

ColorIR™ EVK Camera – Quick Start Manual

Overview

Unispectral ColorIR EVK is a stand-alone multispectral camera for the NIR range. It is offered to customers for both performance evaluation and applications development. The EVK can be used for the capturing of unispectral filtered images. The image processing can be done either directly on the camera or on a PC/dedicated HW accelerator once exported via USB/Wi-Fi.

Kit Content

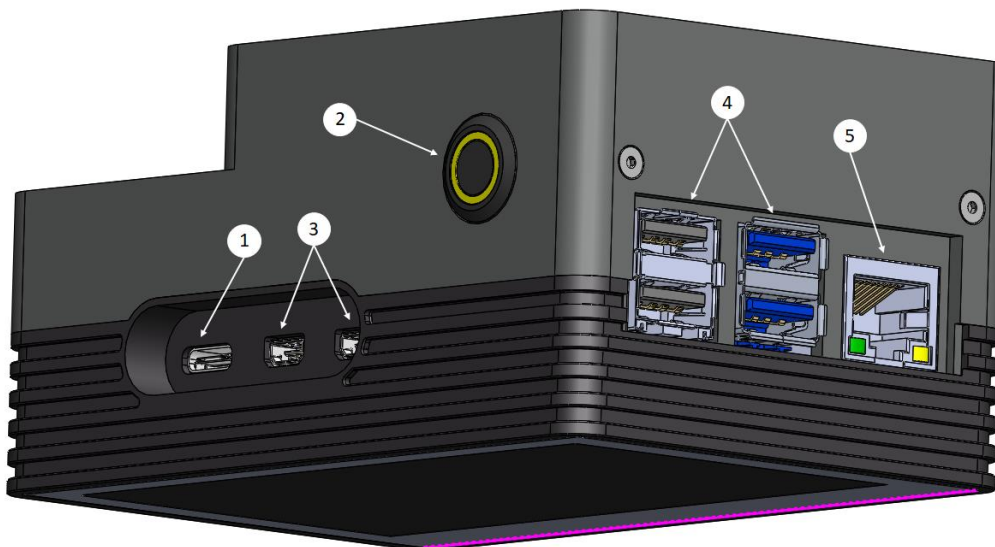
The EVK pack includes:

- ColorIR EVK Camera
- USB-C power cable
- Tripod adjustment patch

Software and Additional documentation

For additional documentation, information on the EVK software and EVK analysis add-ons go to :
<https://www.unispectral.com/product/evk/>

Ports and Controls



1. 5V DC via USB-C connector
2. ON/OFF button and status LED
3. 2 × micro HDMI ports (up to 4Kp60 supported)
4. 4× USB ports
5. Ethernet port

Basic Operations

Power ON

1. Connect the power cable to the camera via USB-C port (1).
2. Connect power cable to the wall socket.
3. Press on the ON/OFF power button (2).
4. When the camera is ON, the status LED turns orange.

Power OFF

1. Press and hold on the ON/OFF power button (2) for 2 seconds then release.
2. Status LED will turn to red and then the camera will shut down.

Toggle screens

Double click the ON/OFF button to toggle between Camera User Interface and device desktop

Getting started

User Interface

The left sidebar of the camera's graphical control panel has 6 buttons related to control screens:

1. **CAM** – Controlling the camera exposure time and gain. Different settings can be used for determining the exposure times.
2. **LED** – Controlling 4 different LEDs illumination options.
3. **BAND** – Presentation of the bands' CWL (central wavelength) and exposure time. Selection of which bands to include or exclude from the captured cube, and independently control each of their exposure times.
4. **PLAY** – Run a preview of the multispectral images.
5. **SAVE** – Saving an image at a single band or saving the entire multispectral cube to drive.
6. **PROC** – Multispectral analysis add-ons (sold separately).

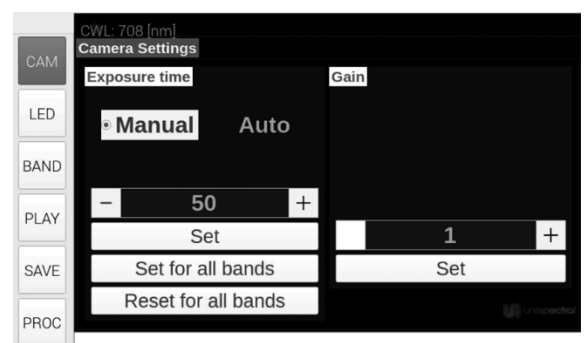


Shooting

1. **Distance:** For best results place the object 50-90 cm in front of the camera.
2. **Lighting:** Run a preview at the **PLAY** screen to make sure the object is lit at all bands.

