

# Epiphan AV.io 4K™



September, 2022  
1.0

# Terms and Conditions

This document, the Epiphan web site, and the information contained therein, including but not limited to the text, videos, and images as well as Epiphan System Inc.'s trademarks, trade names, and logos are the property of Epiphan Systems Inc. and its affiliates and licensors, and are protected from unauthorized copying and dissemination by Canadian copyright law, United States copyright law, trademark law, international conventions, and other intellectual property laws.

Epiphan, Epiphan Video, Epiphan Systems, Epiphan Systems Inc., and Epiphan logos are trademarks or registered trademarks of Epiphan Systems Inc., in certain countries. All Epiphan product names and logos are trademarks or registered trademarks of Epiphan. All other company and product names and logos may be trademarks or registered trademarks of their respective owners in certain countries. For additional terms and conditions, refer to sections at the end of document.

Copyright © 2022 Epiphan Systems Inc. All Rights Reserved.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET OR PRODUCT INSTALLATION SOFTWARE PACKAGE THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSES OR LIMITED WARRANTY, CONTACT YOUR EPIPHAN REPRESENTATIVE FOR A COPY.

PRODUCT DESCRIPTIONS AND SPECIFICATIONS REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. EPIPHAN PERIODICALLY ADDS OR UPDATES THE INFORMATION AND DOCUMENTS ON ITS WEB SITE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION AND RECOMMENDATIONS ARE BELIEVED TO BE ACCURATE AT TIME OF WRITING BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

## LIMITATION OF LIABILITY

UNDER NO CIRCUMSTANCES SHALL EPIPHAN BE LIABLE FOR ANY INCIDENTAL, SPECIAL, CONSEQUENTIAL, EXEMPLARY OR OTHER INDIRECT DAMAGES THAT RESULT FROM THE USE OF, OR THE INABILITY TO USE, THIS PRODUCT OR THE INFORMATION CONTAINED IN THIS DOCUMENT OR PROVIDED ON EPIPHAN'S WEB SITE, EVEN IF EPIPHAN HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL EPIPHAN'S TOTAL LIABILITY TO YOU FOR ALL DAMAGES, LOSSES, AND CAUSES OF ACTION RESULTING FROM YOUR USE OF THIS PRODUCT, WHETHER IN CONTRACT, TORT (INCLUDING, BUT NOT LIMITED TO, NEGLIGENCE) OR OTHERWISE, EXCEED THE AMOUNTS YOU PAID TO EPIPHAN DURING THE MOST RECENT THREE-MONTH PERIOD IN CONNECTION WITH AMOUNTS WHICH YOU PAID FOR USING THIS PRODUCT.

INFORMATION AND DOCUMENTS, INCLUDING PRODUCT SPECIFICATIONS, PROVIDED IN THIS DOCUMENT OR THE EPIPHAN WEB SITE ARE PROVIDED "AS IS". SPECIFICALLY, BUT NOT WITHOUT LIMITATION, EPIPHAN DOES NOT WARRANT THAT: (i) THE INFORMATION IS CORRECT, ACCURATE, RELIABLE OR COMPLETE; (ii) THE FUNCTIONS CONTAINED ON THE EPIPHAN WEB SITE WILL BE UNINTERRUPTED OR ERROR-FREE; (iii) DEFECTS WILL BE CORRECTED, OR (iv) THIS WEB SITE OR THE SERVER(S) THAT MAKES IT AVAILABLE ARE FREE OF VIRUSES OR OTHER HARMFUL COMPONENTS. EPIPHAN SPECIFICALLY DISCLAIMS ALL REPRESENTATIONS, WARRANTIES, AND CONDITIONS, EITHER EXPRESS, IMPLIED, STATUTORY, BY USAGE OF TRADE OR OTHERWISE INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT, TITLE, SATISFACTORY QUALITY OR FITNESS FOR A PARTICULAR PURPOSE.

# Thank you for choosing Epiphan Video!

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

## Product feedback

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

## Specifications

Go to the Epiphan Video website to get the most recent product specifications and additional information about this product.

## Warranty

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

## Technical support

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

- E-mailing [support@epiphan.com](mailto:support@epiphan.com)
- Live chat via the link on our [support site](#)
- 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, resolution, refresh rate, etc.)
- Product serial number
- Your operating system and version number

Copyright © 2022 Epiphan Systems Inc. All Rights Reserved

# Release notes

## Version 4.0.0

Firmware 4.0.0 is a maintenance release that fixes some minor issues and improves the memory allocation performance of the AV.io 4K.

### What's fixed

- Improved the AV.io 4K image quality when downscaling from 1080p to 720p.
- The audio capture using AV.io 4K is improved and audio no longer gets dropped during capture.

# Registering the device

Why should I register my AV.io 4K?

It will allow you to activate your product warranty, give you notifications of firmware and software updates, and enable you to get our free personalized customer support.

How to register

1. Go to [epiphan.com/register](https://epiphan.com/register)
2. Provide the required information. Your six digit serial number is found on your device. A valid e-mail address is required for product registration.

# Table of contents

Terms and Conditions .....	ii
Thank you for choosing Epiphan Video! .....	iii
Release notes .....	iv
Registering the device .....	v
<b>Getting Started .....</b>	<b>1</b>
Product overview .....	2
What's in the box? .....	3
Hardware .....	4
<i>Hardware diagrams</i> .....	4
<i>Indicator LED details</i> .....	5
Quick start .....	6
Technical specifications .....	7
<i>System requirements</i> .....	9
<b>Capture .....</b>	<b>10</b>
How AV.io 4K works .....	11
Set up your AV.io 4K for capture .....	12
Resolutions, aspect ratios, and capture rates .....	13
Automatic image scaling & audio resampling .....	15
Third-party applications .....	16
<b>Configuration .....</b>	<b>17</b>
Install the AV.io Config tool .....	18
Update firmware using the AV.io Config tool .....	21
Identifying the input resolution .....	24
Configure settings using AV.io Config tool .....	25
Advanced Settings .....	27
Set custom resolution user modes .....	28
<b>Appendices .....</b>	<b>31</b>
Troubleshooting .....	32
Limitations and known issues .....	35
Releases and features .....	37
Software license .....	38

# Getting Started

Welcome and thank you for buying Epiphan Video's AV.io 4K!

This guide contains all the information necessary to successfully capture live video content without any configuration - simply connect the cables and you're ready to go!

We'll start off by telling you about the product; giving you an overview, discussing the technical specifications, and more. Then we'll cover capturing video; providing a functional overview of how the product works, as well as some information on common resolutions, and third-party capture applications. Finally, we'll finish with a more detailed look at configuration, including advanced configuration options.

Let's get started!

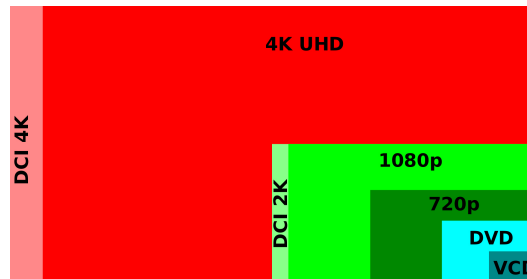
# Product overview

AV.io 4K is the latest addition to Epiphan Video's industry-leading video grabbers product line, adding 4K resolution support while maintaining support for HD and SD resolutions.

To use AV.io 4K, there's no software to install; simply connect the cables and go. It works on Windows, Mac, and Linux and integrates seamlessly with your favorite third-party applications such as Teams, Zoom, OBS, Wirecast, vMix, VLC, and Quicktime.

AV.io 4K captures resolutions up to and including 4096×2160, making it the simplest way available to capture DCI 4K and 4K UHD digital signals.

For those curious as to the difference between DCI 4K and 4K UHD, these are just different definitions of a 4K resolution. 4K UHD (3840×2160) is the standard 4K resolution available on televisions and other common display screens. The 4K resolution of 4096×2160 is referred to as Digital Cinema Initiatives (DCI) 4K, and is the resolution used almost exclusively for cinema-scale film production. It is rare to find this resolution outside of a cinematic context. AV.io 4K is capable of supporting input and output at either.





## What's in the box?

Your AV.io 4K product contains everything you need to easily capture live video content with minimal setup. Your purchase includes the following:

**Table 1** Description of included purchase contents (for identification only, color and appearance of individual cables/adapters may vary).

AV.io 4K video grabber		Your video capture device!
HDMI connector cable (1 m / 3 ft)		Connects an HDMI source to your AV.io 4K's native HDMI port.
USB 3.0 cable (1 m / 3 ft)		The USB 3.0 cable connects your AV.io 4K video grabber with your computer's USB 3.0 or 2.0 port.

# Hardware

This section describes the physical features of your AV.io 4K, including diagrams and hardware feature descriptions.

Topics covered include:

- [Hardware diagrams](#)
- [Indicator LED details](#)

## Hardware diagrams

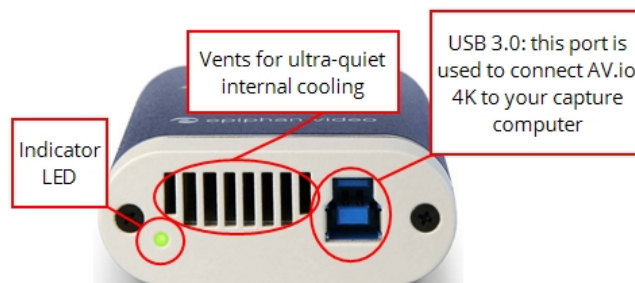
Your AV.io 4K device includes an input, an output, and an indicator light.

Input/output ports and indicator lights are identified and explained in the top and bottom view images below. Indicator light details are explained in the following section.

Top view:



Bottom view:



## 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.



4K resolutions with USB 2.0 will likely be unstable.

From the operating system's UVC drivers, the application will receive the AV.io 4K supported color space, resolution and frame rates.

