FLIR

GETTING STARTED WITH LEPTON® ON WINDOWS®

PureThermal 2 & Basic Lepton Features

REV - 06/26/18

Presentation Outline

The purpose of this presentation is to demonstrate the following:

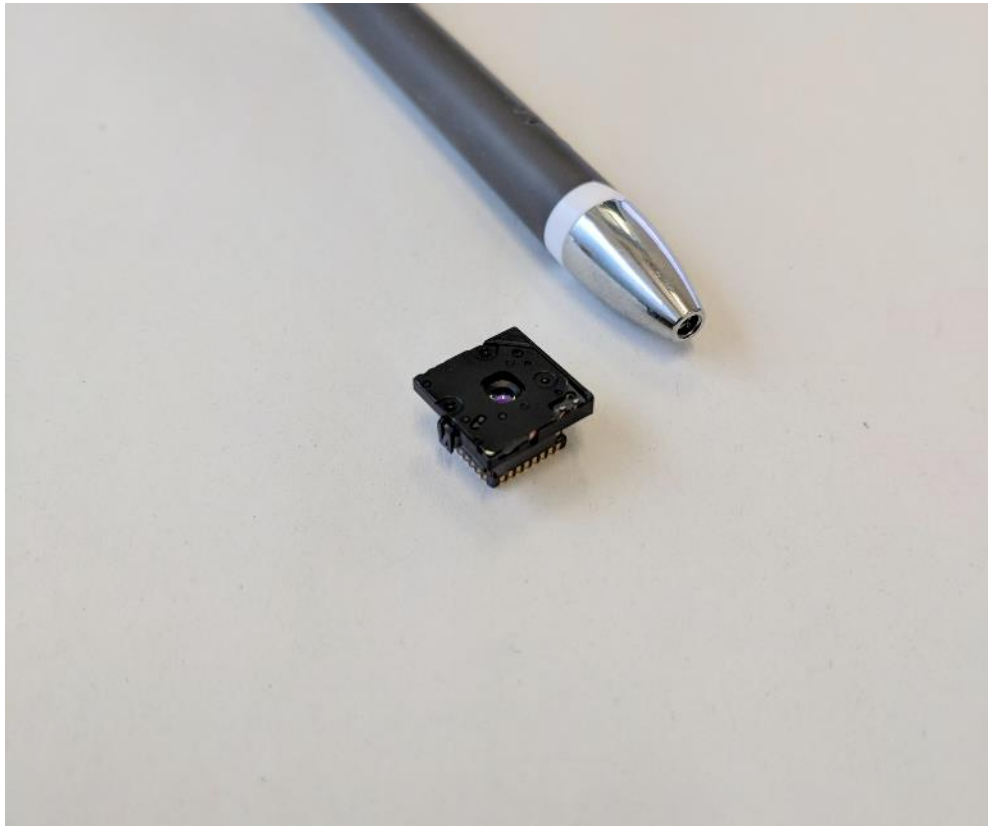
- Set up a PureThermal 2 board with a Lepton camera
- Install the Lepton User App for interfacing with the Lepton
- Use the basic functionality of the Lepton User App

A quick look at Lepton

Get acquainted with your Lepton

Lepton

- Lepton is a micro thermal camera
- Multiple Lepton models are available
- Learn more about the Lepton camera here



Lepton 2.5 vs. Lepton 3.5

Lepton 2.5

- Image Size: 80x60
- Frame Rate: 8.7 fps
- Horizontal Field of View: 50º
- Depth of Field: 10cm - ∞
- Operational Range: -10º C to 80º C
- Energy Consumption: 150 mW
- Scene Dynamic Range: -10 °C to +450 °C
- Radiometric

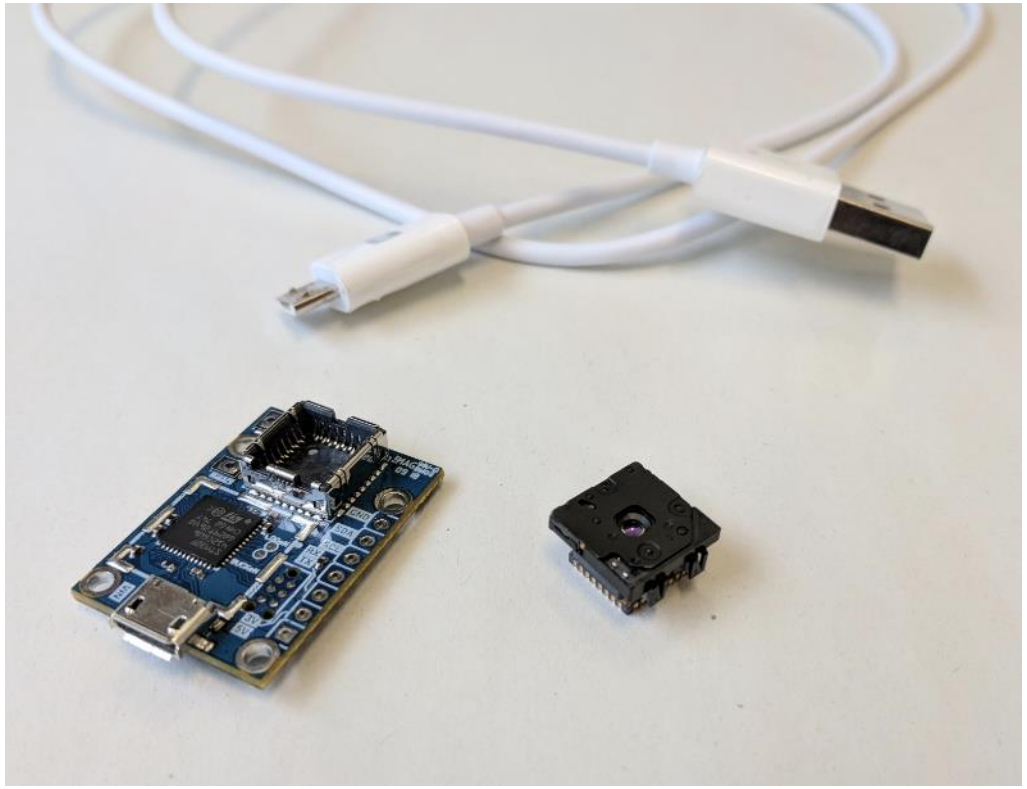
Lepton 3.5

- Image Size: 160x120
- Frame Rate: 8.7 fps
- Horizontal Field of View: 57º
- Depth of Field: 28cm - ∞
- Operational Range: -10º C to 80º C
- Energy Consumption: 150 mW
- Scene Dynamic Range: -10 °C to +400 °C
- Radiometric

Setting up the PureThermal 2 board

Setting Up: Hardware

- Lepton camera
- PureThermal 2 Board
  - Find more click here
- Micro USB cable

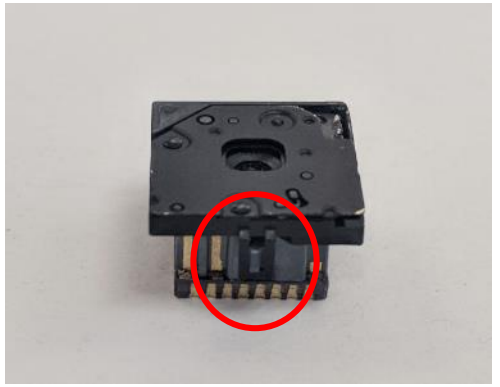


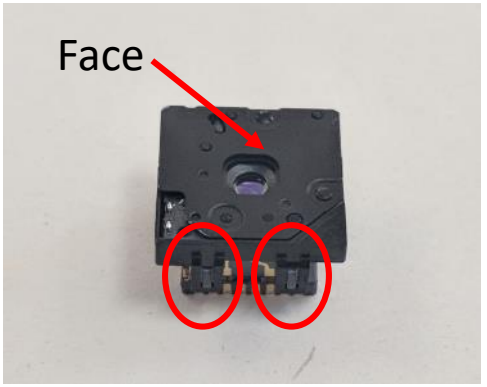
Setting Up: Best Practices

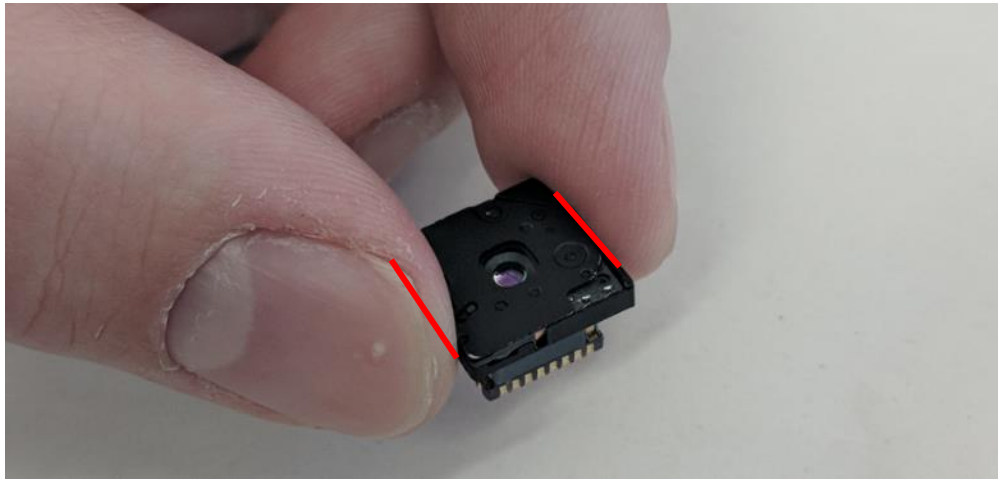
- Lepton is not a closed system
- Handle with care
- Wear ESD gloves - Please note that gloves are not worn in this demo to help provide better views of the procedure
- Prevent dirt and debris from contacting Lepton

