

# Epiphan SDI2USB 3.0



Release 3.30.2  
February 21, 2017

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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

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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](mailto:info@epiphan.com).

## Specifications

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Go to the SDI2USB 3.0 product page on the Epiphan website to get the most recent product specifications and additional information about SDI2USB 3.0.

## Warranty

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

## Technical support

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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](mailto:support@epiphan.com)
- Live chat via the link on our support site <http://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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# SDI2USB 3.0 Release notes

Epiphan Video is happy to announce release 3.30.2 for SDI2USB 3.0. This maintenance release includes the following updates.

## Updated default EDID

SDI2USB 3.0 now has better interoperability with digital video cameras thanks to an updated default EDID.

## Improved power management

Power management improvements mean that SDI2USB 3.0 now supports a wider range of USB host controllers.

## Online help

SDI2USB 3.0 now has searchable online HTML help. Choose your video grabber from the Epiphan support page for a link to online help.

## Improved audio support

SDI2USB 3.0 now has the ability to perform audio resampling and has cleaner audio at all frequencies. Additionally, support is added for 44.1kHz and 32 kHz audio over HDMI.

## Windows 10 support and updated signing process

Epiphan drivers are supported on Windows 10, using SHA-2 signing. Upon moving to this new signing mechanism, we have dropped support for older platforms Windows XP and Windows Vista. If you're using Windows 7, ensure it is up to date to support with drivers signed with SHA-2.

## Resolved issues

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Among numerous design improvements and small bug fixes or tweaks, this firmware and driver release for SDI2USB 3.0 resolves the following important issues found in earlier releases or Beta releases.

- Improved video and audio capture, resolving an issue where capture was occasionally unstable when capturing signals that include embedded audio.
- Capture of SDI level B is now fully supported.



# Table of contents

SDI2USB 3.0 Release notes .....	iii
Resolved issues .....	iii
Table of contents .....	iv
<b>Start here .....</b>	<b>1</b>
What is SDI2USB 3.0? .....	2
What's in the box? .....	4
System requirements .....	5
Quick start .....	6
Install the video grabber drivers: .....	6
Connect the video grabber and the video source: .....	7
Capture video .....	8
What's next? .....	10
SDI2USB 3.0 on Linux .....	11
USB device driver (linux) .....	11
Epiphan capture API .....	12
Sample applications .....	12
Physical attributes .....	13
Indicator LED details .....	15
Troubleshoot .....	16
Capture device not found: .....	16
No signal detected: .....	16
No buttons to apply configuration changes: .....	17
<b>Configure your device .....</b>	<b>18</b>
DirectShow video adjustments .....	19
Visual video adjustments .....	21
Advanced adjustments .....	23
<b>Epiphan Capture Tool .....</b>	<b>24</b>
Epiphan Capture Tool .....	25
Menus .....	27
File menu .....	27
Edit menu (Windows) .....	28
View menu .....	28
Capture menu .....	29
Tools menu .....	31
Application options .....	32

Help menu .....	33
Toolbar .....	34
Copy, save, or print a snapshot .....	35
To print a snapshot .....	35
To copy a snapshot .....	36
Record a video .....	37
Step 1: Set the codec .....	37
Step 2: Record .....	38
Crop the captured image .....	41
Configure display options .....	43
Display options .....	43
Additional features .....	45
Status bar .....	45
Pause video capture .....	46
Record as a series of images .....	47
Configure audio .....	50
Configure optional recording settings .....	53
Add a watermark .....	54
Command line options .....	57
Sharing / streaming demo tool .....	58
Upgrade your drivers and software .....	63
Limitations and Known Issues .....	64
Software license .....	65

# Start here

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Use the topics in this section of the user guide to get started quickly with your SDI2USB 3.0.

Review [What's in the box?](#), get a system overview in [What is SDI2USB 3.0?](#), ensure your system meets the [System requirements](#) and get your video grabber installed and working right away using the [Quick start](#)

# What is SDI2USB 3.0?

SDI2USB 3.0™ is Epiphan's professional-series external SDI (3G-SDI, HD-SDI and SD-SDI) video grabber. In a nutshell, it captures images and video from SDI video sources and digitizes them on your laptop or workstation via connection to a USB 3.0 port.



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 SDI sources. Thanks to Epiphan Video capture technology, this small, portable product connects directly to your computer's USB 3.0 port - no need for a large workstation with a free peripheral component interface (PCI) slot.

SDI2USB 3.0 captures video and audio from any 3G-SDI, HD-SDI or SD-SDI source. Meeting greater demands for transferring larger files at faster speeds, this external video grabber supports USB 3.0 technology, capable of transferring uncompressed data with speeds of up to 5.0 (Gbits/s) - about ten times faster than USB 2.0.



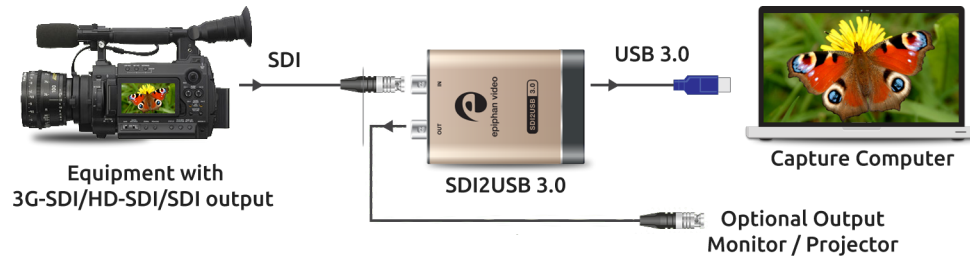
In practice transfer speeds are dependent on factors such as USB load and hardware configuration.

SDI2USB 3.0 is versatile and can be used with multiple workstation configurations. It is backward compatible with USB 2.0 connections, however it transfers video at a reduced frame rate when using USB 2.0.

Using the included Epiphan Capture Tool, SDI2USB 3.0 captures full 1080p HD in RGB-24-bit color at 30 frames per second and supports resolutions up to 1920×1080. When working with third-party software, such as Windows Media Encoder with YUV 4:2:0 chroma sub-sampling, 1080p video is captured and recorded 60 frames per second. 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.

For more information about maximizing the frame rate when capturing, recording and streaming video using third-party applications, refer to the [How to Record Video using Window Media Encoder](#) tutorial on Epiphan's website.

In addition to an input port, the SDI2USB 3.0 offers an SDI output port that can be used for confidence monitoring. In the example below, a monitor connected to the output port allows you to monitor the input signal and make quick adjustments if required.



The SDI2USB 3.0 video grabber 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.



SDI2USB 3.0 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 [USB Video Grabbers](#) page on the Epiphan Video website.

# What's in the box?

The SDI2USB 3.0 package includes the following

1. SDI2USB 3.0 video grabber (read more, [Physical attributes](#))
2. One 3G compliant SDI cable
3. One USB 3.0 cable

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

Image	Name	Description
	SDI cable	Connects SDI sources the video grabber.
	USB 3.0 cable	High speed transfer cable that connects the video grabber to your capture workstation or laptop computer.

# System requirements

System requirements are the technical essentials your computer needs to work with your Epiphan video grabber. System requirements to use SDI2USB 3.0 are:

<b>Video source</b>	Any 3G-SDI, HD-SDI or SD-SDI source. (SDI2USB 3.0 cannot capture from HDCP encrypted sources)
<b>Video capture workstation</b>	Any computer (laptop/desktop/other format) with: <ul style="list-style-type: none"><li>• a compatible USB 3.0 host controller for SuperSpeed operation (recommended Intel ® USB 3.0 eXtensible Host Controller); or,</li><li>• a USB 2.0 controller</li></ul>
<b>Video capture workstation operating system</b>	Windows 7, Windows 8.1, Windows 10 A list of precompiled linux drivers (kernel 3.5 or later) is available on the <a href="#">product support page</a>
<b>RAM</b>	Minimum recommended value: 4 GB
<b>Available hard disk space</b>	16 GB (32-bit OS) or 20 GB (64-bit OS)



Note that the latest versions of the Epiphan drivers for SDI2USB 3.0 (starting with release 3.30.2) use SHA-2 signing which is not supported on Windows XP or Windows Vista. If you want to use either of those platforms, we recommend using an older driver. Windows 7 and Windows Server 2008 R2 must be up to date to work with drivers signed with SHA-2.

# Quick start

This section helps you get up and running quickly with your SDI2USB 3.0 on Windows (for Linux distributions, see [SDI2USB 3.0 on Linux](#)). Using the steps below, you will connect your video grabber to the video capture workstation and connect the video source then begin to capture video (and optional audio) content!

Before you get started, make sure you have:

- reviewed [What's in the box?](#) to make sure you received all the cables and components
- reviewed the [System requirements](#) to make sure your capture workstation meets the requirements
- a video source (i.e. a camera, a computer, a tablet, or a phone). Note the source must not be HDCP protected.
- (on Windows only) accompanying audio over the same source cable
- the appropriate cables or adapters to convert the output to SDI (if needed)
- internet access (to download the video grabber drivers from the Epiphan website)
- admin privileges or password for your capture workstation



These instructions describe how to use your SDI2USB 3.0 with the Epiphan Capture Tool. You can also use third party capture applications, but you must at least complete the driver installation.

## Install the video grabber drivers:

This step must be completed before connecting the video grabber to your video capture workstation.

1. From your capture workstation, open an internet browser and go to your video grabber's [product support page](#).
2. Choose the download link that matches your computer's operating system.



Note that for Windows operating systems there are two packages, 64-bit and 32-bit. Make sure you download the correct package. If you don't know which version you need, you can look at this Microsoft knowledge base article for more help <https://support.microsoft.com/en-us/kb/827218>.

3. When the download is complete, open the download destination folder and find the file.
4. Follow one of the following procedures, depending on your OS.
5. For Windows:
  - a. Right-click on the .zip file and choose **Extract All** (the files **must be extracted** before proceeding).
  - b. Open the extracted files folder.
  - c. Right-click on **setup.exe** and select **Run as administrator** to start the installation.
  - d. Follow the prompts to install the drivers (the Epiphan Capture Tool is also installed).





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.

## Connect the video grabber and the video source:

Now that the drivers are installed, you're ready to begin capturing! Although the steps below ask you to connect the video source to the grabber, then the grabber to the workstation, you can connect the video source and video grabber in any order.

1. Connect the video source to the SDI **IN** port on the video grabber. (If necessary, use an adapter or appropriate converter cable.)



2. Connect the provided USB 3.0 cable to the bottom of the video grabber.



3. Connect the other end of the USB cable to an available USB port on your video capture workstation (use a USB 3.0 port for best performance).
4. Optionally connect an SDI monitor to the **SDI OUT** port using another SDI cable (not included). Note the monitor will only work when the video grabber is connected to the workstation.

