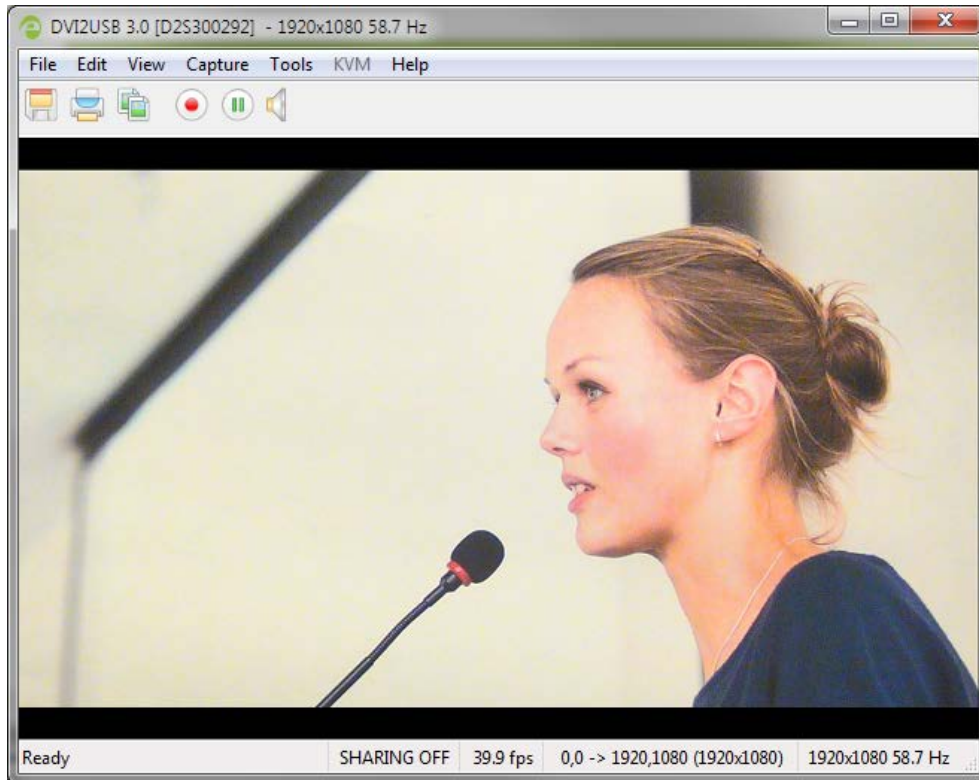
Capture video using the Epiphan Capture Tool

If needed, read [Epiphan Capture Tool](#) for information on how to launch the capture tool.



You can also use third-party capture applications to capture video from DVI2PCIe Duo. Consult the documentation that came with the third-party capture application to select the device.

1. Start the Epiphan Capture Tool; your video source is immediately detected (if you see a No Signal message, disconnect and reconnect the cables to make sure they are all seated correctly).



2. (Windows only) If you want to capture audio from the video grabber, click the Enable Audio button in the toolbar; its style changes to show audio is enabled. (If your source doesn't have audio or if you want to use a different audio input method, select **Capture » Audio Input Device** to select your audio source.)



3. Use the red record button to start recording. On Windows, the **Save** dialog opens. Specify the filename and folder to save your file.



4. When you are done capturing, use the pause (Windows only) or stop buttons to pause or stop recording.



5. Use your operating system's file browser (Windows Explorer or Finder) to find your saved capture file.



Windows only: HDMI audio capture may fail if your device has an old or incorrect EDID loaded. See **Update device EDID**.

What's next?

Now that you have done a basic recording, you might like to know more about the following topics:

- [Configure your device](#)
- [DirectShow video adjustments](#)
- [Epiphan Capture Tool](#)

Refer to the table of contents for a complete list of the topics covered.

DVI2PCIe Duo on Linux

Epiphan provides drivers and an API for linux, but does not provide a capture application. The video grabber is compatible with Video4Linux, so you can use any Video4Linux application for capture. You can also use the Epiphan Linux SDK to write your own application. For more information see the Epiphan product downloads page for your DVI2PCIe Duo. You'll find the **Software Development Tools** section which contains C and C++ api and a java interface and example.



If your capture workstation uses UEFI Secure Boot, your workstation won't be able to discover DVI2PCIe Duo. You must disable Secure Boot on your Linux workstation.

USB device driver (linux)

The Epiphan USB device driver for linux come as a set of pre-compiled binaries and additional source files that you may need to compile before installing on your computer. (Although called the 'USB device driver' this driver also works with Epiphan's internal PCIe video capture cards, including DVI2PCIe Duo).

To download the drivers for your product, go to www.epiphan.com/support and find the support page for DVI2PCIe Duo. From the **Downloads** tab, select the **Linux** download link; the linux download page appears.

Browse all files Epiphan SDK

Applications

v2u_kvm_ui.i686	GUI application for Epiphan framegrabbers and KVM2USB. Requires QT shared libs. Source available in Epiphan SDK .
v2u_kvm_ui.x86_64	GUI application for Epiphan framegrabbers and KVM2USB. Requires QT shared libs. Source available in Epiphan SDK .
v2u_kvm_ui.armv6l	GUI application for Epiphan framegrabbers and KVM2USB Raspberry PI binary. Requires QT shared libs. Source available in Epiphan SDK .
v2n_find_server	Find Epiphan embedded devices on LAN
v2u.i686	Get/set frame grabber parameters, capture frames
v2u.x86_64	Get/set frame grabber parameters, capture frames
v2u.armv6l	Get/set frame grabber parameters, capture frames. Raspberry PI binary.
v2u_edid.i686	Read/write framegrabber EDID
v2u_edid.x86_64	Read/write framegrabber EDID

Driver download

Select driver by bus type, your linux distribution, release and CPU architecture

Driver	Distribution	Release	CPU
vga2usb	Debian		
vga2pci	Fedora		
	Raspbian		
	RedHat/CentOS		
	SUSE		
	Ubuntu		

Choose **vga2usb** from the first dropdown box, and specify your linux distribution specifics in the other boxes. Once you've drilled into the version of linux for which you want the drivers, click the file links to download a compressed file with everything you'll need to compile and install the driver. Unzip the file and read the README for further instructions.

The driver works with Video4Linux compatible applications (including gStreamer, VLC and the Video4Linux application), and with the Epiphan API.

Epiphan capture API

The Epiphan capture API receives captured images from the USB device driver. To record or stream these images you can use a compatible Video4Linux application (such as VLC or gStreamer) or you can use the API to write your own capture application.

The API is optimized for capturing high resolution images from your DVI2PCIe Duo. It analyzes individual images, performs on-device cropping and handles video mode changes.

See the product support page to download the Software Development kit, which includes the Epiphan capture API.

Sample applications

Epiphan provides some sample applications including a sample capture application, a sample settings application and a sample utility for reading and writing EDIDs. Source for some of the samples (such as the capture application) is included in the SDK.

You can download the samples from the same downloads page as the driver.

Physical attributes

The DVI2PCIe Duo is a PCIe x4 card that can fit in a 4x, 8x or 16x PCIe slot on the motherboard of the video capture workstation. It features a single DVI-I type and a SDI (BNC type)connector.

To maintain high performance levels, the DVI2PCIe Duo card requires a minimum of PCIe x4. Consult your motherboard manual to ensure the slot you are using is PCIe x4 or higher.

PCIe card performance is determined by the length of the card and slot (x1, x4, x8 or x16) and the generation of the PCIe card and motherboard slot. The DVI2PCIe Duo card is a generation 2 card and is fully backward compatible with first generation slots. The card will perform at first generation speeds. DVI2PCIe Duo card is also compatible with generation 3 slots; however, the card will perform at generation 2 speeds.

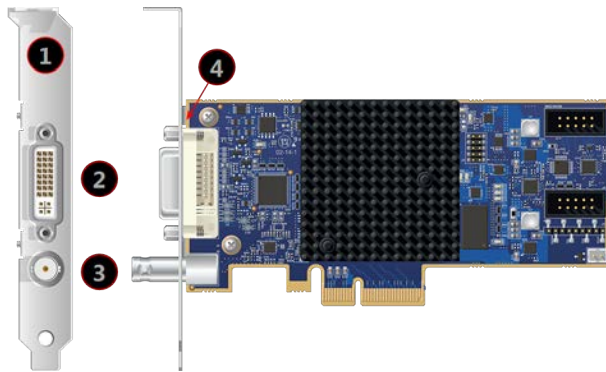


Table 2 Connectors and indicators

Number	Interface	Description
1	Bracket	Mounting bracket that goes into an opening at the back of the computer case. Use either the full height or half-height bracket.
2	DVI-I input	Dual-link DVI-I input port for single-link and dual-link DVI, HDMI and VGA sources.
3	SDI input	SDI input port for 3G-SD, HD-SD and SD-SDI sources.
4	LED	LED indicator light indicates the current status of the video grabber. See Indicator LED details for the meaning of different light colors.

Indicator LED details

Your DVI2PCIe Duo has a small indicator LED located near the DVI-I connector. Used mainly for troubleshooting, this LED isn't visible from the back of your capture computer, but if you need to you can view it by opening your computer case.

LED color	Description
Flashing red	During operation, the LED blinks each time the DVI2PCIe Duo captures an image.
Green and blue	During computer bootup, the LED starts Blue for a few seconds, then turns green for approximately 20 seconds. It then turns blue again to indicate its started and ready to capture images.
Flashing blue	The blue LED flashes during signal test operations and when the system tunes capture parameters.

Troubleshoot

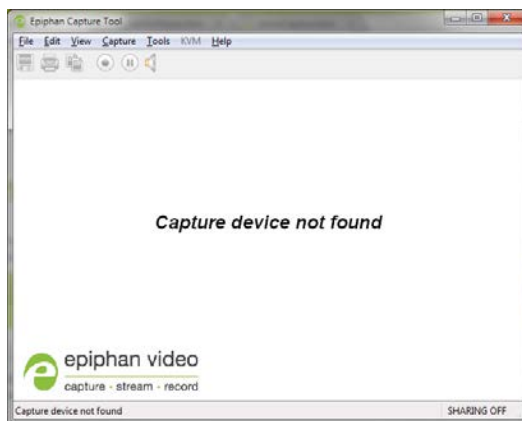
If you're experiencing problems with your DVI2PCIe Duo, use the following tips to attempt to rectify the problem.



If using splitters, be sure to always use high quality splitters. For VGA splitters, use an active VGA splitter rather than a passive or Y-Adapter splitter.

Capture device not found

If the Epiphan Capture Tool does not find the video grabber, the message **Capture device not found** is displayed in the capture application.

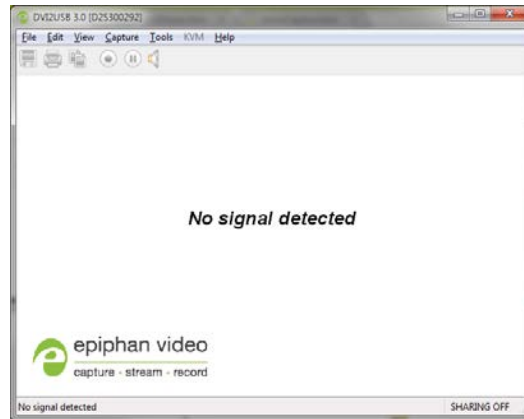


Try the following troubleshooting tips:

- Confirm that the video grabber is connected to the capture workstation's USB port. The device's LED is lit when it is connected.
- Disconnect and reconnect the video grabber from the USB port. This allows the operating system to load drivers for the video grabber, if they haven't already been loaded.
- Check the indicator LED colors and compare to the list described in [Indicator LED details](#).
- On Windows, check the Windows Device Manager to verify that you can see the video grabber in the list of devices.
- If trying the above suggestions does not resolve the issue, close all applications and restart your video capture workstation.

No signal detected

If the Epiphan Capture Tool finds the video grabber but does not see a connected video source, the message **No signal detected** is displayed in the capture application.



Try the following troubleshooting tips:

- Confirm that the video grabber used by the application is the correct one. Compare the serial number in the window frame (300292 in the example above) with the serial number sticker on the back of your device. If they do not match, use the **Capture » Select device...** (Windows) item to select a different video grabber.
- Confirm that your video source is on and is outputting data to the video cable connected to the video grabber (this may be a hardware or software setting in your video source).
- Disconnect and reconnect the video source from the video grabber.
- Check the indicator LED colors and compare to the list described in [Indicator LED details](#).

No button to apply configuration changes

On Windows, if you don't see the button to apply your configuration changes in the Epiphan Capture Tool, the application was opened without administrative privileges. Close the application and then re-open with administrative privileges.

When I power on my Windows workstation, the connected video grabber isn't detected

Try disabling the Fastboot settings on your workstation. You can disable fast start up from **Control Panel > Power Options > Choose what the power buttons do** and deselect **Turn on fast startup** under **Change settings that are currently unavailable**.

If the problem on your Windows capture workstation persists...

Try modifying the power settings. From **Control Panel > Power Options > Change plan settings**, ensure that the power options are set to **High performance**. If your workstation is a laptop, ensure that the AC adapter is plugged in.

Also under **Change plan settings**, modify these advanced power settings:

- **USB settings:** Change the USB selective suspend setting to **Disabled**.
- **PCI Express:** Set the Link State Power Management setting to **Off**.

While you're at it, open the **Device Manager** and under **Universal Serial Bus controllers**, ensure that any USB 3.0 Hubs that are listed here have the **Allow the computer to turn off this device to save power** setting **Disabled** under **Properties > Power Management**.

My Linux workstation doesn't discover the video grabber

If your Linux workstation uses UEFI Secure Boot, your workstation won't be able to discover DVI2PCIe Duo. You must disable Secure Boot on your Linux workstation.

Cannot capture Sync on Green (SoG) signal

On Windows, the DVI2PCIe Duo may not capture the Sync on Green (SoG) signal if the source input is connected before booting your computer. Try disabling the Fastboot settings on your workstation. You can disable fast start up from **Control Panel > Power Options > Choose what the power buttons do** and deselect **Turn on fast startup** under **Change settings that are currently unavailable**.