If you're not sure if your controller is USB 3.0 or USB 2.0, plug AV.io 4K into the capture computer and look at the indicator LED. After initial boot up (red LED), blue is used for USB 3.0 and green is used for USB 2.0:



Blue LED means USB 3.0



Green LED means USB 2.0

Connection type/LED color	USB 3.0 connection	USB 2.0 connection
Solid red	Firmware update in progress AV.io 4K initializing	Firmware update in progress AV.io 4K initializing
Solid green	N/A	USB 2.0 connection active
Blinking green	N/A	Video and/or audio transferring successfully
Solid blue	USB 3.0 connection active	N/A
Blinking blue	Video and/or audio transferring successfully	N/A

# Quick start

Setting up your AV.io 4K device to capture live video and audio content couldn't be easier!

Before you begin the connection process, you will require:

- An HD video source (with or without audio)
- Your capture card device
- A capture desktop computer, laptop or notebook
- A USB cable (included with purchase) to connect your AV.io 4K to your capture computer
- An HDMI cable (included with purchase) to connect your video source to your AV.io 4K.

Once you have these things ready to go, you can now begin the simple process of hooking up your AV.io 4K so you can start capturing!

To connect your AV.io 4K for capture:

1. Connect your AV.io 4K device to your video source
2. Connect your AV.io 4K device to your computer
3. (Optional) Connect your audio device to the 3.5 mm audio input.
4. Open your favorite third-party application, select AV.io 4K from the list of available cameras and start capturing!



And that's it. No drivers to install and no extensive set-up. Just connect the cables and you're ready to go!

# Technical specifications

Technical specifications for AV.io 4K are included in the table below.

<b>Operating System support</b>	Windows 8.1, Windows 10, Mac OS X 10.10 and up, Linux distribution with kernel 3.5.0 or higher		
<b>Drivers</b>	Native UVC and UAC device auto-detected by OS		
<b>Processor requirements</b>	Your capture computer processor should be equal or superior in performance to i7 6770HQ for good 4K results.		
<b>Input connector</b>	HDMI		
<b>Input resolution</b>	Standard and non-standard resolution from 640×360 up to 4096×2160 (4K DCI).		
<b>Output connector</b>	USB 3.0 B-Type connector with USB 2.0 backward compatibility		
<b>Output scaling</b>	Choose from: no scaling (1:1), preserve aspect ratio scaling or aspect ratio conversion scaling		
<b>Supported output resolutions</b>		Color space YUY2 (4:2:2)	Color spaces NV12, YV12 and I420 (4:2:0)
	640×360	15, 23.97, 24, 25, 29.97, 30, 50, 59.94 or 60 fps	15, 23.97, 24, 25, 29.97, 30, 50, 59.94 or 60 fps
	640×480		
	960×540		
	1024×768		
	1280×720		
	1280×1024		
	1600×1200		
	1920×1080		
	1920×1200		

	2048×1024	5, 10, 15, 20 fps	15, 23.97, 24, 25, 29.97, 30 fps
	2560×1440		
	2560×1600		
	3200×1800		
	3840×2160 (4K UHD)		
	4096×2160 (DCI 4K)*		5, 10, 15, 20 fps
USB host controllers	When capturing 4K resolutions we recommend using a computer with an Intel USB host controller (this is the most common type) to achieve the best results. With other USB host controllers such as ASM, AMD, VIA, Renesas, Eltron, Fresco and TI, capture will be at 79% to 96% of the expected frame rate.		
HDMI audio input	Up to 96 kHz sampling rates		
Audio output	16-bit 48 kHz stereo sampling rates		
Capture latency	Near-zero. However, third-party applications may contribute capture delay		
HDCP	High-bandwidth digital content protection (HDCP) protected content cannot be captured		
LED	LED indicates the status of AV.io 4K		
Dimensions	3.54" × 2.36" × 0.91" (90 mm × 60 mm × 23 mm)		

\* Note: For DCI 4K, the actual frame rate is limited to 24 fps for NV12/I420 and 15 fps for YUY2.

## System requirements

---

System requirements are the barebones technical essentials your computer needs to work with AV.io 4K. System requirements to use AV.io 4K include:

<b>Video source</b>	Any VESA-compatible HDMI (or DVI-D) source.
<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 and 4K functionality (for maximum performance, an Intel USB 3.0 host controller is needed); or,</li><li>• a USB 2.0 host controller (will limit maximum frame rate and resolution support)</li></ul>
<b>Video capture workstation operating system</b>	Windows 8.1, Windows 10, and up Mac OS X 10.10 and up Linux distribution with kernel 3.5.0 or higher
<b>Processor frequency</b>	Minimum recommended value: 2.4 GHz
<b>RAM</b>	Minimum recommended value: 4 GB

# Capture

Setting up your AV.io 4K device to capture live video content couldn't be easier!

Before you begin the connection process, you will require:

- An HD video source (with or without audio)
- Your capture card device
- A capture desktop computer, laptop or notebook
- A USB cable (included with purchase) to connect to your AV.io 4K to your capture computer
- An HDMI cable (included with purchase) to connect your video source to your AV.io 4K.

Once you have these things ready to go, you can now begin the simple process of hooking up your AV.io 4K so you can start capturing!



## How AV.io 4K works

Once you're ready to start capturing, you'll need either a built-in or third-party application to capture video and audio content with AV.io 4K.

The application communicates with AV.io 4K and negotiates a **color format** (the range of available colors), **frame rate** (frequency at which frames in a video sequence are displayed) and **frame resolution** (size of a single video frame in pixels). A higher frame rate means smoother video capture while the frame resolution determines the aspect ratio of the video output as well as its dimensions and degree of definition.

With the help of AV.io 4K, the content from your video source is automatically configured and captured on your computer through your selected application. If the application requests a frame size that is smaller or larger than your video source, AV.io 4K automatically scales the video for you. For consistent and widely compatible output, audio is automatically resampled to 16-bit 48 kHz stereo audio.

No configuration required!

# Set up your AV.io 4K for capture

To connect your AV.io 4K for capture:

1. Connect your AV.io 4K device to your video source, ideally directly to the source, but some video sources may require special adapters
2. Connect your AV.io 4K device to your desktop computer, laptop, or notebook
3. Open your favorite third-party application, select AV.io 4K from the list of available input sources, and start capturing!



And that's it! No drivers to install and no extensive set-up! Just connect the cables and you're ready to go!

# Resolutions, aspect ratios, and capture rates

The **resolution** (also known as frame size or display mode) of a video signal, digital image, TV screen, computer monitor or other display device is a count of the number of pixels displayed horizontally and vertically. For example the resolution 1920×1080 (which is 1080p) creates an image that is 1920 pixels wide and 1080 pixels tall.

The **aspect ratio** of an image describes the proportional relationship between its pixel width and height. The resolution 1920×1080 (1080p) is quite a bit wider than it is tall. The ratio of its width to height is 16 to 9, represented as an aspect ratio 16:9.

AV.io 4K outputs resolutions in commonly supported aspects ratios. The table below is a color-coded legend for interpreting the two tables of product resolutions below it:

Aspect Ratio	Common Use
4:3	Standard TV (NTSC/PAL) display and non-widescreen computer displays
16:9	Widescreen (HD) TV displays (1080p, 1080i, 720p etc.), and 4K-capable displays
16:10 (8:5)	Widescreen computer displays, and 4K-capable displays
5:4	Sometimes used in larger format computer monitors
1.90:1	Digital Cinema Initiatives standard resolution for 4K or 2K video projection

AV.io 4K accepts the following inputs by default:

640×480	1024×768	1280×720	1280×800
1280×1024	1440×900	1600×1200	1920×1080
1920×1200	2048×1080	3840×2160	4096×2160

If you're using an input resolution that is not on this list, it might still be possible to capture. However, the video might be stretched, or scaled to a different size and surrounded by black letter-boxing, based on the software and your configuration settings. Read [Configure settings using AV.io Config tool](#) for more detail.

AV.io 4K generates a list of the following possible resolutions for your capture application to select for output display:

640×360	640×480	960×540	1024×768
1280×720	1280×1024	1600×1200	1920×1080
1920×1200	2048×1024	2560×1440	2560×1600

3200×1800	3840×2160	4096×2160	
-----------	-----------	-----------	--

Captured video content is output to your application , depending on your resolution and color space, at **5, 10, 15, 20, 23.97, 24, 25, 29.97, 30, 50, 59.94 or 60 frames per second** (your application chooses one of these frame rates) when captured over USB 3.0. This table is not an exhaustive list of all the resolutions your AV.io 4K can output, just a list of common and tested resolutions.

When capturing 4K resolutions we recommend using a computer with an Intel USB host controller (this is the most common type) to achieve the best results. With other USB host controllers such as ASM, AMD, VIA, Renesas, Eltron, Fresco and TI, capture will be at 79% to 96% of the expected frame rate.

## Automatic image scaling & audio resampling

If your source content is larger or smaller than the frame size chosen by the application, AV.io 4K automatically **scales your source** to match the desired frame size. No user configuration required!


AV.io 4K also automatically performs **audio resampling**, meaning that no matter the bit depth or sampling frequency of audio through an HDMI audio source, AV.io 4K automatically resamples your audio so that your application gets a consistent audio sample rate and bit depth, even if you change the video source.

## Third-party applications


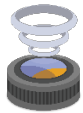



AV.io 4K uses pre-installed drivers on your OS (called **UVC drivers** and **UAC drivers**) to communicate with third-party applications and capture content. Due to AV.io 4K's use of UVC/UAC technology, there is no need for driver installation. Just like a webcam, your AV.io 4K device is immediately recognized as a camera device and can be used to capture content via any UVC-compatible third-party application.

Third-party applications that work with AV.io 4K include, but are not limited to the following list. Try your favorite capture application!