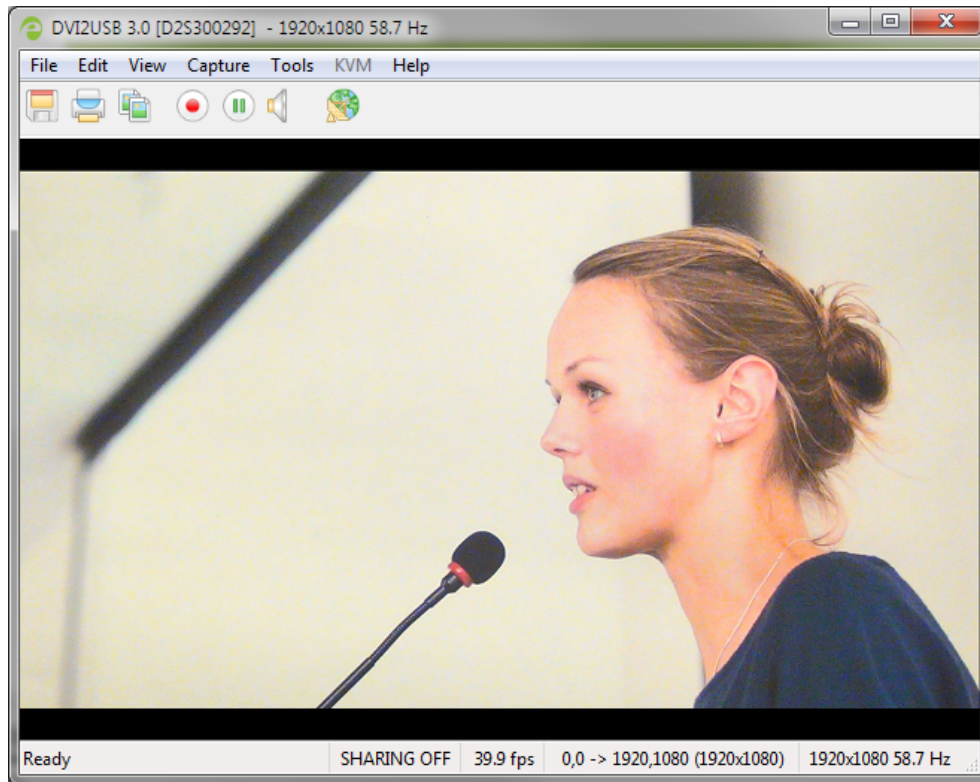


If using a splitter cable for your video source, use a high-quality SDI splitter to split the signal between an other devices and the video grabber. The SDI out port is a practical way to simultaneously display the video to a remote monitor while it is captured, recorded and streamed.

## Capture video

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

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

## 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.

# SDI2USB 3.0 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 SDI2USB 3.0. You'll find the **Software Development Tools** section which contains C and C++ api and a java interface and example.

## 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.

To download the drivers for your product, go to [www.epiphan.com/support](http://www.epiphan.com/support) and find the support page for SDI2USB 3.0. From the **Downloads** tab, select the **Linux** download link; the linux download page appears.

The screenshot shows a web page with two green buttons at the top: "Browse all files" and "Epiphan SDK". Below them is a section titled "Applications" with a list of links and descriptions:

- [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

Below the applications list is a section titled "Driver download" with the instruction "Select driver by bus type, your linux distribution, release and CPU architecture". It contains three dropdown menus: "Driver" (with "vga2usb" and "vga2pci" options), "Distribution" (with "Debian", "Fedora", "Raspbian", "Red-Hat/CentOS", "SUSE", and "Ubuntu" options), "Release", and "CPU".

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 SDI2USB 3.0. 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 SDI2USB 3.0 device measures 90mm x 60mm x 23mm (3.54" x 2.36" x 0.91"). It features a single SDI (BNC type) connector, an SDI passthrough port, a USB 3.0 connector and an LED indicator. This small, portable product easily fits in the palm of your hand.



**Table 2** Connectors and indicators

Number	Interface	Description
<b>1</b>	SDI Input	Connect an input source with an SD-SDI, HD-SDI or a 3G-SDI signal.
<b>2</b>	SDI Output	Connect an SDI output source, such as a monitor, to the SDI2USB 3.0 device. Note: the SDI output port is ONLY active if the SDI2USB 3.0 is connected to a video capture workstation providing power and running the SDI2USB 3.0 driver.
<b>3</b>	USB 3.0 Output	Connects the video grabber to the capture workstation and enables data transfer from the video source to the workstation.  The video grabber works best when connected to a USB 3.0 port on the capture workstation, but is also backward compatible with USB 2.0.
<b>4</b>	LED	LED indicator light indicates the current status of the video grabber. See <a href="#">Indicator LED details</a> for the meaning of different light colors.



Epiphan always recommends using a USB 3.0 port for best performance. If a USB 2.0 port is used instead, SDI2USB 3.0 transfers video at a lower frame rate and is unable to capture embedded audio.



## Indicator LED details

The color and action of the indicator LED depends on whether you are connected by USB 3.0 or USB 2.0. For maximum performance, always use a USB 3.0 port and the included USB 3.0 cable. Note that frame capture rate will be reduced when connected via USB 2.0.

If you're not sure if your controller is USB 3.0 or USB 2.0, plug SDI2USB 3.0 into the capture computer and look at the indicator LED (note that test this assumes there is no video source plugged into the video grabber):



A flashing blue LED means USB 3.0



A flashing green LED means USB 2.0

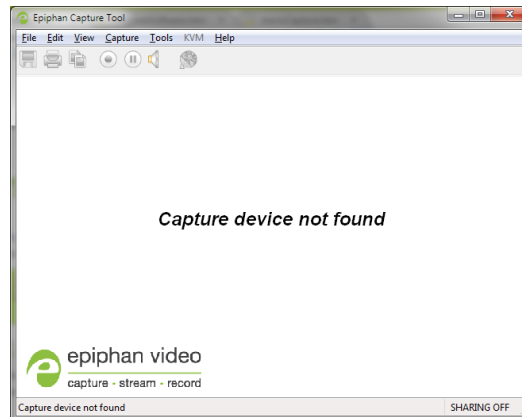
LED color	USB 3.0 connection	USB 2.0 connection
Solid red	The video grabber is powered on but is not functional. The driver is not installed or failed to load. If you installed the Epiphan Capture Tool and drivers, disconnect and reconnect the USB cable.	
Blinking red	The video grabber's security validation has failed. Contact Epiphan support with the product serial number and details of your system.	
Solid yellow	Image/video capture or data transfer is in progress.	
Flashing blue	The firmware is loaded successfully, the device is idle.	-
Flashing green	Video mode detection is in progress.	The firmware is loaded successfully, the device is idle.
Solid green	-	Video mode detection is in progress.

# Troubleshoot

If you're experiencing problems with your SDI2USB 3.0, use the following tips to attempt to rectify the problem.

## 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.

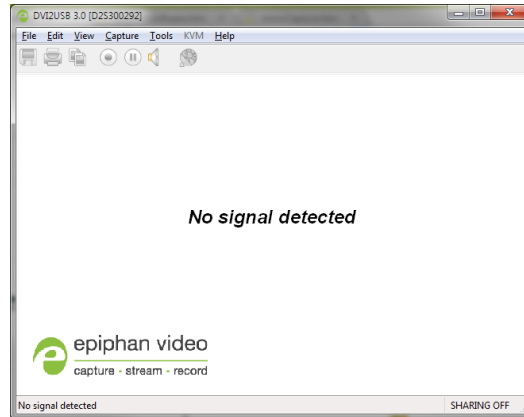


Try the following troubleshooting tips:

- 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 buttons to apply configuration changes:

On Windows, if you don't see the buttons 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.

# Configure your device

---

Epiphan lets you fine tune image adjustments and control how your video grabber works with DirectShow-compatible applications.

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

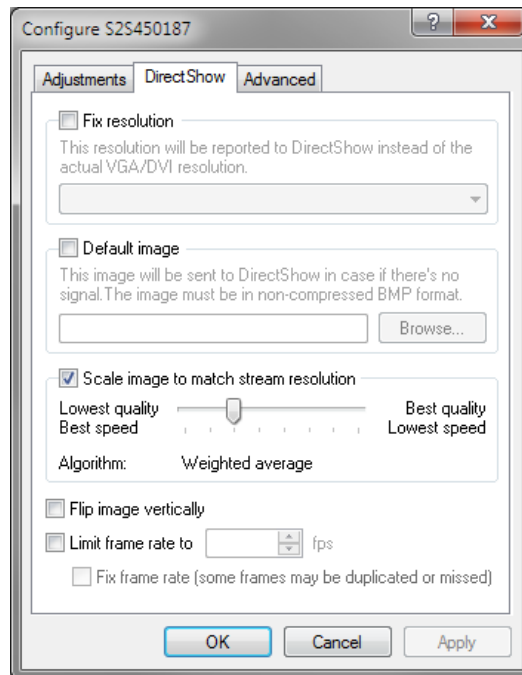
1. From the Epiphan Capture, choose **Capture » Configure Device...** or
2. Open the **Windows Control Panel**.
  - a. Click the Epiphan Frame Grabbers applet; the Epiphan Frame Grabber Configuration window appears.
  - b. Select the grabber you wish to configure.
  - c. Click **Edit Configuration**; 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 <b>Scale image to match stream resolution</b>, 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>

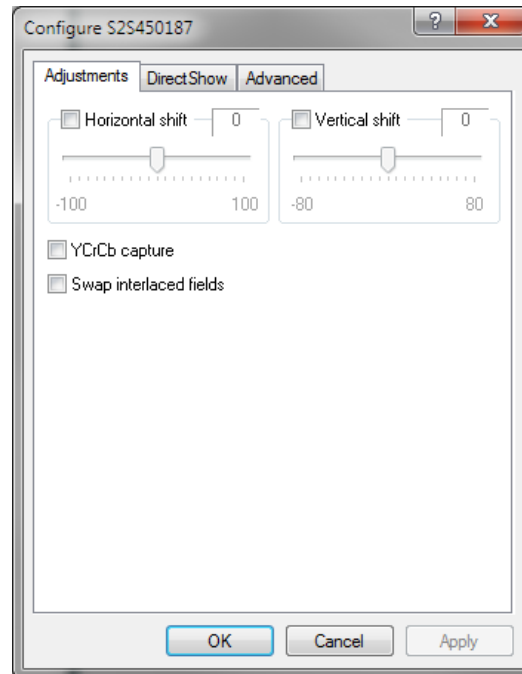
Item	Description
Scale image to match stream resolution	<p>If you are using a fixed resolution and choose not to scale the image, the captured image will appear cropped to your specified resolution when capturing with a DirectShow compatible utility. Generally the cropping happens at the top left corner 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 Epiphan 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	Use this check box to flip your captured image vertically when sending over DirectShow.
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.

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.