Configure your device

Epiphan lets you fine tune image adjustments and select a VGA mode (for analog sources) and control how your video grabber works with DirectShow-compatible applications.

The menu options that appear in the Configure dialog vary depending on the kind of source you have connected to the video grabber. Some menu items are only applicable to VGA sources and therefore only appear when a VGA source is connected.

To access the configuration screen, do one of the following:

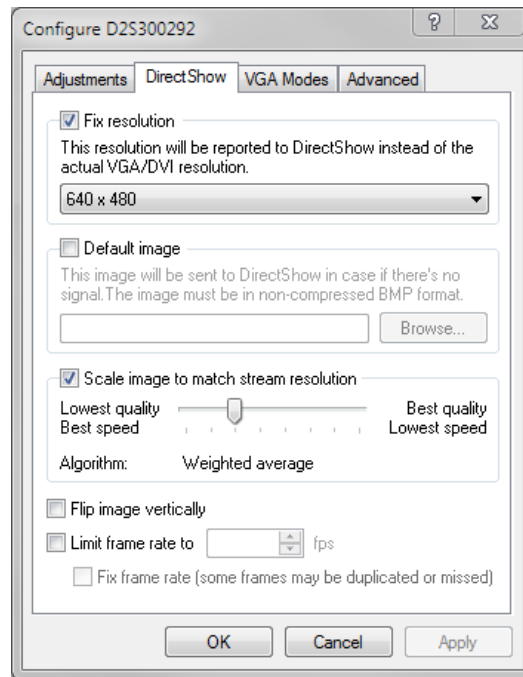
1. From the Epiphan Capture, choose **Capture » Configure Device...** or
2. Open the **Windows Control Panel**.
 - a. Click the Epiphan Frame Grabbers applet; the Epiphan Frame Grabber Configuration window appears.
 - b. Select the grabber you wish to configure.
 - c. Click **Edit Configuration**; the edit configuration window opens.

DirectShow video adjustments

In the **Epiphan Capture Tool**, the **Capture » Configure Device » DirectShow** page lets you configure how the device interacts with DirectShow compatible applications. From the resolution to whether or not the image is flipped, there are a variety of options available. See the table below for an explanation of each option.

You can also access this screen using the Epiphan applet in the Control Panel by selecting the video grabber you'd like to configure and clicking **Configure Device** or **Default Configuration**.

The adjustments made here are stored in the device driver and are used until you change them again. Once applied, you do not need to keep the Epiphan Capture Tool open to use the values you set. Be aware that third party DirectShow compatible applications can also have settings that may make it appear your settings are not being honored. If you're having difficulty seeing your changes, check the third party application's advanced settings.



Item	Description
Fix resolution	<p>Use this checkbox to force the resolution your video grabber reports to DirectShow compatible applications. When checked, the drop down box has a list of resolutions from which you pick your desired resolution.</p> <p>If you choose a resolution that is smaller or larger than the source video, the Epiphan drivers will scale the image for you (unless you uncheck</p>

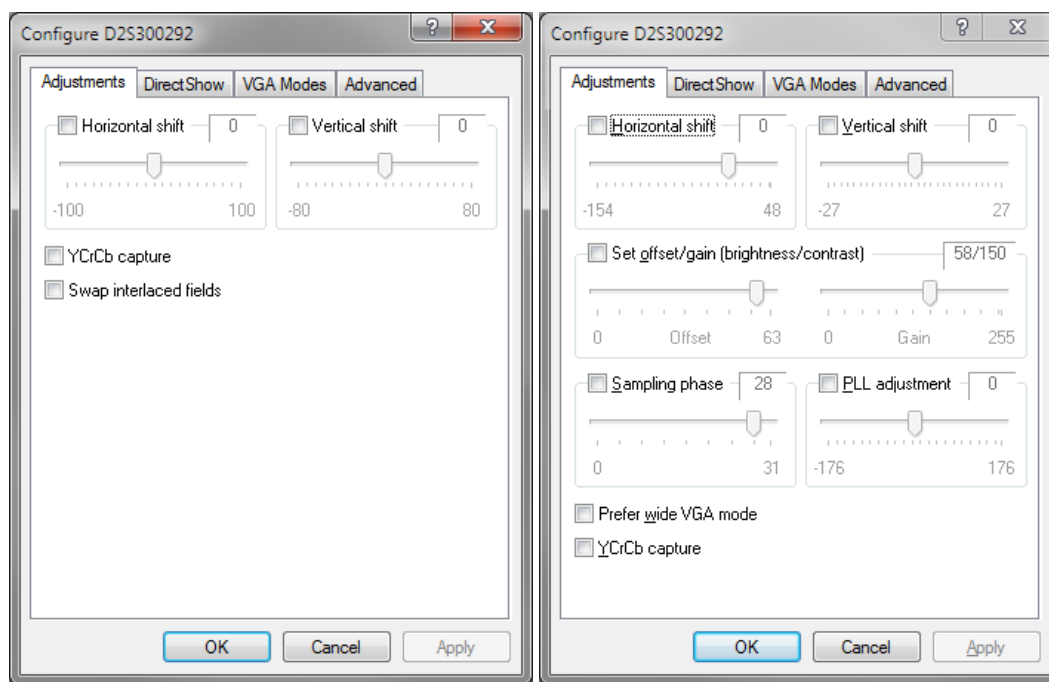
Item	Description
	<p>Scale image to match stream resolution, in which case the image will be cropped to match your chosen resolution).</p>
Default image	<p>Select an image to display when there is no signal captured from your video grabber. The uncompressed BMP image must be located on your video capture workstation.</p>
Scale image to match stream resolution	<p>If you are using a fixed resolution and choose not to scale the image, the captured image will appear cropped to your specified resolution when capturing with a DirectShow compatible utility. Generally the cropping happens at the top left corner of the video, but test first to be sure you see the same results.</p> <p>Normally, when choosing to use a fixed resolution with DirectShow, you'll want the Epiphany drivers to scale the image for you. Use the slider to determine the type of scaling you'd like. Scaling performance is a tradeoff between quality and CPU cycles on the capture computer. Lower quality (left side of the slider) is faster and takes fewer CPU cycles, where higher quality (right side of the slider) is slower and takes more CPU time. Try different values out to find the one that works for your specific use case.</p>
Flip image vertically	<p>Use this check box to flip your captured image vertically when sending over DirectShow.</p>
Limit frame rate to	<p>Use this to limit (or fix) the frame rate for the data you send to DirectShow.</p> <p>For example, if you're using a DirectShow-compatible application like WebEx and you're sharing something relatively static (like a PowerPoint presentation), you could limit the frame rate to 5 fps, which would be plenty for people watching at the other end, and would avoid filling your data pipe with identical images.</p>

Visual video adjustments

The **Adjustments** page lets you configure the device to manage slight shifts in the data and the color mode you're capturing from. If you have a VGA signal connected, options for configuring VGA-specific tuning parameters are also available.

You can access this screen by selecting **Capture » Configure Device » Adjustments** or using the Epiphan applet in the Control Panel by selecting the video grabber you'd like to configure and clicking **Configure Device** or **Default Configuration**.

The main adjustments screen has the following appearance, depending on the source connected (HDMI or DVI source shown on the left, VGA source shown on the right).



Item	Description
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 the value entered in the Horizontal Shift field shifts the image to the right, decreasing it shifts the images to the 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.

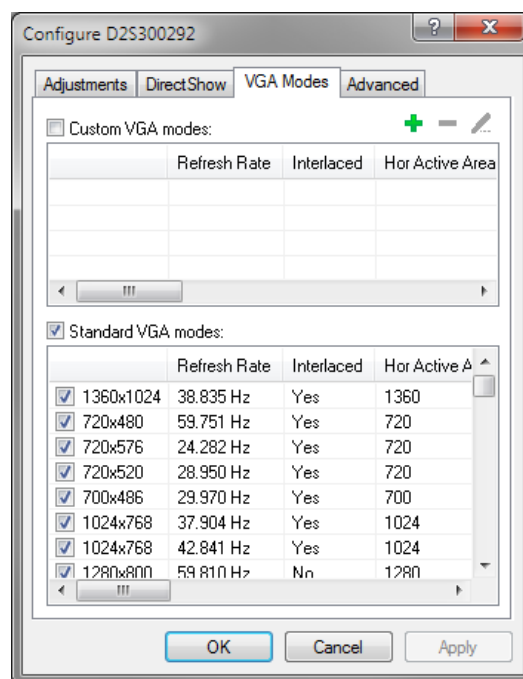
Item	Description
	Increasing the value entered in the Vertical Shift field shifts the image up, decreasing it shifts the images down.
Set offset/gain (brightness/contrast) <i>VGA sources only</i>	<p>The offset and gain settings control the image brightness and contrast respectively.</p> <p>Increasing the offset control causes the image to become darker.</p> <p>Increasing the Gain control gives the image more contrast.</p>
Sampling phase <i>VGA sources only</i>	This setting adjusts the vertical synchronization properties of the image. You may need to change it when there is a repetitive distortion or blurriness on the horizontal axis of the image. Adjust the setting in small steps until a sharper image is displayed.
PLL adjustment <i>VGA sources only</i>	This setting is used to squeeze or stretch the image horizontally.
Prefer wide VGA mode <i>VGA sources only</i>	This checkbox allows Wide Aspect Ratio VGA modes to be displayed by the video capture application window. The Epiphan USB device driver may not be able to determine whether the video source is sending a wide video mode signal. You can select this option if your video source uses a wide video mode to make sure that the Epiphan USB device driver selects a wide video mode.
YCrCb capture	Generally your DVI2PCIe Duo auto-detects input type, but in case of an issue where the input type isn't detected, you can select this checkbox to capture analog component video with YCrCb encoding.
Swap interlaced fields	When capturing from some sources, the video grabber cannot correctly determine the order to place interlaced lines. Use this checkbox to resolve the issue.

Set VGA modes

The **VGA Modes** page lets you configure the VGA modes used for analog video capture.

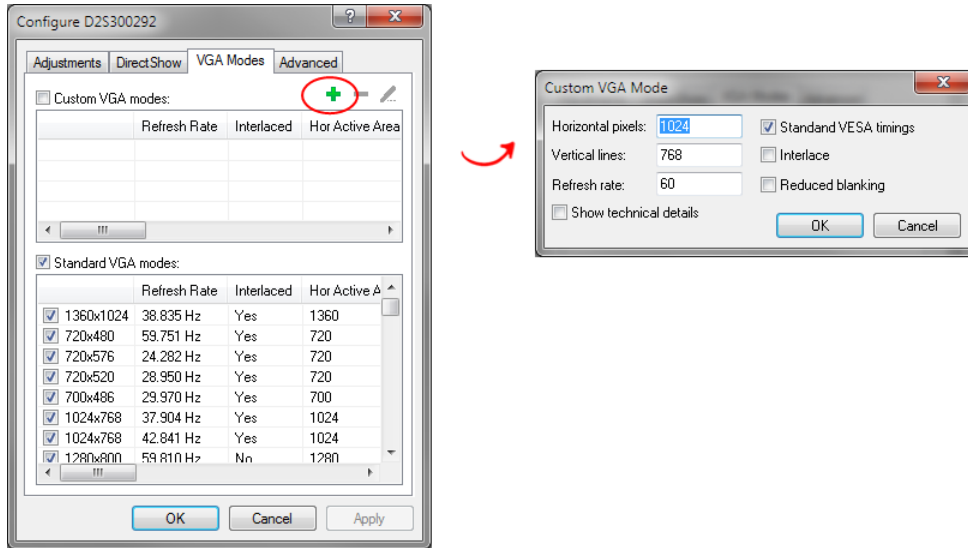
You can access this screen by selecting **Capture » Configure Device » VGA Modes** or using the Epiphan applet in the Control Panel by selecting the video grabber you'd like to configure and clicking **Configure Device** or **Default Configuration**.

The video grabber supports many common VGA modes out of the box. If however you wish to capture from a custom VGA source (i.e. custom resolution or timing) you can add that here. You can also uncheck any VGA modes you'd prefer the video grabber doesn't try to use when tuning the capture parameters for your source.



To add a custom VGA video mode:

1. Launch the Epiphan Capture Tool.
2. Select the **Capture » Configure Device** menu item; the configure dialog appears.
3. Select the **VGA Modes** tab.
4. Click the **plus** button to add a custom mode; the custom mode dialog opens.



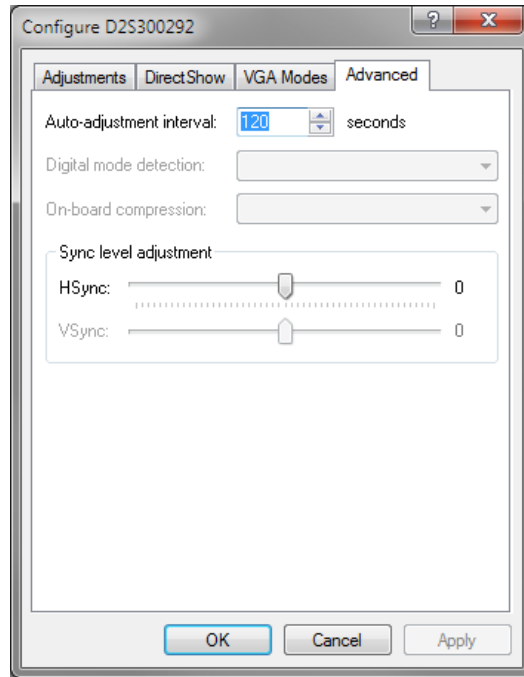
5. Specify your custom frame size in the **Horizontal pixels** and **Vertical lines** fields.
6. Specify the **Refresh rate** for your source and indicate whether it is interlaced or needs reduced blanking.
7. If your source uses non-customary timing, uncheck **Standard VESA timings**; a set of technical timing details appears. Fill in your custom timing values. (If you don't know the timing values for your source, use the standard VESA timings and make minor image tweaks using the Adjustments tab of the Configure Device dialog.)