Setting Up: Handling the Lepton

- Wear ESD gloves
- Mitigate the risk of damaging the shutter by not applying pressure to the face of the Lepton
- Hold the Lepton on the tabs found on opposite sides of the camera

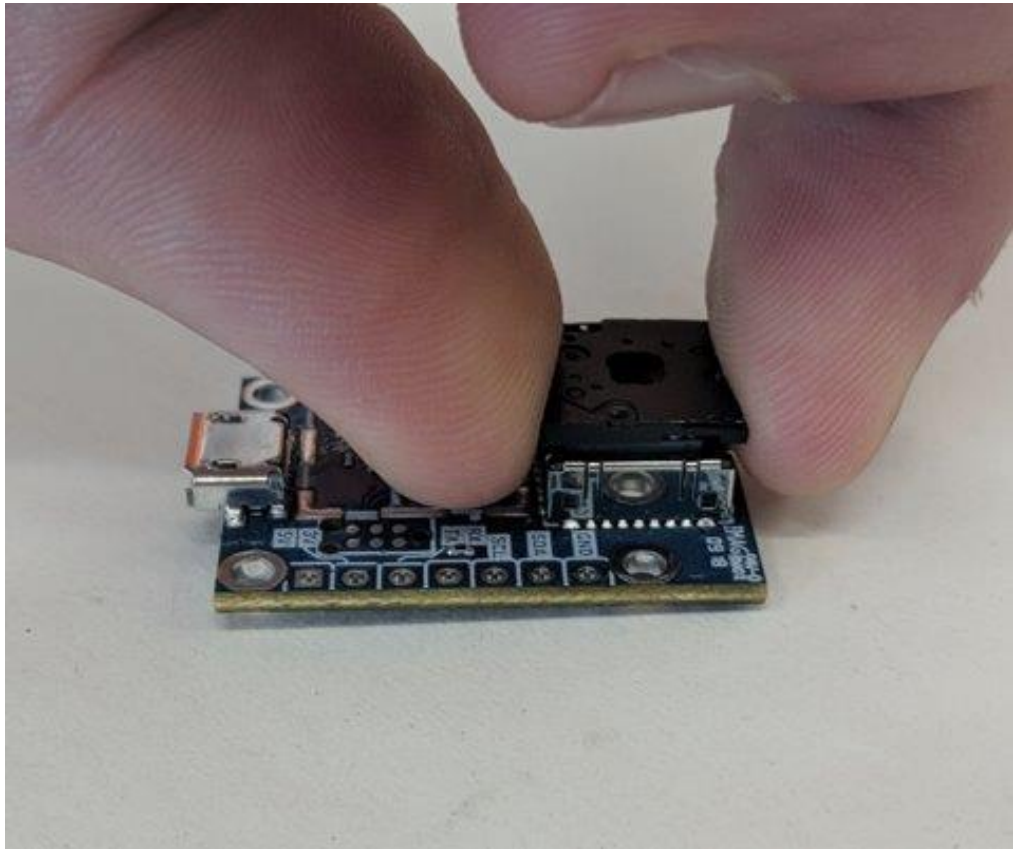






Setting Up: Inserting the Lepton

- Wear ESD gloves
- Hold the tabs of the camera while handling the Lepton
- Press the Lepton gently into the Molex socket
- Hear a "click" when the Lepton is secured in the socket



Setting Up: Plugging in the USB cable

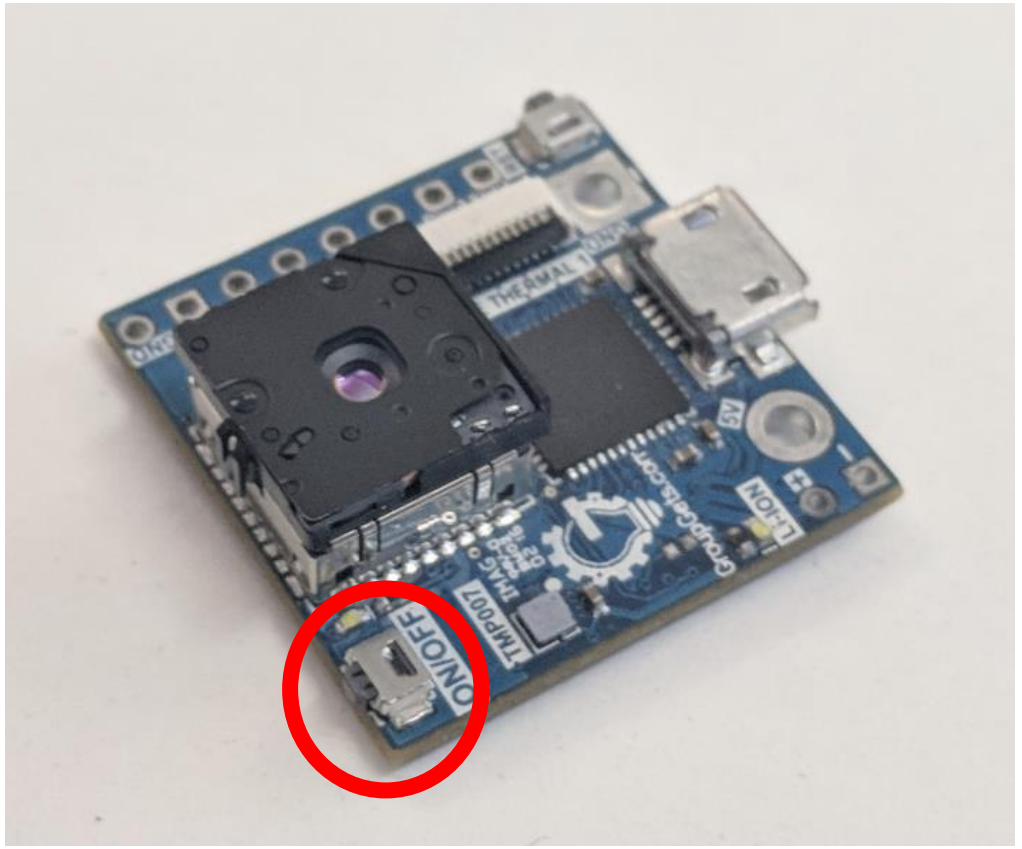
- Plug the Micro USB cable into the PureThermal 2 board
- Plug the Micro USB into your PC
- LED will flash when PC is powered

Hardware troubleshooting

If the PureThermal 2 LED is not flashing

- Ensure that the cable is plugged in correctly
- Ensure that the Lepton is properly inserted into the Molex socket and snapped into place
- If you are using an **older** PureThermal board, you may need to press the power button to turn it on

Locate power button on an **older** board



Setting up the Lepton User App

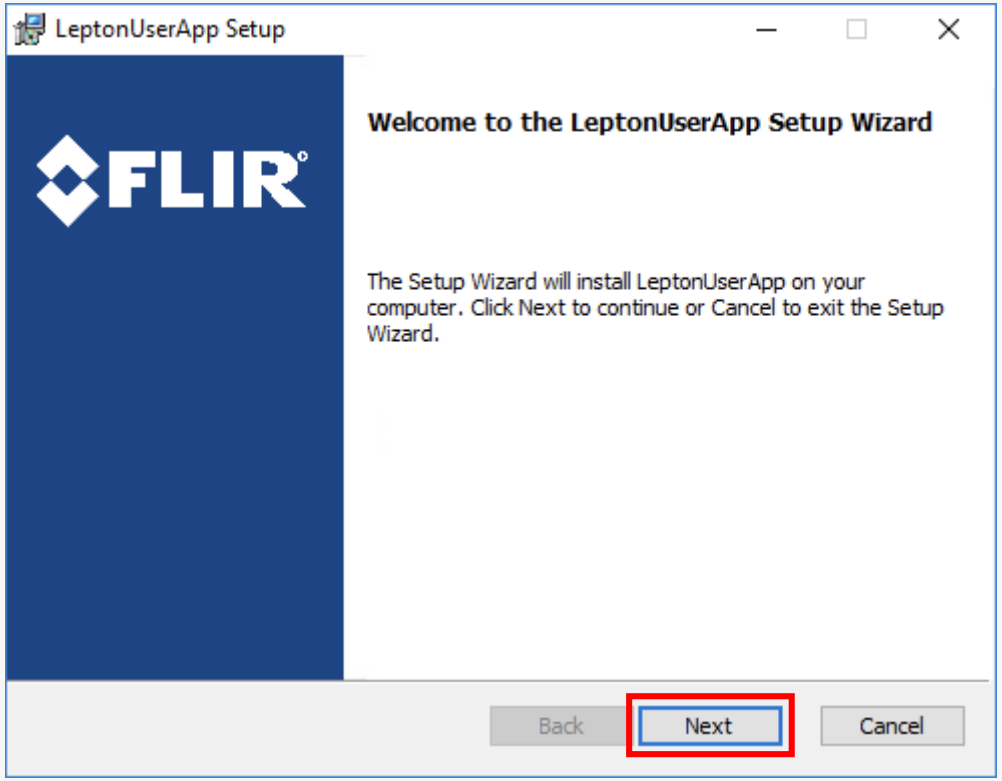
Setting Up: Initial Requirements

You will need:

- PureThermal 2 board plugged into your PC via a Micro USB
    - Check here for firmware updates and use at least v1.1.0
- PC running Windows 10
- Lepton User App Installation file