### Zero-install applications (included with your OS)

 <p><b>Skype</b> (with Windows 8.1 and Windows 10)</p>	 <p><b>Windows Camera app</b> (with Windows 8.1 and Windows 10)</p>	 <p><b>QuickTime</b> (with Mac OS X)</p>
---	--	---

### Popular applications available for download

 <p><b>Skype</b></p>	 <p><b>Wirecast</b></p>	 <p><b>QuickTime</b></p>
 <p><b>Adobe FMLE</b></p>	 <p><b>VLC media player</b></p>	

# Configuration

Your AV.io 4K device is ready to use right out of the box; however, there is support for additional configuration should you need it.

Firmware updates and changes to default capture settings can be applied to your AV.io 4K using Epiphan's AV.io Config tool. For settings to persist after power cycling, please allow 5 seconds before disconnecting or restarting device.

You likely won't need to use the AV.io Config tool for more than firmware updates, but advanced settings can help you tweak the performance to get the most out of your AV.io 4K.

Advanced configuration options include:

- **Preserve aspect ratio**
- **Performance mode**



The option **Audio selector for multichannel inputs** does not apply to AV.io 4K.

Detailed instructions on how to use AV.io Config include:

- [Install the AV.io Config tool](#)
- [Update firmware using the AV.io Config tool](#)
- [Identify input details using the AV.io Config tool](#)
- [Configure settings using AV.io Config tool](#)
- [Advanced Settings](#)
- [Set custom resolution user modes](#)

# Install the AV.io Config tool

Epiphan's AV.io Config tool is used for loading firmware updates on your AV.io 4K and for advanced settings changes.



You may install AV.io Config on the same computer(s) where you use AV.io 4K, or only on one computer for configuration. All firmware updates and settings changes are saved to the device and work without any software installed on the computer. For settings to persist after power cycling, please allow 5 seconds before disconnecting or restarting device.

To install the AV.io Config tool, follow the directions below for your computer's operating system.

## Windows

1. Download the AV.io Config package under the **Windows** heading on the AV.io 4K Downloads page on Epiphan's web site.  
<https://www.epiphan.com/support/avio-4k-software-documentation/>
2. Extract all the files from the zip file (remember the location you're unzipping to).
3. Browse to the unzip folder and open the AV.io Config tool by double-clicking on **AVioConfig.exe**. (Depending on your local security settings, you may need to right-click and choose to run the file as an administrator).
4. AV.io Config starts! If you video grabber is connected to the computer by USB, it is detected.



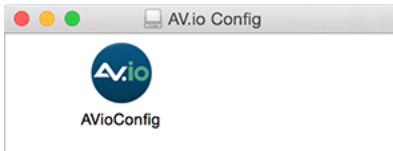


## Mac

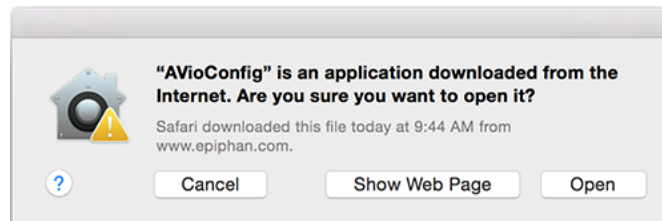
1. Download the AV.io Config package under the **Mac OS X** heading on the AV.io 4K Downloads page on Epiphan's web site.

<https://www.epiphan.com/support/avio-4k-software-documentation/>

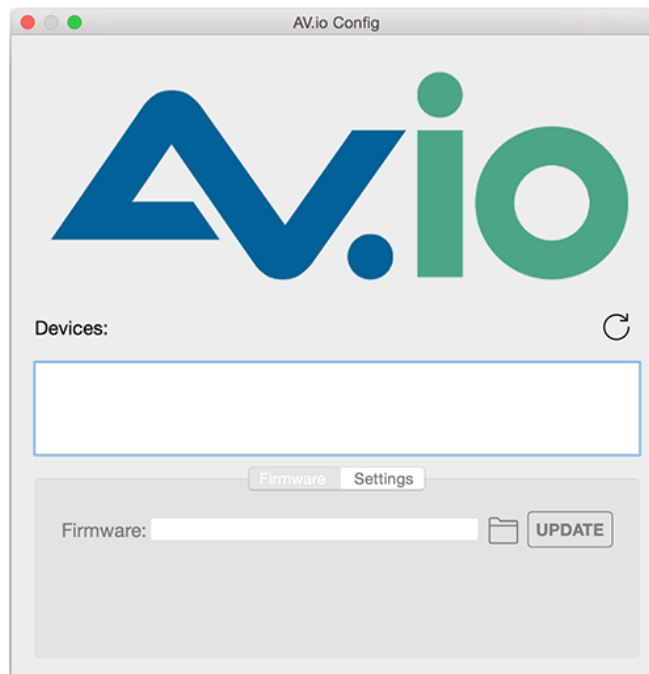
2. Double-click the downloaded file to open the disk image package.



3. If desired, drag the AVioConfig application to your desktop or another location where you will find it for future use.
4. Double-click the AVioConfig application icon to launch AV.io Config; a warning box appears.



5. Click **Open**.
6. AV.io Config starts! If you video grabber is connected to the computer by USB, it is detected.



## Linux

1. Download the AV.io Config package under the **Linux** heading on the AV.io 4K Downloads page on Epiphan's web site.  
<https://www.epiphan.com/support/avio-4k-software-documentation/>
2. Untar and unzip the contents of the .tar.bz2 file (tar -xjvf can be used to untar and unzip in one command).
3. Browse (or change directories) to the unzip folder.
4. Either: Double-click the AV.io Config application icon or execute the AV.io Config application from the command line to launch AV.io Config (./AVioConfig).
5. AV.io Config starts! If you video grabber is connected to the computer by USB, it is detected.



# Update firmware using the AV.io Config tool

When new firmware is available, you can load this firmware onto your AV.io 4K using the AV.io Config tool and the steps below. If you [register your product](#) and agree to be notified of product updates, you'll receive an email when there is an firmware update available for download.



Attempting to update firmware while running virtual machines will result in firmware upgrade failure. For updates to persist after power cycling, please allow 5 seconds before disconnecting or restarting device.

To update firmware using the AV.io Config tool:

1. If you haven't already done so, download and install the AV.io Config tool. See [Install the AV.io Config tool](#).
2. Download the firmware update file from the Epiphan website, as described in your firmware update notification email or discussion with your vendor.
3. Connect your AV.io 4K device to your computer, laptop or notebook.
4. Open the AV.io Config tool.



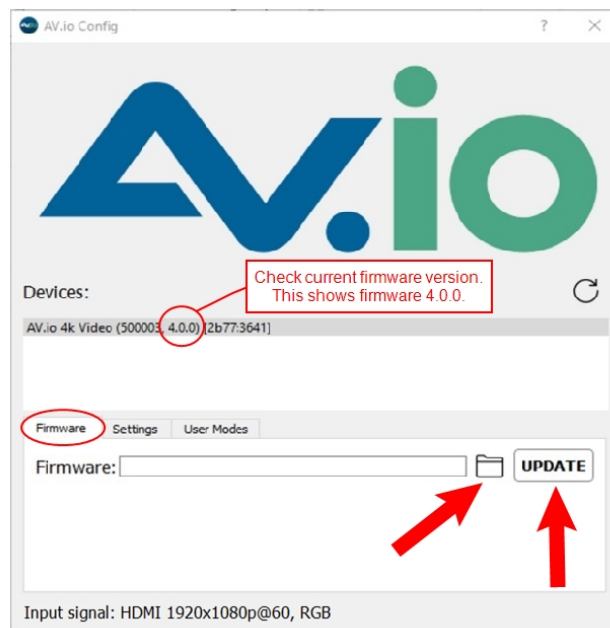
5. Select your AV.io 4K device from the list under the Devices heading.



If your AV.io 4K device is not displayed, press the Refresh icon to refresh the list of connected devices.



6. Using the diagram below, check the current firmware version of your AV.io 4K. If it is the same version as the new firmware you downloaded, there is no need to do the firmware update.
7. Click the **Firmware** tab

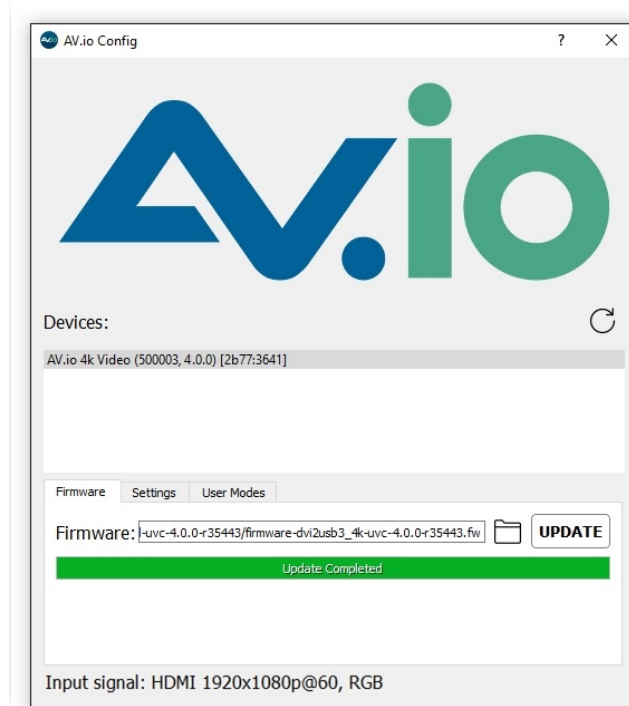


8. Click the **folder icon** to navigate to the saved location of the firmware, and click **Update** to update your video grabber to the selected firmware; an update bar appears and displays the progress of the update.



Do not disconnect your AV.io 4K at any point during the update process! Doing so may cause irrevocable errors and/or permanently damage the device.