Item	Description
Horizontal shift	<p>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.</p> <p>Increasing the value entered in the Horizontal Shift field shifts the image to the right, decreasing it shifts the images to the left.</p>
Vertical shift	<p>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.</p> <p>Increasing the value entered in the Vertical Shift field shifts the image up, decreasing it shifts the images down.</p>
YCrCb capture	<p>Generally your SDI2USB 3.0 auto-detects input type, but in case of an issue where the input type isn't detected, you can select this checkbox to capture</p>

Item	Description
	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.

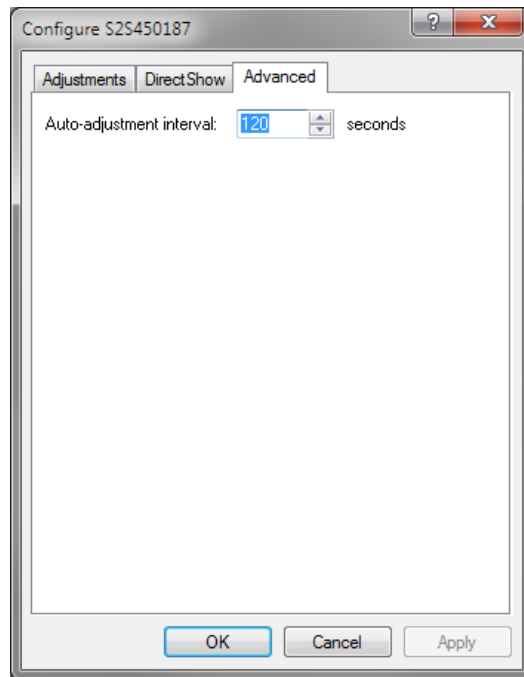


# Advanced adjustments

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

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.
YCrCb capture	(*This option is found in the main Adjustments tab) Generally your SDI2USB 3.0 auto-detects the input type. If the input type isn't detected, select this checkbox to capture analog component video with YCrCb encoding.
Swap interlaced fields	(*This option is found in the main Adjustments tab) When capturing from some sources, the video grabber cannot correctly determine the order to place interlaced lines. Use this checkbox to resolve the issue.

# Epiphan Capture Tool

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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.

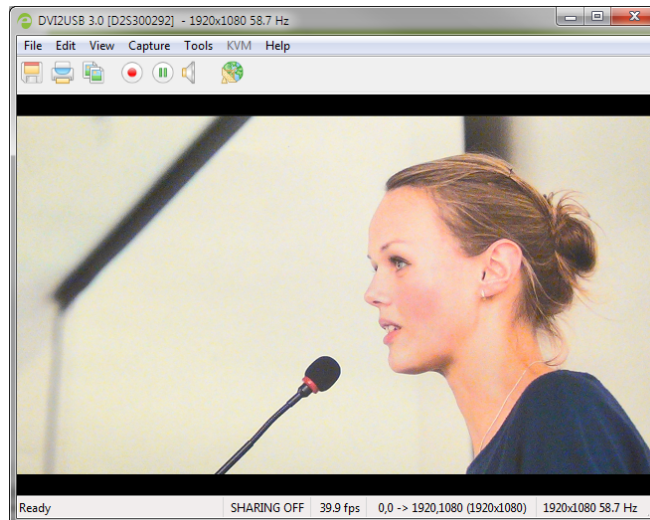
The same Epiphan Capture Tool is used by all Epiphan video grabber models that use Epiphan-supplied drivers (e.g. [DVI2USB 3.0](#), [SDI2USB 3.0](#), [VGA2USB](#), [DVI2PCIe Duo](#) and more) as well as Epiphan's portable USB-based KVM, [KVM2USB](#). As a result, some of the functionality in the software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

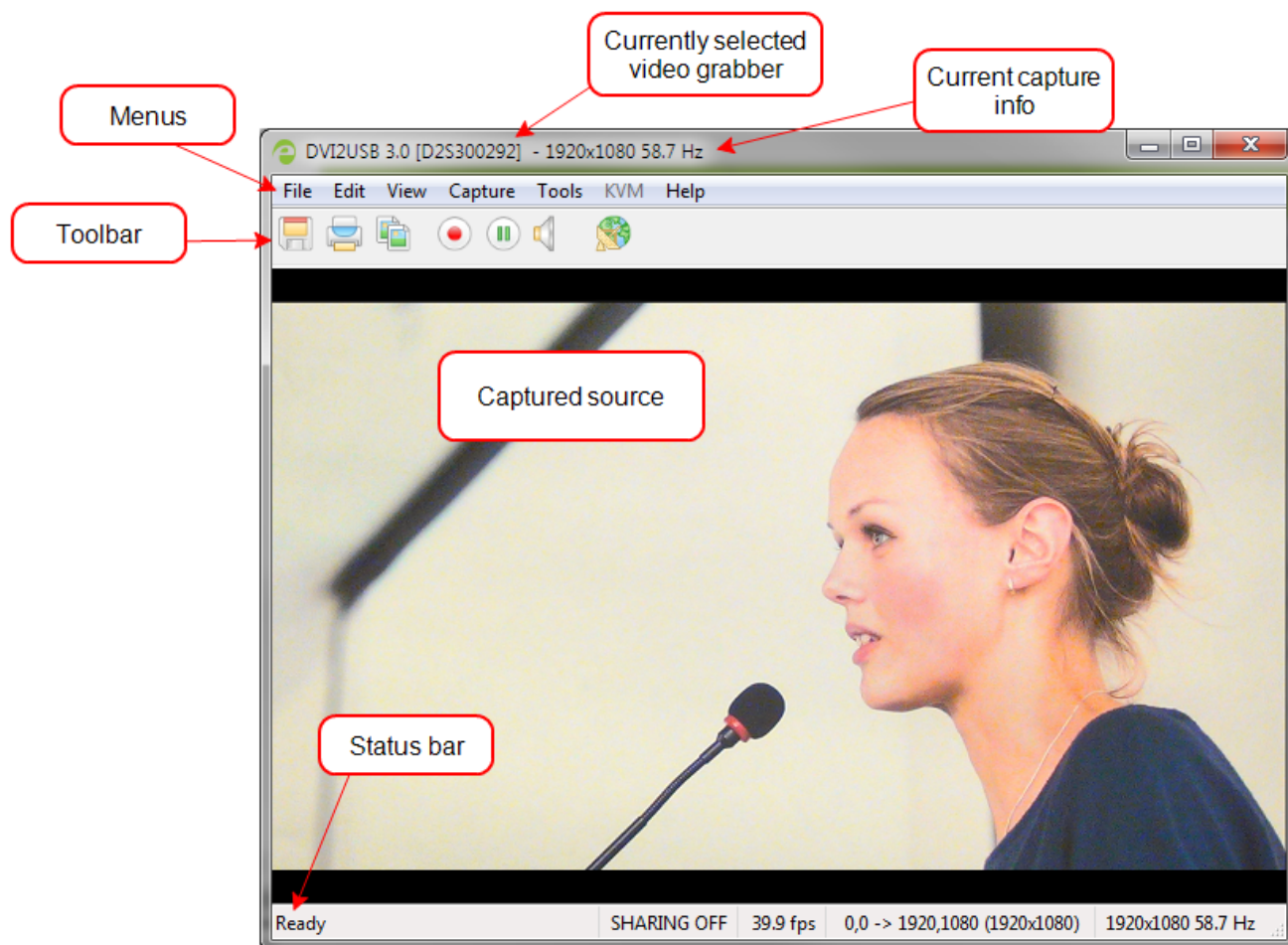


As the application starts, the following messages may appear:

- **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](#).

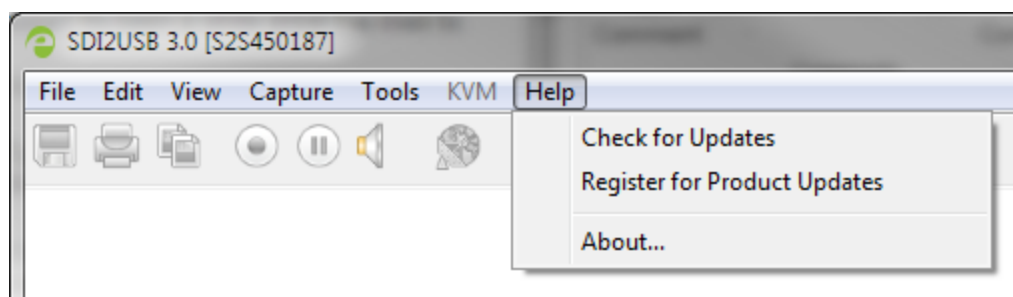
The capture tool has the following sections:



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](#).

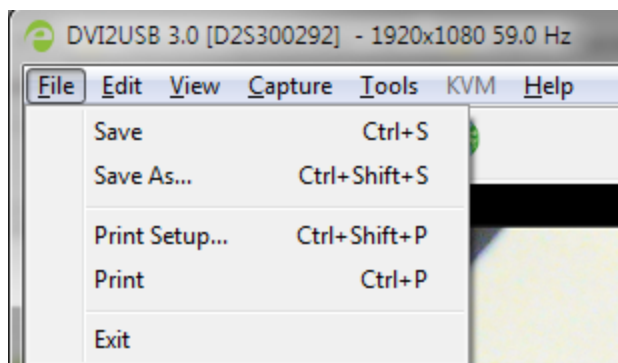
# Menus

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



## File menu

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

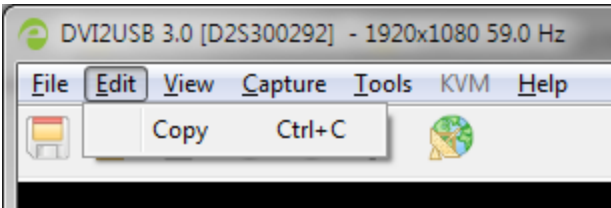


The **File** menu has these options:

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

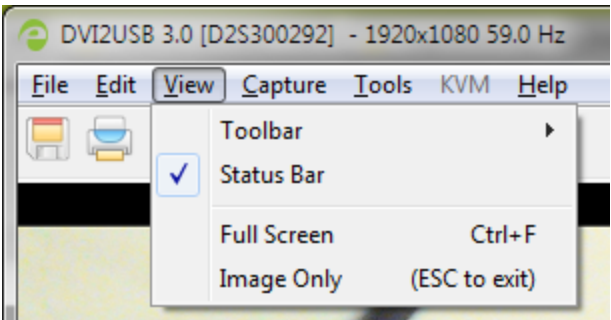


The **Edit** menu has these options:

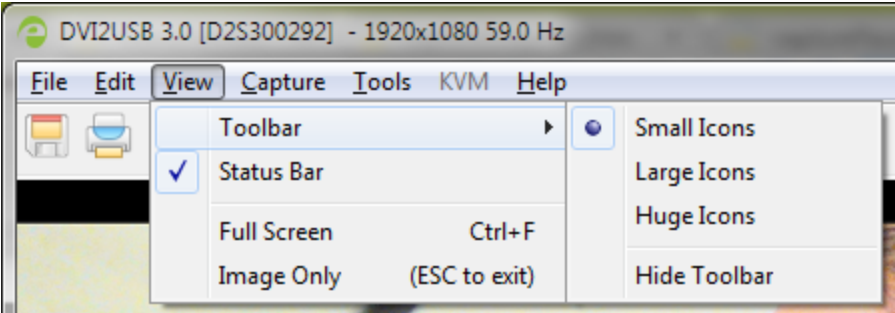
Menu item	Shortcut	Description
Copy	Ctrl+C	Copy a snapshot of the current image to the clipboard. See <a href="#">To copy a snapshot</a> .