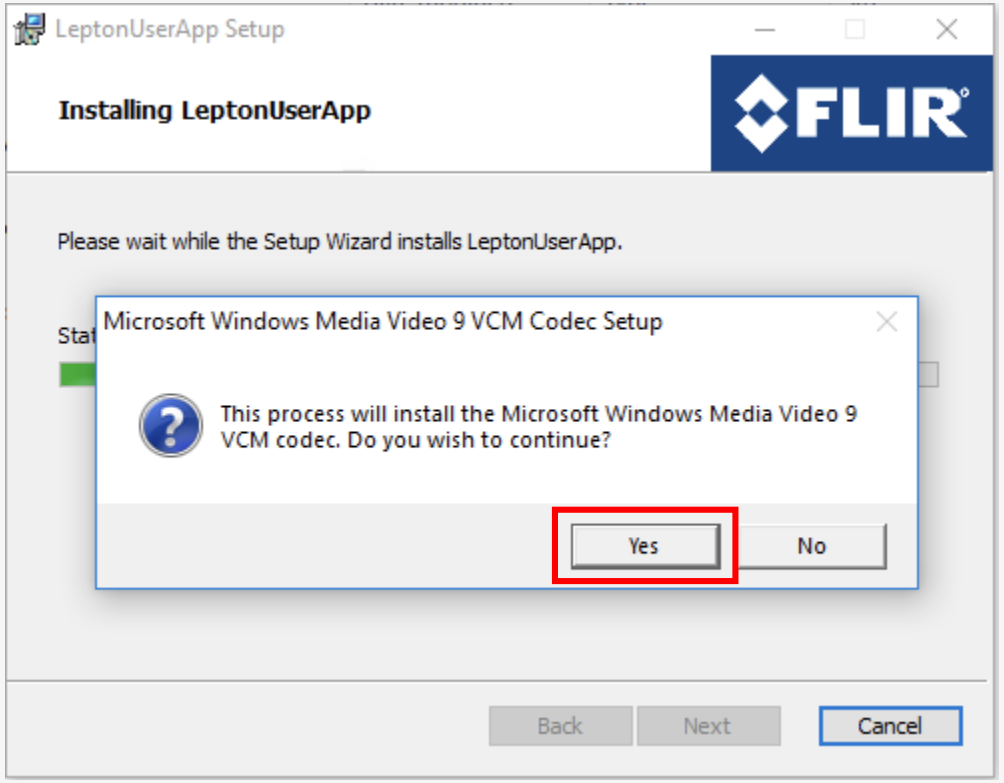
Setting Up: Installing the App

Run the Lepton User App installer and see the following screen. Click Next.



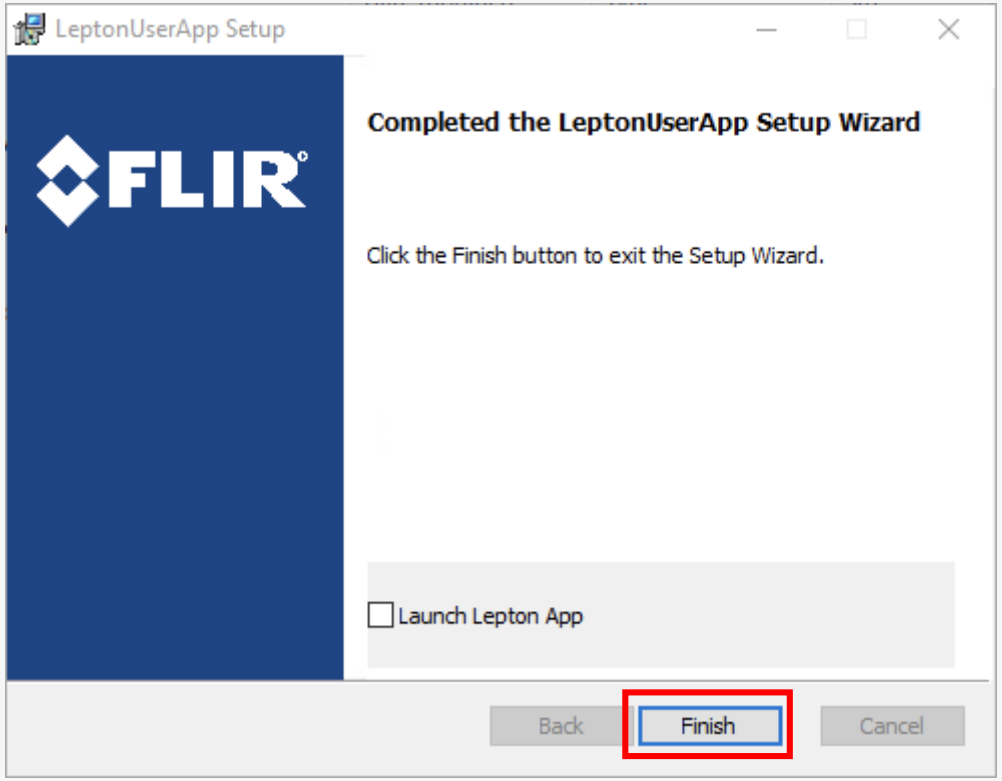
Setting Up: Installing the App

If prompted to install a video codec, click yes.



Setting Up: Installing the App

You will get the following dialogue if the installation successful.

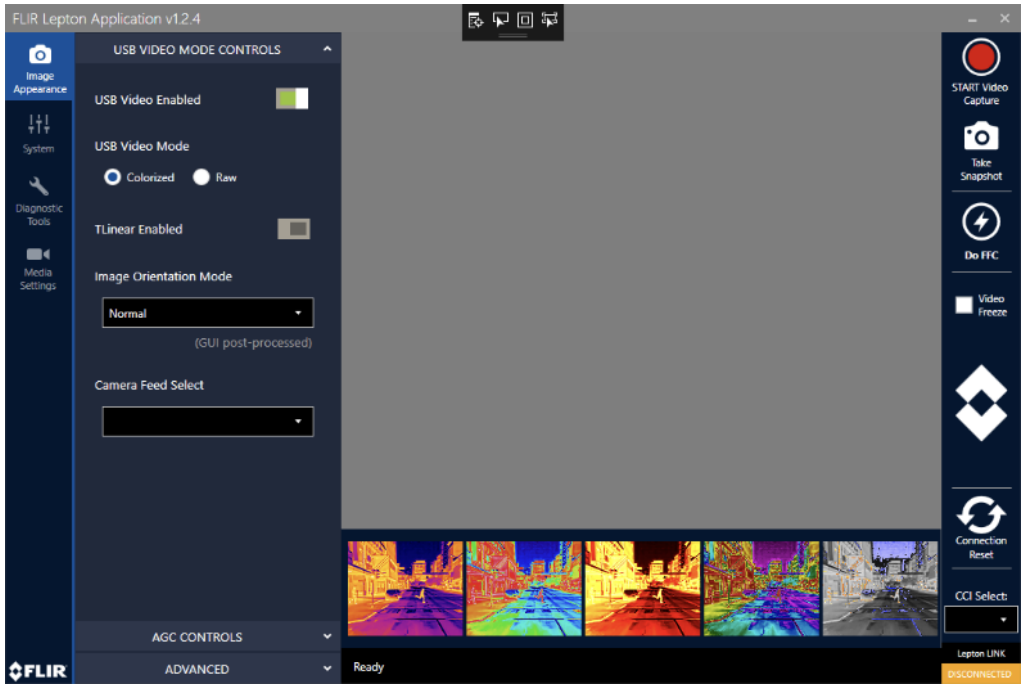


Setting Up: Installing the App

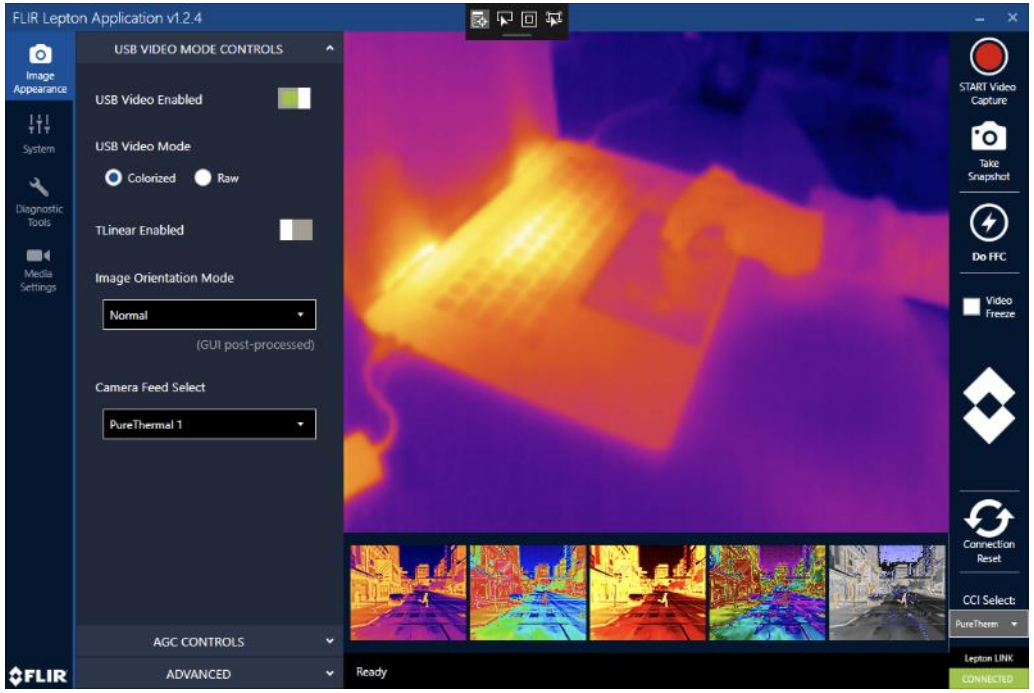
- The installer should setup a desktop shortcut
- Opening this will launch the Lepton User App