Advanced adjustments

The **Advanced** page lets you configure the device's auto-adjustment and detection mechanisms.

You can access this screen by selecting **Capture » Configure Device » Advanced** or using the Epiphan applet in the Control Panel by selecting the video grabber you'd like to configure and clicking **Configure Device** or **Default Configuration**.

The advanced adjustment dialog looks like this:



Item	Description
Auto-adjustment interval	Specify an interval, in seconds that the video grabber should use between auto-adjustments. There is generally no need to change this value, however if you will be changing your source frequently during capture, you may want to reduce the interval.
Sync level adjustment HSync and VSync	Adjust horizontal and vertical sync levels. (This menu option does not apply for SDI sources.)



The DVI2PCIe Duo auto-detects the input type; however, if the input type isn't detected, you can manually select to capture analog component video using the YCrCb encoding from the main Adjustments tab. You can also swap interlaced fields from the main Adjustments tab if the video grabber can't correctly determine the order to place interlaced lines.

Epiphan Capture Tool

The Epiphan Capture Tool is a free software application available for Windows. You can use this tool for capturing and recording video or images from your source, and you can also use it to configure your video grabber for use with third party DirectShow-compatible applications.

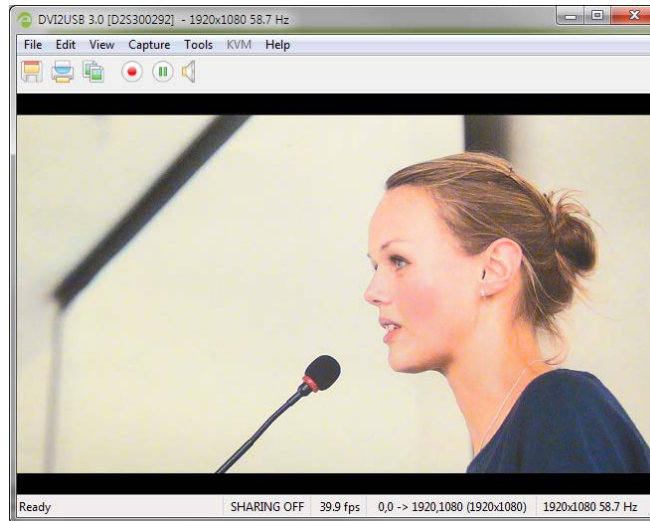
The same Epiphan Capture Tool is used by all Epiphan video grabber models that use Epiphan-supplied drivers (e.g. [DVI2USB 3.0](#), [SDI2USB 3.0](#), [VGA2USB](#), [DVI2PCIe Duo](#) and more) as well as Epiphan's portable USB-based KVM, [KVM2USB](#). As a result, some of the functionality in the software isn't applicable to your DVI2PCIe Duo video grabber. This guide outlines which functions are relevant and explains how to use each one.

Epiphan Capture Tool

To start the application, from the **Windows Start menu** select **Start » Epiphan Capture Tool**, or double-click on the installed desktop icon.

The application starts up and looks for the DVI2PCIe Duo video grabber connected to your PC.

If the video grabber is connected and operating, the capture application finds it and the image being captured appears on the application display.

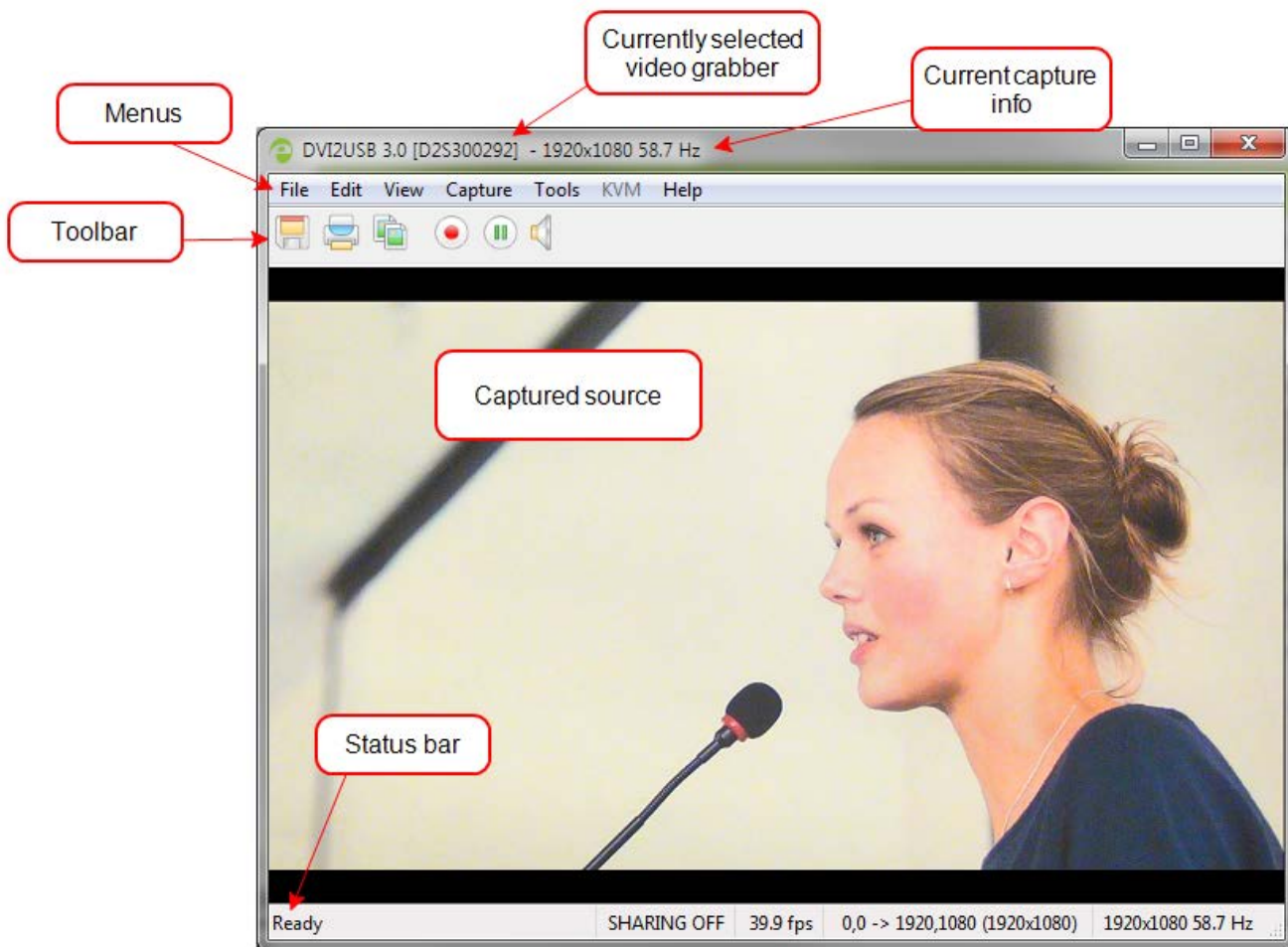


As the application starts, the following messages may appear:

- **Capture device not found** as the application attempts to connect with the video grabber.
- **Detecting Video Mode** as the application connects to a device and then determines the video mode of the device.
- **Tuning Capture Parameters** as the application synchronizes and tunes capture settings and image adjustments.
- **No Signal Detected** if the application connects to a video grabber that is not connected to an active video source.

If the video grabber device is not capturing images when you have a video source connected, follow the troubleshooting tips here: [Troubleshoot](#).

The capture tool has the following sections:

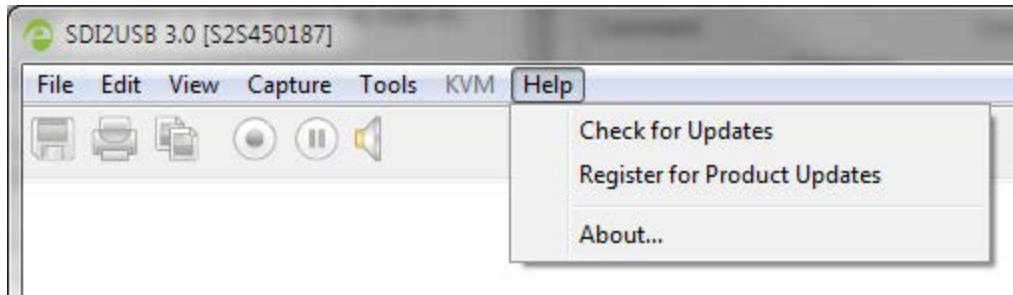


Read more about the menus in these topics: [File menu](#), [Edit menu \(Windows\)](#), [View menu](#), [Capture menu](#), [Tools menu](#)[Help menu](#). You can also read more about the [Toolbar](#) and [Status bar](#).

Menus

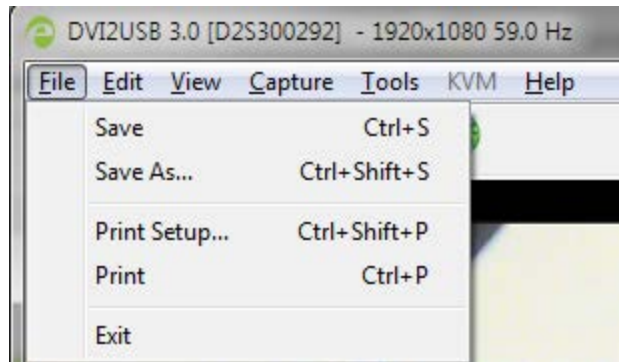
These topics cover the menus found in the Epiphan Capture Tool.

Depending on the source(s) you have connected to the DVI2PCIe Duo, different menu options may appear. This manual describes all the applicable menu items for both sources using the DVI-I input port and the SDI input port.



File menu

The following is a breakdown of the **File** menu in the Epiphan Capture Tool.



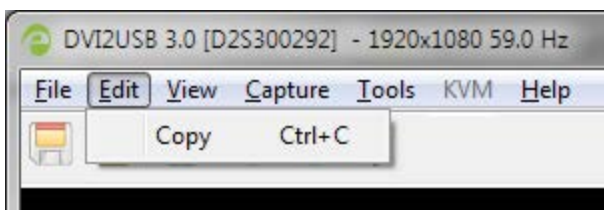
The **File** menu has these options:

Menu item	Shortcut	Description
Save	Ctrl+S	Save a snapshot of the current image to a file on the video capture workstation. See To save a snapshot .
Save As...	Ctrl+Shift+S	Save a snapshot of the current image to a file, using a new name or format. See To save a snapshot .
Print Setup...	Ctrl+Shift+P	Opens the printer configuration dialog, allowing you to select a printer or set printer options.

Menu item	Shortcut	Description
Print	Ctrl+P	Prints a snapshot of the current image. See To print a snapshot .
Exit		Closes the application, terminating all capture and recording done through this instance of the Epiphan Capture Tool.

Edit menu (Windows)

The following is a breakdown of the **Edit** menu in the Epiphan Capture Tool.

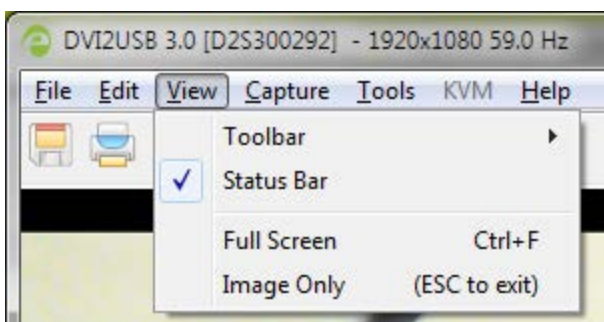


The **Edit** menu has these options:

Menu item	Shortcut	Description
Copy	Ctrl+C	Copy a snapshot of the current image to the clipboard. See To copy a snapshot .

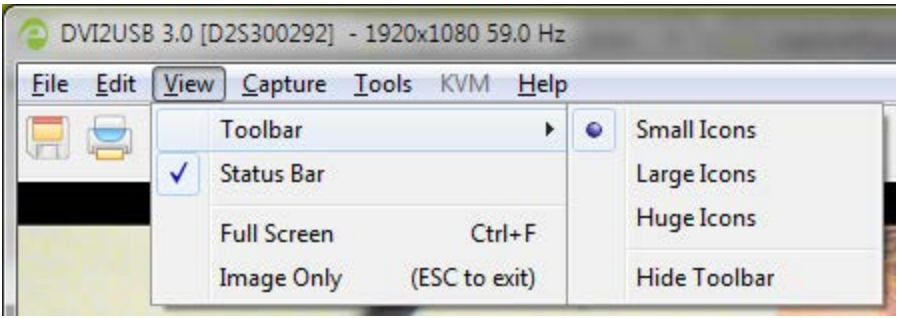
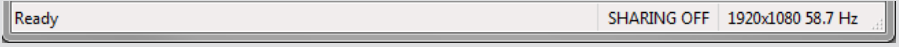
View menu

The following is a breakdown of the **View** menu in the Epiphan Capture Tool.