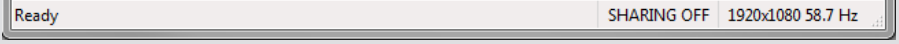
# View menu

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



The **View** menu has these options:

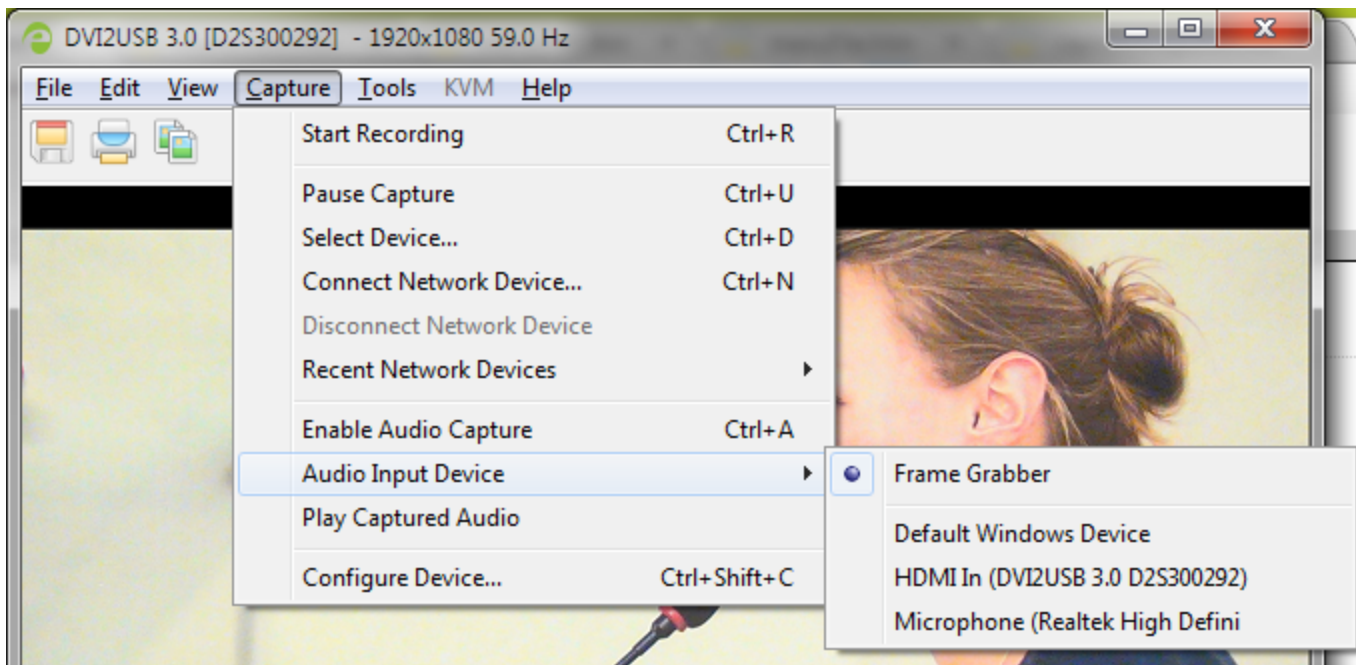
Menu item	Shortcut	Description
Toolbar		Change the size of the toolbar icons or hide/show the toolbar. (When the toolbar is hidden, choose a size to restore it.)  The screenshot shows the 'View' menu with the 'Toolbar' option selected, which has opened a submenu. The submenu contains four options: 'Small Icons' with a radio button, 'Large Icons' with a radio button, 'Huge Icons' with a radio button, and 'Hide Toolbar' with a radio button. The 'Status Bar' option in the main menu is also checked.

Menu item	Shortcut	Description
Status Bar		View or hide the status bar at the bottom of the application window. 
Full Screen	Ctrl+F	Enable full screen mode. Press ESC (the escape key) to return to window mode.
Image Only	(ESC to exit)	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). 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. Press ESC (the escape key) to return to the normal operating mode.

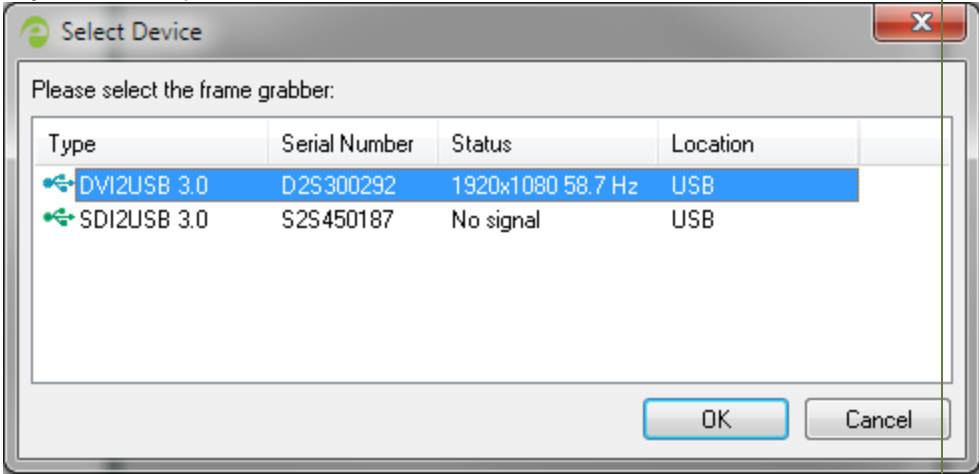
## Capture menu

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 SDI2USB 3.0 device that this instance of the application works with, when you have more than one Epiphan video grabber attached to your video capture workstation.



The **Capture** menu has these options:

Menu item	Shortcut	Description
Start Recording (Stop Recording)	Ctrl+R	Start or stop recording your captured stream as a video or a series of captured images. See <a href="#">Record a video</a> and <a href="#">Record as a series of images</a> .
Pause Capture (Resume Capture)	Ctrl+U	Pause or unpause capture and recording (the last frame will stay visible on the screen). See <a href="#">Pause video capture</a> .
Select Device...	Ctrl+N	<p>Use when you have more than one Epiphan Pro Series Video Grabber connected to your video capture workstation.</p>  <p>Choose the device you want to use in this instance of the Epiphan Capture Tool and click <b>OK</b>.</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 (Disable Audio Capture)	Ctrl+A	When enabled, audio captured by the device, or by the configured external audio source is included in the recording. See <a href="#">Configure audio</a> .
Audio		Opens a sub-menu to let you choose the input device used for audio capture. See

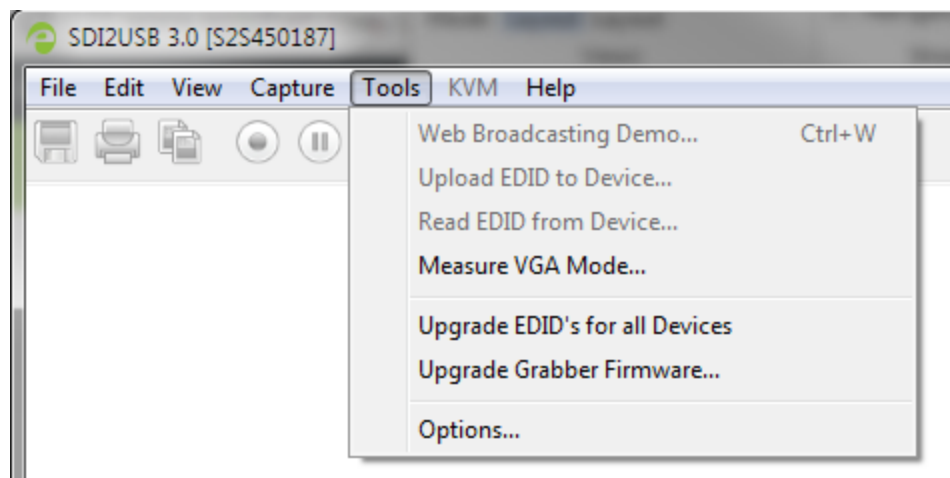


Menu item	Shortcut	Description
Input Device		<a href="#">Configure audio</a> for more details.
Play Captured Audio		When enabled, captured audio is played on the video capture workstation (e.g. through the workstation's speakers or attached headphones). Use as a confidence monitor to check the audio 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 to work.
Configure Device...	Ctrl+Shift+C	Opens a dialog to let you configure specific capture adjustments for the video grabber. See <a href="#">Configure your device</a> .

## Tools menu

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

The Tools menu lets you upload custom EDIDs, test web broadcasting of your capture and set application options.



The **Tools** menu has these options:

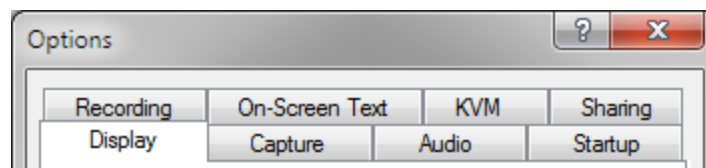
Menu item	Shortcut	Description
Web Broadcasting Demo	Ctrl+W	This feature is not applicable for SDI2USB 3.0.
Upload EDID to Device...		This feature is not applicable for SDI2USB 3.0.
Read EDID from Device...		This feature is not applicable for SDI2USB 3.0.
Measure VGA Mode...		When requested by Epiphan 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.

Menu item	Shortcut	Description
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.
Options		Lets you configure a number of options related to capturing video, recording video and more. See <a href="#">Application options</a> 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.