Setting Up: Test the App

If images are being displayed, the hardware and software were setup correctly



X



✓

Troubleshooting

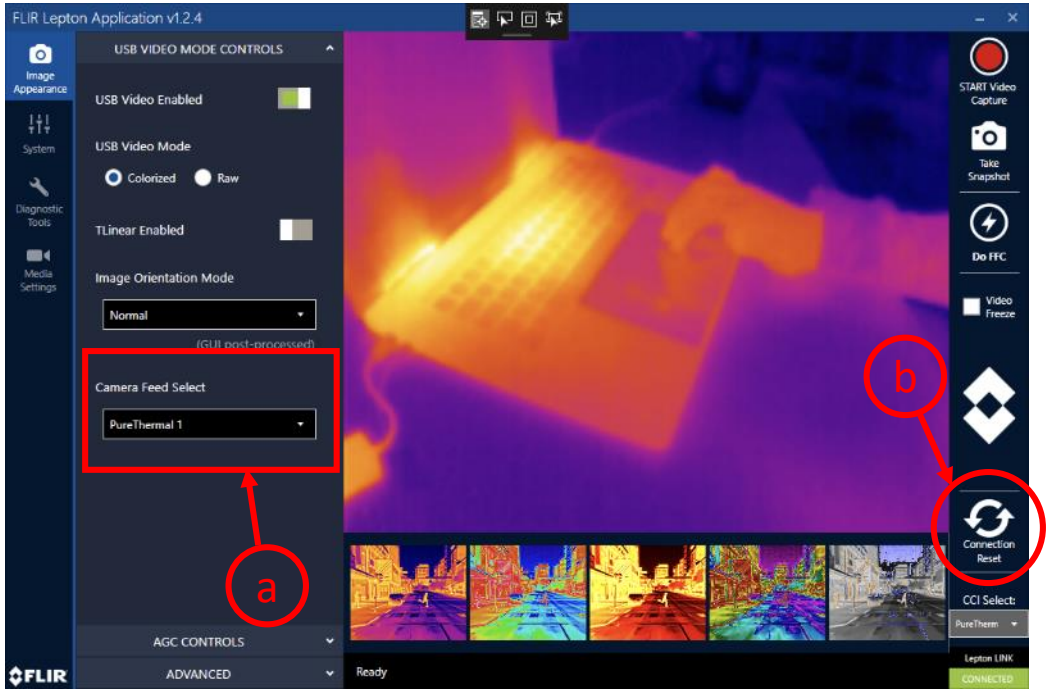
Check to see if the PureThermal 2 board is connected

a) Make sure that a device starting with "PureThermal" is selected by the *"Camera Feed Select"*

b) Perform a Connection Reset

c) Make sure the Lepton is snapped fully into the PureThermal board

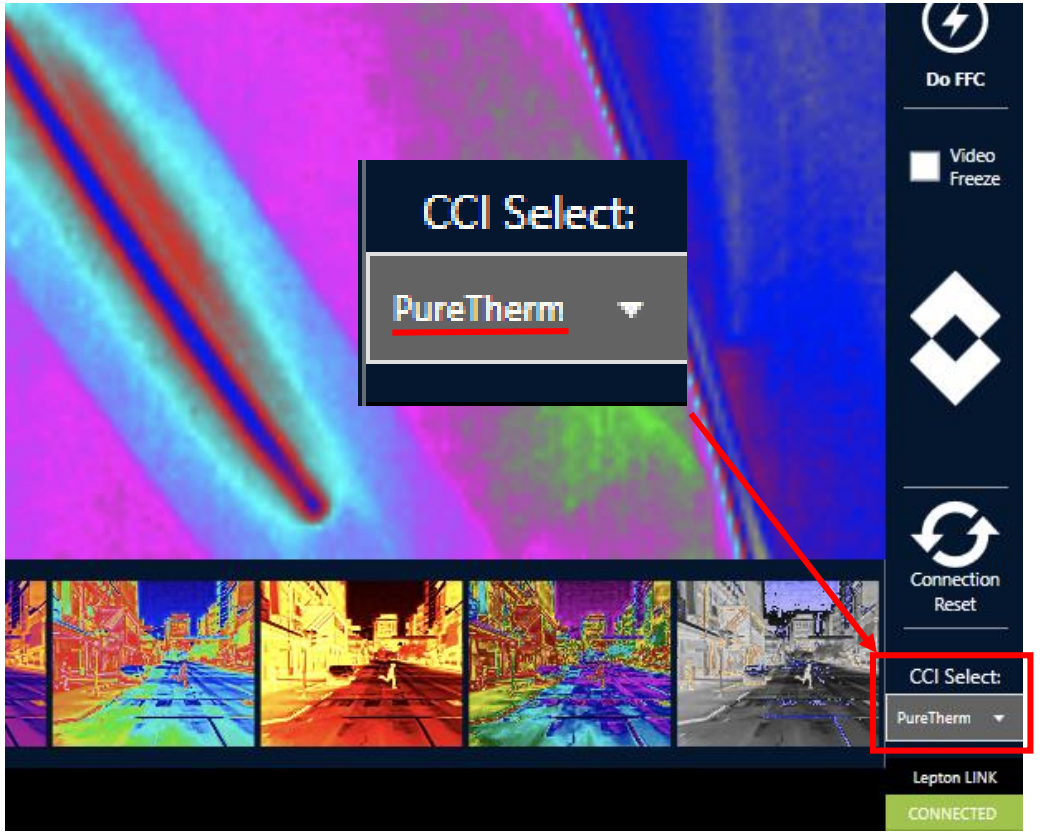
d) Check that the USB is connected to the PC



Troubleshooting

Check to see if the settings are correct

- Confirm that the Command & Control Interface (CCI) Select is a PureThermal option
- If multiple PureThermal boards with Lepton cameras are connected, there will be multiple options



Using the Lepton User App

Get to Know the App

Introduction to the functionality

a) Start video capture

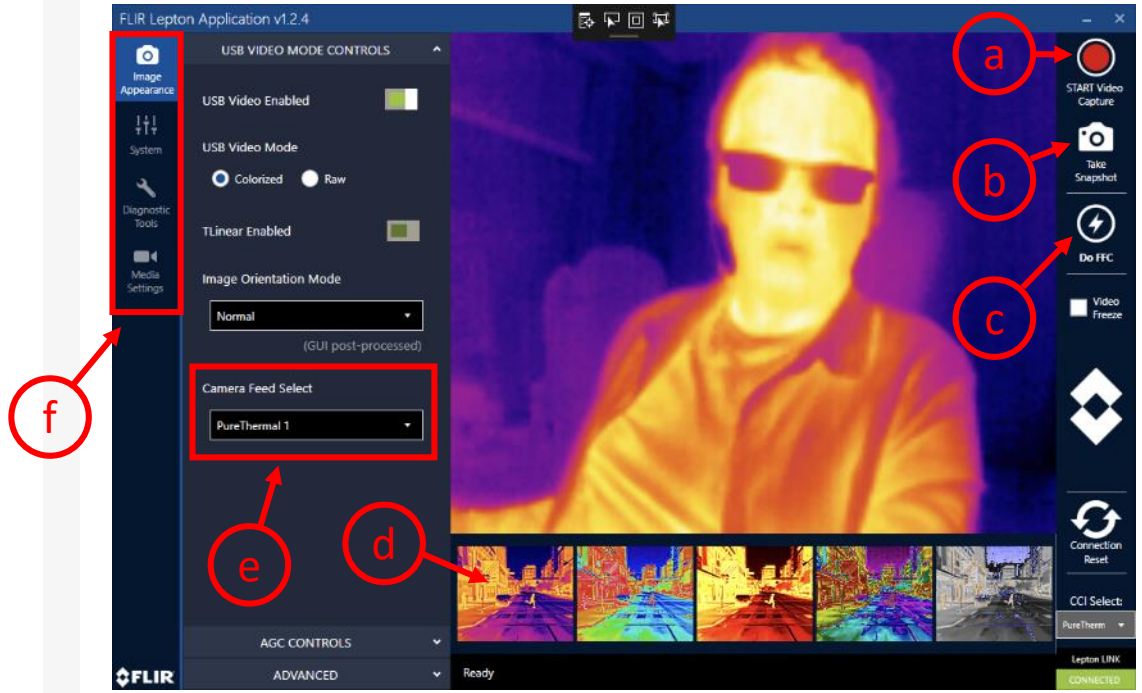
b) Take a snapshot

c) Perform flat field correction (FFC)

