USER GUIDE
USBREEZE VIEWER V1.1

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1 SAFETY CONDITIONS

Read all instructions prior to use.

Observe ESD (electrostatic discharge) precautions when handling.

The camera requires reasonable thermal sinking when operating. Use stirred air and conduction to outside environment when installed in an enclosure.

The camera must be operated within the environmental limits.

Repairs and service are to be completed only by Sierra-Olympia Technologies Inc. Please refer any issues to your sales representative.

2 EXPORT NOTICE

This document is provided for operation purposes only and does not contain export-controlled technology.

3 LICENSING

This application uses the following libraries, see the LICENSE.txt file in the application install directory for details:

- openh264

    Copyright © 2013, Cisco Systems

- OpenCvSharp

    Copyright © 2019, shimat

- FFMPEG

    Copyright © 2001 Fabrice Bellard

- Ookii.Dialogs

    Copyright © C. Augusto Proiete 2018-2020

    Copyright © Sven Groot 2009-2018

- OxyPlot

    Copyright © 2014 OxyPlot contributors

4   PURPOSE AND SCOPE

USBreeze Viewer is a utility for Sierra-Olympia UVC enabled cameras (Viento-10 USB, Viento 1280, Tamarisk USB, Vayu HD). Its purpose is to allow convenient monitoring, basic analysis, and recording of video from these sources.

This user guide applies to USBreeze Viewer version 1.1.

5   SETUP

USBreeze Viewer is packaged with a Windows installer. Run this installer and connect the camera to a USB port on the computer.

> **NOTE: Vayu HD and Viento 1280 cameras must utilize a USB3/SuperSpeed port and cable for proper functionality.**
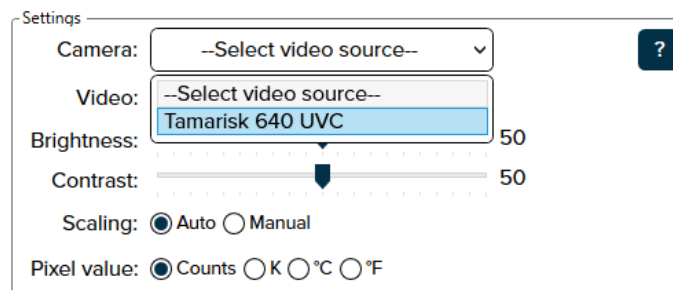
Figure 1: Select a Camera

When the camera is powered on, it can be selected from the **Camera** dropdown to connect it to USBreeze Viewer. Video will then be displayed in the left side of the application.

6   IMAGE CONTROLS

6.1   Video Scaling

The default video scaling mode is **Native Resolution**. In this mode, the video will be displayed in its native format on the screen. If the size of the video is larger than the display area, scroll bars will appear to allow panning.

In **Fit to Screen** mode, the video will expand or shrink to fit the size of the display area. The video will maintain its aspect ratio.
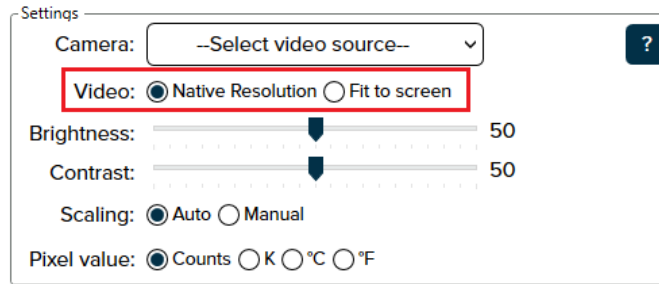
Figure 2: Video Scaling

6.2 Pixel value

Mousing over the live video will display (right aligned in the Settings field) the current value of the pixel under the mouse. By default, the value will be the raw full bit depth value provided by the sensor. If the camera is a Tamarisk Precision, this value may be converted into a temperature using the Pixel value switch. Set the switch to the desired temperature unit, and the pixel value will be scaled accordingly.
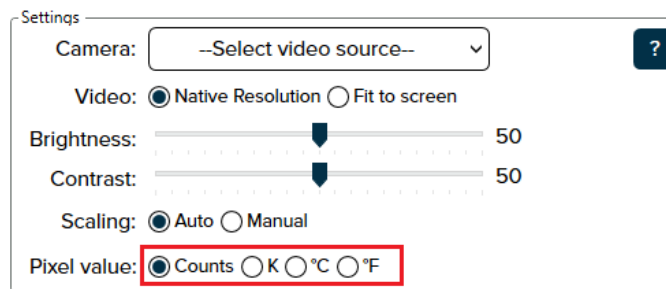

Figure 3: Pixel Value and Temperature Selection

NOTE: Non-thermographic cameras (Vayu HD, Viento-10 USB, Viento 1280, Tamarisk non-Precision) should be displayed in Counts.