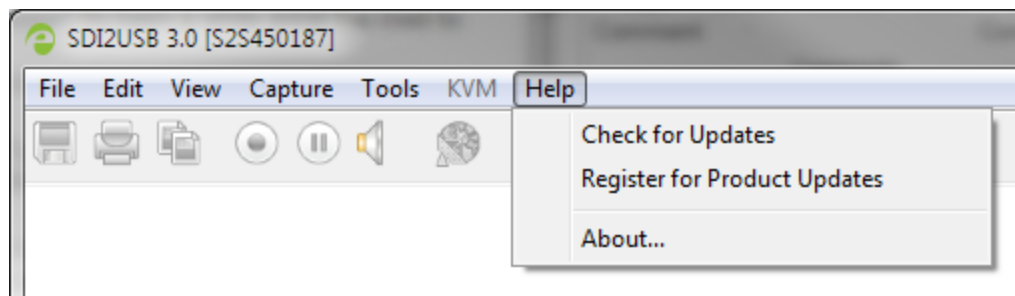
The **Options** dialog has these tabs:

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 <a href="#">Configure display options</a> for more information on the display format and <a href="#">Status bar</a> for a description and examples of the optional status bar indicators.
Capture	<p>Allows you to configure cropping (to capture only a specific part of the video frame). See <a href="#">Crop the captured image</a> for details.</p> <p>From this tab you can also change the interval between <b>video mode detection</b> 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.</p> <p>Lastly, from this tab you can also <b>limit the frame</b> 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.</p>
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 <a href="#">Configure audio</a> for information on configuring audio capture.

Menu item	Description
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 <a href="#">Record a video</a> <a href="#">Configure optional recording settings</a> <a href="#">Record as a series of images</a>
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 <a href="#">Add a watermark</a> .
KVM	This feature is not used by SDI2USB 3.0. It is for Epiphan's <a href="#">KVM2USB</a> .
Sharing	The Epiphan Capture Tool comes with a sample sharing application, VGA2Web, a <a href="#">demo</a> . See <a href="#">Sharing / streaming demo tool</a> . 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 <a href="#">Copy, save, or print a snapshot</a> for more details.
	Prints the currently captured frame. You may wish to pause capture first. See <a href="#">Copy, save, or print a snapshot</a> for more details.
	Copies the currently captured frame to the clipboard. You may wish to pause capture first. See <a href="#">Copy, save, or print a snapshot</a> for more details.
	Starts (or stops) recording of the captured frames (in image or video format). See <a href="#">Record a video</a> and <a href="#">Record as a series of images</a> .
	Pauses capture and recording, if applicable. (Also closes out the recording file.)
	Enables or disables audio capture. See <a href="#">Configure audio</a> for more details on configuring audio capture.
	Launches VGA2Web, a <b>demo</b> utility for streaming/broadcasting your captured signal. See <a href="#">Sharing / streaming demo tool</a> for configuration options. Note there are no privacy, bandwidth or uptime guarantees for this demo service. It is not intended for use with business-critical applications.

# Copy, save, or print a snapshot

You can also use the Epiphan 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.

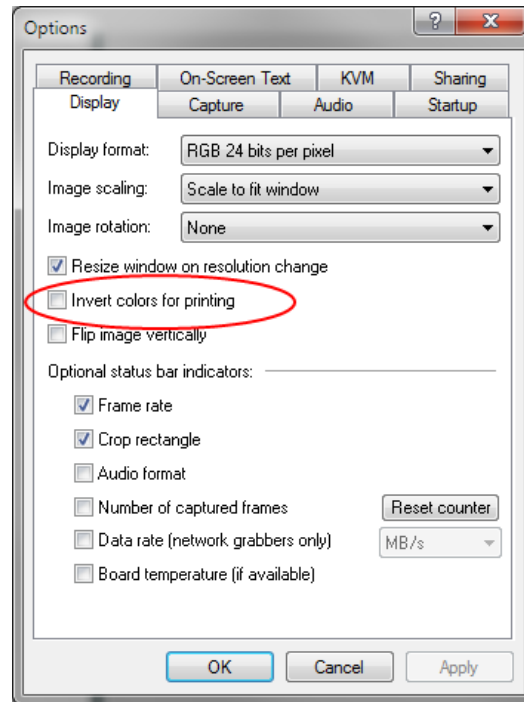
- Select **File » Print**
- Press **Ctrl+P**
- Use the Print icon on the toolbar



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 SDI2USB 3.0 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:

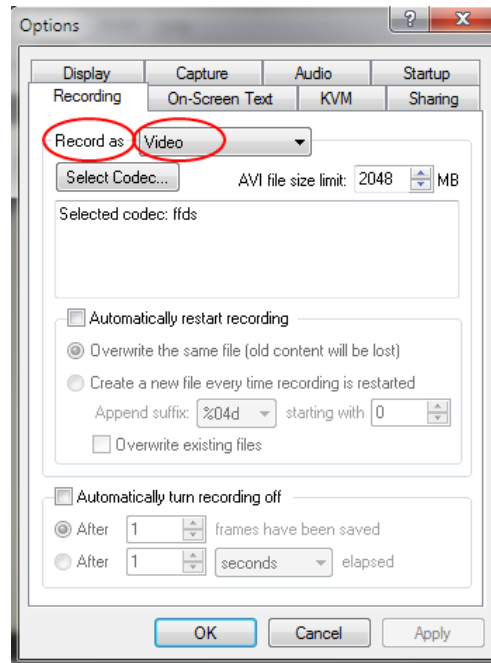
## Step 1: Set the codec

Take this opportunity to select your encoding codec. Codecs are the software that take the uncompressed video frames from the SDI2USB 3.0 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.

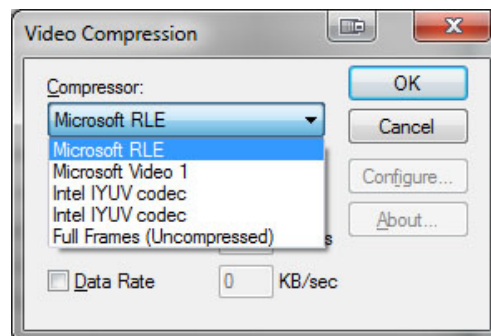
By default, your operating system comes with some default codecs installed, no additional codecs come with the Epiphan Capture Tool. You can choose to install third party codecs such as x264. Picking the best codec for your use case is beyond the scope of this document, but you can find many resources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

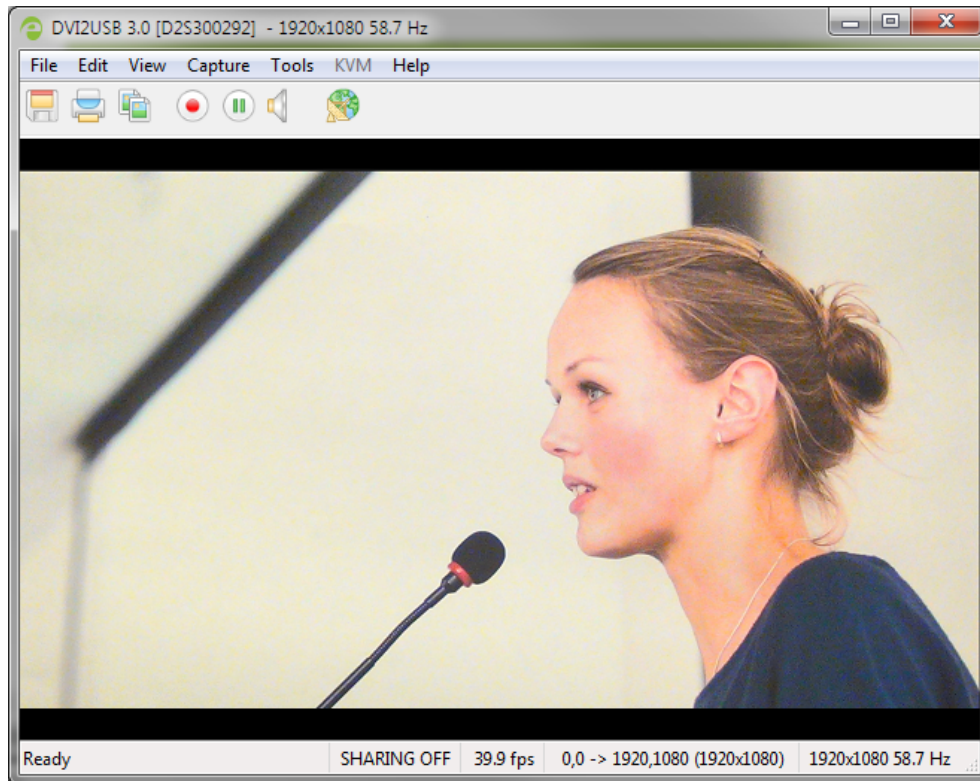
With the Epiphan Capture Tool properly configured, all there is to do is record your video!

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 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. 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.



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.

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

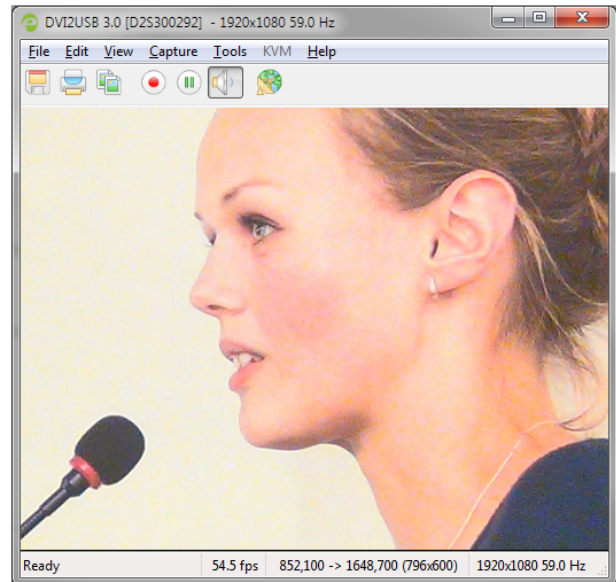
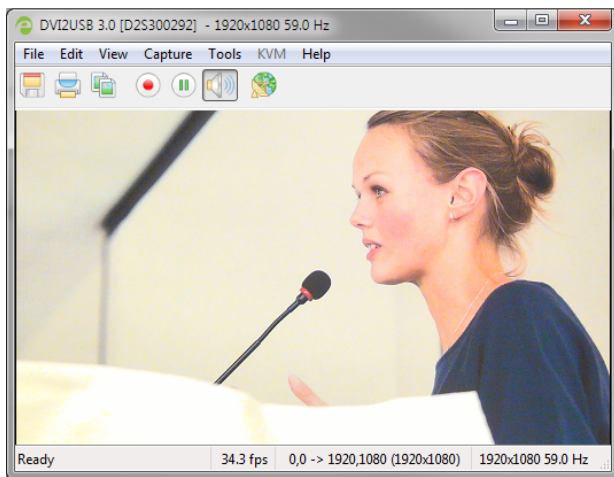
- recording stops;
- recording continues and a new video file is created; or
- recording continues and the original video file is overwritten.

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 SDI2USB 3.0. 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 Epiphan Capture Tool lets you crop the captured source prior to recording.

