# BioVID Cameras

## BVC-4K16-CMT3　　　BVC-1080-CMT3　　　BVC-SCRN-1163

The **BioVID 1080+** and **BioVID 4K** microscope cameras are essential tools for live presentations and client education. The premium **BioVID 4K** camera paired with the 13.3" HD Monitor provides crystal clear 8MP images and 4K video on the screen. The extremely sensitive Sony IMX334(C) sensor chip helps maintain 4K resolution and a fast frame rate in low-light and high magnification settings. The lower-priced **BioVID 1080+** camera also provides beautiful images with amazing sensitivity and speed. Mount the BioVID cameras to any trinocular microscope with C-Mount pipe. Using the provided memory storage, you can click to save, edit, and view your images and videos with side-by-side comparisons when connected to a monitor via HDMI connection. Or, utilize the included image capture software when connected to a PC or MAC via USB connection. Whether in a large lecture hall, a classroom, the laboratory, or the clinic, the **BioVID Cameras** will ensure clients and students see microscope images clearly.

## Unpacking and Setup

The BioVID includes the following parts. If any parts are missing, please contact your distributor or LW Scientific promptly.

• HDMI cable
• 32GB External Storage Device (USB Flash Drive **or** SD Card)
• Power adapter
• USB Mouse with 1.3m cable
• USB220-ATA I USB2.0 A cable - 2 meter
• CD with Camera Driver and Software

Please read and complete the warranty form online at *LWScientific.com/warranty_form*. The warranty form documents your purchase. Failure to fill out the warranty form may void any warranty claims on the unit.

**Mounting camera to microscope:**

Remove all camera components and set them on a secure, clean surface. If your microscope or stereoscope has a trinocular head, you can simply screw the camera onto the C-Mount. If you have a binocular scope, you will need the optional eye tube adapter (part number MVP-ADAO-ETCM) to allow you to insert the camera into one of the binocular eye tubes.



**For HDMI output:**

Once the camera is firmly mounted and secured onto the microscope, plug one end of the included HDMI cable into the top of the camera and the other into your HD TV.

Connect the USB mouse to the "**USB Mouse**" port on the top of the camera.

Attach the external storage device to the camera... either USB flash drive into the "**USB**" port or the SD card into the SD Slot. *(BioVID cameras may come with either)*

Plug the included power adapter into the DC12V port on the top of the camera.* The LED light on the top of the camera will glow red. Next, press the ON/OFF button once to power on the camera. The LED light will change to blue. Your camera is ready to use.

*****DO NOT LEAVE POWER JACK PLUGGED IN FOR EXTENDED PERIODS OF TIME**. Unplug the power jack when camera is not in use.

**For USB output:**

Install included software per instructions in the Software Installation section of this manual.

Remove the HDMI Cable and USB mouse and store in a safe place.

Plug one end of the included USB cable into the "**USB Video**" port on the top of the camera and the other into the USB port of your computer.

Plug the included power adapter into the DC12V port on the top of the camera.* The LED light on the top of the camera will glow red. Next, press the ON/OFF button once to power on the camera. The LED light will change to blue. Your camera is ready to use.

**For Simultaneous HDMI and USB output:**

Attach the HDMI cable to your HD TV and the USB cable to your computer.

**13.3" Monitor Instructions:**
If you purchased the 13.3" Monitor for your camera, please follow the below steps to install the unit. If you did not purchase the monitor, you can skip this section.

1   First, attach the monitor onto your BioVID camera using the included hex key wrench in your package. Do not overtighten the hex screw but ensure you securely tighten it to prevent the monitor from falling off the camera.



2   Once attached, screw the monitor and BioVID onto the C-Mount. From there you can adjust the monitor to the angle that best fits you.



3   Plug the power supply into the camera and monitor.

Note: The 13.3" Monitor includes a double-ended "Y" power cord. You can plug both the monitor and camera into the two connectors, using only one power adapter for both devices. (Use the power adapter from either the camera or the monitor)

**1** Place a slide on your microscope and bring the specimen into focus.

**2** Make certain your BioVID 4K is installed according to the HDMI directions above and that both the camera and TV are powered on. Toggle through the "INPUT" settings on your TV to ensure that the correct HDMI port is selected. An image will appear on the TV screen.