The **View** menu has these options:

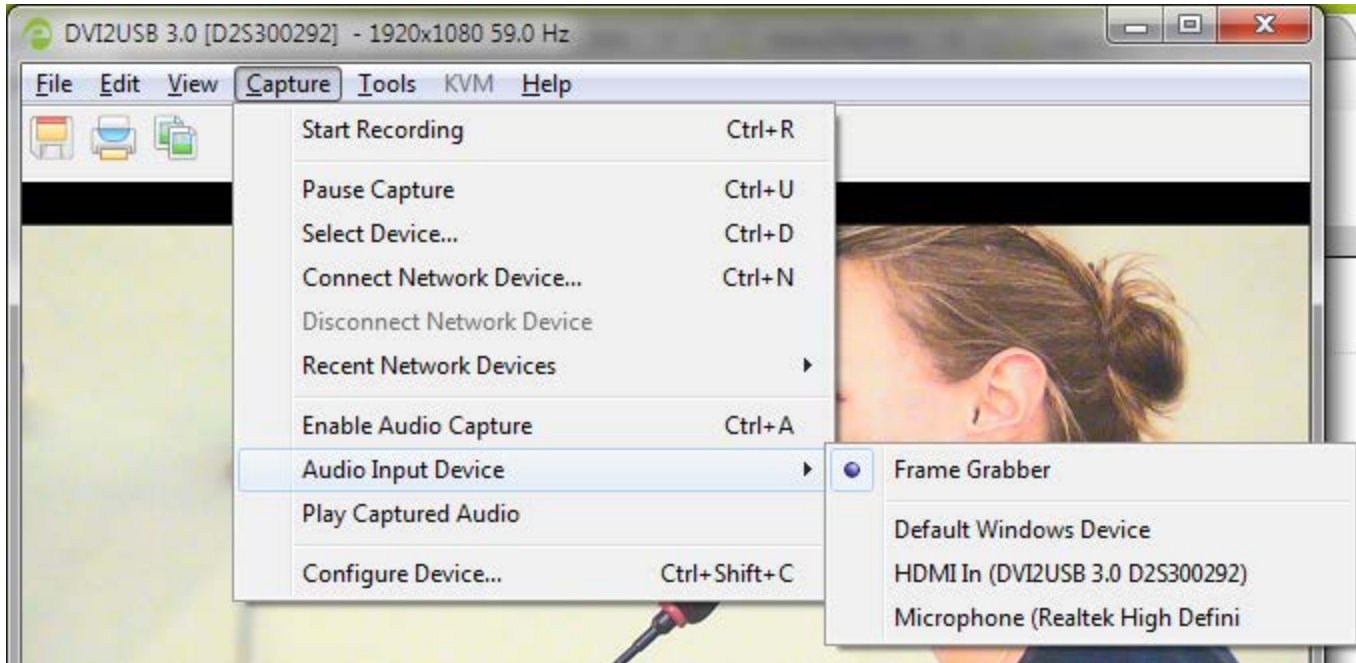
Menu item	Shortcut	Description
Toolbar		Change the size of the toolbar icons or hide/show the toolbar. (When the

Menu item	Shortcut	Description
		<p>toolbar is hidden, choose a size to restore it.)</p> 
Status Bar		<p>View or hide the status bar at the bottom of the application window.</p> 
Full Screen	Ctrl+F	<p>Enable full screen mode. Press ESC (the escape key) to return to window mode.</p>
Image Only	(ESC to exit)	<p>Put the Epiphan Capture Tool into a mode where the window borders, toolbar, status bar and menu bar are not displayed (scroll bars may still be displayed).</p> <p>The image only mode can be useful for integrating the Epiphan Capture Tool into a custom system UI. You can still use the existing shortcut keys.</p> <p>Press ESC (the escape key) to return to the normal operating mode.</p>

Capture menu

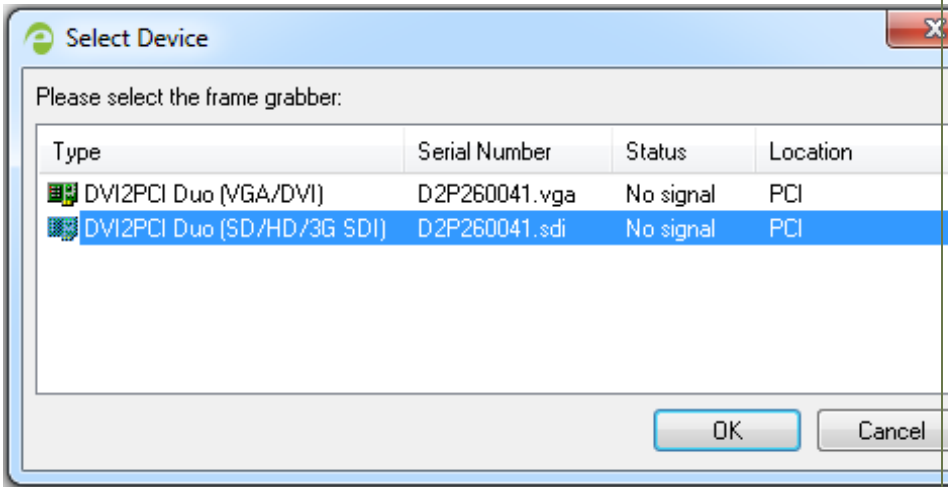
The following is a breakdown of the **Capture** menu in the Epiphan Capture Tool.

The Capture menu lets you start, stop and pause capturing/recording. It also lets you select the DVI2PCIe Duo device that this instance of the application works with, when you have more than one Epiphan video grabber installed in your video capture workstation.



The **Capture** menu has these options:

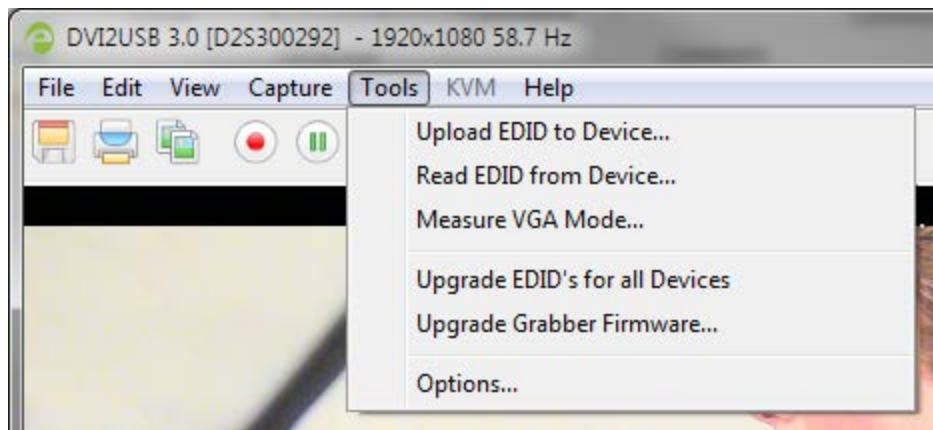
Menu item	Shortcut	Description
Start Recording (<i>Stop Recording</i>)	Ctrl+R	Start or stop recording your captured stream as a video or a series of captured images. See Record a video and Record as a series of images .
Pause Capture (<i>Resume Capture</i>)	Ctrl+U	Pause or unpause capture and recording (the last frame will stay visible on the screen). See Pause video capture .
Select Device...	Ctrl+N	Use when you have more than one Epiphan Pro Series Video Grabber installed in your video capture workstation, or to determine which input you'll use from the installed capture card.

Menu item	Shortcut	Description
		 <p>Choose the device and input you want to use in this instance of the Epiphan Capture Tool and click OK.</p>
Connect Network Device...		Used with Epiphan's legacy VGA2Ethernet device, outside the scope of this product documentation.
Disconnect Network Device		
Recent Network Devices		
Enable Audio Capture <i>(Disable Audio Capture)</i>	Ctrl+A	When enabled, audio captured by the device, or by the configured external audio source is included in the recording. See Configure audio .
Audio Input Device		Opens a sub-menu to let you choose the input device used for audio capture. See Configure audio for more details.
Play Captured Audio		When enabled, captured audio is played on the video capture workstation (e.g. through the workstation's speakers or attached headphones). Use as a confidence monitor to check the audio you're recording, or to share the audio you're capturing with local viewers. Enable Audio Capture must be enabled for the Play Captured Audio settings

Menu item	Shortcut	Description
		to work.
Configure Device...	Ctrl+Shift+C	Opens a dialog to let you configure specific capture adjustments for the video grabber. See Configure your device .

Tools menu

The Tools menu in the Epiphan Capture Tool lets you upload custom EDIDs and set application options.



The **Tools** menu has these options:

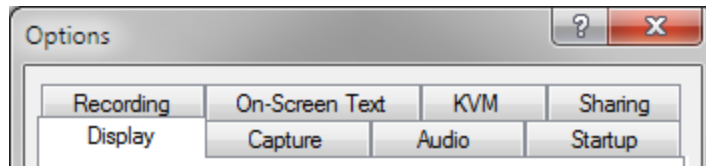
Menu item	Shortcut	Description
Upload EDID to Device...		Use this command to upload a custom EDID to the video grabber. See Update device EDID . (This option does not apply for SDI sources.)
Read EDID from Device...		Use this command to upload a custom EDID to the video grabber. See Update device EDID . (This option does not apply for SDI sources.)
Measure VGA Mode...		When requested by Epiphan technical support, you can use this command to display low-level information they can use to help diagnose problems. Copy this information into an email or chat with Epiphan technical support.
Upgrade EDIDs for all Devices		From time to time, Epiphan releases updated general-purpose EDIDs for video grabbers. Use this tool to check for updates and apply them. (This option does not apply

Menu item	Shortcut	Description
		for SDI sources.)
Upgrade Grabber Firmware		From time to time, Epiphan releases updated drivers and video grabber firmware. Use this tool to check for updates and apply them. If there is an update, new drivers are installed on your computer and those drivers load the firmware onto the DVI2PCIe Duo.
Options		Lets you configure a number of options related to capturing video, recording video and more. See Application options for a detailed explanation of the available options.

Application options

The Epiphan Capture Tool has a number of available configuration options, accessible from the **Tools » Options** menu.

The following categories of options are available: Recording, On-Screen Text, KVM, Sharing, Display, Capture, Audio and Startup.



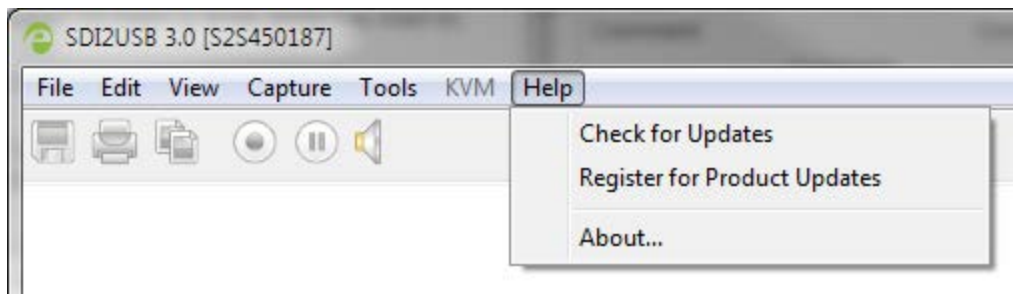
The **Options** dialog has these tabs:

Menu item	Description
Display	Lets you control how the capture tool displays the captured images and what information is displayed in the status bar. See Configure display options for more information on the display format and Status bar for a description and examples of the optional status bar indicators.
Capture	Allows you to configure cropping (to capture only a specific part of the video frame). See Crop the captured image for details. From this tab you can also change the interval between video mode detection attempts. Making the number smaller means the grabber will check more often for a different video mode, but it also means the grabber will work harder and could reduce frame rate.

Menu item	Description
	Lastly, from this tab you can also limit the frame rate of your capture. This could be necessary if you are streaming (or recording) and know you have a small amount of bandwidth (or disk space) and don't want to overwhelm it with too much data.
Audio	Lets you configure the audio format for the recording, the audio source used, and whether or not the Epiphan Capture Tool should play the captured audio on the capture workstation's audio output device (i.e. local speakers or headphones, which are useful for monitoring the audio captured). See Configure audio for information on configuring audio capture.
Startup	Allows you to choose whether or not the Epiphan Capture Tool should start up in full screen mode. The other option on this tab is used for legacy Epiphan products (network-attached video grabbers like VGA2Ethernet).
Recording	Lets you configure the capture application's record feature to save either as video or as images. See Record a video , Configure optional recording settings Record as a series of images for more details.
On-Screen Text	Using the Epiphan Capture Tool you can add a watermark to your captured frames; this tab lets you configure that watermark. See Add a watermark .
KVM	This feature is not used by DVI2PCIe Duo. It is for Epiphan's KVM2USB .
Sharing	The Epiphan Capture Tool comes with a sample sharing application, VGA2Web, a demo . See Sharing / streaming demo tool . This Options tab allows you to override the default compression settings used with that application.

Help menu

The **Help** menu in the Epiphan Capture Tool lets you check for software updates, register your product, and see information about your current software installation.



Use the **Help » Check for Updates** menu to check for updates to the Epiphan Capture Tool and drivers. Note that sometimes there can be an updated version of the software, but it doesn't add any new features or have any updates for the model of video grabber you are using. In those cases the software update check will not recommend an update, however you can still update your software using the method described in [Upgrade your drivers and software](#).

Toolbar

The Epiphan Capture Tool toolbar provides a set of quick-access buttons for actions that are used frequently such as starting, stopping and pausing capture and saving snapshots.







Toolbar:



You can change the size of icons on the toolbar using the menu command **View » Toolbar » (size) Icons**.

You can hide the toolbar using **View » Toolbar » Hide Toolbar**. To show the toolbar again when it is hidden, select any of the toolbar icon sizes.

The toolbar items:

Icon (Windows)	Description
	Saves a snapshot of the currently captured frame. You may wish to pause capture first. See Copy, save, or print a snapshot for more details.
	Prints the currently captured frame. You may wish to pause capture first. See Copy, save, or print a snapshot for more details.
	Copies the currently captured frame to the clipboard. You may wish to pause capture first. See Copy, save, or print a snapshot for more details.
	Starts (or stops) recording of the captured frames (in image or video format). See Record a video and Record as a series of images .
	Pauses capture and recording, if applicable. (Also closes out the recording file.)
	Enables or disables audio capture. See Configure audio for more details on configuring audio capture.

Copy, save, or print a snapshot

You can also use the Epiphany Capture Tool to copy, save, or print a snapshot from the stream.

To save a snapshot

Save a .bmp, .jpg, or .png of the stream you are capturing using any of the following methods. You can optionally [Pause video capture](#) prior to saving the image.

- Select **File » Save**
- Press **Ctrl+S**
- Use the Save icon on the toolbar



The first time you save a snapshot, the **Save As** dialog will open to ask for a file location and file type. Subsequent images will **automatically overwrite** this file unless you use **File » Save As...** or **Ctrl+Shift+S**.

To print a snapshot

You can directly print a snapshot from the stream using any of the following methods. You can optionally [Pause video capture](#) prior to saving the image.