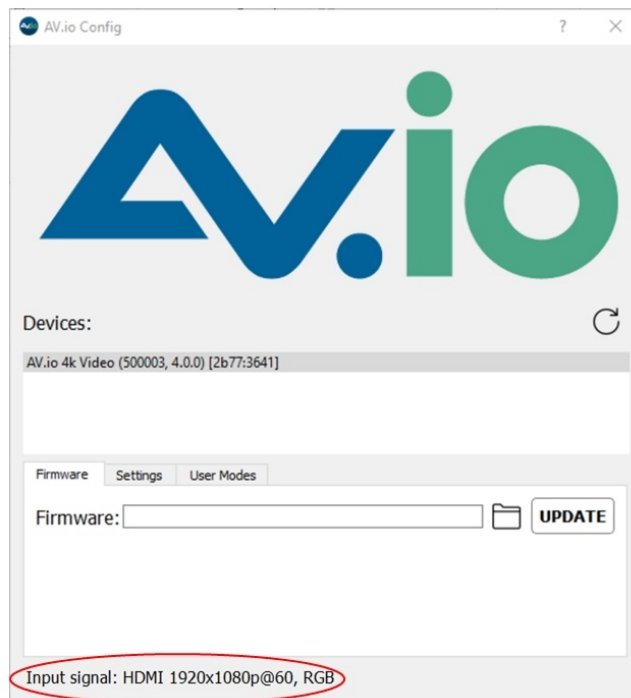
9. When the update is finished the progress bar turns green and displays "Update Completed" (Note the firmware update will not be automatically reflected in the Devices list unless the **Refresh** icon is clicked). You may now safely disconnect your AV.io 4K if needed.



When updating firmware on a Mac, the “Update Completed” text will not be displayed. The firmware upgrade is complete when the progress bar fills the width of the AV.io Config window and the window contents are no longer greyed out.

## Identifying the input resolution

The AV.io Config tool can help you figure out exactly what information your video source is sending. Plug in the source and select your device. The UI detects information about the source and presents it at the bottom of the window.



The line tells you what connector the video source is using, the exact resolution of the source (1920×1080p), and the frame rate the source is outputting (60 fps), and the color model (RGB or YCrCb in these examples).

# Configure settings using AV.io Config tool

Epiphan's AV.io Config tool gives advanced users the ability to change several settings to their video capture experience. The settings that can be changed include: Re-numerate input signal resolution, aspect ratio preservation and performance mode. For settings to persist after power cycling, please allow 5 seconds before disconnecting or restarting device. See [Advanced Settings](#) for more details.

To change the configurable settings with the AV.io Config tool:

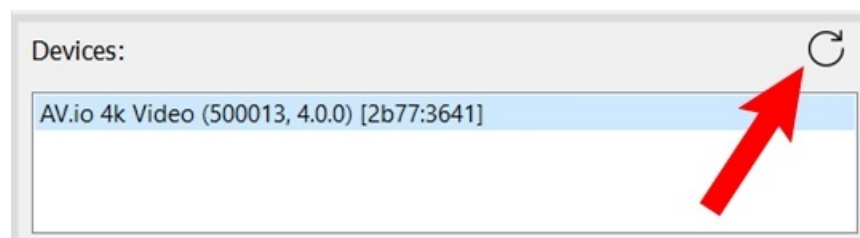
1. If needed, install the AV.io Config tool. For details specific to your OS, see [Install the AV.io Config tool](#).
2. Connect your AV.io 4K device to your computer, laptop or notebook.
3. Open the AV.io Config tool.



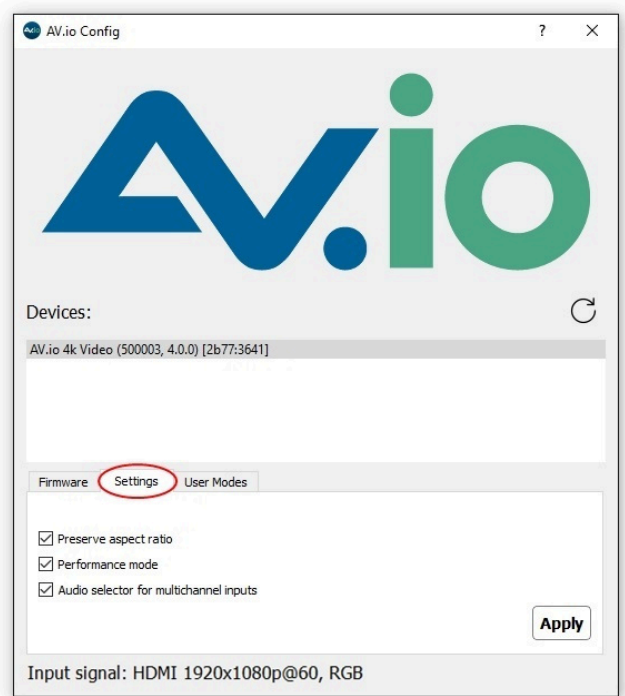
4. Select your AV.io 4K device from the list under the Devices heading.



If your video grabber is not displayed, press the Refresh icon to refresh the list of connected devices.



5. Click the **Settings** tab; the settings page appears.



6. Enable or disable the individual settings by clicking each checkbox according to your needs, then click **Apply**. See [Advanced Settings](#) for a description of each setting.
7. Disconnect and then reconnect the grabber.



# Advanced Settings

The AV.io Config tool allows you to change several settings to make changes to your video capture experience if necessary. Most users won't need to use this utility for anything other than firmware updates, but advanced users may find these tweaks help them get the most out of their AV.io 4K.

These options include:

- **Preserve aspect ratio**
- **Performance mode**



The option **Audio selector for multichannel inputs** does not apply to AV.io 4K.

There are two key descriptors used in the process of video capture using a UVC-based device:

**Extended Display Identification Data (EDID):** The EDID describes to the video source, video player or computer which standard video formats (resolutions, frame rates, etc.) are supported by the capture device as video input.

**UVC Descriptor:** The UVC describes to the capture host computer which formats are available at the capture device USB port.

AV.io 4K does not enforce a direct relationship between the input and output signals. The list of EDID and UVC descriptions are identical so that if the input and output formats are the same, the signal can pass through without scaling. However, if input and output are set to different formats, AV.io 4K will automatically upscale or downscale video to the format requested as output by the capture software.

**Preserve aspect ratio (enabled by default)**

When enabled, your AV.io 4K preserves the aspect ratio of your input signal by adding black bars to the sides or top and bottom of the frame (only for cases when the application using the signal requests a frame size with a different aspect ratio). For example, with this option enabled, a 4:3 input signal gets black bars added to the sides of the image when viewed in an application that requests a 16:9 aspect ratio. With this option disabled, the 4:3 image is instead stretched to fit the full 16:9 size.

**Performance mode (enabled by default)**

When enabled, your AV.io 4K enters and exits system suspend mode (i.e. sleep) faster by disabling support for the Suspend/U3 USB power state. This means AV.io 4K starts working again faster after your computer wakes from a system suspend state, at the cost of increased power consumption. Disabling this setting is ideal in situations where power consumption needs to be monitored, such as battery preservation in laptops.

Now that you've learned what these configuration settings do, you may want to [Configure settings using AV.io Config tool](#) or [Update firmware using the AV.io Config tool](#).

# Set custom resolution user modes

The AV.io Config tool gives users the ability to specify custom resolutions. You can make use of up to three at one time, so you don't have to worry about changing the list every time you change which source you have connected. For settings to persist after power cycling, please allow 5 seconds before disconnecting or restarting device.

To change the custom resolutions with the AV.io Config tool:

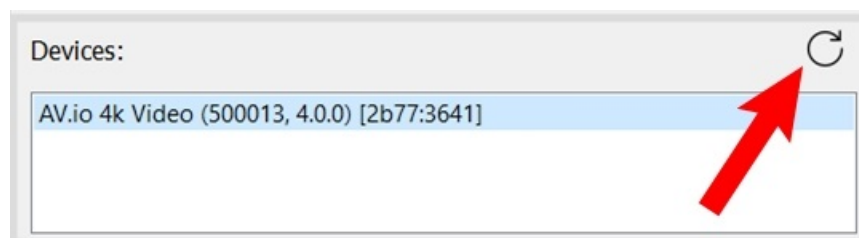
1. If needed, install the AV.io Config tool. For details specific to your OS, see [Install the AV.io Config tool](#).
2. Connect your AV.io 4K device to your computer, laptop or notebook.
3. Open the AV.io Config tool.



4. Select your AV.io 4K device from the list under the Devices heading.



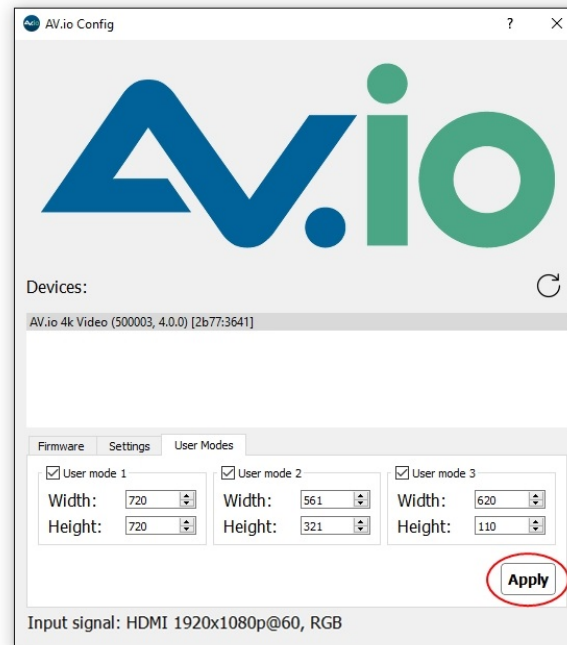
If your video grabber is not displayed, press the Refresh icon to refresh the list of connected devices.



5. Click the **User modes** tab; the User modes page appears.



6. To create a custom resolution, click the check box for one of the user modes. The grayed-out area becomes open for changes.
7. Select the text box labeled **Width**, erase the number that is currently in the box, and type out the width of the custom resolution you wish to use. Then do the same for the resolution height in the text box labeled **Height**.
8. Click **Apply**; The custom resolution you defined will now be added to the list of output resolutions that you are allowed to select from the settings menu from the third-party application of your choice.