Kelvin, Celsius, and Fahrenheit scaling will produce numeric outputs, but temperature readout is not valid.
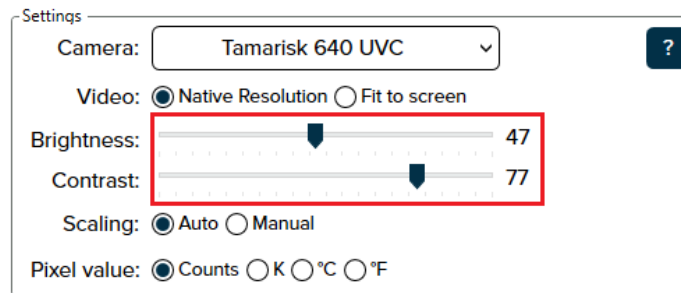
6.3 Brightness and Contrast

The application displays the 16-bit data from the sensor by scaling a portion of the 16-bit range down to 8-bit values which are displayed on screen. The Histogram window displays a live histogram of the full bit depth data, as well as the maximum and minimum limits used for scaling. The minimum limit will map to 0, and the maximum limit will map to 255.

NOTE: This scaling happens in USBreeze software, not in-camera.

When the **Scaling** switch is set to **Auto**, the limits will automatically move based on the mean and standard deviation of the current video frame, scaled by the values of the brightness and contrast sliders. The brightness slider will shift the limits up or down equally, and the contrast

slider will move them closer or further apart. Use the brightness and contrast sliders to adjust the image in auto scaling mode.


Figure 4: Brightness and Contrast Sliders

The limits may also be manually set by setting **Scaling** to **Manual**, or by clicking on the histogram graph. Left clicking will set the minimum limit, right clicking will set the maximum limit. Note that the minimum limit cannot be greater than the maximum. You may return to automatic scaling by setting the **Scaling** switch back to **Auto**.

Freeze the scaling limits by setting scaling to manual (red), or by left or right clicking on the histogram to set the limits (green).

The **Histogram range** slider may be used to narrow the histogram from the full 16-bit range to allow finer control of the minimum and maximum limits.
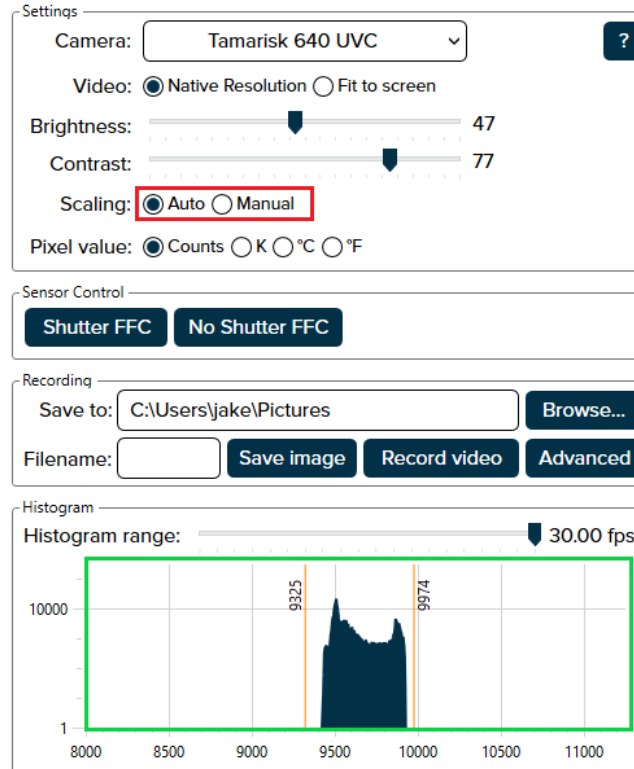
Figure 5: Freeze Scaling Limits

6.4   Full screen

Video may be set to full screen by clicking the button in the lower right of the video. To exit full screen, click the button again or press the escape key. The full screen button will only appear when mousing over the video.

7   RECORDING

7.1   Files

The application will save images and video to the directory specified in the **Save To** box. By default, this will be the user's pictures folder, but may be changed by clicking the Browse button. Image and video files will be named according to the **Filename** box, the file extension will be added automatically.
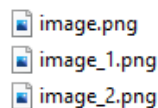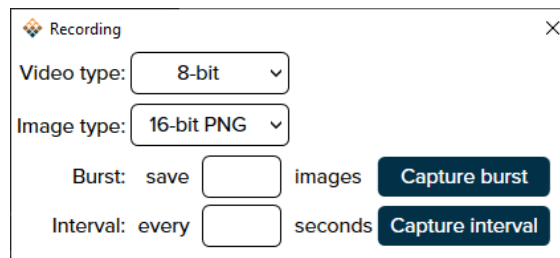

Figure 6: Image and Video Recording

If a file with the same name and extension already exists, the application will append a number to the filename. For example, attempting to save an image with the name "image" three times would result in the files below.