Exposure time and gain

Adjust the exposure Time and Gain at the **CAM** screen. If the image is too dark, increase the exposure time. If the maximum exposure time is reached, increase the gain as well.



LED light control

1. Press the **LED** button on the left sidebar to open LED menu.
2. You can turn on one or two LEDs by pressing the required CWL.

Note: The LEDs are automatically turned off after saving the image. If no picture is captured LEDs remain on.

Caution: If an image is not captured, make sure to manually turn off the LEDs. If the LEDs remain ON for several minutes, the LEDs cover panel will overheat.

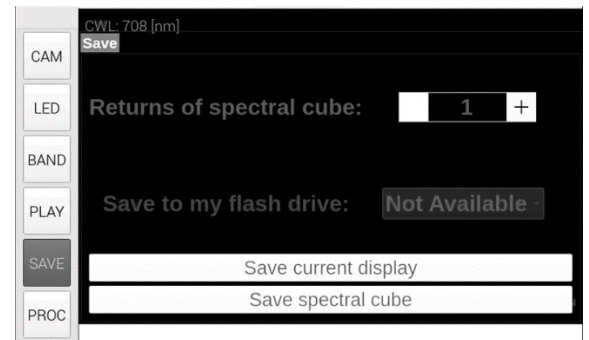


Capture multispectral images

1. Press the **SAVE** button on the left sidebar to open save menu.
2. Press the Save spectral cube button.

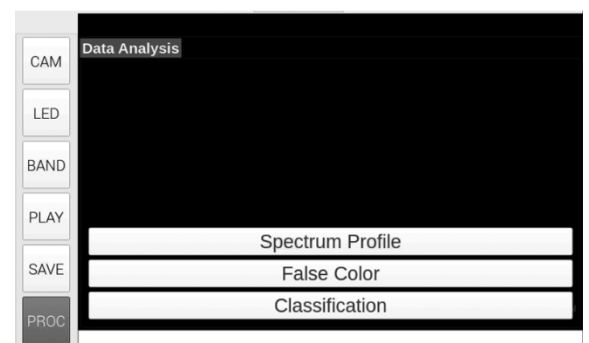
View saved images

The default directory for saved images is the Saved Images folder on the unit's desktop. Double click on the ON/OFF button to toggle between the app and desktop screens.



Multispectral Analysis

1. Press the **PROC** button on the left sidebar to open analysis menu. Choose your desired *process*.
2. Select ROI (region of interest) for processing by drawing a rectangle on the screen. Automatic ROI detection is also available for faces by selecting the Face Detection option on the next screen.
3. Press the SET button on the left sidebar.
4. Choose your desired *method* (algorithm) and additional pre-processing options if needed.
5. Press the SET button on the left sidebar.



Demo suggestions

Demo 1 – LEDs spectrum profile:

Demonstrating the spectrum profile of the 4 LEDs.

Scene setup: white/grey target with a specific LED light: 730, 810, 850, or 940.

1. Adjust the exposure time by using the camera's radiometric calibrated exposure scheme:
 - a. On the **CAM** screen press the *Reset for all bands* button.
 - b. Adjust the exposure time and press set. This will change the exposure times of all the bands but will keep the ratios between them as in the default exposure scheme. Make sure that the image in the band that fits the LED is well lit and not saturated.
2. LEDs capturing:
 - a. Save and process the image. Use process: Spectrum profile and select ROI on the target.
 - b. A graph of the average spectrum profile of the chosen area will show.
 - c. Repeat for the other LEDs.

Demo 2 – Macbeth chart:

Demonstrating the spectral profile of a colorful target.

Scene setup: use Macbeth Color Chart or any other colorful chart.

1. Use 810 + 850 LEDs or any other wideband illumination.
2. Use Auto-exposure setting on a white target placed in the middle of the image.
3. Save and process the image. Use process: False Color + method: 3 bands + check: Normalize Cube.

Demo 3 – Apples with bruises:

Demonstrating bruises detection on apples.

Scene setup: apples with bruises on a dark background.

1. Use 810 + 850 LEDs or any other wideband illumination.
2. Use Auto-exposure setting on a white target placed in the middle of the image.
3. Save and process the image. Use process: False Color + method: PCA + check: Normalize Cube + Denoise.