**NOTE**: If the edges of the image are cut off, make certain that your HDMI TV supports 3840 x 2160p resolution and adjust accordingly.

**3** Camera Control Panel: Move the USB mouse to the left side of the screen to reveal the Camera Control Panel. (**Fig. 1**)

Click the **Snap** button to save the displayed image to the SD card.

Click the **Record** Button to save the displayed video to the SD card.

**Exposure**: Check the box labeled **Auto Exposure** to let the camera do the work. (You will still be able to adjust the brightness of your image by moving the slider marked **Exposure Target**.) Uncheck the box to make the other sliders active for manual adjustment of exposure.

**4** **White Balance Settings:**
Global Auto WB: When this setting is chosen, the camera white balances automatically and adjusts as needed.

Manual WB: When this setting is chosen, the R and B sliders are available for a djustment.

ROI WB: When this setting is chosen, a blue rectangle will appear on the screen. Use the mouse and drag the rectangle to an area on the image that is white. To adjust the size of the rectangle, rotate the mouse wheel until you reach the desired rectangle size. The camera will consider the area inside the rectangle as white for white balancing purposes.

**5** Other settings such as Sharpness, Denoise, Saturation, Gamma, and Contrast can be adjusted by moving the sliders.

**Tool Bar**: Move the USB mouse to the bottom of the TV Screen to reveal the icons below on the Tool Bar.

Digital zoom in function          Digital zoom out function

Horizontally flip image          Vertically flip the image

Freeze and resume

Side-by Side Comparison: When this button is selected, the right side of the screen will display the live image and the left side of the screen will display the images saved to the SD card. Click on the saved image you want to compare and the screen will display both images for Side-by-Side Comparison.
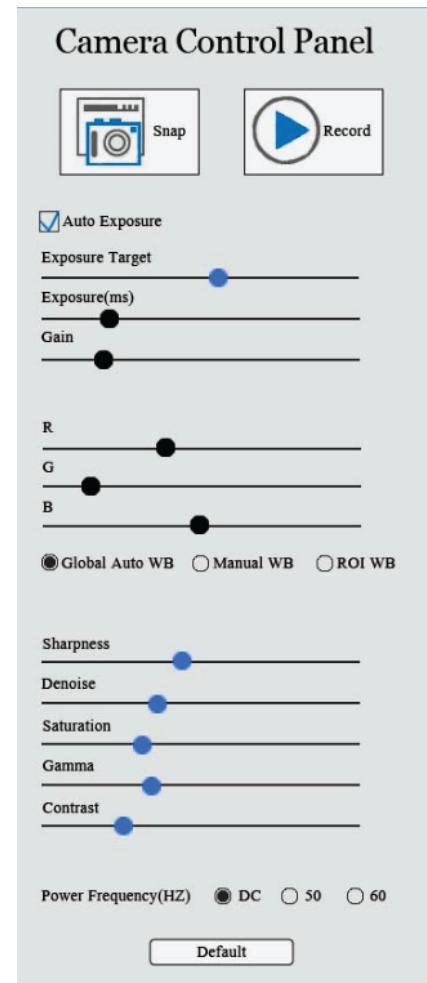


**Camera Control Panel**

Snap          Record

☑ Auto Exposure

Exposure Target

Exposure(ms)