d) Switch between palettes

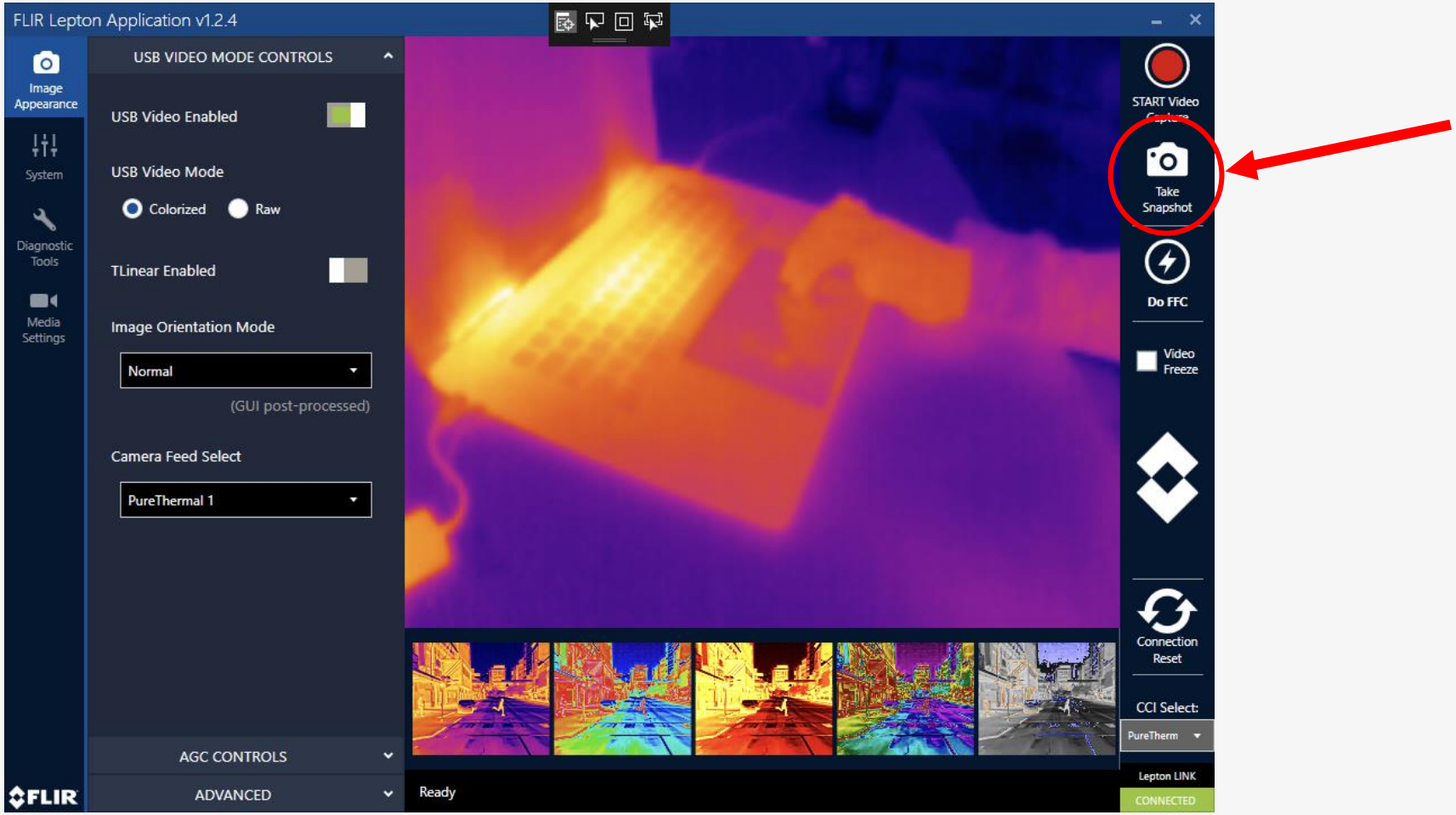
e) Camera feed source

f) Change between tabs



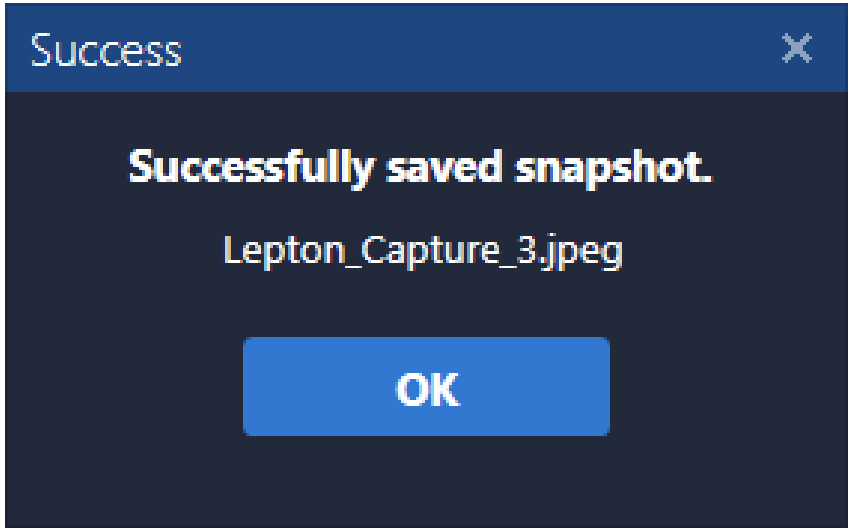
Capture Still Images

"Take Snapshot" will take a photo using the Lepton camera



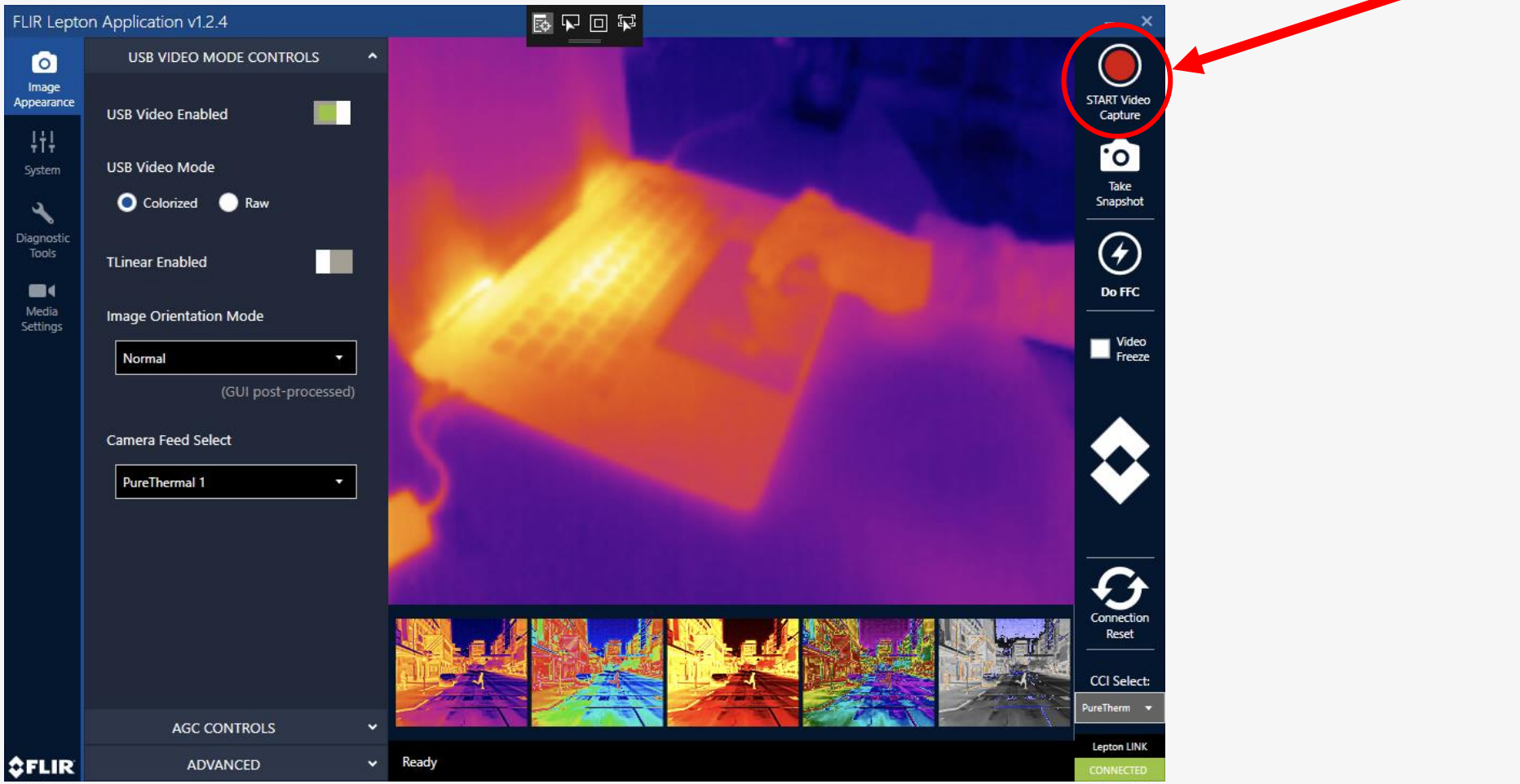
View Still Images

- If everything went correctly, you will see a confirmation dialogue
- The captured images can be viewed in a file browser
  - Default location is "Pictures\LeptonCaptures"
- The default naming convention is "Lepton_Capture_X.jpeg"
  - X will depend on how many saved images there are already



