# OBSIDIAN

# **ThermalCam User Manual**

### **Revision History**

Date	Rev No.	Description	Ву
2/9/2023	2	Initial draft	Jeremy Hong
06/14/2024	2	Update to latest version	Bing Wen

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### Introduction

ThermalCam is a Windows program created to read 16 bit raw frames streamed from a Miramar Camera and render them onto a display window.

#### Installation

ThermalCam is a portable program. There is no installation needed other than unzipping all the contents of ThermCam\*.zip to the desired location. Run "ThermCam.exe" from directory to launch. There are several dependencies, such as .NET runtime from Microsoft Inc., required to run ThermalCam properly. After launching the first time, the system will detect the required runtimes and prompt the user to download and install them if not found.

#### **Opening Camera Stream**

In the top menu bar, go to Source -> Open Device to open a Miramar camera. If playing back raw data, go to Source -> Open File.



Color

The capture devices should be enumerated with only Miramar Cameras, but if running multiple select the desired index. Any other parameters in this menu should be specified correctly. Click Confirm to proceed. The camera stream should now be live on the display window.

#### GenlCam

Once the video stream is open, the corresponding GenICam port will be found and connected. Camera commands can be sent via controls in the *Genicam* tab of the control window.

Any settings that are changed on this page will only be pushed to the camera after clicking **[update camera]**. To overwrite the default settings (loaded at boot) with the camera's current pushed settings, click **[set as Camera Default]** after updating camera. The rest of the functions are as follows: **[Reboot]**: Reboots camera. This will interrupt any stream and reload the camera with user set default settings.

[<-]: Drives the shutter in one direction

[->]: Drives the shutter in the opposite direction

[Save Background]: Performs a background subtraction using the shutter as reference.

Shutter delay: The length of time in frames for background subtraction shutter.



Background frames: The number of frames to be averaged as the background reference. Max BG Gap (minutes): The maximum length of time in minutes between automated shutter calibration Shutter Polarity: Reverses the direction of left/right shutter. This should be correct by default and left unchanged.

**Enable Shutter**: Enables/disables the shutter when performing **[Save Background]**. If disabled, user will need to use an external reference while saving the background.

Auto Background: Enables/disables periodic automatic background subtraction.

**Rotate:** rotate the captured image by 90 degrees before display

Radiometry: display temperature value (for radiometric calibrated cameras only)

Denoise: reduce noise before display

**9Hz:** display only 1 of every 3 frames.

[Load from Flash]: Unused.

[Save to Flash]: Unused.

#### Image

The options in the *Image* tab allow the user to make software adjustments to the image quality. The collected 16-bit raw stream is rendered using CLAHE algorithms to 8-bit video. This process is sometimes called AGC. Proper settings can yield best looking images. But if you are not familiar with the algorithm you can leave these values unchanged.

Clip Limit: Increasing the clip limit will increase the image contrast.
AUTO: automatic change clip limit
Freeze: stop changing existing AGC values
Histogram levels: number of histogram bins used for AGC
% pixel saturation: percentage of pixels are over and under saturated during AGC
Brightness: Increase/decrease overall image brightness.
Sharpen: Sharpens the image. Too big values can cause the image to look noisier.
Zoom: Increases the size of the display window and the streaming images.
Crop: crop rows/columns from 4 sides of the image before display

#### Color

In the *Color* tab, the user can select from many different colormap palettes. To apply any colormapping, toggle on the **color map** checkbox near the bottom of the window. Click on any of the listed colormaps, and toggle **invert** to reverse the cold-hot color spectrum.

#### **Recording Data**

Save current frame as png: Image -> PNG Save current frame as raw: Image -> Raw Copy current frame to clipboard: Image -> Clipboard Save stream as mp4: Video -> Save as MP4 (need to click again when done recording) Save stream as raw: Video -> Save Raw (need to click again when done recording)