

# iV2 Video Capture Interface

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Hardware Reference



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# iV2 Video Capture Interface

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The iV2 iCon module connects to high-resolution USB3 cameras to record video frames synchronized with all behavioral, electrophysiology, fiber photometry, and other research data. Record video from up to two cameras simultaneously per iV2 module.

## USB3CAM Kit

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Each kit includes:

- One [Basler a2A1920-160ucBAS USB3.0](#) camera
- A 3 meter locking USB cable and camera sync cable

## Status Lights

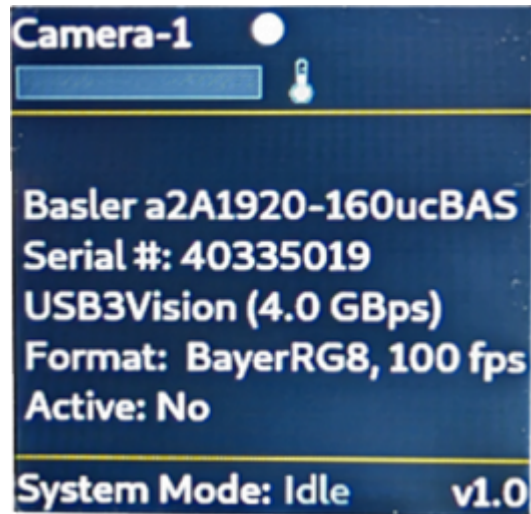
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Each camera has an Error and Active LED. All Err and Act LEDs will flash during the boot process, or if the iCon has no communication.

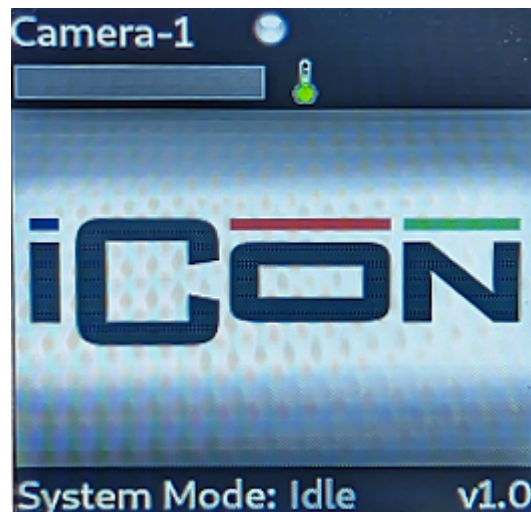
## LCD Screen

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Press the Info button to toggle between live view and camera information



*Camera Information*



*Recording Status*

## Frame Buffer

Synapse triggers asynchronous frame grabs during acquisition. The iV2 has an onboard 10 second frame buffer that allows it to catch up after periods of rapidly changing images. A small progress bar indicator on the LCD screen shows the state of this buffer. If it fills up, you will see Frame Errors in the Synapse run-time tab, indicating lost frames. The frame buffer is shared by both cameras on a each iV2.

## Temperature Indicator

Next to the status bar is a temperature sensor. Make sure the iCon housing the iV2 has adequate room to dissipate heat.

## Camera Status

LED status	Camera Status
hidden	no camera detected
gray	detected but not running
red	running with errors
yellow	running but not capturing frames
blue	running and capturing frames

## Compression

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The iV2 streams data at a fixed bit rate, determined by the Compression Quality setting in Synapse. This ranges from 1 to 5, which corresponds to 2.5 MB/minute to 22 MB/minute, so a 30-minute video is ~75 to ~660 MB depending on this setting. The actual quality of each frame (pixelation) will depend on how much movement there is in the image, like you would see with any live stream at a fixed bit rate.

Compression	MB/minute
1	2.5
2	3.7
3	7
4	14.5
5	22

The iV2 generates mp4 files with three choices of encoding: H264, H265, MJPEG. The max FPS is limited by the choice of the encoder. H264 is around twice as efficient as H265 or MJPEG without a perceived difference in quality, so you can get twice the frame rate using H264.

Examples: A single camera running on the iV2 using H264 encoding can do 1920 x 1200 @ 40 FPS, 1280 x 1024 @ 60 FPS, or 640 x 400 @ 200 FPS. If you're running two cameras per iV2

then cut those FPS numbers in half. Each camera can run at independent resolutions and frame rates.

## Camera Support

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The USB3CAM kit includes the [Basler ace 2 a2A1920-160ucBAS](#) camera. There is a "Pro" model of this camera that is also compatible with the iV2, which might give slightly higher FPS, but likely isn't necessary.

## IR Support

iV2 v1.3 and above firmware supports the [Basler ace 2 a2A1920-160umBAS](#) monochrome camera.

You can also remove the IR filter from the a2A1920-160ucBAS camera following the [instructions here](#).

## Software Updates

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In case the iV2 needs a software update, here is the procedure:

1. Copy the files provided by TDT to a USB drive.
2. Insert the USB stick into the iV2.
3. After about a minute, the iV2 will automatically update itself. The iV2 screen will indicate when it is finished.
4. Remove the USB drive, and the iV2 will reboot itself to complete the process.
5. Verify that the new software version number is correct on the iV2 screen.

## Software Control

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See the [Synapse Manual](#) for software control.