9. If needed, you may follow the same process for **User mode 2** and **User mode 3**. If all three are checked and applied, all three custom resolutions selected will appear in the list of resolutions. You may change the definition of any of these three resolutions at any time.

There are two scenarios in which this feature will not perform as expected.

1. Not all third-party applications are able to support custom resolutions. AV.io 4K will send the custom resolution to the application, but if it is unable to use the resolution, the application will override any AV.io 4K custom capture settings.
2. In a Windows environment, due to restrictions set by Microsoft's Windows Hardware Quality Labs certification, most graphics adapters or drivers will not output resolutions not included in the EDID file of the connected display device. In the scenario where a resolution that is not included in the AV.io 4K standard resolution is requested, the Graphics adapter and driver will apply the resolution requested and then upscale it to AV.io 4K's default resolution. This means the **User modes** feature will not add the custom resolutions to the UVC descriptor and the capture software will be limited to the pre-defined resolutions.

Outside of these restrictions, the feature is recommended in any scenario where you wish to use a custom output resolution.

# Appendices

The following appendices are included in this section:

- [Troubleshooting](#)
- [Limitations and known issues](#)
- [Releases and features](#)

# Troubleshooting

Use the follow table for help if you are experiencing problems or unexpected behavior from your AV.io 4K.

Symptom(s)	Action(s) to resolve
Device not detected after interrupted firmware update	(Windows only) When in the config tool press F12 to enter firmware recovery mode, then select a firmware file and click update to forcibly reflash the capture card.
Applications cannot open the capture card when a custom UVC mode is set	Please make sure that the card is connected via USB 3.0 for all modes to be valid; only low frame rate modes are valid when connecting via USB 2.0

Affecting all operating systems

Symptom(s)	Action(s) to resolve
Frame rates lower than 30 fps at 4K resolutions	<p>1) Optimize performance by using an Intel USB host controller.</p> <p>2) Use your application to change the color space you are using. At 4K resolutions, NV12 and I420 (4:2:0) are available at 15, 23.97, 24, 25, 29.97, or 30 fps, and YUY2 (4:2:2) is available at 5, 10, 15, or 20 fps.</p>

Affecting Windows

Symptom(s)	Action(s) to resolve
Incorrect input resolutions detected	If using <b>Windows 8.1 or 10</b> with <b>VLC Media Player 2.2.1</b> , downgrade to an earlier version of VLC or use a different capture application, such as Adobe FMLE.
Not able to capture UHD resolutions at 30 fps when using VLC	VLC does not support the NV12 (4:2:0) colorspace. 4K must be captured in either the YUY2 (4:2:2) colorspace, which will reduce the frame rate to 20 fps, or I420 (4:2:0) which will allow you to capture at speeds of up to 30 fps.
Audio artifacts are present (popping, missing audio, poorly encoded audio, etc).	<p>If using <b>Windows 8.1 or 10</b> with <b>VLC Media Player 2.2.1</b>, downgrade to an earlier version of VLC or use a different capture application, such as Adobe FMLE.</p> <p>OR</p>

	If using <b>Windows 8.1 or 10</b> with <b>Skype for Business</b> , use a different capture application, such as Adobe FMLE.
Captured video file displays black screen when opened.	If capturing on <b>Windows 8.1</b> using <b>Windows Movie Maker</b> with your AV.io 4K connected to an <b>Etron EJ188H USB 3.0/2.0 host controller</b> , switch to a different capture application, connect to a different USB port, or upgrade to Windows 10.
Recorded file does not have audio.	If capturing on <b>Windows 8.1</b> using <b>Windows Camera</b> with your AV.io 4K connected to a <b>Texas Instruments TSub USB 3.0 controller</b> , switch to a different capture application (such as VLC Media Player) or upgrade to Windows 10.
Firmware update fails	If updating on a computer running Windows <b>8.1 or 10</b> with your AV.io 4K connected to an <b>Etron 3.0 host controller</b> , perform the firmware update on another computer (without an Etron USB host controller) or using another USB port on the same computer. Note that USB 2.0 can be used for firmware updates.

## Affecting Mac

Symptom(s)	Action(s) to resolve
Recorded file does not have audio.	If using <b>VLC Media Player 2.2.1</b> , downgrade to an earlier version or use a different capture application, such as Quicktime.
Quicktime crashes when using a frame grabber to record video in MacOS 10.12	This issue is with the Operating System itself, and affects all brands of video grabbers. Quicktime is able to show a preview of the recording, but then sometimes crashes as soon as the recording starts. This problem can be circumvented by selecting the Maximum Quality Recording option in the Quicktime drop-down menu.

## Affecting Ubuntu

Symptom(s)	Action(s) to resolve
Video cannot be resumed if stopped during a Skype call.	If capturing on <b>Ubuntu 14.04 LTS</b> with your AV.io 4K connected to an <b>Etron EJ168A USB 3.0 controller</b> , switch to a different USB port or simply avoid stopping the Skype call. If it is not possible to stop the Skype call or if it stops accidentally,

	disconnect and reconnect the device. You may need to restart the video call.
--	--

## Affecting Chromebook

Symptom(s)	Action(s) to resolve
AV.io 4K is not detected as a valid audio device.	If capturing using <b>Chromebook Apps Clipchamp</b> and <b>WebRTC</b> on Google <b>Chrome OS v43.0.2357.125 (64 bit)</b> , use a different Chromebook app to capture both video and audio, such as Screencastify or MediaCore Capture.



# Limitations and known issues

This section includes known issues or limitations that affect functionality or usability. It also has ways that you can work around these limitations.

## Affecting Asmedia USB 3.0 controller ASM3142

- There is an issue that presents as an audio problem when using this USB 3.0 controller
  - **Workaround:** Update the driver for the USB controller

## Affecting systems with an AMD Ryzen 7 CPU

- There is an issue that presents as an audio problem when using older drivers
  - **Workaround:** Update the chipset drivers for your CPU.

## Affecting all operating systems

- **UVC-314:** With the exception of the first capture after system reboot, the very first captured frame is always green.
  - **Workaround:** Remove the green frame in post-production editing. If streaming the captured video, begin streaming after the initial green frame has already been captured.
- **UVC-451:** When using an Eltron EJ198 USB 3.0 host controller via USB 3.0 cable, several error messages might appear. These should not affect the functionality of the device.
  - **Workaround:** If the problem does affect functionality, a different USB 3.0 host controller must be used.
- **UVC-438:** When capturing from a source at 720p, 50 fps will occasionally detect as 51 fps, and when capturing at 1600×1200, 60 fps will occasionally detect as 61 fps.
  - **Workaround:** None necessary. This often occurs due to inherent inaccuracies in rounding decimal point fps rate to whole numbers. The reading is still accurate to your expected rate.
- **UVC-346:** When capturing from a source with a 23.98p, 29.97p or 59.94i signal, frame rate occasionally dips before returning to its original capture rate.
  - **Workaround:** Set your source frame rate to a different value, such as 30 or 60 fps.
- **UVC-576:** The grabber does not capture video from monitors with resolutions of 1920×1080p at 144Hz or higher.
  - **Workaround:** Resolutions of 1920×1080p at 144Hz exceed the hardware limits of the grabber. There is no workaround.

## Affecting Windows

- **UVC-270:** Windows 10: Sometimes, Windows 10 will not recognize the grabber properly when connected by a Fresco FL1100 USB 3.0 controller.
  - **Workaround:** Press the refresh icon to refresh the device list or unplug and reconnect the USB. If neither of these work, a different USB 3.0 host controller might be required.
- **UVC-390:** Windows 8.1: On rare occasions (< 5% of the time), captured video has a small vertical fluctuation (of a few pixels) or small artifacts in the lower right quadrant of the screen. This is noticeable

right from the beginning of capture.

- **Workaround:** Start capturing a few moments before your recording or streaming event and check vertical position and the lower right quadrant of the captured image. If any issues are noticed, disconnect and re-connect AV.io 4K's USB 3.0 cable to the capture computer.

#### Affecting Mac

- Your grabber works best with systems that are running the latest version of the Mac OS. If your system is running an older version and you experience issues with your grabber, we recommend that you update your system to the latest Mac OS.
- **UVC-613:** VLC doesn't play audio for video that is captured using AV.io 4K when connected to a USB 2.0 port on the Mac.
  - **Workaround:** Use another media player such as QuickTime.
- **UVC-450:** Device does not boot when connected to Mac USB 3.0 port with USB 2.0 cable.
  - **Workaround:** Wait for 20-30 seconds. If device still does not boot, it will be necessary to use the USB 3.0 cable.

#### Affecting Ubuntu

- **UVC-454:** When saving settings, device does not seem to save changes.
  - **Workaround:** The most likely cause is caching. After saving changes, wait 10-15 seconds before rebooting, turning off or unplugging your device.
- **UVC-601:** The grabber doesn't capture audio and video when using an AMD Ryzen™ 3.0 USB host controller on Ubuntu.
  - **Workaround:** A different USB 3.0 host controller must be used.

# Releases and features

This section outlines the features introduced with AV.io 4K firmware releases.

## Release 3.1.0 features

---

- I420 Color space

The I420 and YV12 color spaces give increased functionality at 4K resolutions, ensuring that AV.io 4K is compatible with a greater number of third-party softwares. Read more details in the [Resolutions, aspect ratios, and capture rates](#) and [Technical specifications](#) sections.

- New default resolutions

Several new default output resolutions were added, namely 1920×1200, 2048×1024, 2560×1440, 2560×1600 and 3200×1800. Read more details in the [Resolutions, aspect ratios, and capture rates](#) and [Technical specifications](#) sections.

- Use input signal resolution button

Previous versions of AV.io Config software have allowed for you to pass through the resolution of your input source as the resolution of the output source, but 3.1.0 has some updates on how this works. See [Advanced Settings](#) for more details.