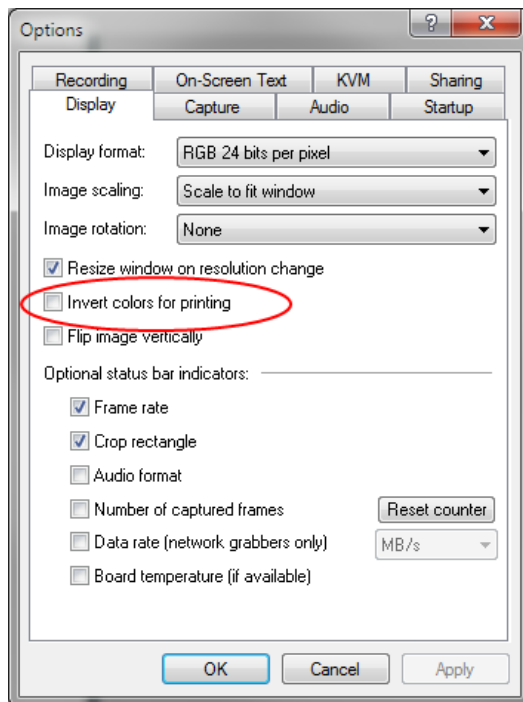
- Select **File » Print**
- Press **Ctrl+P**
- Use the Print icon on the toolbar



Use the menu option **File » Print Setup...** or the keyboard shortcut **Ctrl+Shift+P** to select the printer and configure printer settings.

Optionally, you can choose to have colors inverted for printing (black will appear as white, yellow as blue, red as cyan, etc). To invert the colors for printing:

1. Select **Tools » Options**; the options dialog appears.
2. Select the **Display** tab.
3. Check the **Invert colors for printing** checkbox.



4. Click **OK**.

To copy a snapshot

You can easily copy a snapshot of your stream to the clipboard using any of the following methods. You can optionally **Pause video capture** prior to copying the image.

- Select **Edit » Copy**
- Press **Ctrl+C**
- Use the Copy icon on the toolbar



Open another application on your workstation and use clipboard paste methods (like **Edit » Paste** or **Ctrl+V**) to paste the copied image.

Record a video

The Epiphan Capture Tool can record the images captured from your DVI2PCIe Duo as a video.

You can choose to capture audio (see [Configure audio](#)) and can also alternatively choose to save individual image files instead of a video, see [Record as a series of images](#).

To record a video of your captured video source:

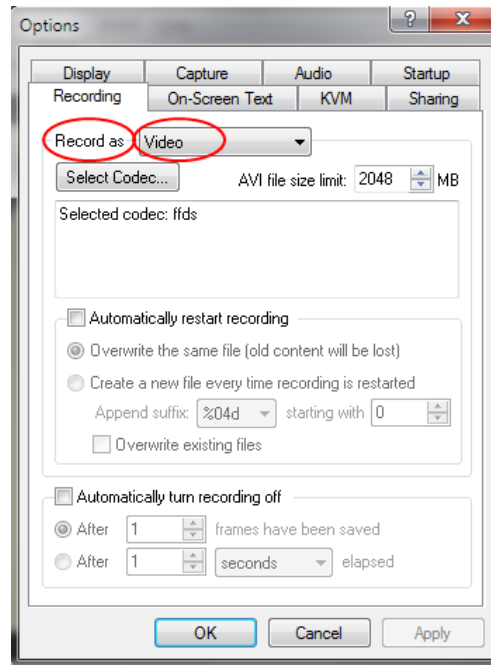
Step 1: Set the codec

Take this opportunity to select your encoding codec. Codecs are the software that take the uncompressed video frames from the DVI2PCIe Duo and combine/compress these into a digital video file that you can view with a player, share with a colleague or upload to a video sharing site, like YouTube.

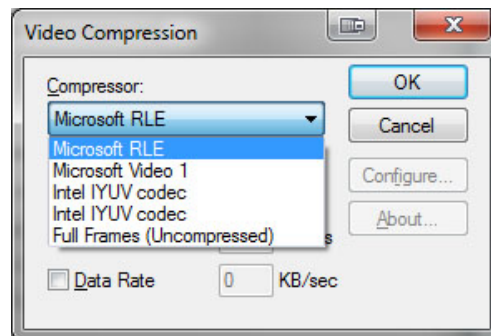
By default, your operating system comes with some default codecs installed, no additional codecs come with the Epiphan Capture Tool. You can choose to install third party codecs such as x264. Picking the best codec for your use case is beyond the scope of this document, but you can find many resources (and debates) about this topic on the Internet.

To configure the codec:

1. Connect your video source to the video grabber.
2. Connect the video grabber to a USB port on your capture workstation (use USB 3.0 for best performance or if you plan to capture embedded audio).
3. Launch the Epiphan Capture Tool using the installed desktop shortcut. See or [Epiphan Capture Tool](#).
4. Select the **Tools » Options** menu item; a dialog box opens.
 - a. Select the **Recording** tab.



- b. Ensure the **Record as** drop down has **Video** selected.
- c. Use the **Select Codec...** button to open the **Video Compression** dialog. Choose from codecs installed on your system and click **OK** to close the Video Compression dialog.



- d. If desired, modify the **AVI file size limit**. Recording will automatically be stopped when this limit is reached.
- e. From this page you can also **Configure optional recording settings** such as file names and recording period.
- f. Click **OK** to save your **Recording** settings.

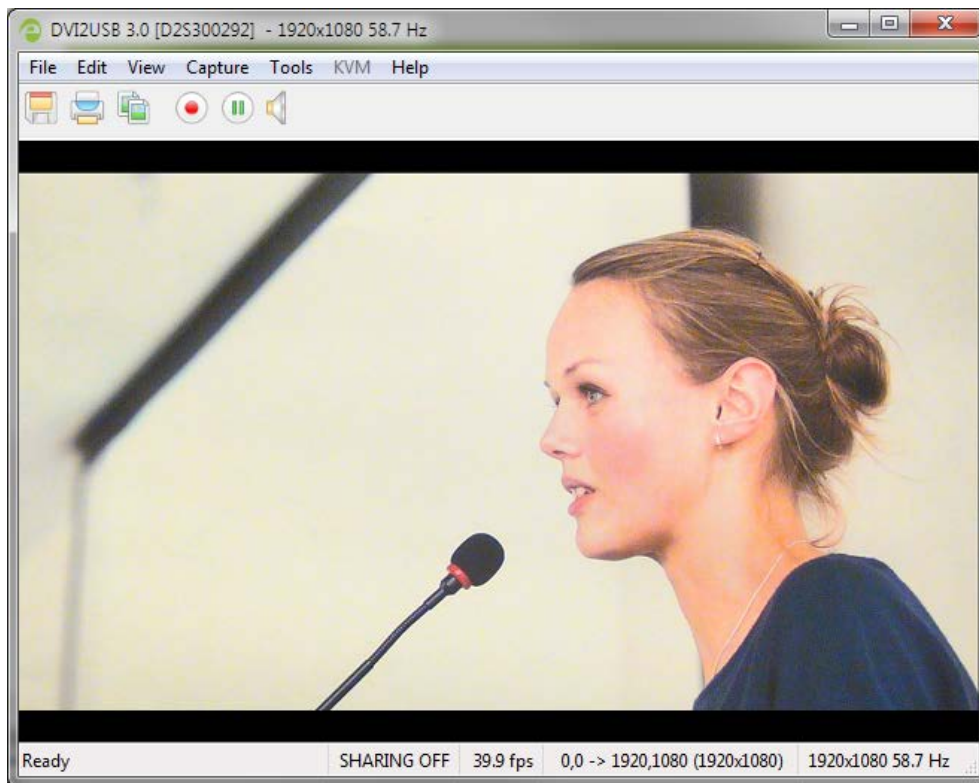
Step 2: Record

With the Epiphan Capture Tool properly configured, all there is to do is record your video!

As images/frames are captured by the video grabber they are recorded to the video file. The status bar displays the name and location of the video file, the elapsed recording time and the number of frames (or images) recorded.

To record your video:

1. The Epiphany Capture Tool should already be capturing and previewing your video source (if you see a No Signal message, disconnect and reconnect the cables to make sure they are all seated correctly).



2. Optionally, configure audio capture and enable audio capture. See [Configure audio](#).



3. Select **Capture » Start Recording**, use the red record button or keyboard shortcut **Ctrl-R** to start recording; a Save dialog opens.



(Windows)

4. Specify the filename and folder to save your file. (See [Configure optional recording settings](#) for pre-configuring recording file names.)
5. When you are done capturing, use the **pause** or **stop** buttons to pause or stop recording. (You can also use the keyboard shortcut Ctrl-U for pause and can use the menu items **Capture » Pause** or **Capture » Stop Recording** to control recording.)



6. Use your operating system's file browser (Windows Explorer or Finder) to find your saved capture file. If the status bar is visible, the filename and path of the last saved file is found in the status bar at the bottom of the Epiphan Capture Tool.



If you're having trouble capturing embedded audio, make sure you have the video grabber connected to a USB 3.0 port. Due to the extra volume of data that needs to be captured, embedded audio capture is only supported when connected via USB 3.0.



HDMI audio capture may fail if your device has an old or incorrect EDID loaded. See **Update device EDID**.

When the video file reaches the AVI file size limit, one of the following occurs based on recording configuration settings:

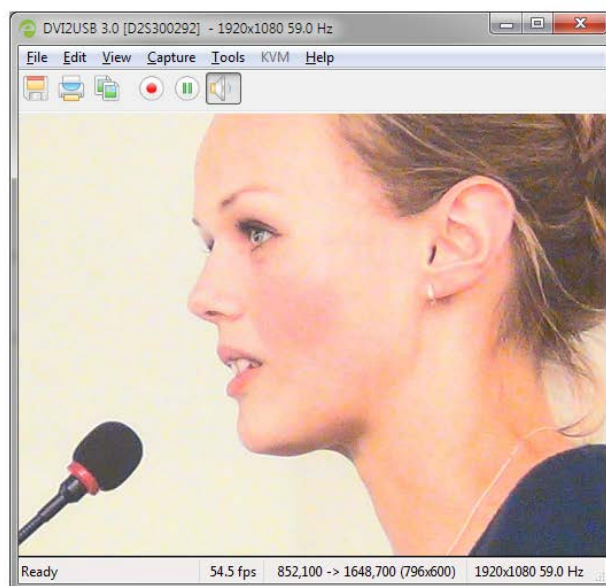
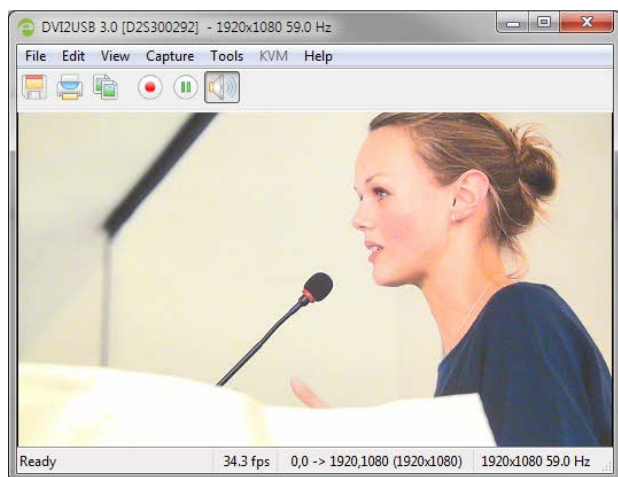
- recording stops;
- recording continues and a new video file is created; or
- recording continues and the original video file is overwritten.

To set recording options refer to [Configure optional recording settings](#).

Crop the captured image

In most video capture situations, you'd like to record everything that is captured by the DVI2PCIe Duo. Sometimes, however, there's a need to remove some information (e.g. confidential or personal information) or to crop out black bars or unwanted areas of a scene. For these purposes, the Epiphany Capture Tool lets you crop the captured source prior to recording.

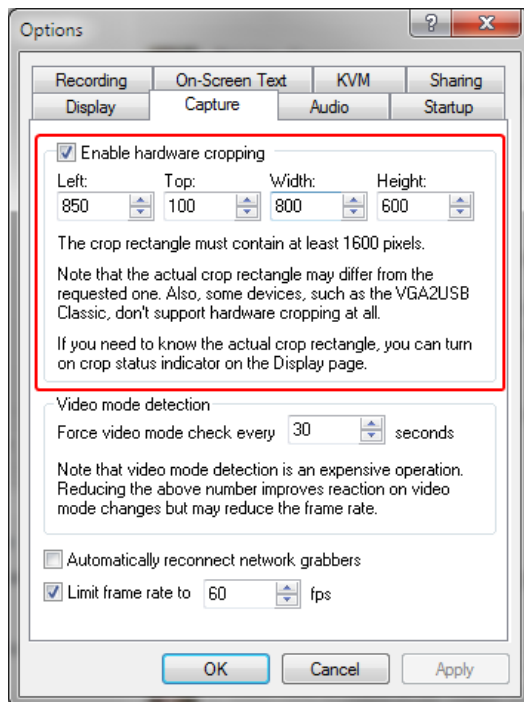
For example, using cropping you can change your capture from what you see on the left side, below, to the cropped image on the right. The status bar displays the cropped coordinates.



To set capture cropping, start by [Record a video](#)

To specify your cropping parameters:

1. From the **Tools » Options** dialog, select the **Capture** tab.
2. Check the **Enable hardware cropping** checkbox.



3. In the **Width** and **Height** fields, specify in pixels the size of the cropped area that you want to capture.
4. Using the **Left** and **Top** fields, specify in pixels the top left corner where to start capturing. As you change these values, you can see the visible portion of the image change in the cropped area.
5. Click **Apply** to see the changes immediately and keep fine-tuning, or click **OK** to save your changes.

Update device EDID

Extended display identification data (EDID) is data provided by a video display device (usually a monitor) to describe its capabilities to a video source (usually a graphics or video output card in a PC or another device). The video source uses the EDID to determine the capabilities of the monitor to determine the resolution, color depth and other settings that the monitor can support.