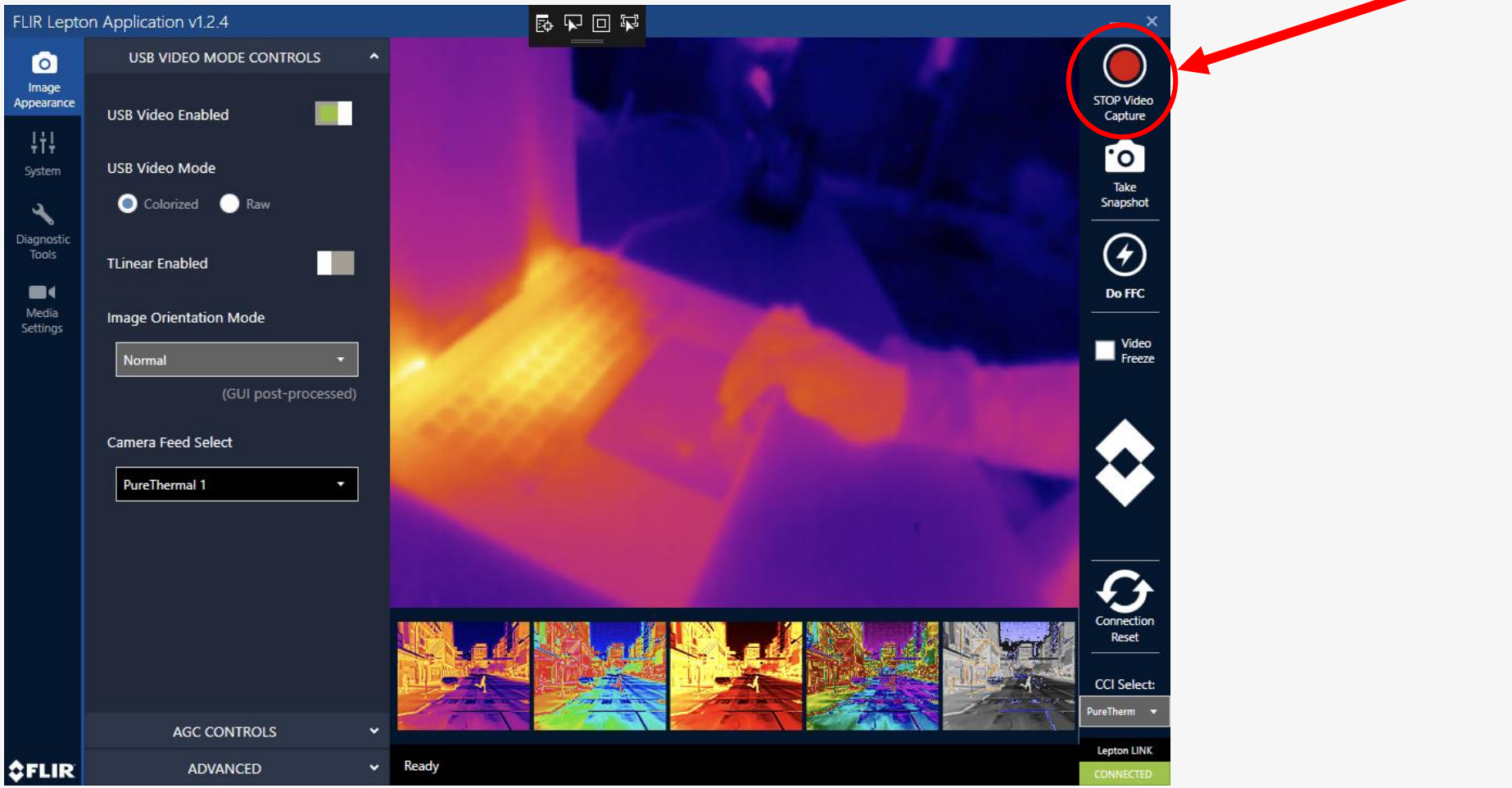
Capture Video

"START Video Capture" begins recording



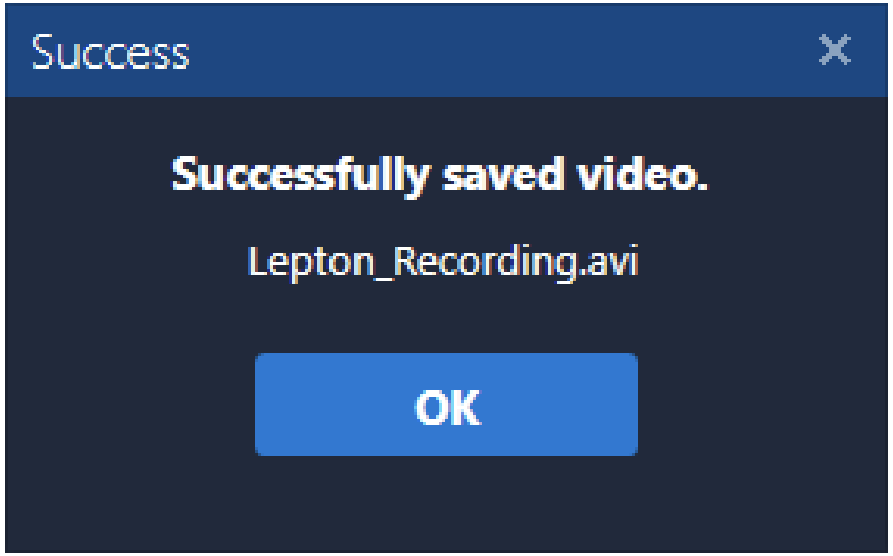
Capturing Video

"STOP Video Capture" ends recording



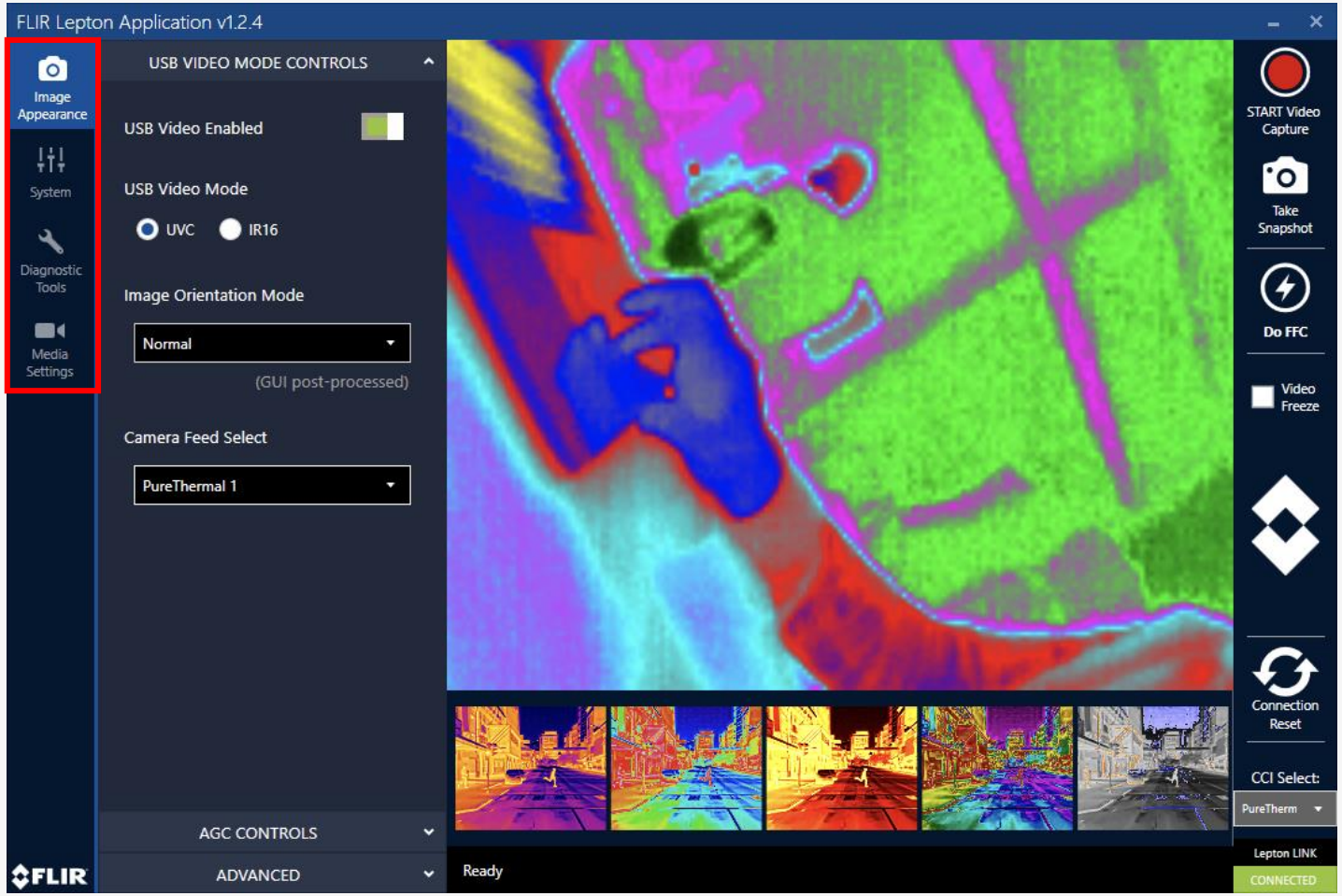
View Video Footage

- If everything went correctly, you should see a confirmation dialogue
- The captured videos can be viewed in a file browser
  - Default location is "Video\LeptonCaptures"
- The default naming convention is "Lepton_Recording_X.avi"
  - X will depend on how many saved videos there are already



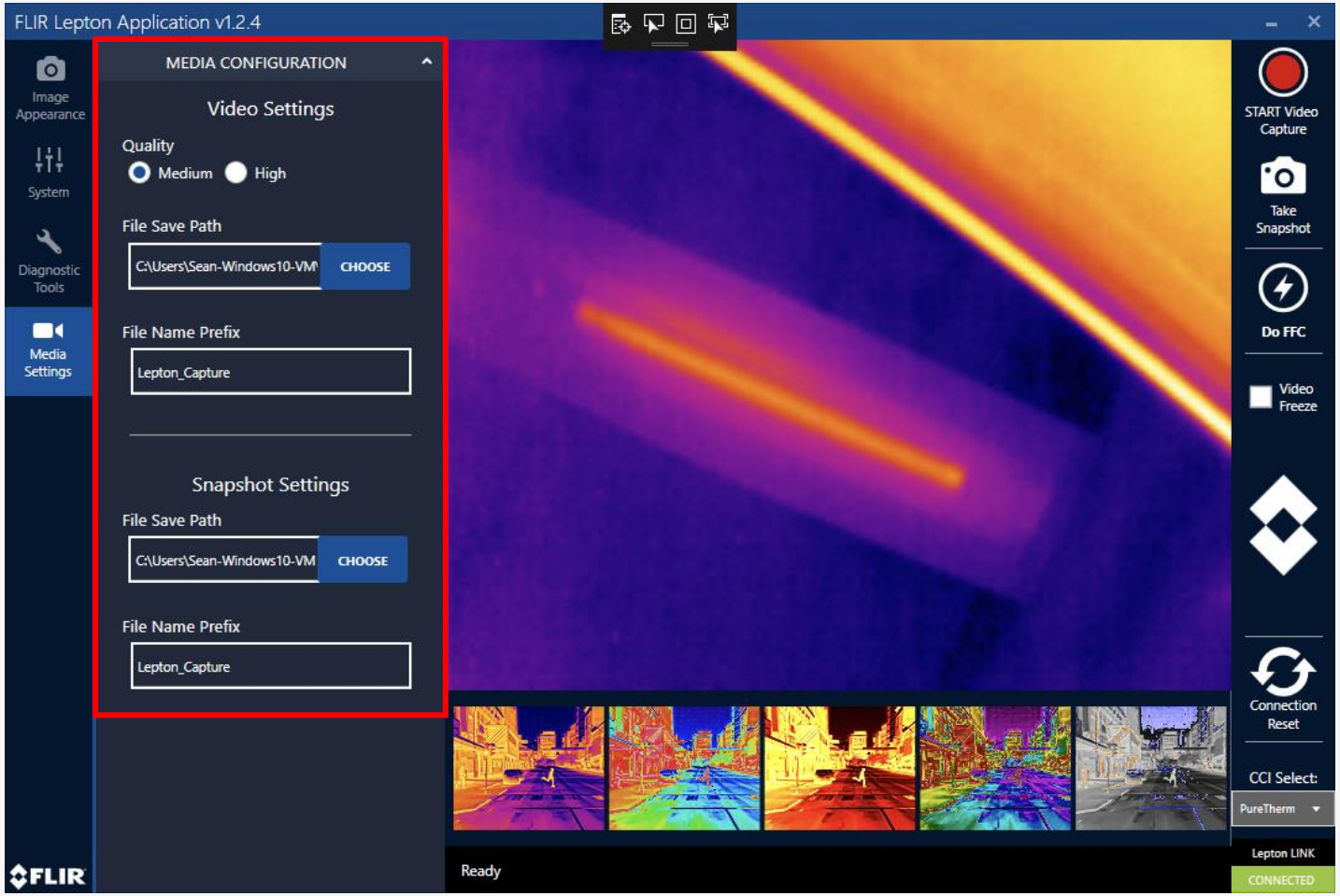
Control Tabs

The buttons on the left of the app change tabs, giving access to different settings and options