- Custom resolution creation

You can now create a list of up to three custom resolutions that can be used as output formats. You can add these in the [Set custom resolution user modes](#) tab of the AV.io Config software.

- Significant changes to limitations, known issues and troubleshooting

Many changes have been made since the last firmware release for AV.io 4K. There have been lots of improvements to the efficiency and functionality. See [Limitations and known issues](#) and [Troubleshooting](#) for more details.

# Software license

ATTENTION: THE SOFTWARE AND DOCUMENTATION PROVIDED UNDER THIS AGREEMENT ARE BEING LICENSED TO YOU BY EPIPHAN SYSTEMS INC. ("LICENSOR") AND ARE NOT BEING SOLD. THIS AGREEMENT CONTAINS LIMITATIONS ON REPRESENTATIONS, WARRANTIES, CONDITIONS, REMEDIES, AND LIABILITIES THAT ARE APPLICABLE TO THE SOFTWARE AND DOCUMENTATION.

## Epiphan Systems Inc.

### Software License

IMPORTANT: BEFORE DOWNLOADING, INSTALLING, OR USING THE SOFTWARE AND DOCUMENTATION, PLEASE CAREFULLY READ THIS AGREEMENT WHICH CONTAINS THE TERMS AND CONDITIONS UNDER WHICH YOU ARE ACQUIRING A LICENSE TO USE THE SOFTWARE AND DOCUMENTATION. IF YOU DO NOT ACCEPT THE TERMS AND CONDITIONS OF THIS AGREEMENT PLEASE DO NOT DOWNLOAD, INSTALL, OR USE THE SOFTWARE AND DOCUMENTATION AND PROMPTLY RETURN OR DESTROY THE SOFTWARE AND DOCUMENTATION. IF YOU DOWNLOAD, INSTALL, OR USE THE SOFTWARE AND/OR DOCUMENTATION, YOU WILL HAVE ACCEPTED AND AGREED TO THESE TERMS AND CONDITIONS. THE SOFTWARE, HARDWARE AND DOCUMENTATION ARE ALSO PROTECTED BY COPYRIGHT LAWS AND INTERNATIONAL COPYRIGHT TREATIES, AS WELL AS OTHER INTELLECTUAL PROPERTY LAWS. IF YOU ARE AN AGENT OR EMPLOYEE OF AN ENTITY, YOU REPRESENT AND WARRANT THAT (I) THE INDIVIDUAL ACCEPTING THIS AGREEMENT IS DULY AUTHORIZED TO ACCEPT THIS AGREEMENT ON SUCH ENTITY'S BEHALF AND TO BIND SUCH ENTITY, AND (II) SUCH ENTITY HAS FULL POWER, CORPORATE OR OTHERWISE, TO ENTER INTO THIS AGREEMENT AND PERFORM ITS OBLIGATIONS UNDER THIS AGREEMENT.

**1. Definitions:** In this Agreement:

**"Agreement"** means this Epiphan Systems Inc. Software License;

**"API"** means an application programming interface;

**"Documentation"** means the technical publications delivered to You with the Software relating to the installation and operation of the Software and/or Hardware, such as reference, user, installation, and technical guides and release notes;

**"Epiphan"** means Epiphan Systems Inc.;

**"Epiphan Hardware Product"** means an Epiphan hardware product (including enclosure and mechanical parts, circuitry and electrical and electronic components contained therein) purchased by You, which is intended to be used in conjunction with the licensed Software and Documentation;

**"License Key"** means a series of computer-generated characters used for the purpose of controlling the operation of Epiphan Hardware Products and/or related Software;

**"Software"** means the Licensor binary and/or bytecode software and/or firmware programs that are (i) specified in Your Order or that are included with or in the Epiphan Hardware Products specified in Your Order, (ii) are made available to You for download after acceptance of this Agreement, (iii) are packaged with this Agreement, (iv) pre-installed on Epiphan Hardware Products, (v) embedded with this Agreement in their installer(s) and which are installed after acceptance of this Agreement, or (vi) embedded with this Agreement in their product documentation. Software also includes the related Documentation;

**"You" or "Your"** means the individual acquiring the Software license or any entity on whose behalf such individual is acting. In the case of an entity, "You" includes any entity that by majority voting interest controls, is controlled by, or is under common control with You; and

**"Your Order"** means (i) the web forms provided by Epiphan or its applicable reseller or distributor for ordering Epiphan Hardware Products and related Software licenses, or (ii) written documents executed by Epiphan, or one of its resellers or distributors, and You in respect to Your purchases of Epiphan Hardware Products and/or related Software licenses.

**2. Grant of Software License:** Subject to the terms and conditions of this Agreement, including payment of any applicable fees specified in Your Order, Licensor grants You a non-exclusive, non-transferable, non-sublicensable, internal license to use the number of copies of the Software specified in Your Order and to use the Software functions specified in Your Order solely for operation on the Epiphan Hardware Products for which such Software has been designed as specified in the Documentation for such Software. If the number of copies of Software is not specified in Your Order, then the number of copies shall be a reasonable number of copies. You acknowledge and agree that the ability to use certain Software functions is controlled by a Licensing Key and that You will not be able to use such functions unless You have paid the applicable fees charged by Epiphan for the right to use such functions and to receive a Licensing Key to enable such functions. For functions

that are controlled by a Licensing String You shall only use that Licensing String with the copy of the Software for which it was issued and You shall not use that copy of the Licensing String with any other copies of the Software that You may have or make. All copies of the Software made by You shall include all trademarks, copyright notices, restricted rights legends, proprietary markings, and the like, exactly as they appear on the copy of the Software originally provided to You. No other rights in the Software or Documentation are granted to You.

**3. Open Source Software:** Binary, bytecode and source code versions of certain open source software packages may be embedded in or distributed with the Software ("Open Source Software"). If a separate license agreement for an item of open source software is: delivered to You with the Software; included in the download package for the Software; referenced in any material (including the Documentation) that is included in the download or distribution package for the Software; or listed at [www.epiphan.com/opensource](http://www.epiphan.com/opensource), then such open source software shall be Open Source Software and such separate license agreement shall govern Your use of that item or version of such open source software. The Open Source Software may include free software (i.e. software licensed under the GNU Lesser General Public License or other free software licenses) for which the applicable free software license may also require that the source code for such free software be made available to those receiving only executable versions of such free software. If the source code for any free software distributed with the Software is not provided with the Software, then upon request, within a three (3) year period from the original receipt of the binary or bytecode version of such Open Source Software from the Licensor, for a fee that shall not exceed the Licensor's costs associated with the shipping of the source code for such free software, the Licensor will provide a copy of the source code for such free software to You.

**4. Restrictions:** The terms set forth in this Section 4 are additional conditions to the licenses granted in Section 2. Your right to use the Software is conditional upon Your timely payment of the full amount of fees due for: (i) the Epiphan Hardware Product(s) on which You want to use the Software; (ii) all support agreements You have entered into with the Licensor or any of its distributors and/or resellers; and (iii) the licensed Software and Documentation.

You shall not reverse engineer, disassemble, reverse translate, decompile or in any other manner decode any Epiphan Hardware Product or Software except to the extent the Software is distributed with any Open Source Software that prohibits the imposition of such a restriction or to the extent the foregoing restriction is expressly prohibited by applicable law notwithstanding a contractual obligation to the contrary. You acknowledge and agree that no rights in respect to the source code of the Software are granted to You. You acknowledge and agree that the rights in respect to use of the Software and Documentation are granted only for use in conjunction with Epiphan Hardware Products. You shall not distribute, lease, rent, grant a security interest in, assign, or otherwise transfer the Software except as expressly provided in this Agreement. You shall not modify or create any derivative works of the Software or merge all or any part of the Software with another program. Notwithstanding the foregoing, You may call public APIs made available by Epiphan in the Software from applications developed by or on Your behalf provided that such applications do not embed any of the Software other than the minimum linkage materials required to call separately running instances of the Software. You shall not use the Software or make the Software available to any third parties as part of any service bureau, time sharing service, application service provider offering, software-as-a-service offering or any other managed service offering. You shall not disclose any performance, benchmarking, or feature-related information about the Software. You further agree not to disclose, transfer or otherwise provide to any third party any portion of the Software, except as expressly permitted herein.

Some Epiphan Hardware Products and Software embed third-party APIs that integrate with third-party services ("Third-Party Services") to allow users of such Epiphan Hardware Products and Software to interact with such Third-Party Services for various capabilities offered by such Third-Party Services, such as, and without limitation, authentication, uploading and downloading of video content and other features made available by such Third-Party Services. If You access or use any Third-Party Service and/or related APIs using an Epiphan Hardware Product and/or the Software then You shall comply with all of the terms and conditions for such Third-Party Service and/or related APIs.