In the case of your DVI2PCIe Duo, it's acting as the monitor for your video source. Epiphan factory-loads your video grabber with a comprehensive EDID that describes all the video modes it can support. When you connect a video source (such as a laptop or video camera), this source interprets your DVI2PCIe Duo as a monitor and uses its EDID to negotiate which video signal to send.



EDID is crucial for DVI sources but mostly ignored by VGA sources.

Generally, the factory loaded EDID correctly emulates a monitor that supports your video source. However sometimes, particularly if your source uses a custom set of display properties, you need to help the video grabber by uploading a custom EDID to force the capture card to report that it emulates a resolution, color depth, etc needed by your laptop, camera or other video source.

For example, you can upload a custom EDID file to your DVI2PCIe Duo that reports that it only operates at 1040x768. When the video source reads the EDID from the video grabber, the video source will reset to operate at 1024x768 as set in the EDID.

In addition to needing to load a specific EDID, you may from time to time, want to upgrade your capture device with the latest factory EDID from Epiphan.

Upload a new EDID

In most circumstances the factory installed default EDID, is sufficient. However, there may be some cases where a video source uses resolutions that you do not want to use. In that case you can choose an EDID that forces the video grabber to use a specific set of attributes.



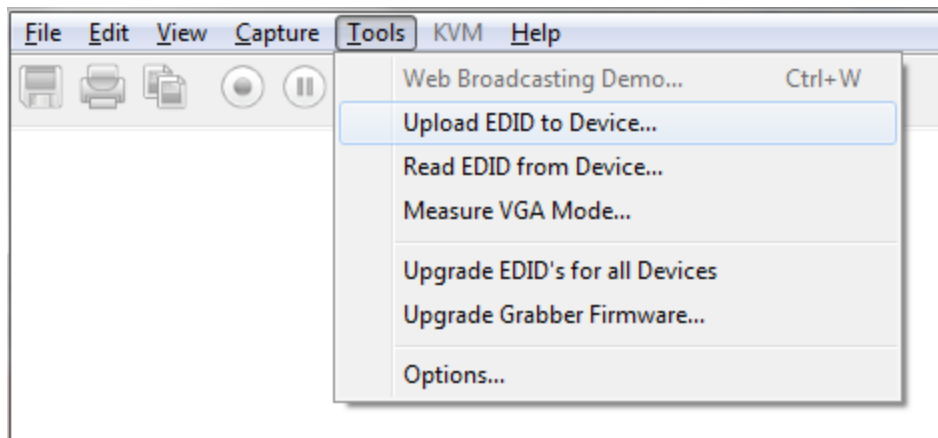
EDID changes are permanent until you replace them with another EDID.

1. First, download a new EDID file, by going to the [Epiphan support](#) web page.
2. Select the support page for DVI2PCIe Duo.
3. Scroll to the **EDID** section.
4. Click an EDID from the list; the file is saved to your downloads folder on your hard drive.

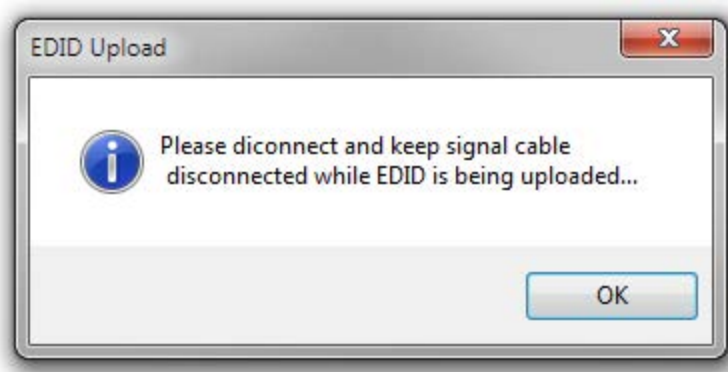


To return to the factory default EDID, select the "default configuration" EDID from the download list.

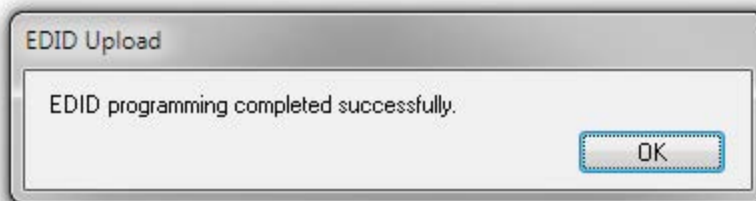
5. Connect your video grabber to the capture computer.
6. Disconnect your video source from the video grabber.
7. Launch the Epiphan Capture Tool.
8. Select the **Tools » Upload EDID to device...** menu option; a file selection dialog opens.



9. From the Open dialog, find the downloaded EDID file and select it.
10. A warning dialog reminds you to disconnect your source. Make sure no source is connected to the video grabber and click OK.



11. In a few short moments, the EDID upload is complete.



Practical EDID example

Here's an example of how a custom EDID can resolve a capture issue.

Let's say you have a flat panel monitor connected as your video output device that has a fixed screen resolution of 640×480. Then you replace that flat panel monitor with a DVI2PCIe Duo and the source system changes its video output resolution to 720×400.

Why did the resolution of the system change? That's because the video source prefers 720×400. Originally, the video source was forced to operate at 640×480 because the flat panel monitor didn't support 720×400. But since the DVI2PCIe Duo supports 720×400, the system automatically changed to its preferred resolution.

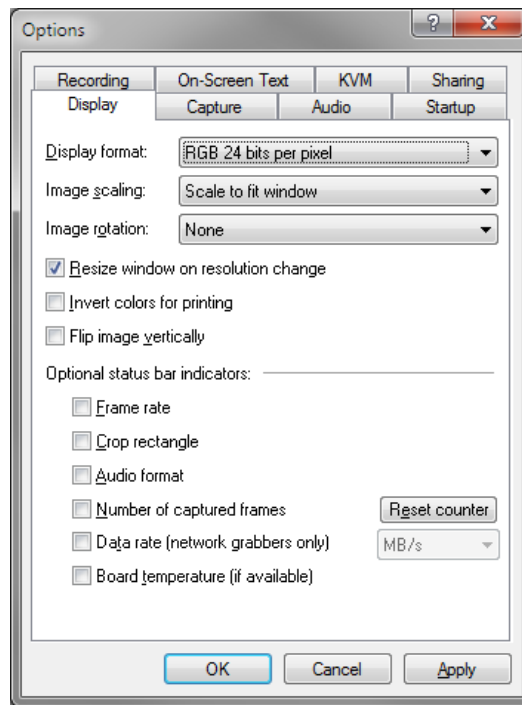
But what if you want a screen resolution of 640×480 and you can't force the video source to operate at that resolution? A custom EDID is what you need. Epiphan creates custom EDIDs for the DVI2PCIe Duo. For example, a custom EDID that excludes support for 720×400 would resolve this situation. Now when you upload the custom EDID to the video grabber, the video source no longer finds support for 720×400 and it returns to operating at 640×480.

Configure display options

The Epiphan Capture Tools gives you the ability to configure some aspects of how your captured frames are displayed. For example, you can choose whether or not the image is scaled if the window is made larger or smaller, or whether or not it is rotated on the screen.

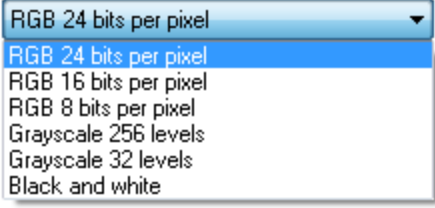

Display options

To access these options, select **Tools » Options** from the Epiphan Capture Tool's menu, then select the **Display** tab.



The available display configuration items are described below. Note the Optional status bar indicator options from this tab are described separately, see [Status bar](#).

Menu item	Description
Display format	<p>You can change the color space used for capture. Color space affects the appearance of your captured video and the maximum frame rate at which data can be captured. Changes in color space affect what you see on the screen and what is saved in your recordings via the Epiphan Capture Tool.</p> <p>The Epiphan Capture Tool supports a variety of RGB and grayscale color formats, but your DVI2PCIe Duo can also capture in the YUV 4:2:0 color</p>

Menu item	Description
	<p>space, if using a third party tool that supports this color space.</p> <p>Display format: </p> <div style="border: 1px solid #ccc; background-color: #e6f2e6; padding: 5px; margin-top: 10px;">  For 1080p video capture at 60 fps, you need to use a third party capture application that supports YUV 4:2:0. </div>
Image scaling	<p>Use this option to choose whether you'd like to have the captured image automatically downscaled to the size of your capture window. If deselected, scroll bars appear when the image is larger than the application window.</p> <p>This setting is for display only and the recorded image or video frame size is not affected.</p>
Image rotation	<p>If needed, the Epiphan Capture tool lets you rotate your captured source. For example, if your camera or source needs to be flipped 90 degrees to the left or right, or 180 degrees for proper viewing. Select the desired rotation from the dropdown list and click Apply or OK to see the results.</p> <p>This setting affects both the display and recorded images/video.</p>
Resize window on resolution change	<p>Check this checkbox if you'd like the application window to resize when the source's resolution changes.</p>
Invert colors for printing	<p>Lets you choose to have colors inverted for printing. Black appears as white, yellow as blue, red as cyan, etc.</p>
Flip image vertically	<p>Select this checkbox to have your image flipped vertically. The effect is as though a mirror is placed along the top edge of the captured frame.</p> <p>To flip the image horizontally, select both this option and add a 180 degree image rotation.</p> <p>This setting affects both the display and recorded images/video.</p>

Additional features

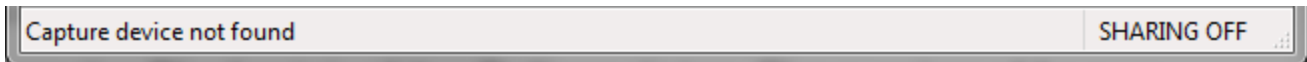
This section describes additional features that help you get the most of out of capture experience.

Status bar

The Epiphan Capture Tool has a status bar that displays information about your DVI2PCIe Duo or the currently selected video grabber. See below for a review of different things added to the status bar depending on configuration settings and your current actions with the utility.

No grabbers

If the software doesn't detect any attached video grabbers, the status bar indicates there are no capture devices found:



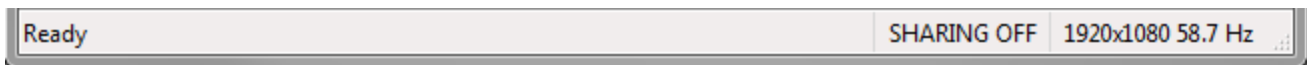
No signal on selected grabber

If there is no signal to the currently selected video grabber, the status bar indicates this with a no signal message:



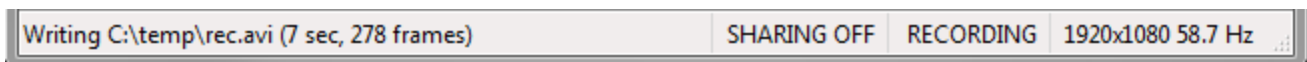
Ready but not recording

Otherwise, the status bar shows a wealth of information. When not actively recording, the status bar indicates that it is Ready to start recording, and shows the VGA Mode of the source signal at the right side of the bar.



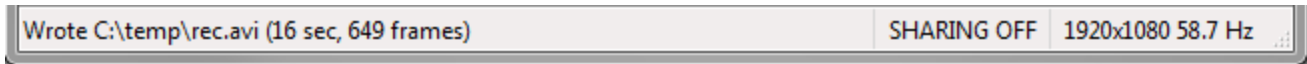
Recording a video

In the default configuration, when actively recording a video, it looks like this (RECORDING tag, file location, duration and frame count are added to the status):



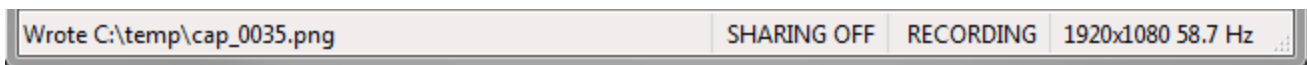
Video recording complete

When video recording is complete, the status bar updates to show the final file location and duration. This stays in the status bar until the application is closed or recording is restarted.



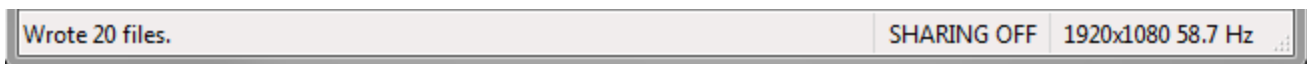
Recording images

When recording your source as a series of images, the status bar shows the RECORDING tag and name of the current file.



Recording images complete

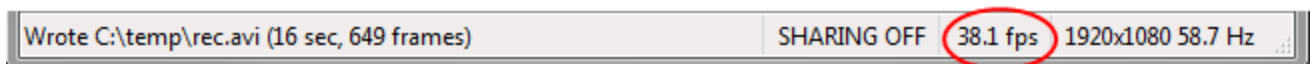
When image recording is complete, the status bar indicates the number of image frames that were saved.



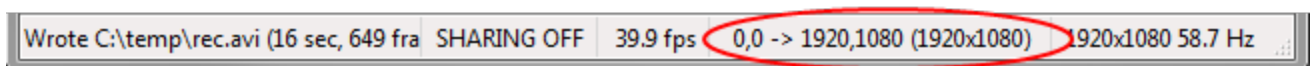
Optional information

Other information can be displayed on the status bar, depending on the configuration items set in the **Tools » Options » Display** menu. They are shown (mostly) separately below, but you can turn any number of these optional status bar items on at the same time - you may simply need to make sure your capture window is wide enough to see all the data!

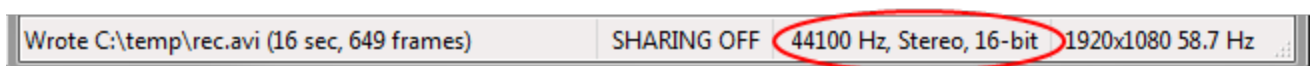
- The current capture frame rate.



- The crop rectangle showing the top left corner (0,0 in the example), the bottom right corner and the resulting frame size.



- Audio encoding information.