Media Settings

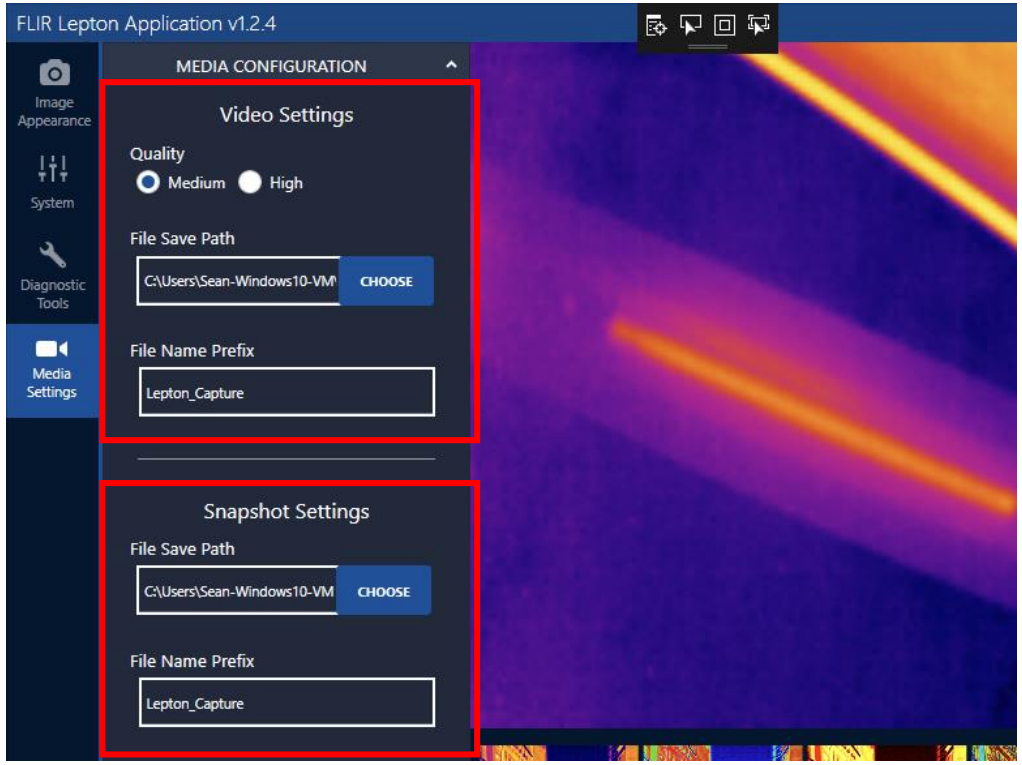
"Media Settings" gives access to settings for saving video and snapshots



Media Settings

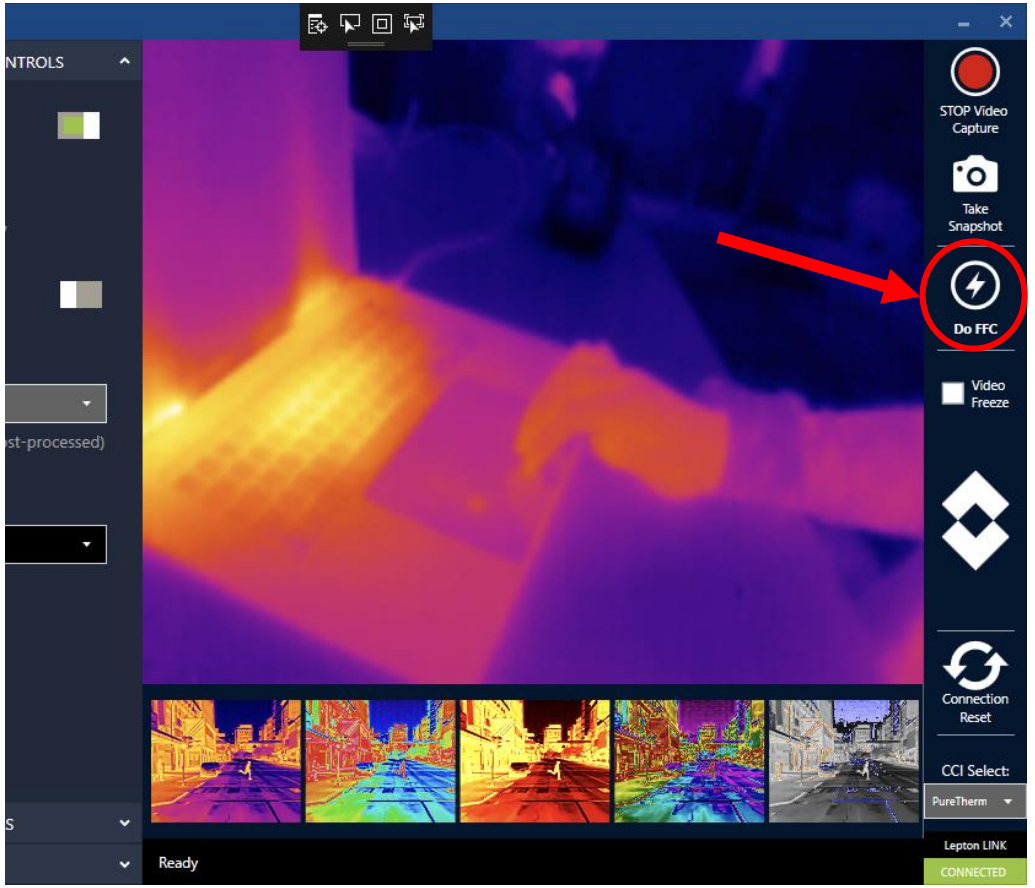
Adjusting default locations

- Video quality
  - Default is "Medium"
  - Select “High” for better video quality
- Image & Video save location
- Naming convention



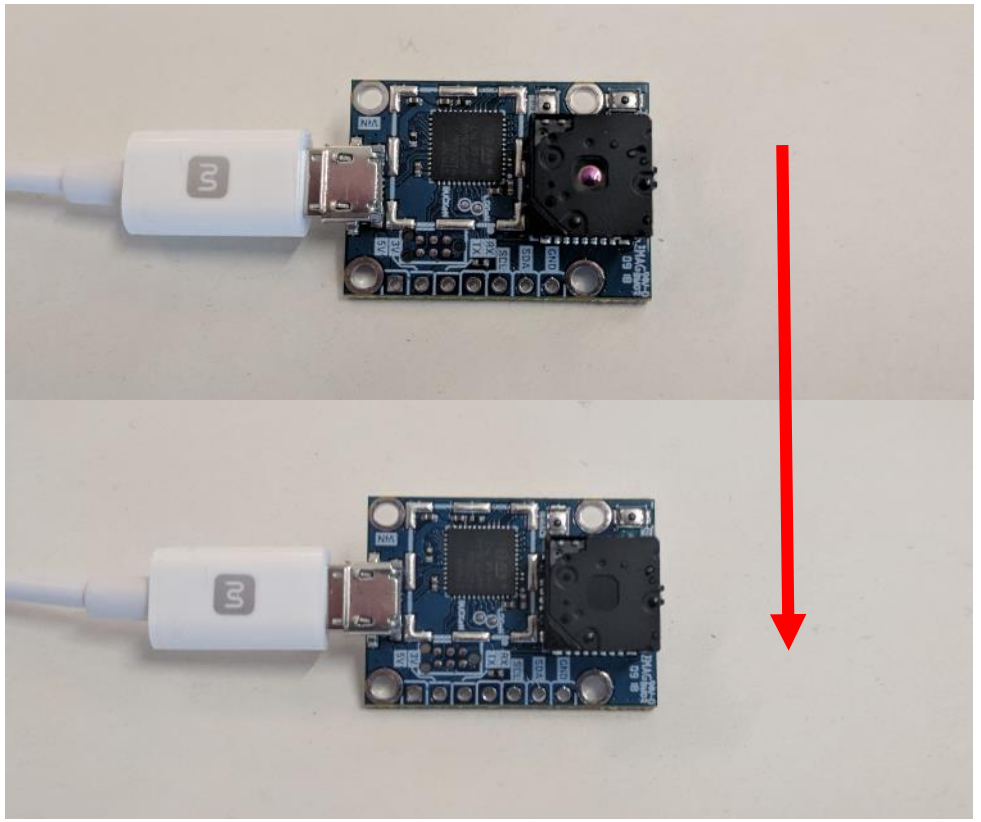
Perform a Flat Field Correction (FFC)

- FFC corrects the sensor values which slowly drift over time
- Lepton automatically performs a FFC every 3 minutes by default
- “DoFFC” performs a manual FFC