**5. Disclaimer of Warranties:** EXCEPT FOR ANY WARRANTIES THAT MAY BE PROVIDED IN ANY COMMERCIAL AGREEMENT EXECUTED BETWEEN YOU AND LICENSOR (OR BETWEEN YOU AND ONE OF LICENSOR'S RESELLERS OR DISTRIBUTORS), THE EPIPHAN HARDWARE PRODUCTS, SOFTWARE AND/OR DOCUMENTATION ARE PROVIDED "AS IS", WITHOUT ANY REPRESENTATIONS, CONDITIONS, AND/OR WARRANTIES OF ANY KIND. WITHOUT LIMITATION, LICENSOR AND ITS AFFILIATES AND ITS AND THEIR LICENSORS, SUPPLIERS, SUBCONTRACTORS, RESELLERS AND DISTRIBUTORS DISCLAIM ANY AND ALL IMPLIED REPRESENTATIONS, CONDITIONS AND/OR WARRANTIES OF MERCHANTABILITY, MERCHANTABILITY, NON-INFRINGEMENT, DURABILITY, COMPATIBILITY, TITLE, SATISFACTORY QUALITY AND/OR FITNESS FOR A PARTICULAR PURPOSE WHETHER ARISING BY STATUTE, COURSE OF DEALING, USAGE OF TRADE OR OTHERWISE. EXCEPT AS OTHERWISE EXPRESSLY PROVIDED IN ANY COMMERCIAL AGREEMENT EXECUTED BETWEEN YOU AND LICENSOR (OR BETWEEN YOU AND ONE OF LICENSOR'S RESELLERS OR DISTRIBUTORS), THE ENTIRE RISK OF THE USE OF THE EPIPHAN HARDWARE PRODUCTS, SOFTWARE AND/OR DOCUMENTATION SHALL BE BORNE BY YOU. EXCEPT AS OTHERWISE EXPRESSLY PROVIDED IN ANY COMMERCIAL AGREEMENT EXECUTED BETWEEN YOU AND LICENSOR (OR BETWEEN YOU AND ONE OF LICENSOR'S RESELLERS OR DISTRIBUTORS), NEITHER LICENSOR NOR ANY OF ITS AFFILIATES NOR ANY OF



ITS OR THEIR LICENSORS, SUPPLIERS, SUBCONTRACTORS, RESELLERS AND/OR DISTRIBUTORS MAKE ANY REPRESENTATIONS OR PROVIDE ANY CONDITIONS AND/OR WARRANTIES ABOUT THE SUITABILITY OF THE EPIPHAN HARDWARE PRODUCTS, SOFTWARE, SERVICES AND/OR DOCUMENTATION. NEITHER LICENSOR NOR ANY OF ITS AFFILIATES NOR ANY OF ITS OR THEIR LICENSORS, SUPPLIERS, SUBCONTRACTORS, RESELLERS AND/OR DISTRIBUTORS MAKE ANY REPRESENTATIONS OR PROVIDE ANY CONDITIONS AND/OR WARRANTIES WHATSOEVER ABOUT ANY INFORMATION AND/OR DATA THAT MAY BE PROCESSED BY OR MADE AVAILABLE USING ANY EPIPHAN HARDWARE PRODUCT AND/OR SOFTWARE OR ABOUT ANY THIRD-PARTY SERVICE THAT MAY BE ACCESSIBLE USING ANY EPIPHAN HARDWARE PRODUCT AND/OR SOFTWARE.

**6. LIMITATION OF LIABILITY:** NEITHER LICENSOR NOR ANY OF ITS AFFILIATES NOR ANY OF ITS OR THEIR LICENSORS, SUPPLIERS, SUBCONTRACTORS, RESELLERS AND/OR DISTRIBUTORS SHALL HAVE ANY LIABILITY TO YOU OR ANY OTHER PERSON OR ENTITY FOR ANY DAMAGES ARISING FROM THIS AGREEMENT, RELATING TO THE HARDWARE, SOFTWARE OR DOCUMENTATION, OR RELATING TO ANY SERVICES PROVIDED TO YOU BY LICENSOR (INCLUDING ITS AFFILIATES AND THEIR LICENSORS, SUPPLIERS, SUBCONTRACTORS, RESELLERS AND/OR DISTRIBUTORS) IN RELATION TO THE EPIPHAN HARDWARE PRODUCTS, SERVICES, SOFTWARE AND/OR DOCUMENTATION FOR ANY INDIRECT, RELIANCE, INCIDENTAL, SPECIAL, PUNITIVE, EXEMPLARY OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF REVENUE OR PROFIT, LOSS OF OR DAMAGE TO DATA, BUSINESS INTERRUPTION, LOSS OF DATA, REPLACEMENT OR RECOVERY COSTS, OR OTHER COMMERCIAL OR ECONOMIC LOSS, WHETHER ARISING FROM CONTRACT, EQUITY, TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR ANY OTHER THEORY OF LIABILITY, EVEN IF LICENSOR (INCLUDING ITS AFFILIATES AND THEIR LICENSORS, SUPPLIERS, SUBCONTRACTORS, RESELLERS AND/OR DISTRIBUTORS) HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, OR THEY ARE FORESEEABLE. THE LIMITATIONS IN THIS SECTION SHALL APPLY WHETHER OR NOT THE ALLEGED BREACH OR DEFAULT IS A BREACH OF A FUNDAMENTAL CONDITION OR TERM OR FUNDAMENTAL BREACH. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, SO THESE LIMITATIONS MAY NOT APPLY TO YOU. IN NO EVENT SHALL THE TOTAL CUMULATIVE LIABILITY OF LICENSOR (INCLUDING ITS AFFILIATES AND ITS AND THEIR LICENSORS, SUPPLIERS, SUBCONTRACTORS, RESELLERS AND DISTRIBUTORS) TO YOU OR ANY OTHER PERSON OR ENTITY FOR ANY DAMAGES ARISING FROM THIS AGREEMENT, RELATING TO THE EPIPHAN HARDWARE PRODUCTS, SOFTWARE, DOCUMENTATION AND/OR RELATING TO ANY SERVICES PROVIDED TO YOU BY LICENSOR (INCLUDING ITS AFFILIATES AND ITS AND THEIR LICENSORS, SUPPLIERS, SUBCONTRACTORS, RESELLERS AND DISTRIBUTORS) IN RELATION TO THE EPIPHAN HARDWARE PRODUCTS, SOFTWARE AND/OR DOCUMENTATION, EXCEED THE LICENSE FEES PAID BY YOU FOR THE SOFTWARE.

NOTWITHSTANDING ANY OTHER PROVISION IN THIS AGREEMENT, NEITHER LICENSOR NOR ANY OF ITS AFFILIATES OR ITS OR THEIR LICENSORS, SUPPLIERS, SUBCONTRACTORS, RESELLERS AND/OR DISTRIBUTORS SHALL HAVE ANY LIABILITY TO YOU OR ANY OTHER PERSON OR ENTITY WHATSOEVER IN RESPECT TO ANY DIRECT, INDIRECT, RELIANCE, INCIDENTAL, SPECIAL, PUNITIVE, EXEMPLARY OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF REVENUE OR PROFIT, LOSS OF OR DAMAGE TO DATA, BUSINESS INTERRUPTION, LOSS OF DATA, REPLACEMENT OR RECOVERY COSTS, OR OTHER COMMERCIAL OR ECONOMIC LOSS, ARISING FROM OR RELATING TO ANY INFORMATION AND/OR DATA THAT MAY BE PROCESSED BY OR MADE AVAILABLE USING ANY EPIPHAN HARDWARE PRODUCT AND/OR SOFTWARE OR ARISING FROM OR RELATING TO ANY THIRD-PARTY SERVICE THAT MAY BE ACCESSIBLE USING ANY EPIPHAN HARDWARE PRODUCT AND/OR SOFTWARE.

THE DISCLAIMER OF REPRESENTATIONS, WARRANTIES AND CONDITIONS AND LIMITATION OF LIABILITY CONSTITUTE AN ESSENTIAL PART OF THIS AGREEMENT. YOU ACKNOWLEDGE THAT, BUT FOR THE DISCLAIMER OF REPRESENTATIONS, WARRANTIES AND CONDITIONS AND LIMITATION OF LIABILITY, NEITHER LICENSOR NOR ANY OF ITS AFFILIATES OR ITS OR THEIR LICENSORS, SUPPLIERS, RESELLERS OR DISTRIBUTORS WOULD GRANT THE RIGHTS GRANTED IN THIS AGREEMENT.

**7. Term and Termination:** This Agreement shall continue for as long as You use the Software; however, it may be terminated sooner as provided in this Section 7. You may terminate this Agreement by destroying all copies of the Software and Documentation under Your control and providing certification of such destruction to Licensor or by returning the Software to Licensor. Licensor may terminate this Agreement immediately by providing You with written notice if: (a) You are in material breach of any provision of this Agreement, which breach, if capable of being cured, is not cured within thirty (30) days after Licensor gives You written notice thereof; or (b) You have committed a non-curable material breach of this Agreement. Upon termination You shall destroy all copies of the Software and Documentation. In addition to this Section, the Sections entitled Definitions, Disclaimer of Warranties, Limitation of Liability, Title, Indemnities, High-Risk Activities, Intellectual Property, and General shall continue in force even after any termination of this Agreement. No termination of this Agreement will entitle You to a refund of any amounts paid by You to Licensor or any reseller or distributor or affect any obligations You may have to pay

any outstanding amounts owing to Licensor or any reseller or distributor. Upon any termination of this Agreement, Your license to the Software and Documentation will terminate and You shall destroy all copies of the Software and Documentation under Your control and certify such destruction to Licensor.

**8. Support and Updates:** This Agreement does not grant You the right to any updates or enhancements of the Software or the right to receive any technical support for the Software. Such updates and other technical support services, if available, may be purchased separately from Licensor or one of Licensor's resellers or distributors. Use of any updates or enhancements to the Software provided pursuant to any technical support You may procure from Licensor or one of Licensor's resellers or distributors shall be governed by the terms and conditions of this Agreement. Licensor reserves the right at any time not to release or to discontinue the release of any Software and to alter prices, features, specifications, capabilities, functions, licensing terms, release dates, general availability or other characteristics of the Software.

**9. Title:** All right, title, and interest (including all intellectual property rights) in, to, and under the Software (including all copies thereof) shall remain with Licensor and its licensors.