- The number of frames or images the video grabber has captured since the application started.



Pause video capture

You can use the pause button on the toolbar, access pause from the capture menu or use the keyboard shortcut Ctrl-U to pause capture. When you pause capture, the following things happen:

- The last captured frame remains open in the Epiphan Capture Tool (no new frames are grabbed). This image can be saved, copied or printed. See [Copy, save, or print a snapshot](#).
- If you are recording video:
 - Your current video recording (if applicable) is closed.
 - If Automatically restart capture (from the **Tools » Options** dialog) is unchecked, video capture is stopped and the video file finalized.
 - If Automatically restart capture is checked, pressing pause again or selecting **Capture » Resume Capture** will unpause and will either overwrite the existing video file or start a new one, depending on the configuration you set. See [Configure optional recording settings](#).
- If you are recording images:
 - No further images (if applicable) are saved.
 - When you press pause again, image capture starts again immediately

Pausing capture is particularly useful when you're also streaming live - this way you can prepare something different or type in a password without having sensitive information captured.

Record as a series of images

There are two ways you can record using the Epiphan capture tool and your DVI2PCIe Duo: capturing individual images or capturing video. To learn how to capture video, see [Record a video](#).



It is not possible to capture audio when recording your source as a series of images.

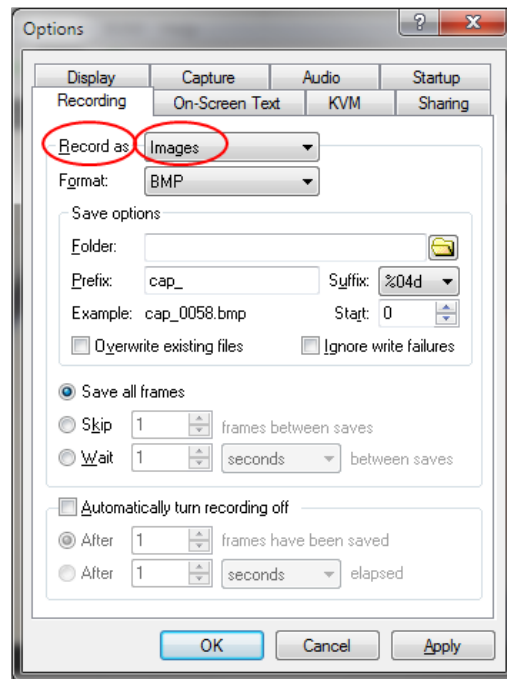
To capture your video source as a series of images:

Step 1: Set the capture mode, file format and capture frequency

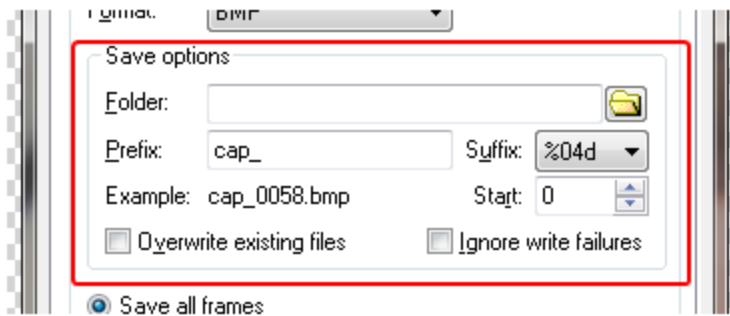
By default, the Epiphan Capture Tool captures in video format, so it's important to change the mode before starting your recording.

To configure the image capture mode and file format:

1. Connect your video source to the video grabber.
2. Connect the video grabber to a USB port on your capture workstation (use USB 3.0 for best performance).
3. Launch the Epiphan Capture Tool.
4. Select the **Tools » Options** menu item; a dialog box opens.
5. Select the **Recording** tab.



6. Ensure the **Record as** drop down has **Images** selected.
7. Use the **Format** drop down to select from BMP, PNG or JPEG (JPG).
8. In the **Save options** section:



- a. Specify a folder for saving the files. If you don't specify a folder, your images will be saved in the same folder as the Epiphan Capture Tool.
 - b. If desired, specify a custom **Prefix** for each file.
 - c. Use the **Suffix** drop down to determine whether you're using decimal (d) or hexadecimal (X) characters for the suffix, and the number of leading zeros in the filename (e.g. %04d means a decimal suffix with 4 digits, the first few will have three leading zeros (cap_0001.bmp)).
 - d. Set the **Start** value to the first number you want to use in your file name.
 - e. Use the **Example** section to see the result of your file name edits.
 - f. Check the **Overwrite existing files** checkbox if you want new images to overwrite old ones.
 - g. Check the **Ignore write failures** checkbox if you want to proceed regardless of whether or not the images are still being saved. (e.g. with this box checked, you will not be warned when you run out of disk space or if there is a permissions issue preventing file writing).
9. Determine how often you want to save images. Saving all frames will save up to 30 images per second, which can quickly take a lot of space on your hard drive!

10. Select **Save all frames** to save each frame as an image.
11. Select **Skip** and set a value to save an image every X frames (e.g. set Skip to 10 and you'll save an image every 10 frames).
12. Select **Wait** and set a time interval between image saves. Use this to collect a frame every few seconds or minutes (choose from milliseconds, seconds, minutes and hours).
13. Lastly, decide if you want to save only a certain number of images or if you want to continue saving images until request the application to stop recording.

14. To use the record button/control to stop saving images, leave **Automatically turn recording off** unchecked; otherwise, check the checkbox and specify your limit in frames or seconds.
15. Click OK to save your **Recording** settings.

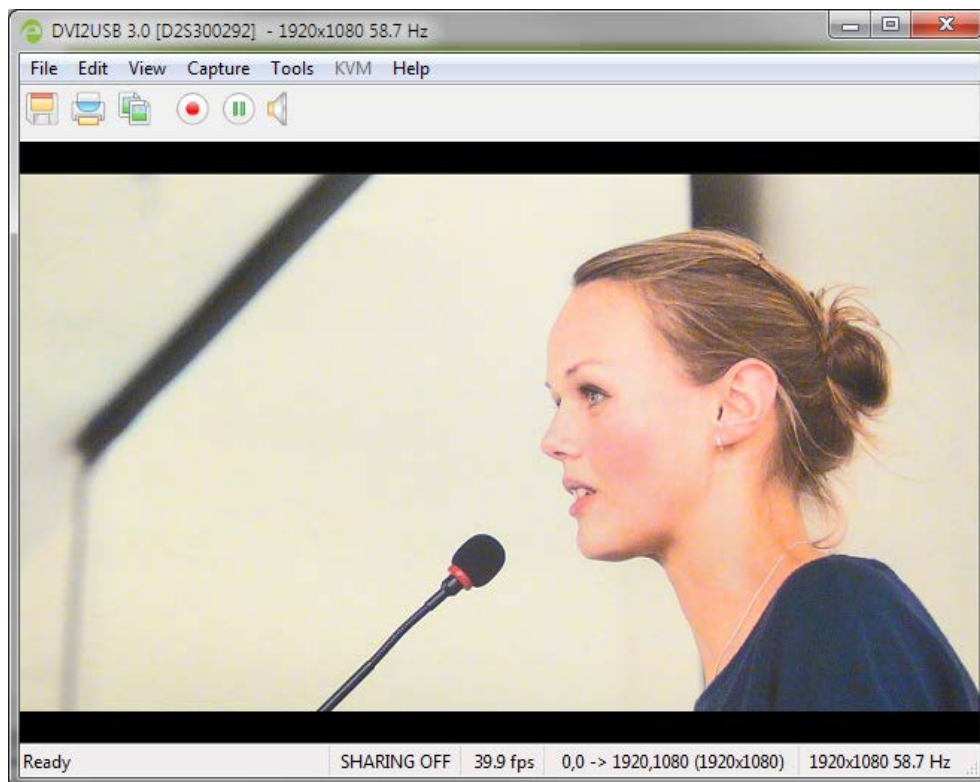
Step 2: Record

With the Epiphan Capture Tool properly configured, all there is to do is record your series of images!

As images/frames are captured by the video grabber they are saved as individual image files. While capturing, the status bar displays the name and location of the last saved image. The total number of images saved is displayed when recording stops.

To record your images:

1. The Epiphan Capture Tool should already be capturing and previewing your video source. If you see a No Signal message, disconnect and reconnect the cables to make sure they are all seated correctly.



2. Select **Capture » Start Recording**, use the red record button or keyboard shortcut **Ctrl-R** to start recording; the **Save** dialog opens.



3. When you are done capturing, use the pause or stop buttons to pause or stop recording. You can also use the keyboard shortcut **Ctrl-U** for pause and can use the menu items **Capture » Pause** or **Capture » Stop Recording** to control recording.



4. Use your operating system's file browser (Windows Explorer or Finder) to find your saved image file(s).

Configure audio

Your DVI2PCIe Duo can capture audio directly from non-encrypted HDMI and SDI sources. The Epiphan Capture Tool can also capture audio from other audio devices plugged into your capture workstation (e.g. embedded laptop microphone or external microphone plugged in via USB or audio in jack).

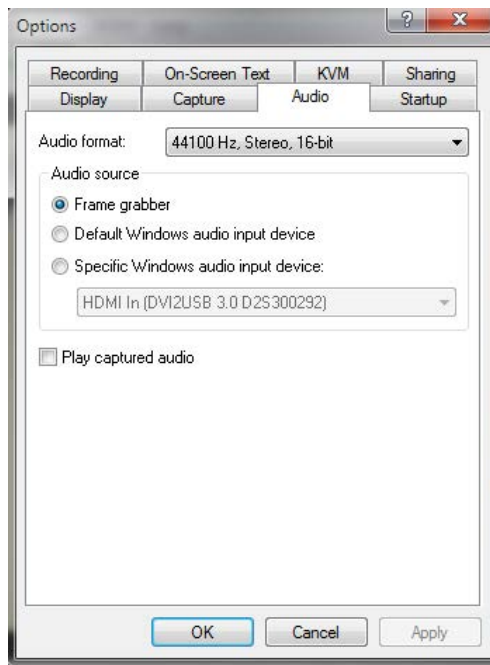
By default, the Epiphan Capture Tool doesn't capture audio, but configuring it is simple!

Step 1: Select your audio source

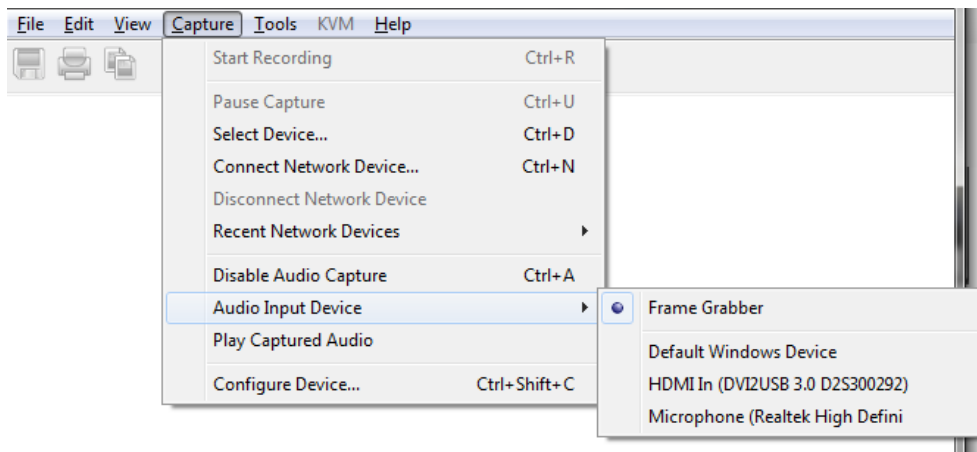
Start by picking the audio source you want to capture. You can do this from either the **Tools » Options** menu, or directly from the **Capture** menu.

To select your audio source:

1. Configure your external audio source with your operating system (generally no configuration is needed for embedded microphones).
2. Or, connect your HDMI or SDI source to the video grabber.
3. Launch the Epiphan Capture Tool.
4. Select the **Tools » Options** menu item, the **Options** dialog appears.
 - a. Select the **Audio** tab.



- a. If capturing embedded HDMI or SDI audio, select **Frame Grabber**.
 - b. If using an external audio source, click **Specific Windows audio input device** and select your audio device from the list.
 - c. If desired, use the **Audio format** drop down to specify the audio bit rate you want saved (or streamed), Stereo/mono and bit-depth. (If this value is different than the incoming audio bitrate, DVI2PCIe Duo resamples the audio to your specified bitrate.)
 - d. If desired, check the **Play captured audio** checkbox to have the audio played over the capture workstation's audio output device (e.g. speakers or headphones connected to the capture workstation).
 - e. Click **OK** or **Apply**.
5. Alternatively, select **Capture » Audio Input Device** and select your audio source from the list.



Step 2: Enable audio capture

You can tell whether audio capture is enabled by looking at the toolbar. If the speaker icon is still (no sound waves depicted coming out from it), audio is not enabled. See the examples below.

Audio enabled



Audio disabled



To enable audio capture:

1. Launch the Epiphan Capture Tool.
2. Click the **Capture Audio** button (speaker icon) on the toolbar; when audio capture is enabled, the icon is animated with sound waves.

To disable audio capture:

1. Click the Capture Audio button; the icon has a static image.

Step 3: Capture!

Use the record button on the toolbar to capture your audio/video stream!



HDMI audio capture may fail if your device has an old or incorrect EDID loaded. See **Update device EDID**.

Configure optional recording settings

When recording your captured frames as a video, as described in [Record a video](#), you can set some optional configuration settings.

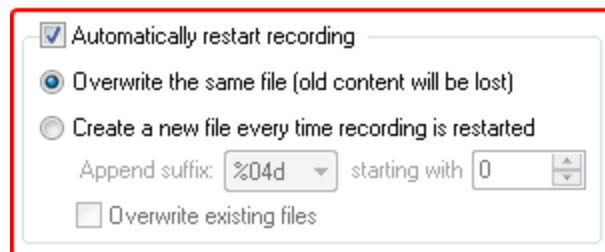
Configure an automatic file name (Automatic restart)

You can avoid needing to enter a file name each time you want to record by using a combination of record and pause along with setting the Epiphan Capture Tool to either overwrite the previous file or create a file name suffix that is added to the base file name you specify the first time you start recording.