Gain

R

G

B

◉ Global Auto WB    ○ Manual WB    ○ ROI WB

Sharpness

Denoise

Saturation

Gamma

Contrast

Power Frequency(HZ)    ◉ DC    ○ 50    ○ 60

Default

*Fig. 1*

 Cancel the comparison

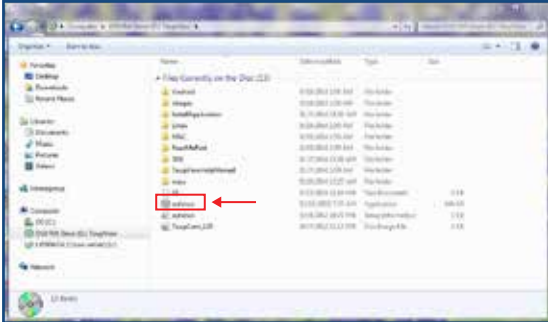 Click the Browser function to view contents saved to the SD card and then select those for display.
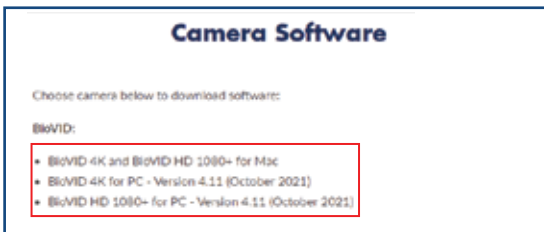
 Choose between red and green cross markings.

## Software Installation

**1**  Insert CD into CD-ROM drive to begin installing your software. Go to "My Computer" to view the files on the CD.
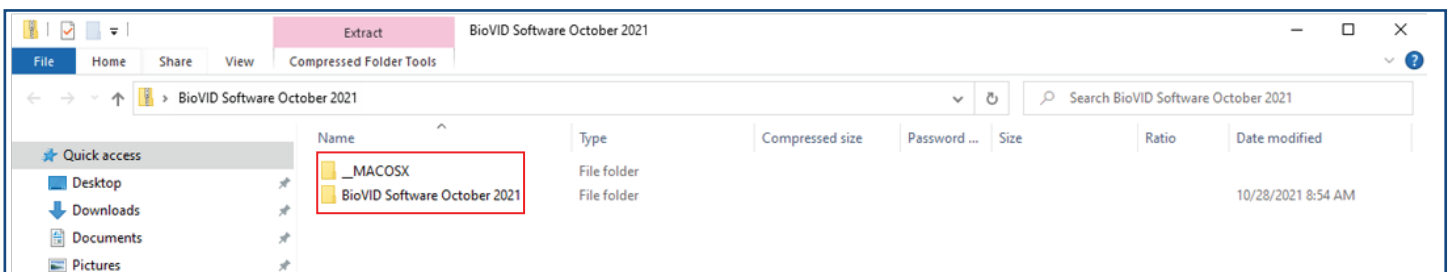


**2**  To download digitally go to:  https://www.lwscientific.com/pages/camera-software   and select the option most relevant to you.



**3**  You will be redirected to Dropbox. From there, click the "Download" tab.
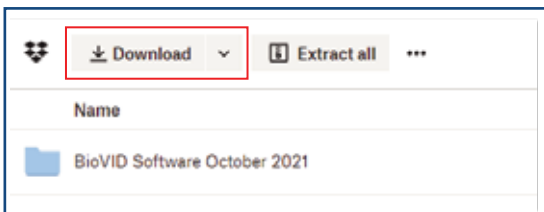


**4**  Unzip the file and select *"BioVID Software"* if on PC and select *"_MACOSX"* for Mac.
**Note\* The date may appear different but you will still choose *"BioVID Software"* for PC.**

**5**  Click the "Install Application" folder and select the "LWScientificToupViewSetup" file to begin installing ToupView onto your desktop.
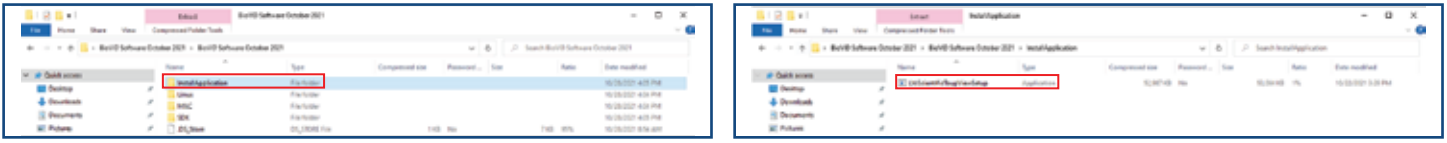