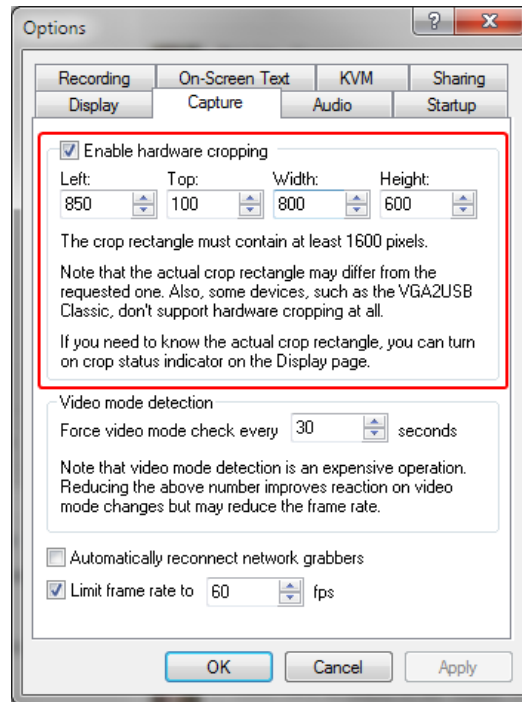
For example, using cropping you can change your capture from what you see on the left side, below, to the cropped image on the right. The status bar displays the cropped coordinates.



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.



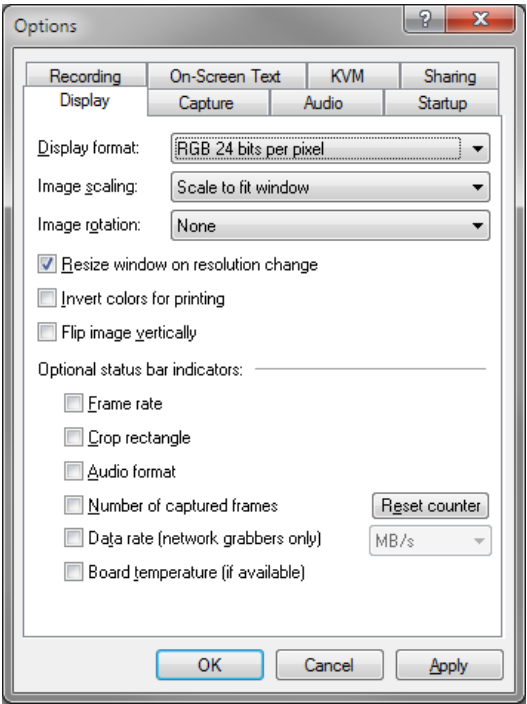
3. In the **Width** and **Height** fields, specify in pixels the size of the cropped area that you want to capture.
4. Using the **Left** and **Top** fields, specify in pixels the top left corner where to start capturing. As you change these values, you can see the visible portion of the image change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

# 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.

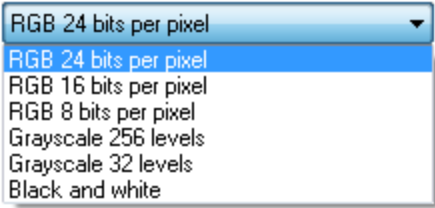

## Display options

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. <b>Changes in color space affect what you see on the screen and what is saved in your recordings via the Epiphan Capture Tool.</b></p> <p>The Epiphan Capture Tool supports a variety of RGB and grayscale color formats, but your SDI2USB 3.0 can also capture in the YUV 4:2:0 color space, if using a third party tool that supports this color space.</p>

Menu item	Description
	<p data-bbox="597 289 737 317"><u>D</u>isplay format:</p> <div data-bbox="776 285 1208 491">  </div> <div data-bbox="602 527 667 604">  </div> <p data-bbox="686 554 1398 617">For 1080p video capture at 60 fps, you need to use a third party capture application that supports YUV 4:2:0.</p>
Image scaling	<p data-bbox="584 674 1446 772">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 data-bbox="584 793 1446 856">This setting is for display only and the recorded image or video frame size is not affected.</p>
Image rotation	<p data-bbox="584 884 1446 1020">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 <b>Apply</b> or <b>OK</b> to see the results.</p> <p data-bbox="584 1041 1365 1068"><b>This setting affects both the display and recorded images/video.</b></p>
Resize window on resolution change	<p data-bbox="584 1094 1446 1157">Check this checkbox if you'd like the application window to resize when the source's resolution changes.</p>
Invert colors for printing	<p data-bbox="584 1188 1446 1251">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 data-bbox="584 1283 1446 1346">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 data-bbox="584 1367 1446 1430">To flip the image horizontally, select both this option and add a 180 degree image rotation.</p> <p data-bbox="584 1451 1365 1478"><b>This setting affects both the display and recorded images/video.</b></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 SDI2USB 3.0 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.

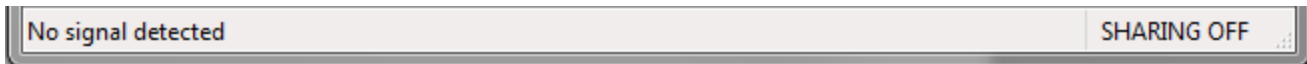
### No grabbers

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



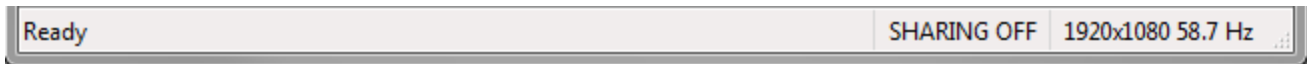
### No signal on selected grabber

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



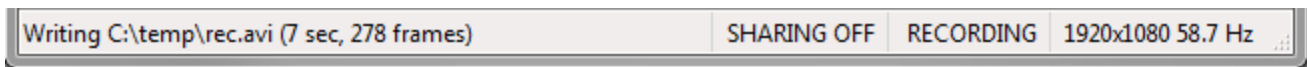
### Ready but not recording

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.



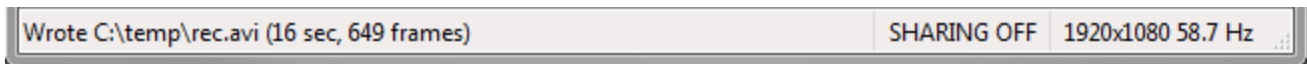
### Recording a video

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):



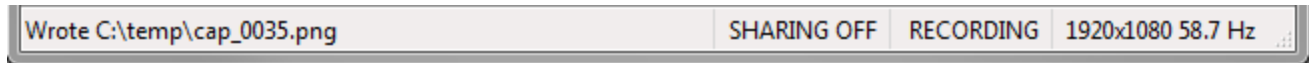
### Video recording complete

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.



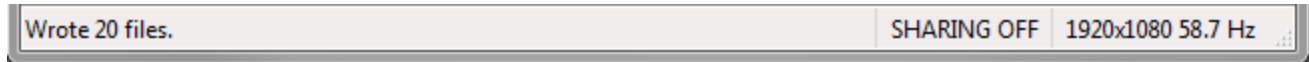
## Recording images

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.



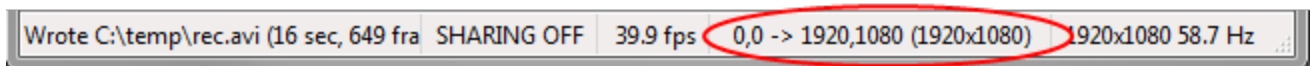
## Optional information

Other information can be displayed on the status bar, depending on the 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!

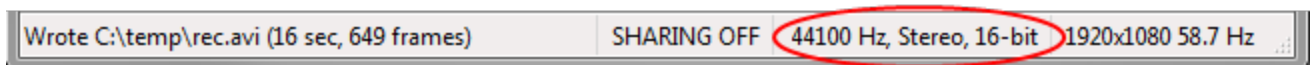
- The current capture frame rate.



- 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 SDI2USB 3.0: 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.

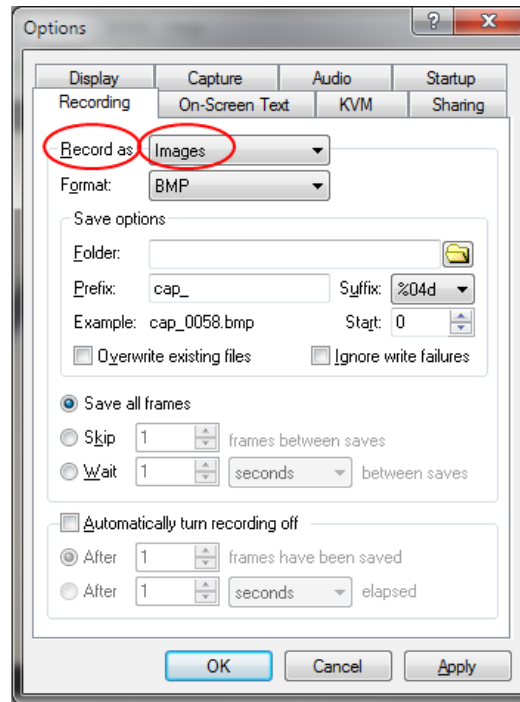
To capture your video source as a series of images:

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

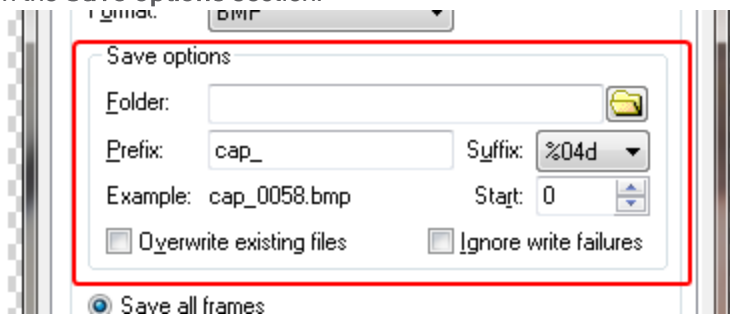
By default, the Epiphan Capture Tool captures in video format, so it's important to change the mode before starting your recording.

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:

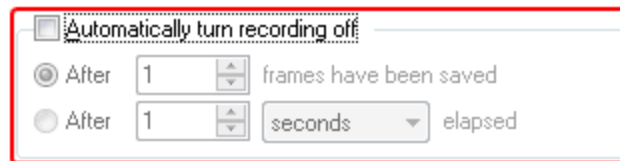


- a. Specify a folder for saving the files. If you don't specify a folder, your images will be saved in the same folder as the Epiphan Capture Tool.
- b. If desired, specify a custom **Prefix** for each file.
- c. Use the **Suffix** drop down to determine whether you're using decimal (d) or hexadecimal (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.