Figure 7: Saved File Iterations

7.2   Format

Images and video may be saved in multiple formats. To switch formats, navigate to the Recording filed and click **Advanced**. The window in Figure 8 will open.

Figure 8: Advanced Recording Window

By default, images will be 16-bit .png files. Switching the **Image type** to RAW will save uncompressed image data with no header in a .raw file. Switching **Image type** to 8-bit PNG will save 8-bit images with brightness and contrast scaling applied. Note that the 16-bit PNG

bypasses the scaling applied by USBreeze Viewer. Opening a 16-bit PNG in a normal photo editor (such as the Windows default) will render an image with low contrast such that it appears to be flat gray or black. We recommend using ImageJ or Adobe Photoshop to work with high bit-depth images.

The default video format is 8-bit, which saves video with H.264 compression in an .mp4 container. Switching the **Video type** to 16-bit saves uncompressed 16-bit binary (little-endian) data to a .raw file in pixel succession without headers, footers, or metadata. This file can be interpreted as a series of RAW images.

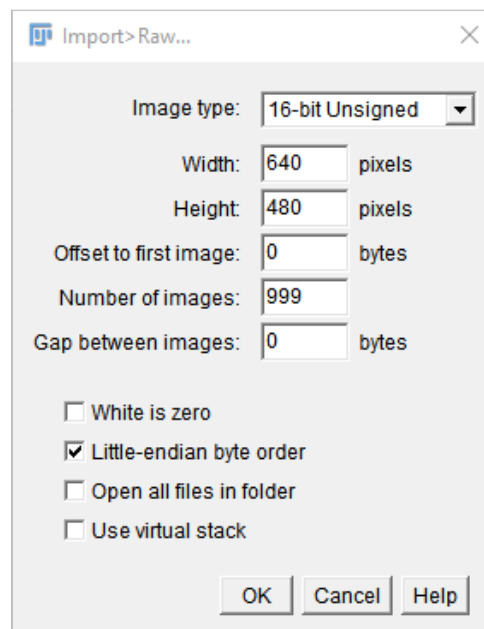Refer to Figure 9 for an example of handling RAW video in the FIJI ImageJ distribution.

Figure 9: Import 16-Bit Raw Video (FIJI)

Handling raw video requires knowing the resolution in advance. In FIJI, you may set Number of Images so that it exceeds the number of frames (framerate * capture length in sec) and it will open all images in a stack.

> **NOTE: Uncompressed 16-bit images require a large amount of storage. On high resolution cameras such as the Vayu HD, each second of video requires several hundred megabytes of storage. The application will buffer video frames in memory while saving video but may run out of space on computers with slower storage devices.**

7.3   Burst and Interval recording

The burst and interval recording modes are located in the advanced recording window. Click **Advanced** to access the advanced recording window. Both modes will save images in the selected format (see above). Burst mode will save the specified number of sequential frames. Interval mode will save frames separated by the specified number of seconds. Click the **Capture interval/Stop capture** button again to stop capturing.
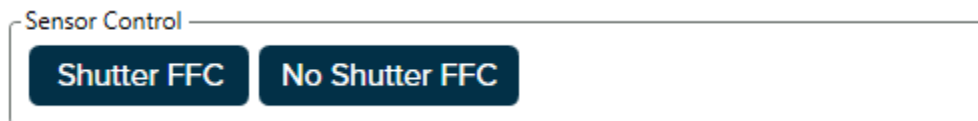
8   SENSOR CONTROL

8.1   FFC Controls

The application can perform shutter and no shutter Flat Field Corrections (FFCs) on Viento-10 USB, Viento 1280, and Tamarisk USB cameras. This control is not active for Vayu HD cameras.

Once the camera has been selected from the dropdown, click the **Shutter FFC** button to perform a correction using the sensor's internal shutter, or click the **No Shutter FFC** button to perform a correction through the lens against a uniform temperature source placed in front of the camera.

Figure 10: Sensor Controls

8.2   NVP Controls

Non-volatile parameters (NVPs) may be set and read on Viento-10 USB, Viento 1280, and Tamarisk USB cameras by launching the application with the `--nvps` command line option. This option may also be set by editing the Target field in the application's shortcut. This mode is not recommended unless users are familiar with altering NVPS.

9   REVISION HISTORY

Revision	Date	Description	ECO
A	2022/08/26	Initial release	1236
B	2023/04/24	USBreeze Viewer 1.1	1402