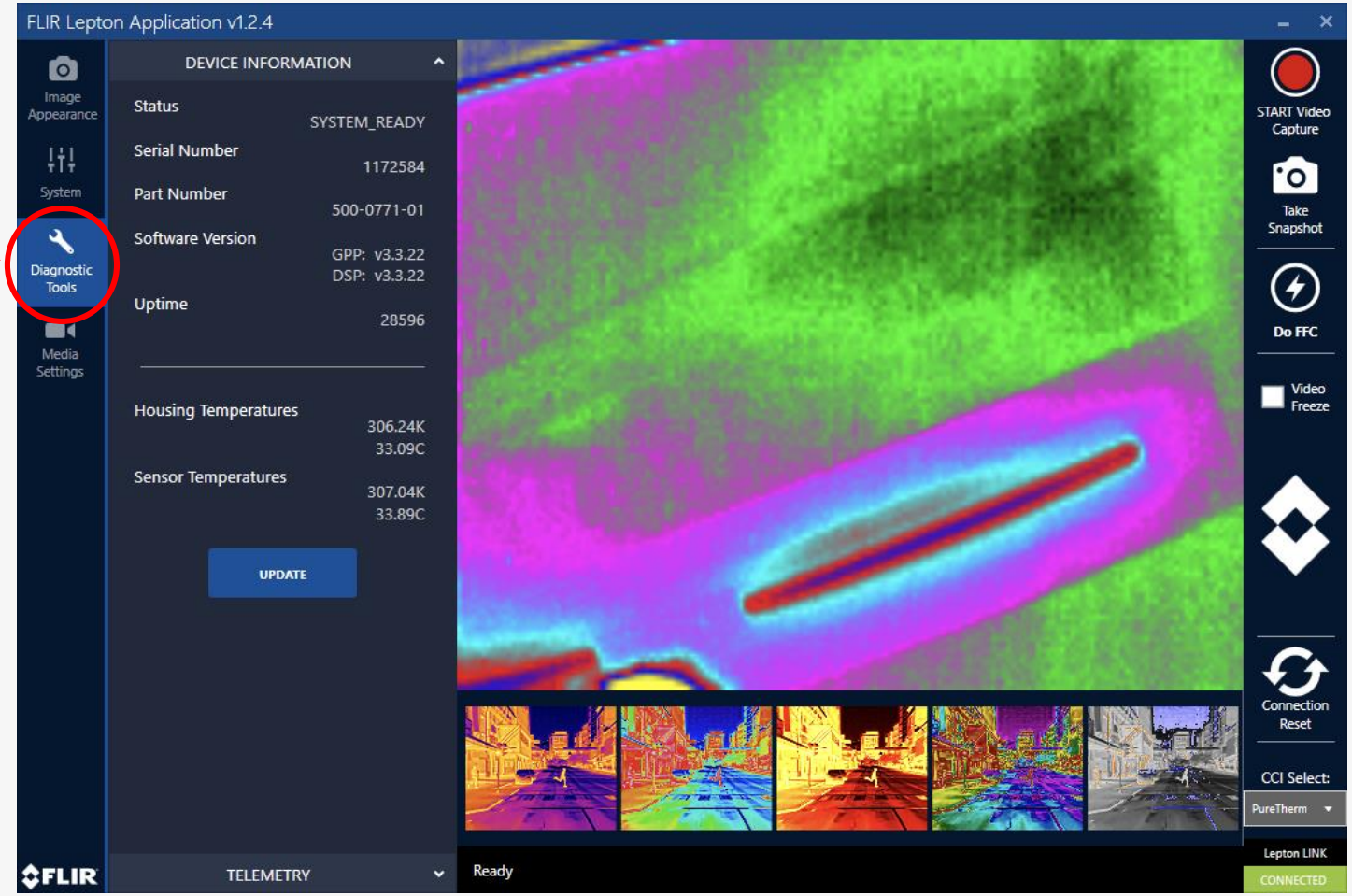
Perform an FFC: Behaviour

- The shutter closes
- Lepton makes an audible “click”
- The shutter opens
- *There is a 1-2 second video stream pause*



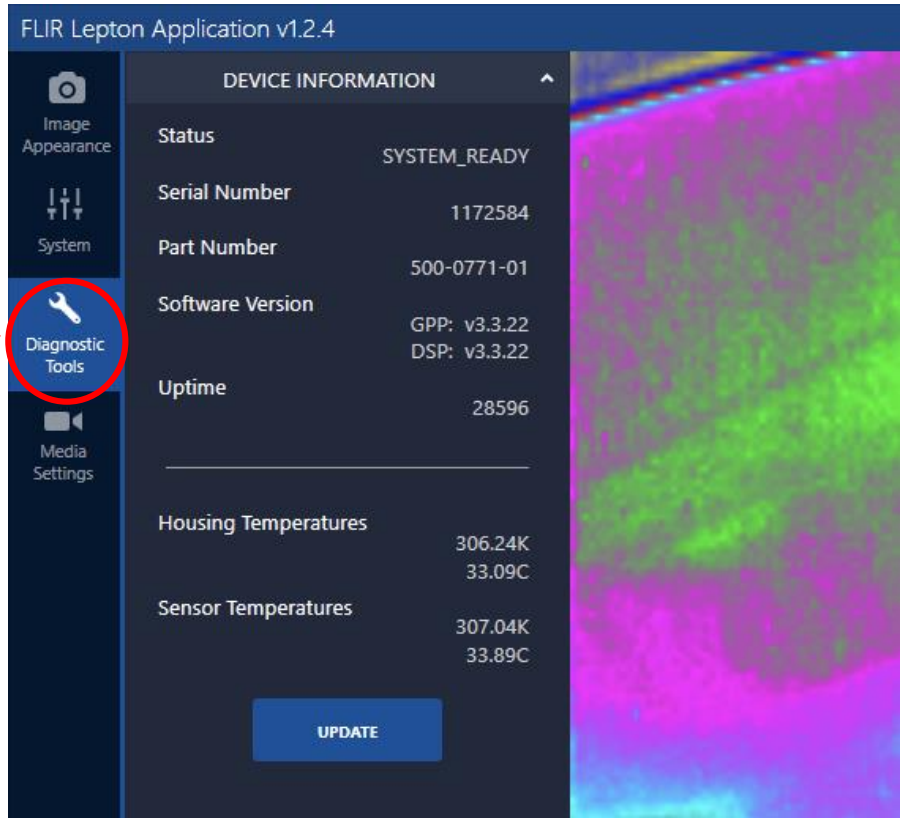
Device Information

Click “Diagnostic Tool”



Device Information

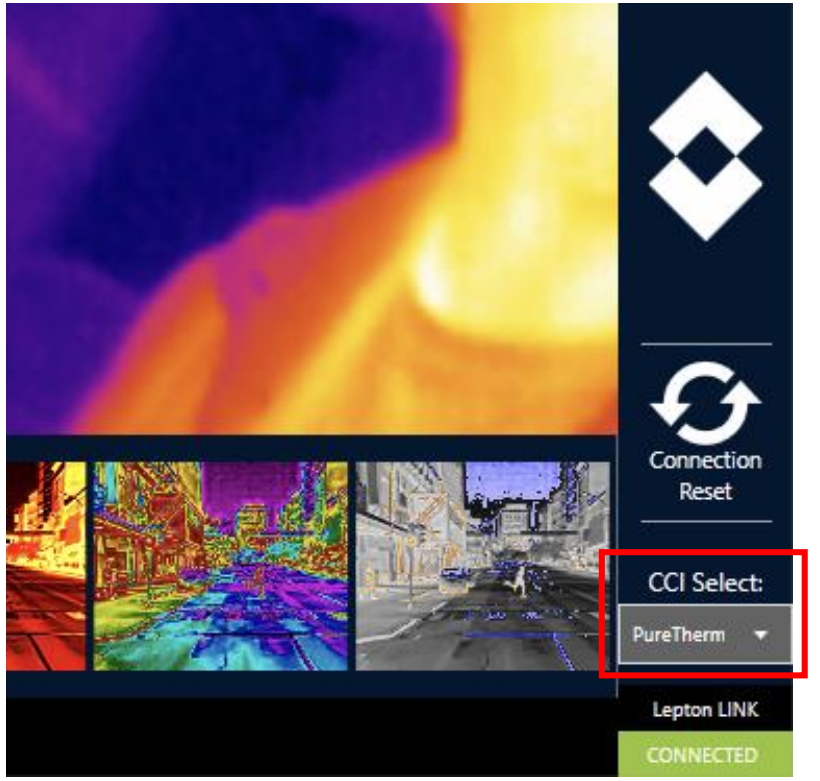
- Current status of the Lepton
- Current SW version running on your lepton Lepton
- Time that the Lepton has been running (in milliseconds)
- Housing Temperatures
- Sensor Temperatures



Command and Control & Video Interfaces

Command & Control Interface (CCI)

- Allows control over the Lepton
- Gives access to information about camera status
- A different CCI can be selected within the Lepton User App
    - *It will be automatically set when selecting a new camera feed*



Command & Control Interface: Examples

- Perform FFC
  - FFC (or *Flat Field Correction*) applies a uniform temperature to every detector element to reset correction coefficients
  - Recalibrates the pixels of the Lepton
- Check Uptime
  - Returns the running time of the Lepton
- Lepton Software Version
  - Example: *v3.3.22*
- Serial Number
- Part Number

Video Interface

There are two streaming modes

- **Colorized** mode:
  - Lepton does colorization and gain control
- **Raw** mode:
  - Lepton passes full range thermal data
  - Raw images are explained in the course "Advanced Lepton Usage on Windows"

Note: Default setting for Lepton is RAW output. However, the Lepton User App sends a command to the Lepton to switch the default mode (in the application) to colorized RGB 888 mode.

Example of Colorized mode

More Information

- Lear more about Lepton and join the conversation on our developer forum at the Lepton Developer Site
- Firmware download page
- Click here to learn more about PureThermal 2

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