**6**  Follow the prompts below and click "Finish" once the install in complete.
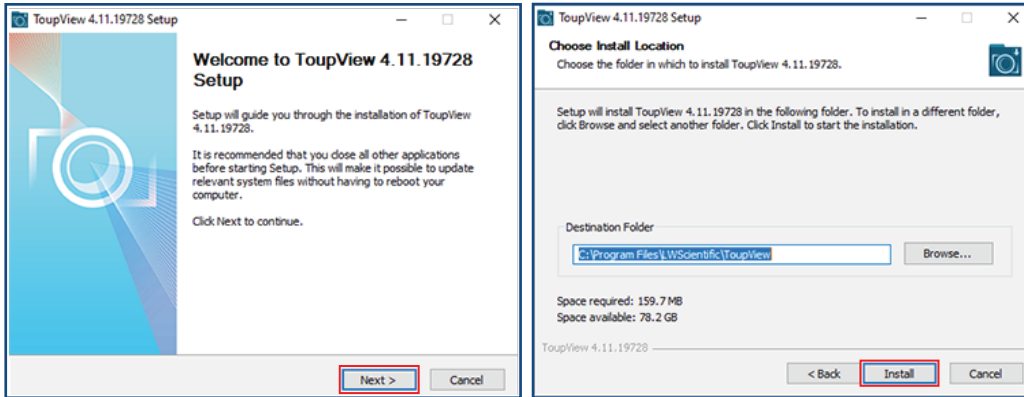


**7**  The Software should automatically install a short cut on either your desktop or on the start menu. If it does not, look under "All Programs" in the START Menu, and find the LW Scientific folder. Open the software from there, or right click on the icon, and send a shortcut to the desktop for easy access.

**8**  Not required, but for easy image organization, create a new folder named "BioVID Images" on your desktop next to your ToupView icon. As images are saved, they will be easy to find in the image folder on the desktop. Otherwise, images can be saved into any folder or client file on the computer or network.

**9**  Select the "Toupview" icon.

**10**  Plug the DC12V power adapter into the camera and connect the camera to the computer using the **"USB Video"** slot located on the camera. Use the included USB cable. Your computer should bring up a window which reads, "Device driver software installed successfully."
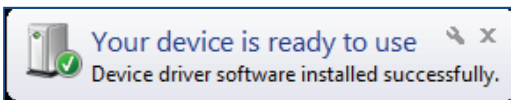


The software is now loaded, and the camera is ready to use.

## Operation - USB Output

Install your camera per the instructions in **Setting Up Your Camera** Section:

**1**  With the camera's power and USB plugged in, turn on your camera using the **"ON/OFF"** button and start the ToupView software. If the light on the camera is **Blue**, the camera is on. If **Red**, the camera is off.

**2**  To begin capturing images, click your device under "**Camera List.**"  Depending on the device your screen may read either "**XCAMLITE4K8MPA**" for the *BioVID 4K* **or** "**XCAM1080P2MPA**" for the *BioVID HD 1080+*.

In this example we are using the BioVID 4K.

**3**  At this point, the screen should be showing a live image from the microscope. If not, look at the microscope head and check if there is a pull knob that directs light up to the trinocular head.

Capture and Resolution: Use the drop-down boxes to select your resolution. Using maximum resolution will slow down the capture rate but will produce larger images, while smaller resolution will allow faster motion while viewing specimens.  See image under Step 5.



**4**  **White Balance:** Empty the microscope stage and turn on the light so the camera is viewing an empty illuminated field. Then go to White Balance and click the "White Balance" button.
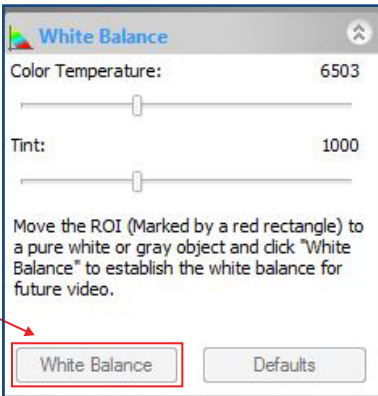


**5**  Most other settings are set to "auto" or to the best setting. Settings for Frame Speed Level or Flip Horizontal/Vertical can be adjusted if needed.