**10. Indemnities:** You shall indemnify, defend and hold Licensor, its affiliates, its and their licensors, suppliers, subcontractors, resellers and/or distributors and all of the directors, officers, employees of all of the foregoing (collectively the "Indemnified Parties") harmless from and against any damages, losses, liabilities, expenses, costs, claims, demands, actions, suits and/or proceedings incurred by the Indemnified Parties as a result of (i) Your use of the Epiphan Hardware Products, Software and/or Documentation, (ii) any use of the Epiphan Hardware Products, Software and/or Documentation on Your behalf, (iii) the use of the Epiphan Hardware Products, Software and/or Documentation by anyone to whom You give the Epiphan Hardware Products, Software and/or Documentation, and/or (iv) the use of the Epiphan Hardware Products, Software and/or Documentation on behalf of anyone to whom You give the Epiphan Hardware Products, Software and/or Documentation, including, without limitation, in all of the foregoing cases, any damages, losses, liabilities, expenses, costs, claims, demands, actions, suits and/or proceedings arising from or relating to any information and/or data that may be processed by or made available using any Epiphan Hardware Product and/or Software or arising from or relating to any Third-Party Service that may be accessible using any Epiphan Hardware Product and/or Software (collectively, each matter falling within any of the foregoing, a "Claim"), including, without limitation, indemnifying, defending and holding the Indemnified Parties harmless from and against any settlements agreed by You in connection with any Claims and/or any damages, costs or other amounts (including reasonable attorneys' fees) awarded to a third party against any of the Indemnified Parties by a court or tribunal of competent jurisdiction in respect to any Claim. If You do not defend in a timely manner against or resist a Claim after notice from Licensor, Licensor shall be entitled to investigate, defend, compromise, settle, or otherwise dispose of the Claim, and incur costs in connection therewith, at Your expense, in such manner as Licensor deems in its best interests until a reasonable time after You comply with its obligations under this Section 10. You shall not enter into a settlement of any Claim without the Licensor's written consent unless such settlement is solely for monetary payment by You and contains an express, complete, unconditional release of all of the Indemnified Parties and which does not impose any obligations or restrictions on any of the Indemnified Parties.

**11. High-Risk Activities:** The Software and Epiphan Hardware Products are not fault-tolerant and are not designed, manufactured or intended for use in or in conjunction with on-line control equipment in hazardous environments requiring fail-safe performance, such as in the operation of nuclear facilities, aircraft navigation systems, air traffic control, or direct life support machines. Licensor, its licensors, suppliers, subcontractors, resellers and distributors specifically disclaim any express or implied representations, warranties and/or conditions for such uses.

**12. U.S. Government End-Users:** The Software and Documentation are each a "commercial item" as that term is defined at FAR 2.101, consisting of "commercial computer software" and "commercial computer software documentation" as such terms are defined in FAR 12.212, and are provided to the U.S. Government only as commercial end items. Government end users acquire the rights set out in this Agreement for the Software, Epiphan Hardware Products and Documentation consistent with: (i) for acquisition by or on behalf of civilian agencies, the terms set forth in FAR 12.212; or (ii) for acquisition by or on behalf of units of the Department of Defense, the terms set forth in DFARS 227.7202. Use of the Epiphan Hardware Products, Software and Documentation is further restricted by the terms and conditions of this Agreement and the applicable commercial purchase agreement for the Epiphan Hardware Products. For the purposes of any applicable government use, the Epiphan Hardware Products, Software and Documentation were developed exclusively at private expense, and are trade secrets of Epiphan Systems Inc. for the purpose of any Freedom of Information legislation or any other disclosure statute, regulation or provision.

**13. Export Restrictions:** The Epiphan Hardware Products, Software, Documentation and related information are subject to export and import restrictions. By downloading, installing, or using the Software, Epiphan Hardware Products, Documentation and/or related information, You are representing and warranting that You are not located in, are not under the control of, and are not a national or resident of any country to which the export of the Epiphan Hardware Products, Software, Documentation and/or related information would be prohibited by the laws and/or regulations of Canada or the United States. You are also representing and warranting that You are not an individual to whom the export of the Epiphan Hardware Products, Software, Documentation or related information would be prohibited by the laws and/or regulations of Canada or the United States. You

shall comply with the export laws and regulations of Canada and the United States that are applicable to the Epiphan Hardware Products, Software, Documentation and related information and You shall also comply with any local laws and/or regulations in Your jurisdiction that may impact Your right to export, import, or use the Epiphan Hardware Products, Software, Documentation or related information, and You represent and warrant that You have complied with any such applicable laws and/or regulations. The Epiphan Hardware Products, Software, Documentation and related information shall not be used for any purposes prohibited by export laws and/or regulations, including, without limitation, nuclear, chemical, or biological weapons proliferation. You shall be responsible for procuring all required permissions for any subsequent export, import, or use of the Epiphan Hardware Products, Software, Documentation or related information.

**14. Intellectual Property:** Epiphan, Epiphan Systems and Epiphan Video are tradenames, trademarks or registered trademarks of Epiphan Systems Inc. in certain countries. All Licensor product names and logos are trademarks or registered trademarks of Epiphan Systems Inc. in certain countries. All other company and product names and logos are trademarks or registered trademarks of their respective owners in certain countries. You shall not disclose, transfer or otherwise provide to any third party any portion of the Software, except as expressly permitted in this Agreement.

**15. General:** This Agreement is the entire agreement between You and Licensor in respect to the Software, superseding any other agreements or discussions, oral or written. The terms and conditions of this Agreement shall prevail over any pre-printed terms on any quotes, orders, purchase orders, or purchase order acknowledgements, and shall prevail over any other communications between the parties in relation to the Software. You may not assign this Agreement whether voluntarily, by operation of law, or otherwise without Licensor's prior written consent. Licensor may assign this Agreement at any time without notice. The failure of a party to claim a breach of any term of this Agreement shall not constitute a waiver of such breach or the right of such party to enforce any subsequent breach of such term. If any provision of this Agreement is held to be unenforceable or illegal, such decision shall not affect the validity or enforceability of such provisions under other circumstances or the remaining provisions of this Agreement and such remaining provisions shall be reformed only to the extent necessary to make them enforceable under such circumstances. This Agreement shall be governed by the laws of the Province of Ontario and the laws of Canada applicable therein. No choice or conflict of laws rules of any jurisdiction shall apply to this Agreement. You shall only be entitled to bring any action or proceeding arising out of or relating to this Agreement, the Epiphan Hardware Products, Software, Documentation or any services provided in respect to the Epiphan Hardware Products, Software and/or Documentation in a court in Ottawa, Ontario, Canada, and You consent to the jurisdiction of such courts for any such action or proceeding. You waive all rights that You may have or that may hereafter arise to contest the jurisdiction of such courts for any action or proceeding brought by You. You hereby waive any right You may have to request a jury trial with respect to any action brought by You in connection with this Agreement, the Epiphan Hardware Products or Software or any services provided in respect to the Epiphan Hardware Products or Software. The application of the United Nations Convention on Contracts for the International Sale of Goods to this Agreement is expressly excluded.

## Environmental Information

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

## Important Safety Warnings

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

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

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

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

## FCC Compliance Statement

47 CFR Section 2.1077 Compliance Information

Unique identifier: AV.io 4K



This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

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

Responsible party (US contact):

Epiphan Video  
459 Hamilton Avenue, Suite 301  
Palo Alto, CA  
94301, USA

[www.Epiphan.com](http://www.Epiphan.com)

## FCC CAUTION

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

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

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

## Innovation, Science and Economic Development Canada:

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

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

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

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

## CE Compliance Statement

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

Directive 2014/30/EU - Electromagnetic Compatibility

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



## Other Jurisdictional Issues

Epiphan makes no representation that its products or information in this document or its web site are appropriate or available for use in your jurisdiction. Those who choose to access the Epiphan web site or use Epiphan products do so on their own initiative and are responsible for compliance with local laws, if and to the extent local laws are applicable

### **Submissions to Epiphan and Affiliated Servers**

Any information, including but not limited to remarks, suggestions, ideas, graphics, or other submissions, communicated to Epiphan through their Epiphan web site is the exclusive property of Epiphan. Epiphan is entitled to use any information submitted for any purpose, without restriction (except as stated in Epiphan's Privacy Statement) or compensation to the person sending the submission. The user acknowledges the originality of any submission communicated to Epiphan and accepts responsibility for its accuracy, appropriateness, and legality.

### **Third Parties and Links to Third-Party Web Sites**

Mention of non-Epiphan Systems Inc. products or services on their website, or this document site is for informational purposes and does not constitute an endorsement or recommendation.

This document may contain links to non-Epiphan web sites. These links are provided to you as a convenience, and Epiphan is not responsible for the content of any linked web site. Any outside web site accessed from the Epiphan web site is independent from Epiphan, and Epiphan has no control over the content of that web site. In addition, a link to any non-Epiphan web site does not imply that Epiphan endorses or accepts any responsibility for the content or use of such a web site.

In no event shall any reference to any third party or third party product or service be construed as an approval or endorsement by Epiphan of that third party or of any product or service provided by a third party.

### **Miscellaneous**

It is the user's responsibility to ascertain whether any information downloaded from the Epiphan web site or other websites is free of viruses, worms, trojan horses, or other items of a potentially destructive nature.

### **Enforcement of Terms and Conditions**

These Terms and Conditions for use of this document and the associated Epiphan Product are governed and interpreted pursuant to the laws of the province of Ontario, Canada, notwithstanding any principles of conflicts of law.

All disputes arising out of or relating to these Terms and Conditions shall be finally resolved by arbitration conducted in the English language in Ottawa, Ontario, Canada under the commercial arbitration rules of Canada. The parties shall appoint as sole arbitrator a retired judge who presided in the province of Ontario. The parties shall bear equally the cost of the arbitration (except that the prevailing party shall be entitled to an award of reasonable attorneys' fees incurred in connection with the arbitration in such an amount as may be determined by the arbitrator). All decisions of the arbitrator shall be final and binding on both parties and enforceable in any court of competent jurisdiction. Notwithstanding this, application may be made to any court for a judicial acceptance of the award or order of enforcement. Notwithstanding the foregoing, Epiphan shall be entitled to seek injunctive relief, security, or other equitable remedies from any court of competent jurisdiction.

If any part of these terms is unlawful, void, or unenforceable, that part will be deemed severable and will not affect the validity and enforceability of the remaining provisions. Epiphan may, at its sole discretion and without notice, revise these terms at any time by updating this posting.

Copyright © 2022 Epiphan Systems Inc.

All Rights Reserved.

© and ™ 2022, Epiphan Systems, Inc.