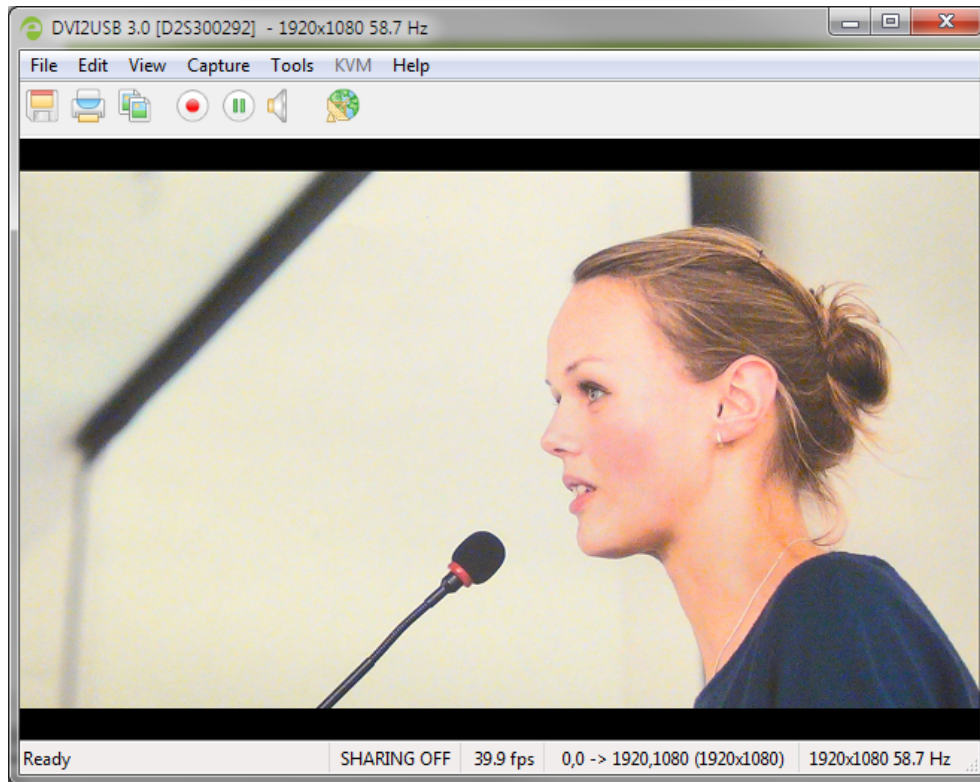
## Step 2: Record

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.



(Windows)

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

## Configure audio

Your SDI2USB 3.0 can capture audio directly from non-encrypted 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.

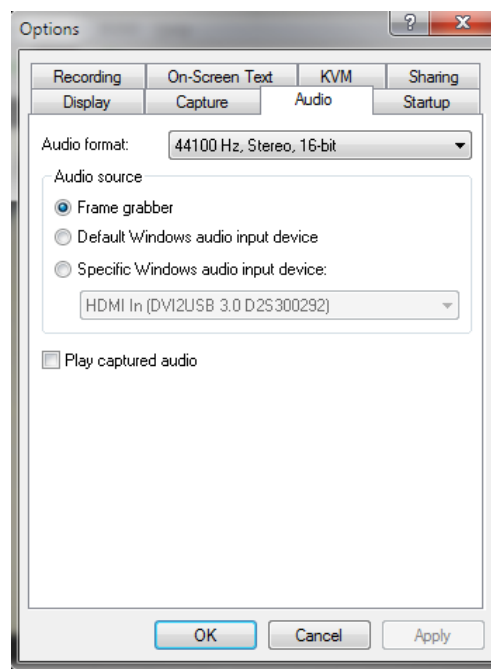
To select your audio source:

1. Configure your external audio source with your operating system (generally no configuration is needed for embedded microphones).
2. Or, connect your SDI source to the video grabber.
3. Connect the video grabber to a **USB 3.0** port on your capture workstation (you can use USB 2.0 if you're planning to use an external audio source instead of embedded audio).



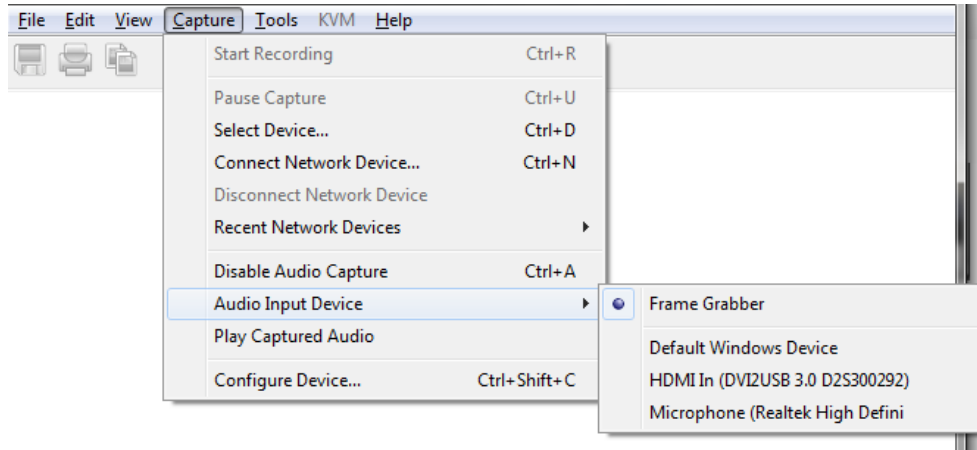
Due to the extra volume of data that needs to be captured, embedded audio capture is only supported when connected via USB 3.0.

4. Launch the Epiphan Capture Tool.
5. Select the **Tools » Options** menu item, the **Options** dialog appears.
  - a. Select the **Audio** tab.



- a. If capturing embedded 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, SDI2USB 3.0 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**.
6. 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 of 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!

## 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.

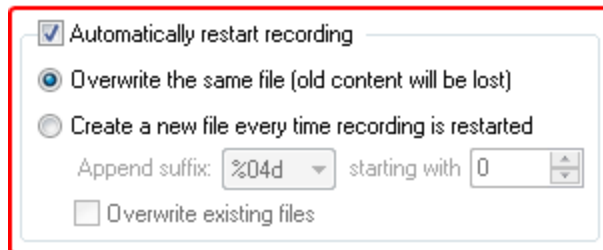
### Configure an automatic file name (Automatic restart)

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:

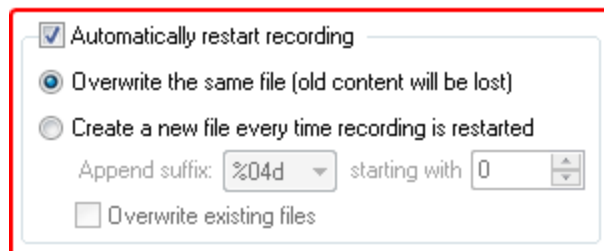
1. From the **Tools » Options » Recording** tab, check the **Automatically restart recording** checkbox.



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.

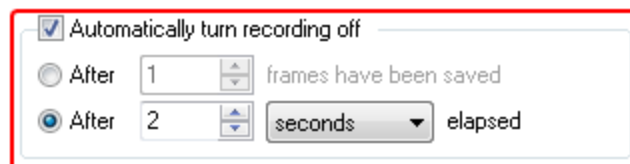
## Configure recording period

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.

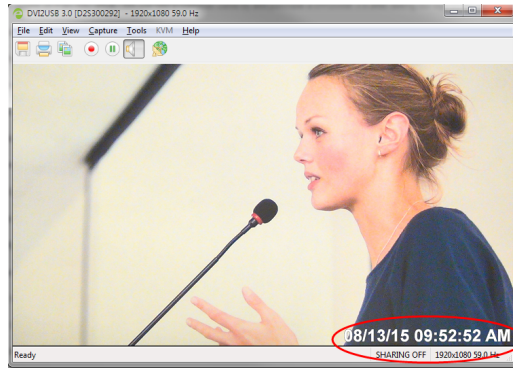


2. Select the appropriate radio button to specify stopping after a **number of frames have been saved** or after a specified amount of time has **elapsed**.
3. Enter your limit: number of frames or time in milliseconds, seconds, minutes or hours.
4. Click **OK**.
5. Start recording as usual, the recording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





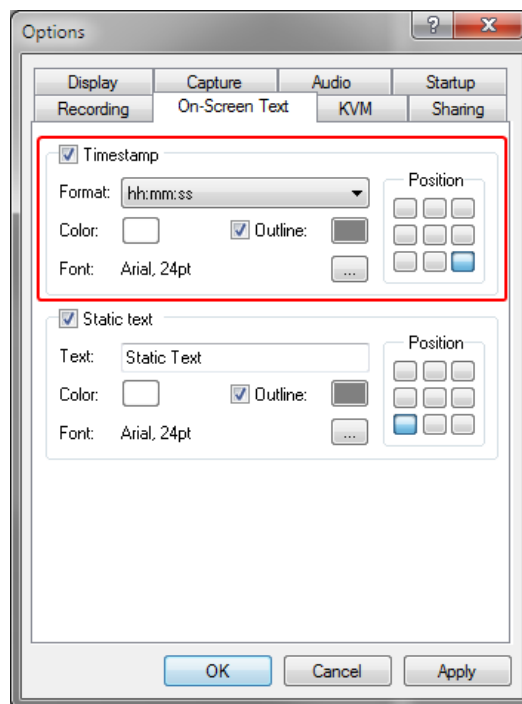
## Add a timestamp

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 **elipsis (...)** 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.

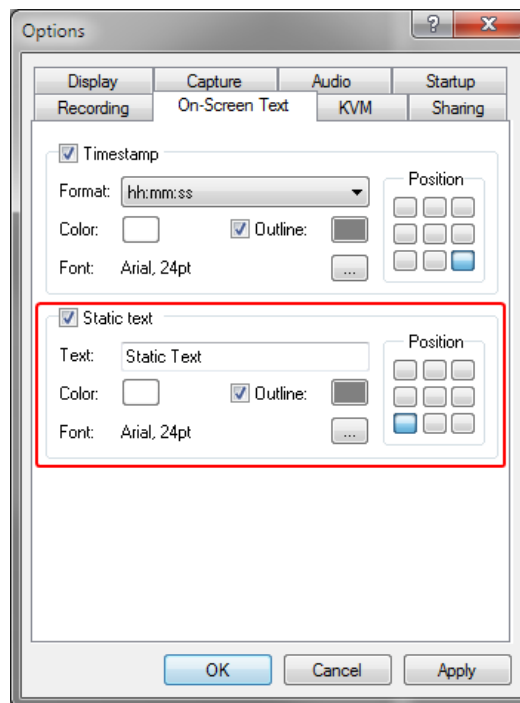
### Add a static text watermark

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 **elipsis (...)** 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 <a href="#">Configure your device</a> 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\Framе Grabber Software.

1. Open Windows Explorer and navigate the following path: C:\Program Files\Epiphan\Fram 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.

## Sharing / streaming demo tool

The Epiphan Capture Tool includes VGA2Web, a **demo** utility for streaming/broadcasting your captured signal. This tool is intended for demonstration purposes only and gives you an idea of how you can share your captured stream using other third party tools.