Capture the image or several images by clicking on the "Snap" button. Capture videos by clicking on the Record button once to begin records and then a second time to end recording.



**6**  Tabs for the captured images will appear across the top of the live view window. You can then rename and save these to the appropriate folder on your computer. The images will appear behind the live view screen. Click on the first tab, labeled "Video" and then the camera number, to return to the live view screen.

*Note: For further assistance, please refer to the Operation Manual found under the "Help" tab in the ToupView Software to find all software features.*

## General Precautions and Maintenance

Treat your BioVID as you would any high-quality electronic device. Handle it with care, and do not expose it to moisture or extreme temperatures.

Do not touch the chip inside the camera. If you see spots on the screen, there is likely dust on the chip. This can be cleaned by blowing canned air into the camera.

Please do not attempt to open camera case. There are no user serviceable parts inside.

USB Conflicts: When there are a number of devices installed at the same time, unexpected errors can arise. The cause can be insufficient USB bandwidth or too much combined current being drawn by USB devices. To test these conditions you should uninstall and unplug as many other USB devices as possible.

Image viewing problems: If you see only a black screen, ensure that the trinocular port is opened on the microscope. Point the camera towards a window to confirm that the camera is functioning – light should appear on the screen (though it will not focus when not installed on a microscope).

Computer does not recognize device: Make sure you have plugged into a USB 2.0 port. Always try to use the same port each time; otherwise the computer will see the camera as a new device when plugged into a new port. If this happens, just follow the wizard again and the camera will work on the new port as well.

Slow frame rate or frozen screen: Select smaller resolution settings. Depending on the age of the computer, the video driver may not support the maximum resolution and speed performance capable by the BioVID camera.

## Specifications

|  | **BioVID HD 1080+** | **BioVID 4K** |
|---|---|---|
| **Resolution:** | 1920x1080 | 4K - 8 MegaPixels (3840x2160) |
| **Image Sensor:** | 1 / 2.8" Sony Imx236(C) CMOS Pixel Size: 2.8um x 2.8um | 1/1.18" Sony IMX334(C) Pixel Size: 2.0um x 2.0um |
| **Video Output:** | **HDMI**: - USB Mouse on-screen control - SD Card or USB Flash Drive - 60 FPS @ 1920x1080 (HDMI) **USB**: - Includes Toupview Software - PC or Mac - 30 FPS @ 1920x1080 (USB) - White Balance | **HtMI**: - USB Mouse on-screen control - SD Card or USB Flash Drive - 30 FPS @ 3840x2160 (HDMI) **USB**: - Includes Toupview Software - PC or Mac - 30 FPS @ 3840x2160 (USB) - White Balance |
| **Power:** **AC Input:** **DC Output:** **Operating Condition:** | cUL/CE Approved Power Adapter 100-240Vac 50/60Hz Power Adapter 12v, 1.0 Amp Temperature: -10°C ~ 50°C Humidity: 30-80%RH | cUL/CE Approved Power Adapter 100-240Vac 50/60Hz Power Adapter 12v, 1.0 Amp Temperature: -10°C ~ 50°C Humidity: 30-80%RH |
| **Output:** | HDMI Connector SD Card Slot USB Connector | HDMI Connector SD Card Slot USB Connector |
| **Weight and Dimensions:** | Height: 3.6" (92mm) Length: 2.8" (70mm) Width: 3.1" (78mm) Weight: 1.03lbs. (0.47kg) | Height: 3.6" (92mm) Length: 2.8" (70mm) Width: 3.1" (78mm) Weight: 1.03lbs. (0.47kg) |