Start by connecting your video grabber to the capture workstation and your source to the video grabber. Launch the capture tool and configure it for recording video following the instructions in [Record a video](#), if needed.

To overwrite the same file each time you record:

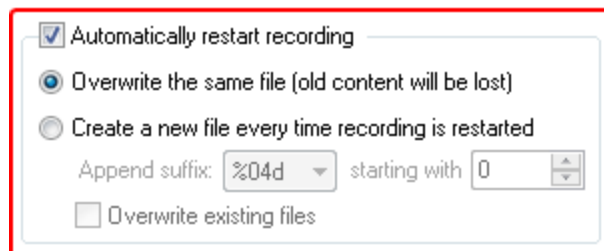
1. From the **Tools » Options » Recording** tab, check the **Automatically restart recording** checkbox.



2. Click the **Overwrite the same file (old content will be lost)** radio button.
3. Click **OK**.
4. Start recording and provide location and name for your video file.
5. Use the **pause** button on the toolbar (keyboard shortcut Ctrl+U or **Capture » Pause**) between recordings and click either pause again to restart, automatically overwriting the previous file name.

To record a sequence of video files (each with a different suffix):

1. From the **Tools » Options » Recording** tab, check the **Automatically restart recording** checkbox.



2. Click the **Create a new file every time recording is restarted** radio button.
3. Use the **Suffix** drop down to determine whether you're using decimal (d) or hexadecimal (X) characters for the suffix, and the number of leading zeros in the filename (e.g. %04d means a decimal suffix with 4 digits, the first few will have three leading zeros (cap_0001.bmp)).
4. Optionally, choose a starting digit for your sequence.
5. Optionally, check the **Overwrite existing files** checkbox if you'd like to automatically overwrite files if you already have files with the same name.
6. Click **OK**.
7. Start recording and specify a location and root name for your video files.
8. When recording, use the **pause** button on the toolbar (keyboard shortcut Ctrl+U or **Capture » Pause**) between recordings and click either pause again to restart, automatically creating a new video file with the name in the sequence.

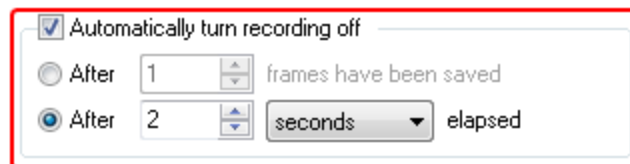
Configure recording period

If desired, you can configure the Epiphan Capture Tool to stop recording after a specified time period has elapsed or a specified number of frames have been saved. For example, if you know you always need a 1 minute video when capturing from an ultrasound.

Start by connecting your video grabber to the capture workstation and your source to the video grabber. Launch the capture tool and configure it for recording video following the instructions in [Record a video](#), if needed.

To overwrite the same file each time you record:

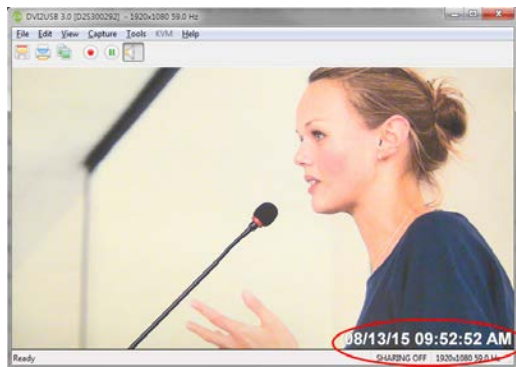
1. From the **Tools » Options » Recording** tab, check the **Automatically turn recording off** checkbox.



2. Select the appropriate radio button to specify stopping after a **number of frames have been saved** or after a specified amount of time has **elapsed**.
3. Enter your limit: number of frames or time in milliseconds, seconds, minutes or hours.
4. Click **OK**.
5. Start recording as usual, the recording will automatically stop when the stop criteria is met.

Add a watermark

Using the Epiphan Capture Tool, you can add a watermark in the form of a time-stamp or other static on-screen text to your captured video or images.



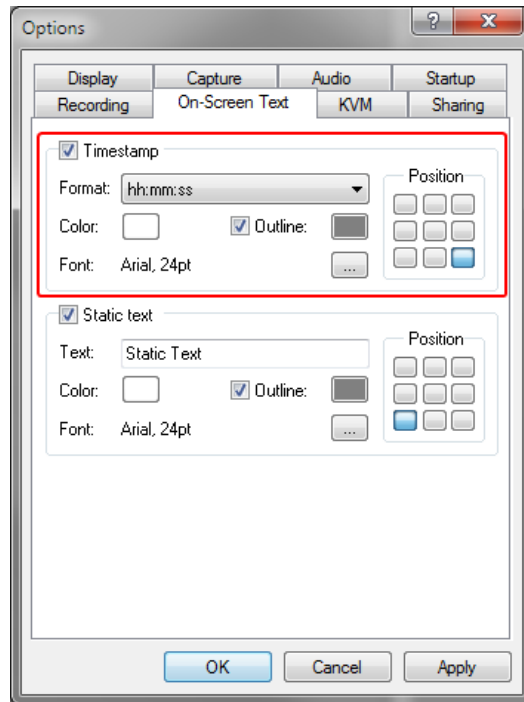
Add a timestamp

You can add a timestamp to your captured video by choosing from one of the pre-created formats and selecting the font, size, location and color.

Start by connecting your video grabber to the capture workstation and your source to the video grabber. Launch the capture tool and configure it for recording video following the instructions in [Record a video](#), if needed.

To configure a timestamp watermark:

1. From the **Tools » Options** dialog, select the **On-Screen Text** tab.
2. Check the **Timestamp** checkbox.



3. Choose a timestamp format from the **Format** drop down box.
4. If desired, change the **color** and **outline** color from the default white and gray values.
5. Click on a location in the Position grid to specify the location of the timestamp.
6. Change the Font type and size by clicking the **ellipsis (...)** next to the Font description; a font selection dialog opens.
7. When you are done configuring, click **Apply** to see the changes while keeping the dialog open for further tweaks, or click **OK** to apply your changes and close the dialog.

Note that you can include both a timestamp and a static text watermark.

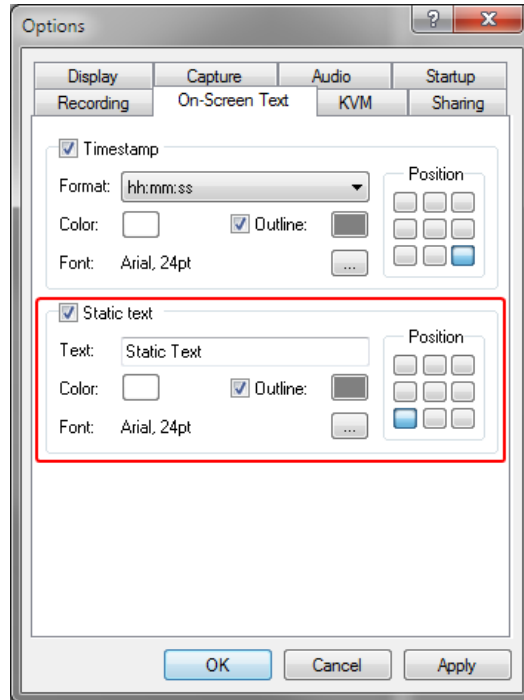
Add a static text watermark

You can add static text to your captured video by adding your text and selecting the font, size, location and color.

Start by connecting your video grabber to the capture workstation and your source to the video grabber. Launch the capture tool and configure it for recording video following the instructions in [Record a video](#), if needed.

To configure a static text watermark:

1. From the **Tools » Options** dialog, select the **On-Screen Text** tab.
2. Check the **Static text** checkbox.



3. In the **Text** field, enter your text string.
4. If desired, change the **color** and **outline** color from the default white and gray values.
5. Click on a location in the Position grid to specify the location of your static text watermark.
6. Change the Font type and size by clicking the **ellipsis (...)** next to the Font description; a font selection dialog opens.
7. When you are done configuring, click **Apply** to see the changes while keeping the dialog open for further tweaks, or click **OK** to apply your changes and close the dialog.

You can have both a text watermark and a timestamp mark on your captured video or images. Give them both a try to see what you like best.

Tip: You can use a custom font generator to generate a font that has a monotone version of your company logo or other graphic to overlay as "text" on the image. Using this trick, it will appear like you have a graphical watermark.

Command line options

You can use command line options to control how the Epiphan Capture Tool starts up. Add as many command line options as needed, in any order. Each command line option starts with two dashes and is separated from other options with a space.

The following command line options are supported:

Option	Description
--borderless	Start the capture application in image only mode. Press the Escape key to exit from image only mode.
--sn <serial number>	Specify which video grabber to use (when more than one is connected to the video capture workstation). <serial number> is the serial number of the desired video grabber.
--hs <value>	Set the horizontal shift value.*
--vs <value>	Set the vertical shift value.*
--phase <value>	Set the sampling phase value.* Range is 0 to 31.
--pll	Set the PLL adjustment.*
--offset <value>	Set the offset (brightness).* Range is 0 to 63.
--gain <value>	Set the gain (contrast).* Range is 0 to 63.
--topmost	Keep the capture application window as the topmost window on your screen.
--fullscreen	Start the Epiphan Capture Tool in full-screen mode.
"*" - Refer to the Configure your device section for more details	

Example

You can create a desktop shortcut that includes one or more command line options. For the purposes of this example, the Epiphan Capture Tool's executable file name is v2ugui2.exe and is installed in C:\Program Files\Epiphan\Framer Grabber Software.

1. Open Windows Explorer and navigate the following path: C:\Program Files\Epiphan\Framer Grabber Software
2. Right click on the file **v2ugui2.exe** and select **Create Shortcut**; Windows creates a shortcut file that, depending on your Windows settings, may be named "Shortcut to v2ugui2.exe.lnk". The ".lnk" may not appear if Windows does not display file extensions.
3. If desired, change the name of this file and copy it to another location if required. Don't change the file extension.
4. Right click the shortcut file and select **Properties**.
5. Edit the **Target** field and add command line options after the closing quote.

For example, to add the `--topmost` command line option, change the Target line to:
`"C:\Program Files\Epiphan\Fram Grabber Software\v2ugui2.exe" --topmost`

Or to add `--topmost`, `--borderless`, set the horizontal shift to `-67`, and the vertical shift to `10`:
`"C:\Program Files\Epiphan\Fram Grabber Software\v2ugui2.exe" --topmost --borderless --hs -67 --vs 10`

6. Select **OK** to save your changes to the shortcut.
7. Double-click the shortcut to start the video capture application with your specified command line options.

Appendices

- Upgrade your drivers and software
- Limitations and Known Issues
- Software license

Upgrade your drivers and software

The drivers and the latest version of the Epiphan Capture Tool are bundled together in a single package, which you can download from the Epiphan Video support website for your product. If you register your DVI2PCIe Duo, you can choose to be notified when driver updates are available.

Typically, you can download and install the new Epiphan Capture Tool and drivers without uninstalling older versions. Simply follow the driver installation instructions in the [Quick start](#) to update your device drivers and install the latest Epiphan Capture Tool.



Be sure to update the drivers and Epiphan software on each capture workstation where you use your DVI2PCIe Duo. The device reloads the firmware from the capture computer time each time you connect the device.

Limitations and Known Issues

This section includes known issues or limitations that affect functionality or usability for the current release and offers workarounds these them.

- DVI2PCIe Duo's 3.5 mm audio port can appear as either the Line In or as Microphone In in your computer's device manager.
Workaround: After reboot, stop any applications using the device before making changes in the control panel. For best results, ensure all applications are using the same input device.
- Opening the video signal in multiple applications at the same time on your video workstation affects signal performance. For the best performance during live streaming and recording, we recommend that you close any unnecessary applications that access the video signal. For example, if you aren't using the Epiphan Capture Tool for live streaming or to record, close the tool after you finish configuring the video grabber.
- The Epiphan Capture Tool labels VGA input signals that are 1400x1050 @ 60fps as 1680x1050 in the window title, even though the actual signal is 1400x1050. The input signal is not impacted and you can either disregard the text in the title or add a custom video mode that is 1400x1050 @ 60fps.

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Important Safety Warnings

WARNING: This product has no user-serviceable parts and the battery used in this device is not replaceable. Do not attempt to disassemble. Return the device for service.

CAUTION, RISK OF ELECTRIC SHOCK: This device may have multiple AC power cords installed. All power sources shall be disconnected before servicing to avoid shock hazard.

ATTENTION: Cet appareil ne contient aucun composant pouvant être entretenu ou réparé par l'utilisateur. En cas de panne, retourner l'appareil pour réparation.

ATTENTION, RISQUE DE CHOC ÉLECTRIQUE: Cet appareil peut être équipé de multiples cordons d'alimentation en courant alternatif. Pour placer cet appareil hors tension, débrancher tous les cordons d'alimentation sans exception.

FCC Compliance Statement

47 CFR Section 2.1077 Compliance Information

Unique identifier: DVI2PCIe Duo

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.

Responsible party (US contact):

Epiphan Video
116 University Avenue, Suite 100
Palo Alto, CA
94301, USA

www.Epiphan.com

FCC CAUTION

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Innovation, Science and Economic Development Canada:

This device complies with ICES-003 of the ISED rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Cet appareil est conforme à la norme ISED NBM-003 pour les appareils radio agréés. Son fonctionnement est sujet aux deux conditions suivantes:

- (1) le dispositif ne doit pas produire de brouillage préjudiciable, et
- (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

CE Compliance Statement

Marking by the symbol **CE** indicates compliance of this device with the applicable directives of the European Community and meets or exceeds the following technical standards:

Directive 2014/30/EU - Electromagnetic Compatibility

Directive 2011/65/EU - RoHS, restriction of the use of certain hazardous substances in electrical and electronic equipment



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