Note there are no privacy, bandwidth or uptime guarantees for this demo service. It is not intended for use with business-critical applications. As this feature is for demonstration purposes only, a 10 hour time limit is applied.

To stream captured images over the Internet, the video capture application sends the currently captured images to an Epiphan web broadcasting portal. The web broadcasting feature does not include sound, even when audio and video is captured for HDMI sources.

Each web broadcast session is labeled with the serial number of the SDI2USB 3.0 that is capturing the images. The card's serial number appears on the video capture application title bar.

This feature is very limited, for a robust streaming solution, see [Epiphan's other streaming products](#).

### Setup for streaming

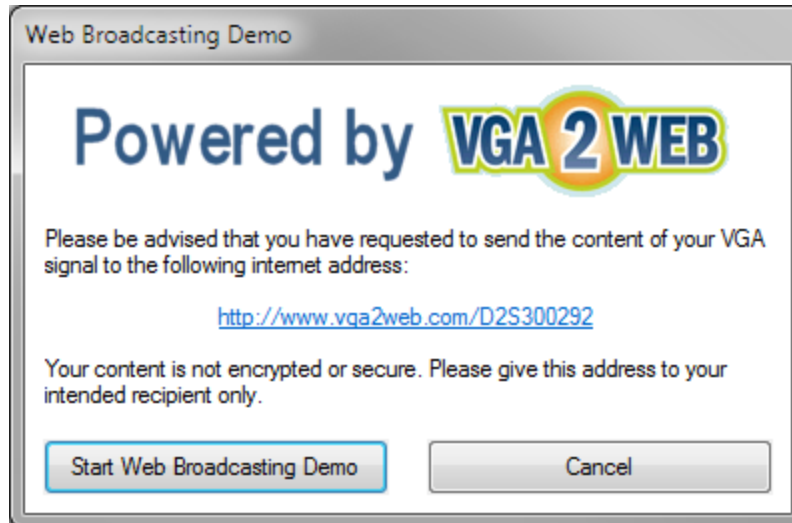
Start by connecting your video grabber to the capture workstation and your source to the video grabber.

The captured data needs to be setup for RGB 24-bits. You can also optionally limit the frame rate to reduce the bandwidth you'll use for transmission. Review [Configure display options](#) and [DirectShow video adjustments](#) for information on setting these values.

Ensure your video capture workstation is able to connect to the Internet.

## Start the broadcast

1. From the Epiphan Capture Tool, select **Tools » Web Broadcasting Demo** or the Sharing button  from the toolbar; the **Start web broadcasting** dialog appears.

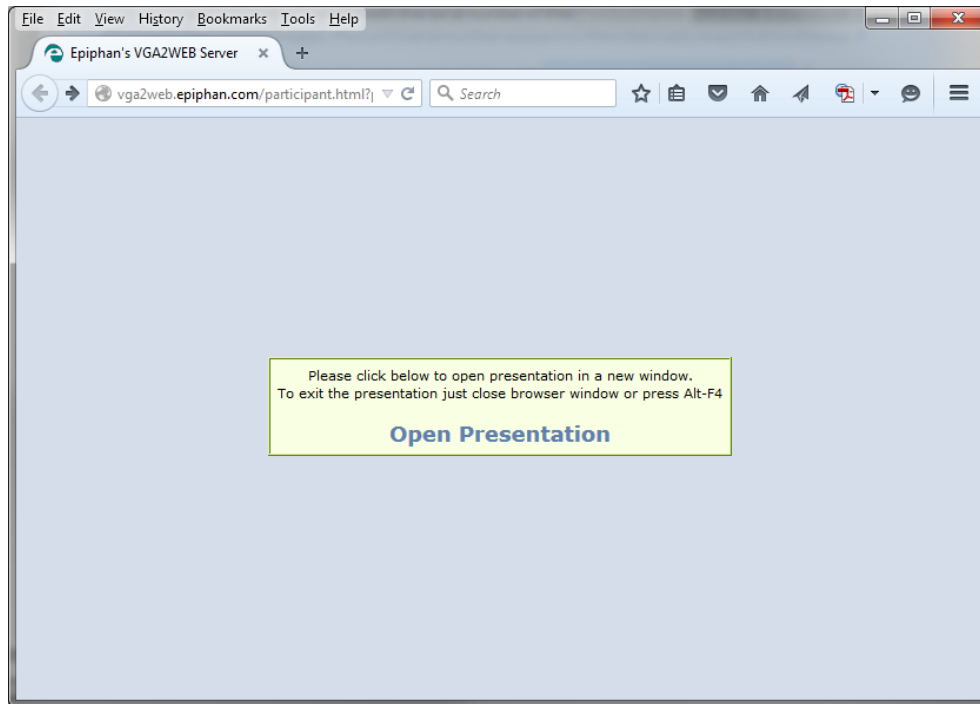


2. Copy the **URL** provided in the window.
3. Click the **Start Web Broadcasting Demo** button; you are now sharing your captured video frames over the internet. Provide the URL to the person with whom you wish to share they stream. (Note you can return to this window to get the URL again if you forget it.)

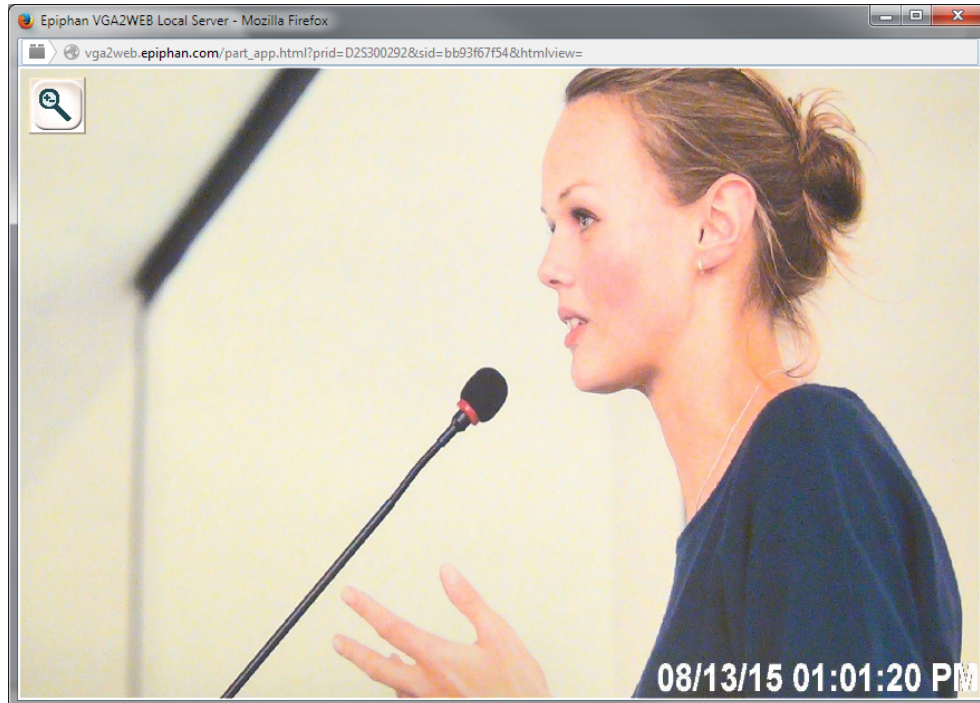
## View the broadcast

Viewers use their web browser to see the broadcast. Some web browsers, including Chrome, do not support running java applications, such as the one used by this demo. Therefore your viewer may need to spend some time making sure their browser has the latest java virtual machine installed, and may also need to add a Java security exceptions for <http://vga2web.epiphan.com>. Steps necessary for the java setup are outside the scope of this document. For assistance, please see your local IT or networking department.

1. Open a web browser and browse to the URL provided in the Web Broadcasting Demo dialog.



2. Click **Open Presentation**; the presentation window opens. (At this point some java configuration may be required to permit this java application to run.)
3. After approximately 10-20 seconds, the broadcast begins.

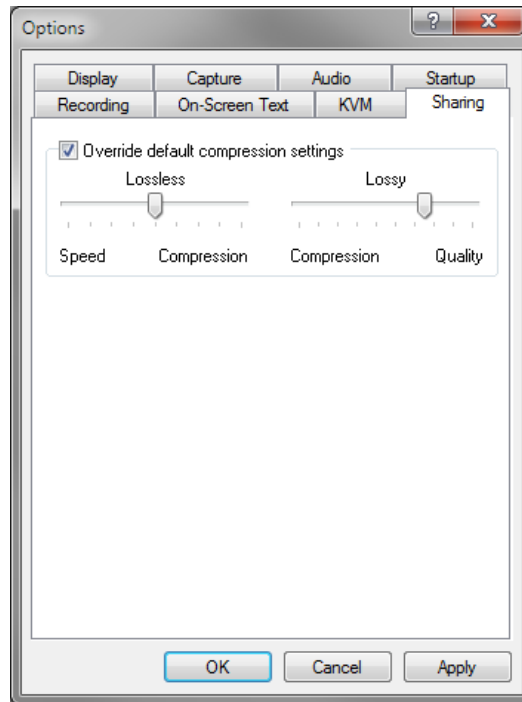


## Tweaking the broadcast

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

To change the web broadcasting compression:

1. Select **Tools » Options » Sharing**; the Sharing dialog opens.



2. Click the **Override default compressions settings** checkbox; the other controls become active.
3. Adjust **Lossless** and **Lossy** sliders. Moving the sliders towards speed and compression reduces delay and increases the frame rate at the cost of more noticable artifacts in the stream. Moving the sliders the other way reduces frame rate, increases delay but improves picture quality.

## Troubleshooting tips

Here are three typical reasons for adjusting web broadcasting compression:

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



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

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



# Upgrade your drivers and software

From time to time, Epiphan releases new drivers and a new version of the Epiphan Capture Tool. These two pieces of software are bundled together in a single package, available from the Epiphan Video website, on the support page for your product.

When you register your SDI2USB 3.0, you can choose to be notified of updates. You can also go check the product support web page to look for updates, and occasionally, Beta versions of our drivers and software.

In most cases, you can download and install the new Epiphan Capture Tool and drivers without needing to do anything special first (i.e. no need to uninstall the old version). If particular version of the software has different instructions, they will be provided on the website and in the product update email.



Be sure to update the drivers and Epiphan software on each computer where you use your SDI2USB 3.0. The drivers load the firmware each time the device is plugged into the capture computer. If you plug your video grabber into a computer with an older driver/firmware, you'll be using that older firmware for your grabber.

## Limitations and Known Issues

This section includes known issues or limitations that affect functionality or usability and ways that you can work around these them.

- 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.

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October 6, 2016

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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.

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1. This device may not cause harmful interference
2. This device must accept any interference received, including interference that may cause undesired operation.

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



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